



Igor Dukeov

**ON ANTECEDENTS OF ORGANIZATIONAL INNOVATION:  
HOW THE ORGANIZATIONAL LEARNING, AGE AND  
SIZE OF A FIRM IMPACT ITS ORGANIZATIONAL  
INNOVATION**



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# Abstract

**Igor Dukeov**

**On antecedents of organizational innovation: how the organizational learning, age and size of a firm impact its organizational innovation**

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The main goal of this thesis is to increase the understanding of how a company can improve its organizational innovation performance. Organizational innovation in this thesis means innovation in management practices, workplace organization, and the external relations of a firm.

The focus was on how a firm's age and size as well as the antecedents that are considered as the components of organizational learning impact the organizational innovation in a firm. To collect the data for investigating the phenomenon in question a quantitative survey method was applied.

The data was collected in Latvia and the Central and Northwestern Economic Regions of Russia. The regression analysis and the structural equation modeling methods have been employed for the purpose of the data processing. The study provides evidence that the organizational innovation performance in a firm is exposed to the components of the organizational learning as well as to a firm's age. The main contribution of the study is the input into increasing the understanding of the theory of organizational innovation. In comparison with the previous studies in order to provide more focused research this study breaks down organizational innovation into subtypes and analyzes the last ones separately. The study also makes an attempt to compare a firm's organizational innovation in two countries at the level of specific practices. These two countries are Latvia and Russia, which are rarely in focus in the research on organizational innovation.

The results of the study can be useful for firms' managers and policymakers for better understanding how to make a company more efficient in terms of innovation performance.

**Keywords:** Organizational innovation, administration and management innovation, innovation management, organisational learning, a firm's age and size



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Igor Dukeov  
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Abstract

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## List of publications

This dissertation is based on the following papers. The rights have been granted by publishers to include the papers in dissertation.

- I. Dukeov, I., Bergman, J., Heilmann, P., Platonov, Jaschenko, V. (2018). How do a firm's age and size affect its organizational innovation? *Journal of Innovation Management*, 6, 3, pp. 97-132.
- II. Dukeov I., Bergman J.-P., Heilmann P., Nasledov A. (2020). *Impact of a firm's commitment to learning and open-mindedness on its organizational innovation among Russian manufacturing firms*. *Baltic Journal of Management*, 15, 4, pp. 551-569.
- III. Dukeov, I., Jaschenko, V., Apsalone, M., Heilmann, P. (2020). *Openness and staff training as antecedents of administration and management innovation: a cross-country study*. *Int. J. Comparative Management*, 3, 3, pp. 183-207.
- IV. Dukeov, I., Apsalone, M., Baumane-Vitolina, I., Bergman, J.-P., Sumilo, E. (2019). *A firm's organizational innovation and organizational learning abilities*. *New Challenges of Economic and Business Development – 2019: Incentives for Sustainable Economic Growth*. Riga, Latvia, pp. 251-260.
- V. Dukeov, I., Apsalone, M., Baumane-Vitolina, I., Bergman, J.-P., Sumilo, E. (2018). *A firm's organizational innovation and organizational knowledge management abilities*. *New Challenges of Economic and Business Development – 2018: Productivity and Economic Growth*. Riga, Latvia, pp. 177-187.

## Author's contribution

I am the principal author and the investigator in publications 1–5. I was also responsible for the research idea, the theoretical framework, and the conclusions of the study. The data was collected and analyzed in cooperation with the co-authors.



## Abbreviations

CEO	Chief Executive Officer
CFO	Chief Financial Officer
CIS	Community Innovation Survey
GD	Guidance Document
IMP	Innovation in management practices
IWO	Innovation in the workplace organization
IER	Innovation in external relations
IT	Information Technology
OECD	Organisation for Economic Co-operation and Development
RQ	Research question
SQ	Sub-question



## 1 Introduction

The main goal of this thesis is to increase the understanding of the phenomena associated with organizational innovation in a company. By organizational innovation this thesis means innovation in management practices, workplace organization, and external relations of a firm. The focus was made on exploring what impact some antecedents of physical nature like a firm's age and size as well as ones that can be considered as organizational learning components have on organizational innovation. Additionally, this thesis aims to inform managers of how to increase the efficiency of a company in terms of introducing organizational innovation.

Each enterprise that has innovation strategy development as a strategic goal should consider the external business environment as a system that tends to change continuously (Bergman et al., 2006). According to Damanpour (1992) to enable a company to adapt dynamically to these changes assumes introducing innovations in products, processes, marketing, or management. Thus, many companies consider innovation management as a significant part of their overall strategy (Wang & Ahmed, 2004; Forsman, 2009; Nandakumar et al., 2011). In the process of innovation various types of innovation are usually strongly interrelated. The innovation related to technology are supported by innovation in the area of management and marketing (Henderson & Clark, 1990; Dougherty, 1993; Danneels, 2002; Aragón-Correa, et al., 2007; Armbruster et al., 2008) creating a non-technological competitive advantage in the firm (Geels & Schot, 2007; Lokshin et al., 2009). As it comes to management and marketing innovation they would not work well as such without product and process innovation underlying them (Damanpour & Wischnevsky, 2006).

Since Shumpeter's (1912/1934) proposed his taxonomy of innovation deterring a change in organization's structure as an innovation various research on that topic has been conducted. Many studies (e.g., Rosenbusch et al., 2011; Bradley et al. 2012) have shown that innovation in organizational structures and management approaches take a considerable place in a company's development in general and, in particular, in the context of development other types of innovation. However, many related concepts are still missing a scientific explanation as well as high degree of inconsistency in results can characterize the current state of affairs in this area (Damanpour & Wischnevsky, 2006). Thus, more studies needed to explain the impact of a firm's characteristics on innovation of non-technological nature (Camisón & Villar-López, 2014).

In this regard the studies on antecedents of organizational innovation have always been popular among scholars (Greice et al., 2012). Among those studies ones that devoted to investigation of the impact of physical characteristics of a firm like its age and size attract interest of many researchers (e.g., Gopalakrishnan & Damanpour, 2000; Heimonen, 2012). However, despite of some research in this area the relationship between a firm's age and size and its organizational innovation was not covered in the literature as broadly as for the product and process innovation. The results of many studies are in inconsistency and the problem is needed to be further explored

(Damanpour, 1991; Wolfe, 1994; Van de Ven et al., 2000). This thesis investigates the problem on how a firm's age and size impact the organizational innovation of a firm.

The second problem that was studied in the thesis is the impact of several non-physical antecedents on organizational innovation. In this context a number of constructs associated with a firm's organizational learning have been investigated. Great deal of studies was devoted to the relationship between a company's organizational innovation and the organizational learning. Most of these studies have found the positive relation between the processes that involve innovation and a firm's organizational learning system (e.g., Sinkula et al., 1997; Calantone et al., 2002; Griese et al., 2012; Brix, 2017, 2019a; Morland et al., 2019; Peronard & Brix, 2019; Patky, 2020). And again, the most of these studies consider the relation based on the empirical data obtained in the context of innovation related to product or process (Delgado & Verde et al., 2011). Thus, the aim of this thesis is obtaining additional knowledge on how organizational innovation is influenced by organizational learning.

The third research topic of this thesis is to attempt providing a comparison of organizational innovation performance of organizations in different countries. There is a consensus among scholars that the way of how business is usually run in a country depends strongly on specific characteristics of the business environment of the country (Senge, 1990; Argote, 1999) and cannot be considered out of the cultural and institutional context of that country (Hutchings & Michailova, 2006). In this regard the thesis undertakes the effort to find the difference in companies' behavior towards organizational innovation in Russia and Latvia.

The thesis explores the above mentioned research problems based on the data collected in Russia and Latvia.

## 2 The main concepts

In this chapter the main concepts of the study are presented. In this dissertation this involves organizational innovation and its subtypes, namely 1) innovation in management practices; 2) innovation in workplace organization; 3) innovation in external relations. Then the positioning of the study and the research gap are described. At the end of the chapter the list of publications along with the author's contribution is presented.

### 2.1 Organizational innovation

The scholars seem to be in consensus that Joseph Schumpeter (Schumpeter, 1912/1934) was the first to suggest the term "new industrial organization" as one of the five types of innovation, besides the four others such as the introduction of new goods, the introduction of new methods of production, the implementation of a new supply source of raw materials or half-manufactured goods usage, and the opening of new markets.

However, after Schumpeter's study the type of innovation associated with the implantation of new organizational forms or new approaches in management researched only occasionally until the mid-1960s (Klette & Kortum, 2004). As an example, the study by Trist & Bamforth (1951) can be mentioned which argues that new ways of organizing the work of employees in a firm and changing their job responsibility supports an increase in the overall performance of the organization. About ten years later a study by Burns & Stalker (1961) devoted to investigating management approaches in a company suggests that an approach in management that is associated with less bureaucracy is more suitable for a fast-changing environment. Gradually the distinction between innovation in the area of technology and the area of organizational change was becoming clearer due to the increasing number of studies on non-technological innovation (e.g., Evan & Black, 1967).

Studies that appear during the later period, especially during the 1980s and 1990s, have suggested various terminology and definitions for a type of innovation that did not deal directly with a product or a technology. It was called organizational innovation, management innovation, administrative innovation, or managerial innovation (e.g., Hage & Aiken, 1970; Daft, 1978; Kimberly, 1981; Damanpour, 1991; Wijnberg, 2004; Lam, 2005; Birkinshaw et al., 2008; Mothe & Nguyen Thi, 2010). In this vein, several studies (e.g., Kimberly, 1981; Etlie & Reza, 1992, Damanpour, 1996) suggested considering innovation dealing with a process, a product, or an attribute of an organization as an independent type of innovation and discussed how organizational innovation should be defined. Later a discussion was initiated in the literature on how radical an organizational innovation must be. In this context, for example, Hamel (2006) suggested that an organizational innovation should be significantly different from the current approach in management, whereas Birkinshaw et al. (2008) noted that a change should be new to the state of the art.

In parallel to the research work on innovation and as an integration of the knowledge accumulated by scholars elaborating the innovation theory the OECD/GD (1992) released the first edition of the “Oslo Manual” defining the terminology and discussing the problem of measuring innovation. The first edition was focused only on product and process innovation. In 2005 the third edition of the “Oslo Manual” was released which proposed the term “organizational innovation” and defined it in the following way: “An organizational innovation is the implementation of a new organizational method in the firm business practices, workplace organization or external relations,” (OECD-Eurostat, 2005, p.51).

As OECD-Eurostat (2005) states, organizational innovation should increase a company’s performance by improving the quality of the management system. The introduction of organizational innovation must also reduce transactional and administrative costs and make the productivity of labour more efficient, increase satisfaction in working places, as well as make it easier access assets that are non-tradable such as external and internal knowledge that is non-codified. For a change to be considered an organizational innovation it should take place in an organization for the first time and the firm’s strategy must underlie it (Tidd & Bessant, 2021).

Because organizational innovation introduced in a firm is based on the specific organizational structure of the firm in question, another firm cannot directly copy it (Barney et al., 2001; Lam, 2005). This makes organizational innovation an effective tool for creating competitive strengths because organizational structures are often crucial elements for efficient business performance (Porter, 1985; Wright et.al., 1994; Bierly et al., 2000; Barney et al., 2001; Wolfe et al., 2006; Armbruster et al., 2008).

Many studies (e.g., Damanpour, 1987, 1991, 1996, 2010, 2014; Damanpour & Gopalakrishnan, 2001; Birkinshaw & Mol, 2006; Birkinshaw et al., 2008; Beblavý et al., 2012; Damanpour & Aravind 2012; Amarakoon et.al., 2016) have developed the theoretical framework further for the organizational innovation concept and have demonstrated the potential positive effect that a firm might have concentrating systematically on introducing organizational innovation. Nevertheless, in practice it is not often that a company deliberately includes organizational innovation in its operational and strategic plan, and if it does the scope of efforts devoted its introduction varies broadly (Oeij et al., 2011).

This study considers organizational innovation as an implementation in a firm a new or significantly improved 1) business practice, 2) workplace organization, or similarly new or improved 3) external relations.

## 2.2 Subtypes of organizational innovation

Organizational innovation is a complex concept that some scholars have broken down into a few specific innovation subtypes (e.g., Battisti & Stoneman, 2010; Camisón & Villar-López, 2010, 2011, 2014; Mothe & Nguyen Thi, 2010). However, many studies

(e.g., Murphy, 2002; Camisón & Villar-lópez, 2010, 2011, 2014; Gunday et al., 2011) are grounded on a taxonomy that recognizes three subtypes of organizational innovation, notably, innovation in business practices, innovation in workplace organization, and innovation in external relations. In 2005 this taxonomy was proposed by OECD-Eurostat (2005) as a recommended standard for measuring innovation in European countries. Thus, for example, in their study Camisón & Villar-lópez (2011, 2014) proposed three dimensions of organizational innovation and suggest that each of these dimensions can be measured by means of three indicators.

However, the 2018 edition of the OECD-Eurostat innovation measuring standard (OECD-Eurostat, 2018) proposes the further evolution of both the terminology and taxonomy. In this document organizational innovation was titled “administration and management innovation” and it was suggested to consider it in more narrow categories. Since the updated taxonomy was proposed relatively recently, it has not yet been broadly used in the literature so far.

### 2.2.1 Innovation in management practices

Innovation in management practices (IMP) is a subtype of organizational innovation and implies new for a firm methods that are focused on re-organizing work routines by changing or introducing management processes and procedures (OECD-Eurostat, 2005; Murphy, 2002). IMP is highly important to knowledge generation and dissemination processes in a firm (Montoro- Sánchez, 2011). The initial implementation and further development of management approaches such as, Lean Production, the Theory of Constraints, Total Quality Management, Six Sigma, Kaizen, the Just-in-Time approach are considered IMP (OECD-Eurostat 2005). Typically, they are implemented as a firm matures (Temtime, 2003).

IMP also means the first implementation of knowledge management techniques, for example a system for codifying knowledge, e.g., “establishing databases of best practices, lessons and other knowledge, so that they are more easily accessible to others” (OECD-Eurostat, 2005, p.51). The usage of practices related to knowledge management increase a firm’s competitiveness and its ability to innovate in general. The last in turn opens new opportunities to intensify organizational innovation (Prahalad & Hamel, 1990; Nonaka & Takeuchi, 1995; Grant, 1996; Spicer & Sadler-Smith, 2006).

An innovation in human resource management is also considered IMP (Laursen & Mahnke, 2001). Since IMP assumes implementing new elements of a company’s behaviour or, in other words, new procedures it is sometimes also referred to as procedural organizational innovation (Som et al., 2012). The majority of research on specific IMP innovation, for example innovation related to the Total Quality Management approach, suggests their positive relation with a firm’s overall performance (Crosby, 1980; Deming, 1986; Hendricks & Singhal, 1996; Hendricks & Singhal, 1997; Douglas & Judge, 2001; Brah et al., 2002; Sharma, 2006).

### 2.2.2 Innovation in the workplace organization

Innovation in the workplace organization (IWO) is the next subtype of organizational innovation and this refers to the introduction of methods aimed at employees' work organization, for example re-organizing a firm's structure, business processes integration, decentralization or centralization (OECD-Eurostat, 2005). IWO attracted the attention of scholars from around beginning of 1990s (e.g., Lawler et al., 1992; Appelbaum & Batt, 1994; Osterman, 1994). IWO focuses on increasing the overall efficiency of the organization through employee empowerment (Ichniowski et al., 1997; Cappelli & Neumark, 2001; Mothe & Nguyen Thi, 2010). Any forms of integration or diversification, changes in a firm's department functions or structure, the lines of accountability and responsibilities, the way of receiving and disseminating knowledge can be considered IWO (OECD-Eurostat, 2005). Guest (1987) suggests that a workplace innovation that gives employees more autonomy has a positive impact on the employees' commitment to working. In line with this, OECD-Eurostat (2005, p.52) proposes an example of workplace innovation as "the first implementation of an organizational model that gives the firm's employees greater autonomy in decision making and encourages them to contribute their ideas." Another examples of workplace innovation can be various of motivation approaches (Kochan & Osterman, 1994; Osterman, 1994) continuous rotation, changes in working hours such as flexibility in working schedule, remote working approaches (Chaykowski & Verma, 1992), and organizing project groups (Appelbaum & Batt, 1994). In several studies (e.g., Mothe & Nguyen Thi, 2010) considerable positive relations between IWO and the propensity of a firm to perform well have been reported.

### 2.2.3 Innovation in external relations

Innovation in external relations (IER) deals with developing relations with entities outside the firm such as customers, suppliers, other firms, public institutions, or research organizations (OECD-Eurostat, 2005). To be an IER the innovation must increase the efficiency of the firm's performance. This means "new ways of building relations with a firm's external environment. This includes "implementation of new ways of organising relations with other firms or public institutions, such as the establishment of new types of collaborations with research organisations or customers, new methods of integration with suppliers, and the outsourcing or subcontracting for the first time of business activities in production, procuring, distribution, recruiting and ancillary services" (OECD-EUROSTAT, 2005, p.53). IER is a tool that a company can use to multiply the scale and scope effect, achieve synergy with its external commercial partners and government and non-government organizations in the area of the main activity and the management (Jacquemin, 1988; Kogut, 1988; Kogut & Zander, 1993; Sakakibara 1997, 2001; Cassiman & Veugelers, 2002; Heidenreich, 2009; Rammer et al., 2009). This suggests that the introduction of IER reduces risks of venture projects and increases the efficiency of R&D and knowledge absorption. The activity in IER indicates how well the firm uses its networking abilities and hence it characterizes the intensity of the potential knowledge flow between the firm and external environment

(Arora & Gambardella, 1990; Mothe & Nguyen Thi, 2010; Sapprasert & Clausen, 2012). In this context, Lööf & Heshmati (2002) and Belderbos et al. (2004) argue that IER related to the development of a firm's cooperation with universities has a positive effect on the firm's overall performance. The development of IER in the sphere of customer relations (Klomp & van Leeuwen, 2001; Kärkkäinen & Elfvengren, 2002; Hogan et al. 2002; Kärkkäinen et al., 2003; Mithas et al. 2005; Williams, 2006) and with suppliers (Scannell et al., 2000) can be also characterized by a positive influence on the organization's performance indicators. However, there is some inconsistency in the research results. Thus, Mothe & Nguyen Thi (2010), for example, reported a negative trend in the effects of IER related to supplier change on a firm's overall performance.

### 2.3 Positioning of the study

The literature on innovation suggests that the first definition of innovation was given by Joseph Schumpeter more than a hundred years ago. Schumpeter refers to innovation as a development and implementation of new products, new processes, new services, new markets, and new organizations (Schumpeter, 1912/1934). Since Schumpeter proposed his definition, many others appeared.

Twiss, (1989) characterized innovation as a combination of management, economics, technology, and science. A focus on the incorporation of new knowledge into the end product or service in order to generate an innovation was proposed by Afuah (1998). Social aspects of innovation were emphasized by Drucker (1992). In their study devoted to definitions of innovation Baregheh et al. (2009) proposed an aggregated one based on the literature they analyzed. They defined innovation as a transformation of a firm ideas into new product or processes.

However, a definition of innovation implies that an innovation must have some novelty and as an end result increase the competitive advantage of a firm (Baregheh et al., 2009; Afuah, 1992). This novelty attribute of innovation can appear at various levels. It can be at the level of a firm, industry, economy, or even be global (Edison et al., 2014). By implementing theoretical knowledge of innovation the management of a firm can commercialize ideas (Kelly & Kranzburg, 1978; Clark, 1980).

Besides Schumpeter's (Schumpeter, 1912/1934) classification of innovation, scholars have proposed other classifications. In this context, for example, Henderson et al (1990) suggested breaking down innovation into four types: 1) radical innovation, 2) incremental innovation, 3) architectural innovation, and 4) modular innovation. Afuah (1998) proposed to consider technological (product, process, and service) innovation, market (price, place, promotion) innovation, and administrative (strategy, structure, systems, people) innovation. In line with Afua's classification many studies (e.g., Battisti & Stoneman, 2010; Camisón & Villar-López, 2010, 2011, 2014; Eurostat, 2011) follow the framework proposed by the OECD/Eurostat (2005) that suggests four main categories of innovation. These are: 1) product innovation, 2) process innovation, 3)

organizational innovation, and 4) marketing innovation. However, in this dissertation only organizational innovation is considered. After Joseph Schumpeter released his first book suggesting the first taxonomy of innovation (Schumpeter, 1912/1934), studies investigating various aspects of innovation have mostly focused on technological innovation covering organizational innovation problem by scarce research (Abernathy & Clark, 1985; Armbruster et al., 2008; Damanpour, & Schneider, 2008; Damanpour & Aravind, 2012; Freeman & Soete, 2012; Keupp et al., 2011; Dubouloz, 2013; Černe et al., 2016). Up until the beginning of the 1980s the studies investigating the organizational innovation topic (e.g., Daft, 1978) appeared only occasionally. In this context this thesis deals only with investigating organizational innovation of all the research on innovation.

The studies on organizational innovation can be classified using different approaches. One of them is to break down the studies into two large areas based on the method employed. Qualitative and quantitative methods underlie this classification. The studies that belong to qualitative studies compose the first group. Usually, specific cases describing the implementation of a single management practice and its effect underlie the studies of this group (e.g., Foss, 2003; Kanigel, 2005; Birkinshaw & Mol, 2006; Chesbrough, 2006; Hamel, 2006; Huston & Sakkab, 2006; Birkinshaw, et al., 2007; Yeh & Chou, 2007). Several scholars (e.g., Ganter & Hecker, 2016) have criticised this approach bringing forth the argument that it seems to be hard to aggregate the results of the studies and that each of them deals with a very narrow research perspective.

As for the second area it covers studies that are based on proposing various models describing the phenomenon of organizational innovation and often employs econometric calculations to estimate the values of the relationship between the given constructs. The data for the studies belonging to the second group is collected from a sample of companies (e.g., Tether & Tajar, 2008; Damanpour et al., 2009; Mol & Birkinshaw, 2009; Battisti & Stoneman, 2010; Evangelista & Vezzani, 2010, 2012; Wischnevsky et al., 2011; Vaccaro et al., 2012; Ganter & Hecker, 2013; Ganter & Hecker, 2016). These studies investigate the problem at a more general level and can provide more knowledge on antecedents of organizational innovation or organizational innovation performance (Ichniowski et al., 1997; Cappelli & Neumark, 2001; Hung et al., 2011).

The main directions of the studies on organizational innovation can also provide other grounds for their further classification. First, one of the areas of these studies deals with the key notions in general. These studies discuss the essence of the concept (Damanpour et al., 2009; Damanpour, 2010, 2014; Damanpour & Aravind, 2012), as well as the possibility of applying the concept at both the empirical or the conceptual levels (Birkinshaw et al., 2008; Walker et al., 2015) and explore the characteristics of organizational innovation (Ansari et al., 2010; Ansari et al., 2014; Meuer, 2014).

The next area of studies focuses on the performance of an organization (Sapprasert & Clausen, 2012; Gallego et al., 2013; Perez-Luno et al., 2014; Hervas-Oliver et al., 2016;

Nieves, 2016). These studies consider how the processes of introduction and adaptation of organizational innovation influence a firm's performance. Some of the studies investigate business-related environmental antecedents that are elements of a firm's macro- and micro-environment (Ganter & Hecker, 2013). These elements can relate, for example, to competitors, suppliers, customers, legislation, technology, and economics (Damanpour & Schneider, 2006). The studies in this area assume that a firm reacts to changes in its environment by introducing innovation (Kim & Lui, 2015; Damanpour & Schneider, 2006). Studies that focus on managerial antecedents of innovation investigate how managerial behaviour and attitudes can increase efficiency by introducing organizational innovation in a firm (Santos-Vijande & Álvarez-González, 2007, Rezvani, et al., 2017).

One more area of the research on organizational innovation is centred on the resource-based view and considers how a firm may introduce organizational innovation by developing various resources (Camison & Villar Lopez, 2010; Daugherty et al., 2011). According to Damanpour & Aravind (2012), resourced-based factors are crucial for a firm's innovation activities as they might foster or constrain innovation. Khosravi et al. (2019) identified the following crucial factors that can be considered in the context of their relation to organizational innovation: organizational structure and strategy, knowledge management and learning, human resource management, organizational culture, dynamic capabilities, networks, resources, and ambidexterity.

Several studies elaborate knowledge in relation to organizational innovation and a firm's dynamic capabilities (García-Morales et al., 2007), ambidexterity (Lloréns-Montes, et al., 2005; Grover et al., 2007; Birkinshaw, 2009; Mol & Birkinshaw, 2009; Eng & Okten, 2011; Camison & Villar-Lopez, 2011; Gebauer, 2011; 2014; Tan & Nasurdin, 2011; Prajogo & Mcdermott, 2014; Dieguez-Soto et al., 2016; Pino et al., 2016; Lin et al., 2017), knowledge management (Tang & Murphy, 2012; Perez-Luno et al., 2014; Mariano & Casey, 2015; Wubben et al., 2015; Lichtenthaler, 2016), organizational learning (García-Morales et al., 2008; 2011; Rhee et al., 2010; Bolívar-Ramos et al., 2012; Kim et al., 2012; Wong et al., 2013), human resources (Seifried & Katz, 2015; Prasad & Junni, 2016), and a firm's age and size (Damanpour & Schneider, 2006; Ganter & Hecker, 2013).

From the research areas listed above the focus in this dissertation was on further investigation of relations between a firm's organizational innovation performance and its age, size and organizational learning dimensions. The framework of the study is presented in Fig. 1.

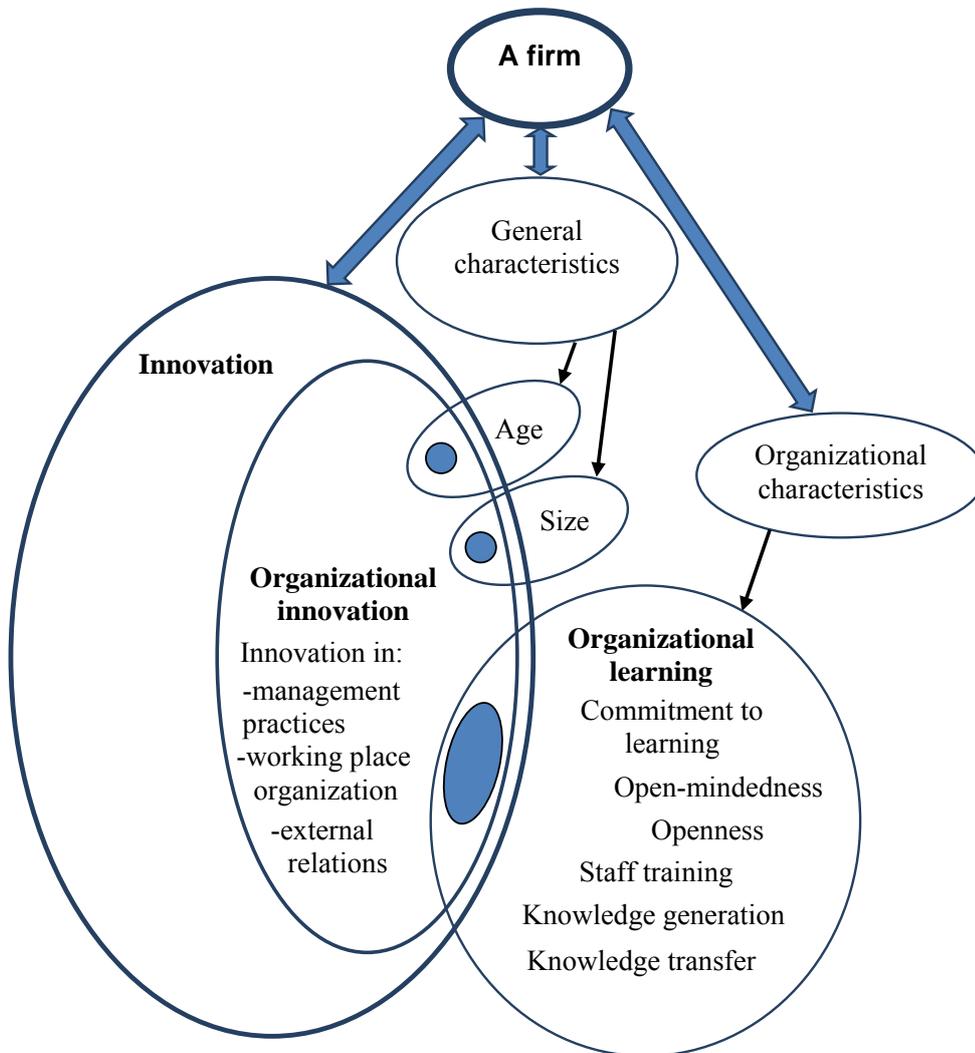


Fig.1. The framework of the study

In the literature there can be found many studies that provide evidence of both the positive and negative impact of a firm's age and size. At the same time, not many of them investigate the problem at the level of organizational innovation subtypes, for

example, at the level of a managerial practice. Another conclusion that can be derived from the literature analysis is that knowledge on the relationship between a firm's age and size is quite ambiguous. There is a shared opinion among scholars that more research in this area is needed. Further discussion on the studies dealing with a firm's organizational innovation and its age and size is given in following sections.

Investigation of the relationship between innovation and organizational learning in firms has received large coverage in various studies both in the literature devoted to innovation and in the literature focused on organizational learning. However, more empirical data is in demand in this area of studies (Lopez, et.al., 2005). At the same time, several studies associate organizational learning with gaining a competitive advantage by firms, and therefore, with innovation performance efficiency (Lopez, Peon, & Ordas, 2005; Lampela & Karkkainen, 2008). For example, in the context of organizational innovation, evolving organizational learning in an organization often involves new organizational structures (Crossan & Berdrow, 2003) or business models (Lampela, 2017). Further discussion on studies dealing with a firm's organizational innovation and organizational learning is provided in the following sections.

## **2.4 Research gap, objectives, and research questions**

This thesis aims to capture the complex and interdisciplinary phenomenon of organizational innovation. Based on the literature streams mentioned above and that suggest that an organization should continuously develop the existing resources and technological and organizational processes (e.g., Barney et al., 2001; Damanpour & Aravind, 2012), the study employs statistical methods and develops further knowledge on crucial enabling factors for introducing organizational innovation in a firm. In the frame of the study the investigated factors include: 1) the physical characteristics of the firm, such as the firm's size and age, 2) the dimensions of organizational learning, and 3) elements of the external context such as the country where the firm operates.

The thesis intends to provide new information to fill the gap in integrative studies related to the relation between organizational antecedents and organizational innovation in general and, in particular, what impact these antecedents have on the subtypes of organizational innovation. Additionally, this thesis aims to inform managers of how to increase the efficiency of a company in terms of introducing organizational innovation.

The survey based research in the field of innovation often examines whether an organizational innovation or its subtype was applied within a certain time frame. This approach can be found in the studies by Armbruster et al. (2008), Battisti & Stoneman (2010), and Evangelista & Vezzani (2010, 2012), for example. There was an attempt made in this study to overcome this constraint by seeking to compare innovation in comparison with competitors similarly to the approach applied in studies by Camisón & Villar-López (2010, 2011, 2014).

Several scholars (Meyer & Goes, 1988; Wolfe, 1994; Chaminade & Edquist, 2006) claim that relations between organizational innovation and its various antecedents are not well researched. These antecedents could have different impacts in different cultural contexts (Balabanova et al., 2018). The existing studies do not provide a comprehensive picture of the phenomenon of organizational innovation and in many areas there is a lack of consistency between them. There is a reason underling this fact. The literature on innovation historically has been very much focused on technological innovation (Abernathy & Clark, 1985) leaving the organizational innovation topic beyond the realm of intensive research. This has provoked scholars investigating innovation to criticise the imbalance of research on innovation which seems largely to be in favour of product and process innovation (Freeman & Soete, 2012; Damanpour (2014).

The organizational innovation theory lacks studies focused on the relationships between a firm's characteristics and organizational innovation (Camisón & Villar-López, 2014; Alabbas & Abdel-Razek, 2016) and these need to be further researched (Koren & Palcic, 2015). The findings provided by existing studies in many respects are not comprehensive or are controversial (DeTienne & Koberg, 2002) because many of them do not define the types of innovation under consideration or are not specific in their conclusions (Drazin & Schoonhoven, 1996; Gopalakrishnan & Damanpour, 1997). The subtypes of organizational innovation differ in many aspects and for this reason each of them should be considered separately (Gopalakrishnan & Damanpour, 1997; Camisón & Villar-López, 2010, 2011, 2014).

Thus, there is not a sufficient number of studies to fill the gap in lacking generally accepted terminology, sets of metrics, or definitions (Lam, 2005). Despite the intensity of studies in the last two decades devoted to organizational innovation (e.g., Birkinshaw et al., 2008; Damanpour et al., 2009; Damanpour & Aravind, 2012; Amarakoon et al., 2016), the demand for further elaboration and research in the area of organizational innovation is still very high (Guest, 2011). Therefore, the first research gap is the insufficient amount of research on organizational innovation and dissertation attempts to fill in this gap by delivering further knowledge on the factors that have an impact on organizational innovation.

Even though many studies focus on a specific type of organizational innovation, there are not many studies that elaborate on the comparison of organizational innovation subtypes which manifest themselves as constructs of the same phenomenon. The studies by, for example, Murphy (2002) and Camisón & Villar-López, (2010, 2011,2014) can be mentioned as one of those that considers subtypes of organizational innovation. Their research investigates the problem of organizational innovation by breaking it down into three subtypes. The first subtype is described as “new business practices for organizing procedures”; the second is, “new methods of organizing work responsibilities and decision making”, and the third one “new methods of organizing external relations”. However, the study considers the subtypes of organizational innovation in the context their introduction frequency by companies and does not investigate their impact on other activities of the firm. Thus, the second research gap relates to the lack of

knowledge on how the specific subtypes of organizational innovation are influenced by a firm's physical and organizational characteristics.

The third research gap lies in fact that the majority of the current studies deal with samples of organizations operating in one country. This means that they function in the same business environment. However, the behaviour of management is to some extent a derivative of the business environment, which depends on a national culture. In this regard Evangelista & Vezzani (2012) demonstrated that the rate of introducing organizational innovation and its subtypes varies broadly from country to country.

The general aim of this thesis is to increase the understanding of the interconnection between organizational innovation subtypes and a firm's physical and organizational characteristics. In this thesis the physical characteristics are limited by age and size of a firm and the organizational characteristics are limited mostly by organizational learning dimensions.

The first goal is to generate new knowledge for academia, as there is still scarce research on organizational innovation. The second goal is to provide some practical implementation ideas for the strategic management of a firm that would facilitate decision making processes in the area of innovation management. The third goal is to expand the vision of policymakers on concerning how to achieve business sustainability by providing additional knowledge on how organizational innovation can be managed.

Hence, the main research question (RQ) for this thesis is as follows:

**RQ: What is the impact of age, size and the antecedents associated with organizational learning on organizational innovation performance in a firm?**

The main research question is divided into three sub-questions (SQ) which investigate the problem in a few various contexts. The SQs are studied in five research publications which cover the SQs and the general RQ as the core question.

The first sub-question deals with understanding what impact a firm's size and age have on its organizational innovation. The assumption underlying the investigating of the first sub-question is that the size and age of a firm have an impact on introducing each of its organizational innovation subtypes (Blau & McKinley, 1979; Scott & Bruce, 1987; Damanpour, 1996; Churchill, 2000; Camisón-Zornoza et al., 2004). The data set for the study was gained from companies located in the west and central regions of Russia. The first publication employs a quantitative approach to find the dependence of a firm's organizational innovation subtypes on its size and age.

Thus, the first SQ relates to the interconnection between the organizational innovation intensity in a firm and its physical characteristics.

**SQ1: What is the relationship between a firm's organizational innovation performance and its age and size?**

While the first sub-question deals with understanding the physical characteristics of a firm in terms of its organizational innovation intensity, the second sub-question focuses on the problem of the relationship between organizational innovation and organizational learning in a firm. For this purpose, organizational learning was regarded as a concept that can be broken into a number of dimensions. The question is analyzed in the second, third, fourth, and fifth publications considering different organizational learning components based on data collected in Russia and Latvia. Prior studies suggest that the interaction between a firm's performance and organizational learning are positive (e.g., Argyris & Schön, 1978). The investigation of the sub-question is based on the assumption that the organizational learning process in a company enforces its management to be open to generate and adapt new ideas in order to face challenges of the ever-changing business environment (O'Reilly & Tushman, 2008). Thus, the second SQ aims to understand how the different components of organizational learning affect organizational innovation in a firm.

**SQ2: What is the relationship between a firm's organizational innovation and its organizational learning performance?**

The third sub-question focuses on understanding how the antecedents of organizational innovation depend on the cultural context in which the firm operates. This question is elaborated in the publications three, four, and five. This problem was investigated under the assumption that the environment plays a crucial role in a company placing it within a specific cultural context (Poesche et al., 2019). At the same time some research (e.g., Evangelista & Vezzani, 2012) has found that organizational innovation subtypes also depend on a country context. Therefore, it is natural to suggest that organizational innovation would also depend on a certain cultural context. The third sub-question was elaborated based on a comparison of Russian and Latvian companies. The idea underlying this comparison was that Russia and Latvia as former Soviet Union republics with quite strong interconnections in the business environment, then, separated, and the countries went their own ways and continued developing their own business cultures. Thus, the third SQ focuses on understanding whether a certain national context is critical for a specific relation between organizational learning and organizational innovation.

**SQ3: Is there a country-related context influencing the relationship between a firm's organizational innovation and organizational learning performance.**

The research sub-questions along with the publications aiming to answer them is shown in Table 1.

Table 1. The research sub-question along with the publications aiming at finding pertained answers to them

	Publication 1: How do a firm's age and size affect its organizational innovation?	Publication 2: Impact of a firm's commitment to learning and open-mindedness on its organizational innovation among Russian manufacturing firms	Publication 3: Openness and staff training as antecedents of administration and management innovation: a cross-country study	Publication 4: A firm's organizational innovation and organizational learning abilities	Publication 5: A firm's organizational innovation and organizational knowledge management abilities
<b>SQ1:</b> What is the relationship between a firm's organizational innovation performance and its age and size?	X				
<b>SQ2:</b> What is the relationship between a firm's organizational innovation and its organizational learning performance?		X	X	X	X
<b>SQ3:</b> Is there a country related context influencing the relationship between a firm's organizational innovation and organizational learning performance?			X	X	X



### 3 Theoretical approach of the study

In this chapter a description of the evolvement of organizational innovation is presented followed by an observation of the main stands on organizational innovation and its relationship with antecedents of a physical nature, namely: a firm's age and size; and with antecedents of an organizational nature, notably: organizational learning dimensions.

#### 3.1 The evolvement of studies on organizational innovation

In general innovation as a research topic has attracted a great deal of interest in many academic areas. Historically studies in innovation originally evolved because of contributions of scholars in the field of organizational economics theory. Thus, rationality prevailed in the initial theoretical approaches investigating the problem of innovation (Damanpour, 2014). In addition to viewing innovation as an efficient element of management, it is also often seen as an essential concept for creating a competitive advantage, or even for development totally new industries.

The point of departure in most studies devoted to organizational innovation is its importance in the processes of developing the sustainability of an organization. This assumes the development of a firm's long-term competitiveness, continuous growth, and secure of internal evolvement. Many scholars state that the process of organizational innovation often cannot be seen clearly in terms of its content and results, as it is complex and ambiguous (Dosi, et al., 1988; Brouwer, 2000; Boer, 2001; Jalonen, 2012). Teece et al., (2016) state that the process of whether an innovation should be introduced is often associated with a high level of ambiguity.

As it was mentioned earlier, the innovation of products and then later of processes have been the point of departure for the evolution of innovation theory. Furthermore, studies on innovation have exceeded the frame set just by product and process innovation and have encompassed other types of innovation in the organization and beyond it (Evangelista & Vezzani, 2010, 2012; Birkinshaw et al., 2011). As for organizational innovation a number of theoretical perspectives can be noted. It is widely acknowledged that Schumpeter (1912/1934) was the first who introduced the notion of organizational innovation. The study by Trist & Bamforth (1951) argues that the overall productivity of an organization can be increased by implementing changes in organizing work simultaneously with any improvement in technology. At the beginning of the 1960s Burns & Stalker (1961) suggested that for securing more radical change in an organization the management should be less bureaucratic. Later a number of studies contributed to evolving the concept of organizational innovation arguing that innovation could be considered as an organizational attribute (Kimberly, 1981), providing a comparison between technical and non-technical innovation (Evan & Black, 1967), investigating the impact of administrative innovation on the social system of an organization (Damanpour et al., 1989) and the value that can be added by organizational innovation (Ettlie & Reza, 1992).

There exist many ways to conceptualize the notion of organizational innovation as well as various proposed definitions (Camisón, & Villar-López, 2014). Thus, organizational innovation has been characterized by improvement of job routines, centralization and decentralization (Womack et al., 1990; Armbruster et al., 2008; Mol & Birkinshaw, 2009), information flow and changes in employees' responsibility (Evangelista & Vezzani, 2012), as well as changes in practices concerning external relations recruitment, and the reward process, or recourse usage (Evan, 1966; Damanpour & Evan, 1984), and the organizational structure (Walker et al., 2011; Vaccaro, et al., 2012). As for the terminology, there are also terms in use such as "administrative innovation" (e.g., Evan, 1966; Daft, 1978; Damanpour & Evan, 1984; Wang, 2010; Jiménez-Jiménez & Sanz-Valle, 2011) and "management innovation" (Kimberly, 1981; Hamel, 2006; Birkinshaw et al., 2008) which have been used along with the term "organizational innovation" although the use of these terms is not exactly the same (Camisón, & Villar-López, 2014). In today's literature on economics the term "organizational innovation" is usually used. Traditionally this term distinguishes innovation that occurs in the non-technological sphere. (Damanpour & Aravind, 2012). Some scholars (e.g., Tether & Tajar, 2008) define organizational innovation as a mechanism that brings changes in social technologies.

Organizational innovation is an efficient vehicle for promoting innovations of other types. Firms introduce organizational innovation for various reasons. Among others these reasons include: increased quality control (Womack et al., 1990; Laforet, 2011), the development of knowledge management and organizational learning (OECD-Eurostat, 2005; Mol & Birkinshaw, 2009; Merono-Cerdan & Lopez-Nicolas, 2013), market and network elaboration (Gunday et al., 2011), technological and marketing innovation support in general (Armbruster et al., 2008; Tether & Tajar, 2008; Gallego et al., 2013; Peris-Ortiz & Hervás-Oliver, 2014; Damanpour, 2014; Pino, et al., 2016; Bodlaj et al., 2018; Sakowski et al., 2018), and as an ultimate goal overall performance enhancement (Hamel, 2006; Mol & Birkinshaw, 2009; Evangelista & Vezzani, 2010; Azar & Ciabuschi, 2017; Arranz et al., 2019).

The categorization of organizational innovation has been the focus of scholars dealing with investigating innovation. In the literature a number of categorizations can be found. For example, one of them breaks down organizational innovation into structural and procedural aspects. It can be also categorized as intra-organizational and inter-organizational organizational innovation (Armbruster et al., 2008). Thus, four types of organizational innovation have been suggested. Structural innovation deals with changes in the structure of an organization at an internal level (intra-organizational structural innovation), for example, centralization or decentralization, or at an external level (inter-organizational structural innovation) new structures for organizing outsourcing or creating alliances. Examples of procedural organizational innovation at an internal level (intra-organizational procedural innovation) could be the Plan-Do-Study-Act (PDCA) approach or the Total Quality Management system implementation, whereas examples of procedural organizational innovations at an external level (inter-

organizational procedural innovation) could be the Just-In-Time approach or elements of supply chain management implementation.

Besides the above-described classification, scholars have suggested some other classifications based on what processes or end-results an organizational innovation is focused on. Thus, for example, various classifications have been suggested composed of a number of categories. Whittington et al., (1999) suggest a classification composed of three categories: boundaries, structure, and process. Hollen et al. (2013) propose a four element classification: motivation, goal-setting, coordination, and allocation of resources. Wischnevsky & Damanpour (2008) broke down organizational innovations into strategy related and structure changing innovations. There are also classifications based on other grounds (e.g., Wang, 2010, Walker et al., 2011).

Several studies (e.g., Uhlaner et al., 2007; Camisón, & Villar-López, 2010, 2014) use three subtypes of organizational innovation, which include innovation in business management practices, workplace organization, and external relations. This taxonomy was formalized in the third edition of the OSLO Manual (OECD-Eurostat, 2005). The fourth edition of the OSLO Manual (OECD-Eurostat, 2018) suggested a more complex taxonomy of organizational innovation subtypes. The document proposed a new term called “administration and management innovation” and a new taxonomy (OECD-Eurostat, 2018, p. 73) that includes six sub-categories, namely:

- strategic and general business management (cross-functional decision-making), including organising work responsibilities
- corporate governance (legal, planning and public relations)
- accounting, bookkeeping, auditing, payments and other financial or insurance activities
- human resources management (training and education, staff recruitment)
- workplace organization (provision of temporary personnel, payroll management, health and medical support)
- procurement
- managing external relationships with suppliers, alliances, etc.

The results of organizational innovation are hard to observe directly. Partly this can be explained by the fact that organizational innovation do not constitute an end outcome as such. It is only a way of producing an outcome (Frost & Egri, 1991; Damanpour & Gopalakrishnan, 2001). A number of scholars (e.g., Armbruster et al., 2008; Walker et al., 2011) argue that organizational innovations are seen to be less tied to complicated technological processes compared to technological innovations. However, this does not make them easier or faster to generate and/or adopt (Damanpour, 2014).

On average in monetary terms, the overall benefit from an organizational innovation is less obvious than from introduction of a technological innovation (Ettlie & Reza, 1992; Pisano & Wheelwright, 1995). Finally, because of its complexity the implementation

process of an organizational innovation is also more complicated than the process of technological innovation (Tornatzky & Fleischer, 1990; Gopalakrishnan et al., 1999).

To draw a conclusion, organizational innovation has numerous elements which make it complex and the process of its implementation difficult. On the other hand, the elements that might be encompassed in an organizational innovation make it flexible and reduce the barriers for its adoption. As the studies on organizational innovation in general lag behind those on technological innovation, the studies on a particular issue namely the generation and adoption of organizational innovations follow behind the studies on the generation and adoption of technological innovations (Birkinshaw & Mol, 2006; Birkinshaw et al., 2008). At the same time, several researchers (e.g., Lam, 2005; Damanpour & Aravind, 2012) argue that there could be an analogy drawn between the process of adoption of organizational innovation and the process of organizational change. However, McNulty & Ferlie (2004) argue that the process of organizational innovation adoption is slower than for technical innovation. The fact that an organizational innovation aims to change the organizational structure, the personnel's area of responsibility, authority, and other characteristics of a firm related to the interaction of people means that it is difficult to introduce, it is not easy to measure, and it is difficult to assess its efficiency.

### **3.2 Relationship between organizational innovation and the age and size of a firm**

Organizational innovation can be underlain by various organizational factors. These include the physical parameters of the organization such as its age and size, the organizational culture and behaviour (Boer, 2001; Baer & Frese, 2002; Smith, et al., 2008; Çakar & Ertürk, 2010; Laforet, 2011; Turró et al., 2014; Ali et al., 2016; Shahzad et al., 2017), the attitude of managers towards innovation (Grant, 1996; Spicer & Sadler-Smith, 2006; Griese et al., 2012; Sapprasert & Clausen, 2012; Bortolotti et al., 2015; Khosravi et al., 2019), the external environment (Prange & Pinho, 2017).

Based on an extensive literature review, Khosravi et al. (2019) suggested to group these factors into organizational, managerial, and environmental factors. According to Khosravi et al. (2019), the organizational group of factors includes a few subgroups of factors such as organizational structure and strategy, knowledge management and organizational learning, human resource management, dynamic capabilities, networking characteristics, organizational size and age, organizational culture, and organizational resources. The managerial-related group of factors consists of leadership behaviour, stewardship, characteristics and attitudes. The third group of factors considers political and legal aspects, market dynamics, and people/community related factors.

For the purpose of this dissertation, the factors of a firm's size and age have been analyzed in the context of the impact they have on organizational innovation. The impact of a company's age and size on its ability to innovate in general and to introduce organizational innovation in particular has been a topic of scholarly focus for a long

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time (e.g., Gopalakrishnan & Damanpour, 2000; Damanpour, & Schneider, 2006; Heimonen, 2012).

### 3.2.1 A firm's age and organizational innovation

Various studies provide evidence of both the positive and the negative impact of a firm's age on innovation intensity. As for the negative relation, Damanpour (1987), for example, argues that a firm becomes more bureaucratic and loses flexibility in terms of introducing innovation and as it gets older. In addition, as a firm ages the number of formal procedures and the level of centralization increase (Kelly & Amburgey, 1991), and as a result the internal barriers that prevent innovation grow (Van de Ven, 1986; Scott & Bruce, 1994; Churchill, 2000). However, at the same time, according to a study by Huergo & Jaumandreu (2004), many firms that have been in operation for many years are still very innovative. Hafkesbrink & Schroll (2014) suggest that learning how these companies were keeping their ability to innovate during a long period could contribute new knowledge to organizational theory.

As for innovations in the workplace organization, older firms are often forced by the continually changing environment to develop this type of innovations. One of the drivers to be considered in this context is employee satisfaction with the firm, which considerably impacts the overall performance. According to Antoncic & Antoncic (2011), the level of employee satisfaction gets lower as a firm gets older, and therefore younger firms need to invest less effort in keeping the level of employee satisfaction on a desirable level. The innovations in the workplace organization focused on maintaining employee satisfaction deal with activities in developing and running training programmes, reducing the formality in decision-making processes, increasing general flexibility in internal and external communication, developing and implementing knowledge sharing systems, and eliminating inefficient formal procedures (Tansel & Gazioglu, 2014; Hafkesbrink & Schroll, 2014).

In order to innovate, firms have to develop their network because isolation is not conducive to facilitating innovation (Montoro-Sanchez, 2011). The networking process promotes introducing the third subtype of organizational innovation, namely the external relation organizational innovation subtype (Dufour & Son, 2015). Coad et al. (2016) argue that older firms compared to younger ones more often seek to establish external relations pertaining to research and development activities. However, young technology oriented firms very actively seek opportunities to obtain niche-based knowledge (Gopalakrishnan & Bierly, 2006). At the same time, younger firms are not mature enough to recognize weak signals in the external environment in order to form appropriate and timely responses to the forthcoming challenges. This means they are often late with external relation organizational innovations (Ismail & Jenatabadi, 2014).

### 3.2.2 A firm's size and organizational innovation

According to Blau & McKinley (1979) and Camisón-Zornoza et al. (2004), a firm's size is one of the critical factors that have impact on its innovation activity. Large and small companies merely introduce innovations of different value (Tether, 1998). However, there seems to be no consensus yet achieved among scholars regarding how it influences the innovation. On the top of that, to the best knowledge of the author, the characteristics of different subtypes of organizational innovation have not been studied intensively in detail.

As a consequence of the controversial results by various studies concerning the impact of a firm's size on organizational innovation there are three stands on the previously mentioned relations. First, Schumpeter (1934) proposed that large firms are more successful in introducing technological innovation as there are larger resources of any kind in terms of both the scale and the scope at their disposal (Kimberly & Evanisko, 1981; Damanpour, 1987; Zmud, 1984; Zhou, 2018).

Several scholars have investigated the problem of how the usage of organizational, financial, and human resources contribute to the process of introducing innovation (Audretsch, 1987; Santarelli & Piergiovanni, 1996; Freeman & Soete, 1997; Tether, 1998; Acs & Bhattacharya & Bloch, 2004). These resources sometimes compensate for passiveness in innovation (Downs & Mohr, 1976). Many scholars have also proved a positive relationship between the size of a firm and the rate of adoption of innovations in the broad sense of this term because they have more access to innovation-related information (Aiken et al., 1980; Kim, 1980; Fennel, 1984).

It seems that the literature lacks evidence regarding the impact of a firm's size on various subtypes of organizational innovation. However, there are studies that focus on some specific organizational innovations that are considered innovation in management practices, in workplace organization, or in external relation. As for innovation in management practices. For example, some scholars (Temtime, 2003; Hajjem, 2017; Youssef et al., 2002) argue that smaller firms are less active in implementing TQM-related practices, however, the relation found was not very strong.

Large firms with a more complex structure and being less flexible compared to smaller firms introduce innovations in the workplace organization more often than medium sized and small firms (Damanpour, 1992). Investigating the level of employee satisfaction, Tansel & Gazioglu (2014) argue that large firms on average underestimate the importance of introducing innovations related to employee-care. Small firms in general fall behind large companies in introducing external relation innovations. As it was shown by Coad et al. (2016) and Badillo et al. (2017) they do not use outsourcing for research and development activities as they have no resources or necessity for these kinds of activities. Large companies are also more advanced in developing their relations with customers and suppliers. This is because small organizations are far from intensively implementing elements of customer relationship or Total Quality Management systems, e-business related networks, or other sophisticated technological

systems that stimulate companies to establish new relationships with potential outside partners (Youssef et al., 2002; Gopalakrishnan & Bierly, 2006; Lun & Quaddus, 2011; Bordonaba-Juste et al., 2012; Fort et al., 2013; Minguela-Rata et al., 2014). Some scholars represent another cluster of studies that advocate the idea of the absence of any considerable relationship between a firm's size and its ability to innovate (e.g., Mohr, 1969; Utterback, 1974; DeTienne & Koberg, 2002; Wagner & Hansen, 2005; Kalkan et al., 2011; Campos-Climent & Sanchis-Palacio, 2015).

There is also a group of scientists that have found that smaller firms are more active in terms of innovation than large firms (e.g., Nelson, 1993). The scholars of this cohort argue that the organizational structure complexity of large companies often hinders them in their efforts to introduce and/or adopt innovations by reducing the dynamics of information flows (Kohn & Scott, 1982; Damanpour, 1996) and making the process of relocating the available resources more complex (Van de Ven et al., 2000). Damanpour (1991) and Kimberly et al. (1988) argue that due to their inherently less bureaucratic organizational structures, small companies are more active at introducing organizational innovations because the risk of negative effects because of a failure is lower compared to large organizations.

An analysis of the current available studies has demonstrated that the impact of a firm's age and size on organizational innovation has not been studied enough to gain an unambiguous understanding. In this context Ono & Stango (2005) suggested the given relationship depends on a combination of factors as well as on a specific organizational innovation.

### **3.3 Relationship of organizational innovation and organizational learning**

The process of learning in a firm is a crucial element that is underlying its main and secondary processes (Patky, 2020). Organizational learning is a collective process bringing together through the actors' network individual and group knowledge (Argyris & Schön, 1978; Kim, 1993; Nonaka, 1994; Kieser & Koch, 2008; Lichtenthaler, 2009a,b; Morland et al., 2019).

The concept of organizational learning became a broad focus of scholars from the mid 1970s (March & Olsen, 1975; Argyris & Schön, 1978). Since that time the number of studies in this field has tremendously increased and the research on learning resulted in numerous analytical, empirical, and review papers (Dutton, 1984; Fiol & Lyles, 1985; March, 1991; Dodgson, 1993; Wang & Ahmed, 2003; Visser, 2007; Liao et al., 2008; Jyothibabu & Farooq, 2010; Andersen, 2016; Guan & Liu, 2016; Aranda et al., 2017; Brix, 2017, 2019a; Javadpour & Samiei, 2017; Mcgrath, 2017; Valaei et al., 2017; Wang et al., 2017; Peronard & Brix, 2019; Nahardani et al., 2019).

These studies consider the concept from cultural, cognitive or behavioral perspective (Shrivastava, 1983; Fiol & Lyles, 1985; Levitt & March, 1988). They also explore

different organizational levels from individual to corporate and various forms of organizational learning (Bappuji & Crossan, 2004; Harkins & Moravec, 2011). As the result a few broadly recognized concepts have been developed.

Thus, Argyris (1976) introduced the single-loop and double-loop learning concept. The single-loop learning assumes in case detection of an inconsistency or an error its immediate correction in order to improve the firm's operation. The double-loop learning concept implies a process of reflection before modifying the firm's operation (Dodgson, 1993). Studies on organizational learning also distinguish between exploratory and exploitative learning (Tsai & Huang, 2008; Kostopoulos & Bozionelos, 2011; Huang & Li, 2012; Kang et al., 2012; Yannopoulos et al., 2012; Wang & Hsu, 2014; Chung et al., 2015; Valaei et al., 2017) or between exploratory, exploitative and transformative learning (Lichtenthaler, 2009b). Exploratory learning is associated with flexibility, knowledge acquisition, risk-taking, innovation, experimentation, and variation (March, 1991; Lane et al., 2006). Transformative learning relates to storage of knowledge (Lane et al., 2006; Lichtenthaler, 2009b), while exploitative learning aims at making a match between a firm's skills with its markets (Brady & Davies, 2004; Murray & Atuahene-Gima, 2007; Kostopoulos & Bozionelos, 2011; Xia & Roper, 2016; Brix, 2017; Caniels et al., 2017; Bresciani et al., 2018; Brix, 2019a,b). The process that consist both the exploration and exploitation components is called organizational ambidexterity (Brix, 2019a).

There are numerous definitions of organizational learning existing in the literature suggested by broad variety of studies (e.g., Sange, 1990; Sinkula et al., 1997; Calantone et al., 2002; Marsick & Watkins, 2003; Perez Lopez et al., 2004; Jerez-Gomez et al., 2005; Jimenez-Jimenez & Sanz-Valle, 2011; Hislop, 2013; Park et al., 2014). Simon (1969) grounded a definition of organizational learning on the ability of individuals of an organization to generate knowledge by reflecting both the internal and external informational flows. In line with Simon's definition, March (1991) argues that organizational learning is a process by a firm of converting all the incoming information into codified or non-codified knowledge. Patky (2020, p.1) defines organizational learning as "the process by which organizational knowledge base and insights are developed through associations between past actions, the effect of those, and future operations". Organizational learning can be also defined as the set of a firm's competences that facilitates its adaption to a continuously changing environment (Eisenhardt & Martin, 2000; Chaston et al., 2001) and increases the potential of the organization to compete successfully evolving competitive advantages that are hard to copy (Winter, 1987; Prahalad & Hamel, 1990; Senge, 1990; Day, 1992, 1994; Leonard-Barton, 1992; Kiernan, 1993; 1995; Henderson & Cockburn, 1994; Nonaka, 1994; Kogut & Zander, 1996; Nonaka & Toyama, 2003; Garcia et al., 2007). O'Reilly & Tushman (2008) argue that the organizational learning process is a crucial driver for reconsidering organizational competences in order to adapt them to the continuously changing environment by developing new business structures, reinforcing research and development activities, and implementing new business practices and workplace routines. By implementing the principals of organizational learning, a firm can secure

its organizational development (Stalk et al., 1992) because through the process of organizational learning a firm obtains knowledge from outside the company (Lam, 2010). This aggregated knowledge absorbed from the external environment underlies the development of many essential processes aiming to increase the firm's overall performance (Pierce & Delbecq, 1977; Shipton et al., 2006). These processes include among others the process of introducing organizational innovations (O'Reilly et al., 1991; Baker & Sinkula, 1999, 2002; Henderson, 2006; Hung et al., 2011; Noruzy et al., 2013).

Innovation and learning processes are strongly linked (Glynn, 1996; Bartel Sinkula et al., 1997; & Garud, 2009). Several studies that investigate the relationship between organizational innovation and organizational learning argue that only when a firm's management supports a continuous organizational learning process might the company succeed in all kinds of innovation (Sinkula et al., 1997; Calantone et al., 2002; Vera & Crossan, 2004; Llorens Montes et al., 2005; Lopez et al., 2006; Liao et al., 2008). In order to introduce innovations efficiently, the processes of organizational learning and as its outcome the process of new knowledge generation should be well developed (March, 1991; Grant, 1996; Liao et al., 2008; Lam, 2010) suggested that in the context of innovation management face the dilemma of whether their company should continue doing business according to the way it used to it or to learn new ways of executing the processes.. In a way this dilemma is in line with exploratory and exploitative concepts of learning (Patky, 2020). Many studies have demonstrated that organizational learning as well as knowledge generation and sharing are antecedents of the process of innovation (Aiken & Hage, 1971; Stata, 1989; Cohen & Levinthal, 1990; Kogut & Zander, 1992; Nonaka & Takeuchi, 1995; Baker & Sinkula, 1999; Hage, 1999; Sørensen & Stuart, 2000; Darroch & McNaughton, 2002; Liao & Wu, 2010; Fink et al., 2017; Liao et al., 2017).

Organizational learning is a multidimensional concept and each dimension is important for a firm's sustainable development. The literature on organizational learning offers many models of the concept that differ in the numbers of dimensions that are also called core elements (Yang et al., 2004), or constructs (Jimenez-Jimenez & Sanz-Valle, 2011; Griese et al., 2012) and their descriptions. Some of these dimensions are:

- commitment to learning (e.g., Sange, 1990; Sinkula et al., 1997; Calantone et al., 2002);
- open-mindedness (e.g., Sinkula et al., 1997; Calantone et al., 2002);
- shared vision (e.g., Sinkula et al., 1997; Calantone et al., 2002);
- intraorganizational knowledge transfer (e.g. Calantone et al., 2002; Moshabaki, 2008);
- continuous learning (e.g., Marsick & Watkins, 2003; Park et al., 2014);
- openness (e.g., Perez Lopez et al., 2004; Jerez-Gomez et al., 2005; Jimenez-Jimenez & Sanz-Valle, 2011; Hislop, 2013).

To achieve good performance in innovation, an organization must synchronize the process of the external environment change with its own learning process in order to efficiently exploit obtained information, converting it into knowledge (Van de Ven et al., 2000). A few scholars (e.g., Argyris & Schön, 1978; Nonaka & Takeuchi, 1995) argue that the influence of organizational learning on innovation is high and positive. However, the majority of these studies investigated the phenomenon of technological innovation. In the dissertation some of the dimensions of organizational learning are considered in the context of their relation to organizational innovation.

### 3.3.1 Commitment to learning and organizational innovation

Several scholars (e.g., Sinkula et al., 1997; Calantone et al., 2002) argue that commitment to learning as one of the dimensions of organizational learning plays a crucial role in introducing innovations in an organization. According to Dixon (1992) and Calantone et al. (2002) a firm which is committed to learning considers an internal learning process to be an investment in its future sustainability and they seek opportunities to learn more and ways to make the learning process more efficient.

Griese et al., (2012) suggest that in order to be innovative a firm must continuously learn. Commitment to learning is an essential element of a learning-oriented organization (Norman, 1985). This indicates the degree of a company's devotion to the organizational learning process and the ability of that firm to learn based on the knowledge obtained to develop a competitive advantage (Dixon, 1992; Sinkula et al., 1997). The organizational learning process directs how the obtained information pertaining to the internal and external environment is processed and converted into knowledge (Dixon, 1992; Calantone et al., 2002).

The management of an organization that is committed to learning encourages the staff members to continuously develop their knowledge beyond the level demanded by the current job responsibilities (Calantone et al., 2002). This means that commitment to learning is also a core value element for an organization that considers development of its personnel as a strategic priority (O'Reilly & Tushman, 2008). In turn, well educated personnel better understand the firm's environment, which underlies efficiency in introducing innovation (Galer & van der Heijden, 1992). In this regard, Tohidi et al. (2012) argue that commitment to learning strongly relates to the overall innovation activity of a firm. In this context Senge (1990) argues that one of the fundamental principals of a continuously innovating organization is its commitment to learning.

Many scholars (e.g., Von Hippel, 1988; Nonaka, 1993) further elaborated the problem of interrelation between the commitment to learning and innovation. In this regard it was shown that the successful development of innovation strategies depends on the ability of a firm to support a continuous learning process (e.g., Norman, 1985; Sackmann, 1992). However, despite that a company's commitment to learning highly and positively impacts its overall innovation performance (Ussahawanitchakit, 2008),

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the development of a specific type of innovation depends on the relevant dimension of organizational learning (Henderson & Clark, 1990).

### 3.3.2 Open-mindedness and organizational innovation

Another important characteristic of a firm that succeeds in innovation is open-mindedness (Sinkula et al., 1997; Liao et al., 2008; Griese et al., 2012; Mothe et al., 2015). An efficient process of introducing an innovation can take place in a firm only when open-mindedness had become an essential element of the organizational culture (Vătămănescu et al., 2017). Taramigkou et al., (2017) argue that open-mindedness underlies sagacity and serendipity which are indispensable attributes of an organization that is successful in innovation. An open-minded internal environment of a firm can be characterized by a number of attributes, for example, intensive and smooth information and knowledge flows, the ability to aggregate knowledge easily, as well as accepting and analyzing failures (Henderson & Clark, 1990; O'Reilly & Tushman, 2008).

In order to realize new ideas and be innovative the key members of a firm's staff must be open to accepting new knowledge which is relevant to the firm's strategy regarding competing in the market place and internal development (e.g., Senge, 1990; Sinkula et al., 1997; Verona, 1999; Baker & Sinkula, 2002). On the other hand, Nystrom & Starbuck (1984) and Sinkula et al., (1997) suggest that open-mindedness supports the process of unlearning, which is crucial for a firm's management in order to be ready to switch to new products, processes, technologies or organizational structures. In case existing staff-members are not open-minded, in most cases it is necessary to hire and train new employees who are open-minded to being more efficient (Hsu et al., 2013, Nielsen & Nielsen, 2011, Vătămănescu et al., 2017).

Open-mindedness is also a vitally important characteristic for companies that aim to penetrate or operate in international markets. It promotes the development of new organizational structures by introducing organizational innovation to help the company to adapt itself to a market (Velo & Mittaz, 2006). In this context, a firm that is active in international markets has more opportunities to innovate because operating in an international market provides an opportunity to develop networking, by which means new knowledge can be absorbed (Vera & Crossan, 2004; Peng & Lin, 2017; Vătămănescu et al., 2017).

Open-mindedness also supports the creation and running of a cross-cultural internal environment, which usually favours the process of introducing innovations of various kinds (Henderson & Clark, 1990). This also supports a company's research and development capability and results in both technological and organizational innovations (Lazonick, 2010; Peng and Lin, 2017).

### 3.3.3 Openness and organizational innovation

Ulrich et al. (1993) state that openness provides various interactions between individuals and is a precondition for organizational learning. Openness underlies the process of introducing innovations in a firm (Paasi et al., 2013). Generalizing various definitions proposed in the literature (e.g., Maxwell, 2006; Lichtenthaler & Lichtenthaler, 2009; Dahlander & Gann, 2010) openness can be defined as “ease of knowledge flow”. This means developing circumstances for each of the employees of an organization to receive knowledge from any available source through a number of communication channels (Jerez-Gomez et al., 2005) Openness is an essential element for the efficient implementation of organizational learning (Hislop, 2013).

Several scholars (e.g., Gambardella et al., 2009; Niebuhr, 2010; González-López & Fernández-Montoto, 2017) have noted the positive impacts of openness on organizational innovation, which can take various forms of manifestation. In this context, many studies have been provided evidence that organizations with free information and knowledge diffusion are on average efficient when introducing innovations (Garvin, 1993; Wick & Leon, 1993; Goh, 2003; Banutu-Gomez, 2004; Lin, 2008). This can be explained by the fact that an open culture supports working teams in generating and exchange ideas (Anderson & Pineros, 1990). This is also in line with the study by Day (1994), who came to the conclusion that internal knowledge can be efficiently used only when it is actively shared between all the key staff of the organization. Openness assumes that a company develops databases and networks that provide document flows between the stockholders for the purposes of effective knowledge usage (Hansen et al., 1999; Haas & Hansen, 2007). The process of document exchange is essential for a firm to achieve effective innovation development. Polanyi (1966) argues that a large portion of a company’s knowledge can be classified as tacit and non-codified knowledge. This is disseminated only via direct communication of individuals, which is extremely significant to the process of knowledge generation, learning, and, as a consequence, for the successful introduction of innovations (Argyris & Schön, 1978; Brown & Duguid, 1991; Lave & Wenger, 1991; Bartel & Garud, 2009). Openness secures direct communications between staff members in firms (Griese et al., 2012).

In order to fully implement the principals of openness an organization must continuously develop organizational innovations that ensure the ability of staff members to freely access non-codified and tacit knowledge (Olsen, 2016). According to Soosay et al. (2008), by providing easy access to the shared information in an organization internal synergy is created which increases the effectiveness of a firm’s performance including innovation-related activity (Madhavan & Grover, 1998).

### 3.3.4 Staff training and organizational innovation

Staff training is another essential dimension of organizational learning Senge (1990). Alone staff training does not secure the process of organizational learning in an

organization. However, organizational learning is not possible without continuous staff training element (Senge, 1990, Cohen & Levinthal, 1990). In the literature staff training is associated with the process of increasing the employees' skills and knowledge related to their work (Aguinis & Kraiger (2009). According to Bell et al., (2017), scholars started to carry out research on staff training in the early 1900s. It is assumed that all the training must fit the general strategy of the firm and meet the demands of operational strategies (Page-Tickell, 2014).

Since the learning process underlies innovation performance (Lam, 2010), and because an organization's innovation performance depends on the level of skills that the employees possess (Wang & Wang, 2012), staff training that increases the employees' competences is an indispensable element in the process of introducing innovations. In line with the previous statements, according to Börner et al. (2012) to ensure the efficacious innovation process a firm must have well-trained and skilful employees. To foster the innovation process in a firm, the staff must meet the specific requirements in terms of technicalities of the executed processes as well as be able to process and develop knowledge which is relevant to these processes. This means, for example, to be able to use appropriate data collection methods, to apply adequately data processing analytical methods, to know how to transfer and store knowledge (Griese et al., 2012).

At the same time, various training for the staff should be aiming not only at directly providing demanded staff competences that are essential for innovation, but also supporting the development of their complementary competences depending on the context of the organization's operations (Simpson et al., 2007; Olsen, 2016). These complementary skills and competences might cover such areas as openness, personal development, communication skills, creativity, team working, project management, or time management (Prange & Pino, 2017; Olsen, 2016; Zhang & Merchant, 2020). Staff members should have a certain degree of social skills in order to be able to communicate efficiently within and outside the company, share knowledge, and be able to resolve problems and conflicts (Ritter & Gemünden, 2003; Griese et al., 2012). Huber (1991) argues that these social skills are crucial for knowledge transfer.

Lastly, the employees of a company that aims to demonstrate high performance in innovation must have special skills related to various kinds of knowledge processing (Cohen & Levinthal, 1990; Mata et al., 1995). That is, that they should be able to find sources, and recognize, receive, codify, analyze, transfer, and store knowledge, in addition to generating new knowledge pertaining to the market in general as well as to the company itself (Lane & Lubatkin, 1998; Zahra et al., 2000).

### **3.3.5 Knowledge generation, knowledge transfer and organizational innovation**

The literature on organizational learning suggests that generated organizational knowledge is the result of organizational learning (e.g., Winter, 1987; Prahalad & Hamel, 1990; Leonard-Barton, 1992, 1995; Henderson & Cockburn, 1994; Nonaka, 1994; Kogut & Zander, 1996; Sivadas and Dwyer, 2000; Rindfleisch & Moorman,

2001; Mohr & Sengupta, 2002; Nonaka & Toyama, 2003; Johnson et al., 2004; Rowley, 2004; García et al., 2007). There seems to be a consensus among scholars that knowledge as the result of organizational learning is one of the crucial factors that secures a firm's long-term competitive advantage (Nonaka, 1994; Hunt, 1995; Nevis et al., 1995; Grant, 1996; Hunt & Morgan, 1996; Davenport & Prusack, 1997; Nonaka & Konno, 1998; Teece, 1998; Nonaka et al., 2000; Chow et al., 2000; Gold et al., 2001; Lin & Lee, 2004; Lee & Sukoco, 2007; Hicks et al., 2007; Li et al., 2009; Shanker et al., 2017). A competitive advantage based on the knowledge generation ability of a firm in fact seems to be very strong and hard to imitate due to the invisible from the outside nature of the knowledge generation process (Prahalad & Hamel, 1990).

A firm's relations with its partners and customers are opportunities for receiving new information about various characteristics of the internal and external environment (Lane & Lubatkin, 1998; Rindfleisch & Moorman, 2001). This assumes that a firm which demonstrates a high level of performance in knowledge generation should also actively introduce the external relations subtype of organizational innovation and other types of innovation as it converts the obtained information into knowledge initiated by continuous changes in the environment (Cohen & Levinthal, 1990; Day, 1992; Day, 1994; Kogut & Zander, 1996; Lane & Lubatkin, 1998; Crossan et al., 1999; Du Plessis, 2007; García et al., 2007; García et al., 2009; Shanker et al., 2017). In general, the previous research has provided evidence that the ability of an organization to generate knowledge and transfer it underlies its efficient innovation performance (Carneiro, 2000; Cavusgil et al., 2003; Chen et al., 2004; OECD-Eurostat, 2018).

As stated by Senge (1990), the knowledge generation underlies organizational learning. Therefore, knowledge management and organizational learning are the approaches that enable a firm to implement continuous improvements (Crossan et al., 1999; Du Plessis, 2007). Knowledge transfer is seen as a set of behavioural activities by which certain staff members gain the experience of some others (Day, 1991; Hansen et al., 1999; and Haas & Hansen, 2007). Knowledge transfer in a firm can be realized due to contacts directly between employees. This is the most efficient way for disseminating tacit or non-codified knowledge that cannot be completely formalized in documents (Nonaka, 1991). In this case the new knowledge is generated directly by individuals (Madhavan & Grover, 1998). Knowledge transfer can be also implemented by means of printed or electronic documents. This kind of knowledge transfer refers to knowledge which is possible to formalize (Haas & Hansen, 2007).

Huber (1991) and Slater & Narver (1995) found evidence that the knowledge generation and transfer capabilities of a firm augured its innovation performance well. Development of knowledge generation and knowledge transfer in a firm can be seen as an element of its organizational learning strategy (Greice et al 2012). In the knowledge-based economy the terms "knowledge" and "innovation" have come to be closely associated with each other (OECD, 1999) as substantial drivers for social and economic development. This has brought the process of knowledge transfer to the forefront as the vital link between that two (Tzameret, 2014; Jones & Mahon, 2018).

## 4 Methodology

This chapter discusses the methodological background of the thesis. It describes the research design, the data collection, the analysis, and the quality of the research.

This thesis is built on the broadly accepted assumption in the literature that organizational innovation is a specific type of innovation that refers to new organizational methods in business practices, workplace organizations, or external relations. In other words, this is an innovation in the area of management (Murphy, 2002; OECD/Eurostat, 2005; Battisti & Stoneman, 2010; Camisón & Villar-López 2010, 2011, 2014). The thesis aims to obtain a better understanding of how organizational innovation is impacted by a firm's organizational and physical characteristics. Concerning the organizational characteristics, organizational learning dimensions are investigated in this study. In terms of the physical characteristics, the firm's age and size are considered.

An exploratory research type was chosen for the study as the phenomenon under investigation was not clearly defined yet by the literature (Denzin, 1978). Prior to collecting the data, a thorough literature review was carried out and a hypothesis was proposed. To collect the data for the analysis a quantitative survey method to investigate the phenomenon in question was used. When studying organizational innovation, a researcher must make a decision on two main problems. The first is what is meant by organizational innovation. There was a continuous discussion in this context (e.g., Birkinshaw & Mol, 2006; Damanpour & Evan, 1984). The second is how to measure organizational innovations related to various types of its manifestation (Murphy, 2002).

### 4.1 Philosophical assumptions

A research philosophy is a system that consists of assumptions and beliefs regarding knowledge that is generated by a scientific study (Gouldner 1970). The philosophical assumptions of the research on innovation need to be chosen carefully as it forms the intrinsic framework of the study. Philosophical assumption underlies the structure of the study and provides internal logic for the results obtained. A research philosophy determines the design of the research, the methods of collecting data and its analysis, as well as the final conclusion and perspectives for potential further research (Moon & Blackman, 2014). It secures the process of correct interpretation the findings. The philosophical position of a researcher influences the whole research in many ways and this is why it is crucial for delivering sound and reliable research results (Johnson & Clark, 2006).

Studying organizational innovation involves methods dealing with investigation of the environment developed by human beings (Berger & Luckmann, 1967). This leads to the necessity for understanding the ontological and epistemological context along with the process of obtaining the final results of the thesis.

From the ontological and epistemological point of view this thesis can be characterized as tending to belong to the objectivistic pole of continua. It implies that the nature of reality is real, the world is external to the researcher, only one true reality exists, and things happen in a certain order. It deals with numbers and facts and aims to deliver a generalization of the results that in its character are law-like.

Given the fact that for the data collection in this thesis the data was collected from all the firms once during a relatively short period of time by applying a survey method and that a mono quantitative method was employed, the research philosophy of this study can be classified as positivism (Johnson & Onwuegubuzie, 2004; Moon & Blackman, 2014). Positivism originally was developed by Auguste Comte (Pickering, 2009) and then further elaborated during the beginning of 20th century (Saunders et al., 2009). The very term “positivism” originated from a Latin word “positus” which means “given”. This implies that a positivist aims to collect pure facts and data, applying for this purpose only scientific empirical methods (Crotty, 1998). A positivist sees a firm as a real object. From the point of epistemology, a positivist would collect only observable and measurable data (Crotty, 1998). The positivistic point of view aims at developing causal relationships in the obtained data and the final generalisations created must resemble a scientific law, which eventually in this context should be used for describing organizational behaviour (Gill & Johnson, 2010).

The hypotheses for the research are usually developed based on theories that exist and during the study they are tested and confirmed or rejected provoking further evolution of the study. The developed hypotheses are used to collect the facts, which are eventually used for testing them. A positivist carrying out research should remain neutral, relying only on facts and not rest on his or her on values, remaining external to the data collection and analysis procedures (Crotty, 1998). Positivistic study can be often characterized by a methodology that is highly structured (Gill & Johnson, 2010). To eliminate the influence on the end results a researcher’s personal values and/or the underlying theory eliminating potential bias the research questions should be chosen to match the research method (Bryman & Bell, 2003; Eriksson & Kovalainen, 2008; Turner et al., 2015).

## 4.2 Measurement of innovation performance

Researchers who investigate innovation actively employ both survey and case study methods (Cooper, 1986, Tether, 2002; Eurostat, 2004; CIS survey, 2006). There are many approaches to measuring innovation performance. All of them have appeared as practical implementations of various scientific stands on what innovation is (Tidd & Bessant, 2021). Previous research has shown that there is a need to further development of the innovation measurement problem and to elaborate a conventional set of metrics for measuring innovation (Birchall et al., 2011). There have been a variety of suggestions on how to measure innovations both on a national and firm level (Birchall et al., 2011; Som et al, 2012). However, no broad agreement exists between scholars on how to measure innovation (Godener & Soderquist, 2004; Neely, 2004).

As for the technological innovation at a firm's level there are a few popular research topics such as measurement relationship between innovations at one side and, for example, the firm's overall performance, its research and development activities, R&D investment, or the management style (Kerssens-van Drongelen & Bilderbeek, 1999; Godener and Soderquist, 2004). These measurements focus mostly on facilitating decision-making process (Birchall et al., 2004; Birchall & Tovstiga, 2005). In major nationwide surveys there can be found a few approaches to measuring organizational innovation. However, the various studies on organizational innovation have different goals, and utilize various measurement or evaluation approaches. They also identify organizational innovation and its nature differently and are based on different models of organizational innovation effect and diffusion. This results in providing data that is hard to compare (Armbruster et al., 2008).

There have been a few large-scale surveys carried out that focus on organizational innovation. The NUTEK survey "Towards Flexible Organizations" carried out in Sweden in 1995 focused on the problem of flexibility work organization. In particular, the implemented management practices, external relations activities, and changes in working places were evaluated (Armbruster et al., 2008). In 1996 the Danish Research Unit for Industrial Dynamics surveyed companies in Denmark on how they were able to react to challenges of continually changing environment based on adapting organizational structures and developing organizational learning (Lundvall & Skov Kristensen, 1997; Lund, 1998; Armbruster et al., 2008). During the same year, the European Foundation (1997) administered a survey in ten European countries on organizational change which aimed to identify the extent of employees' responsibilities (European Foundation, 1997). In 1997 the INNFORM survey on organizational innovation (Whittington et al., 1999) was launched that examined the impact of implementation of various management practices and was distributed in Europe, Japan, and the USA. This survey had many topics under consideration such as for example decentralization at the levels of a unit, a firm and a corporation, informational technology usage, changes in human resource management practices. In 1998 a national-level survey was carried out in France that also investigated changes in firm structure, external relations, management approaches, and time-sharing techniques (Bureau, 2021).

The Community Innovation Survey (CIS) is the widely-known survey that has been carried in the European Union for many years and that has used the methodology based on the Oslo Manual (2005). In this survey the questions on organizational innovation was included in 2001 (Arundel & Smith, 2013). The attempts to measure or monitor organizational innovation are quite different and various surveys including a few well known ones have demonstrated distinct approaches. They have specific goals, target population, and timetables (Armbruster et al., 2008).

The surveys differ in the level of aggregation, for example, aiming at a higher level like the CIS (Arundel & Smith, 2013) survey or at a more detailed level dealing with particular organizational innovation concepts, for example surveys like NUTEK,

DISKO, EPOC, INNFORM, COI (Armbruster et al., 2008). Based on the inherent duality of the organizational innovation concept nature studies may also differ in methodology depending on whether organizational innovation is considered as a process or a result. That is, a survey may classify the respondents as adapters or non-adapters of a certain organizational innovation practice or they may learn if a certain organizational change has taken place within a certain period of time (Armbruster et al., 2008).

As a result of a review of the literature devoted to approaches employed for measuring organizational innovation it seems that the variety of these approaches implies the utilization of different indicators. In turn, this results in different interpretations of the results. Today's trends in research into organizational innovation demonstrate the usage of different methods investigating the research problem (Cunningham et al., 2000; Buchanan & Bryman, 2007). This study similarly to a considerable number of other studies on organization innovation (e.g., Schmookler, 1966; Mansfield, 1983, 1986; Pavitt, 1984; Levin et al., 1987) uses quantitative data and implements its empirical analysis to find an answer to the research questions.

According to Archibugi & Pianta (1996) surveys that investigate innovation performance can be characterized as object-based surveys and subject-based surveys. The first type assumes that the data is obtained from experts or a literature analysis. Because of generalization on a high level, the object-based survey method is not applicable for testing hypotheses at the level of the firm. A subject-based approach to surveys related to innovation considers a single firm as an element of the analysis it assumes to investigate (the phenomenon of innovation) and the data is collected from the respondents by asking them to fill in a survey form (Archibugi & Pianta, 1996). Indicators that compose the scales for measuring a phenomenon that is under investigation underlie such a survey questionnaire. According to Kleinknecht et al. (2002), the weak point of the subject-based approach is the subjective nature of responses, which can be overcome by combining various questions aiming at eliminating this problem or overcoming the problem at the level of the whole study by using a combination of complementary methods. It is very common to use the Likert scale method in a questionnaire to measure the degree of a phenomenon's characteristics (Griese et al., 2012; Zortea-Johnston et al., 2011). When applying this method, a respondent is asked to mark on a scale how much he or she agrees with a given statement. The scale goes from poles of "completely agree" to "completely disagree" and can be usually composed from up to ten points. In this dissertation a survey was employed, and the questionnaire was based on a seven-point Likert scale (Burns, 2000).

### 4.3 Questionnaire

Based on the literature on organizational innovation measurement (Zortea-Johnston et al., 2011; Camisón & Villar-López, 2010, 2011, 2014; Griese et al., 2012), the first version of the questionnaire used in this study was developed in English to let all the members of the research team discuss the structure and the articulation of the questions

together. There were also five face-to-face meetings between the main investigator and potential respondents organized to discuss the content and wording of the proposed questions. Afterwards the preliminary version of the questionnaire was translated into Russian and Latvian. The Russian and Latvian language versions were also back translated into English to check that the articulations were translated fully correctly into the other languages. After any discrepancies were identified and corrected a test based on a snowball approach was carried out collecting 10 filled in forms in Russia and 5 forms in Latvia. The collected test forms were checked and processed to assure that the respondents who participated in the questionnaire testing had filled all the fields of the questionnaire form as it was planned by the research team of the study.

Each of the innovation constructs was measured by scales adapted from the literature (Camisón & Villar-López, 2010, 2011, 2014; Zortea-Johnston et al., 2011; Griese et al., 2012). The respondents were asked to compare the perceived average performance in innovation of their firm in the last three years with their main competitor. The questions concerning organizational innovation assessment had a Likert scale system from 1 to 7, where 1 was “much worse than our competitors” and 7 was “much better than our competitors” so that respondents had a reference to compare their performance with (Zortea-Johnston et al., 2011). As has been pointed out by several scholars (e.g., Khazanchi et al., 2007; Kilic 2015), this kind of measuring might bias the end result (Porter, 1979; Dess & Robinson, 1984) however, it is widely spread as firms are often reluctant to release absolute numbers on their own performance (Boyer et al., 1997; Choi & Eboch, 1998; Ward & Duray, 2000).

The questionnaire is presented in the Appendix. Needless to mention that the questionnaire includes more topics that are considered in this dissertation, as it aimed to collect a broader data set to make it possible to study other phenomena as well.

#### **4.4 Data collection**

The methodology of the study is grounded on a survey that addresses incumbent firms. The firms were chosen according to their location, main activity, and size.

The data was collected in Latvia and the Central and Northwestern Economic Regions (CNWER) of Russia. As for Russia, the following reasoning lies behind the choice of these two regions centred on Moscow and Saint Petersburg. First, more than 25% of Russian citizens live in these regions with 80% of inhabitants living in urban areas. Second, these regions are characterized by a concentration of skilled human resources and highly developed manufacturing and service related sectors of the economy (ROSSTAT, 2019). In the case of Latvia as the country is relatively small there were no geographical limitations taken into consideration and the country was considered as a whole.

In Russia firms dealing in manufacturing and services were selected as potential respondents. As for the manufacturing-related sector, firms operating in all kinds of

industries were considered as elements of the survey population, such as machinery, electronics and instrument engineering, construction, production of chemicals, textile, construction materials, and food/beverages. Concerning the service companies, the selected firms were are involved in IT and related services, maintenance of machinery, electronic and electrical devices, systems maintenance and financial services.

In Latvia, the survey population firms included mostly service companies. This selection was made because in Latvia there were many more companies involved in services, than in manufacturing. The Latvian sample included 189 companies with more than 25 employees and operating in the market for more than three years. The database of the University of Latvia was used as for the purpose of conducting the survey.

In Russia a commercial database based on the organization register was used to derive the sample. The Russian sample was formed from 550 target companies with more than 25 employees and operating in the market for more than three years. These companies were chosen randomly from the list of companies in the database for the target area.

The questionnaire was distributed electronically to the respondents of the target companies who held a top managerial position (CEO, CFO or similar) during the second half of 2016 and the beginning of the 2017. After two weeks, a reminder was sent to those who had not replied. As a result of the fieldwork in total 167 completed surveys were collected.

To eliminate potential bias of the interviewing process the data was collected both by interviewers, visiting companies and interviewing management representatives, as well as by sending the electronic forms after preliminary agreement on the phone. Each questionnaire was checked by the researcher to increase the reliability of the data and to keep the track of the information.

The samples for Russia and Latvia differ. In Russia the sample consisted of small, medium and large manufacturing and service companies, while in Latvia mostly small and medium sized service companies were surveyed. The Russian sample consisted in total of 167 observations, while the Latvian sample consisted of 63 responses. However, in order to make the study comparable only a part of cases observed in Russia were taken into consideration.

The larger number of observations in the Russian sample were adjusted to match to Latvian one when it was necessary to make a comparative study. On the other hand, the larger number of forms collected in Russia made it possible to study the relations of the firm's characteristics such as age and size and the organizational innovation subtypes.

## 4.5 Variables

The measures for organizational innovation performance were based on the definitions presented in the Oslo Manual (OECD/Eurostat, 2005). The organizational innovation

measuring scales were taken from previous studies with minimal adaptation. The same scales have been used by Merono-Mothe & Thi (2010), Eurostat (2012), Kam Sing Wong (2013), Cerdan & Lopez-Nicolas (2013), and Camisón & Villar-López (2014). Respondents were asked to compare the innovation performance of their firm in comparison to the innovation performance of their competitors using a seven-point Likert scale, where 1 corresponded to “strongly disagree” and 7 corresponded to “strongly agree”, (Dadura & Lee, 2011; Eurostat, 2012; Camison, 2014). The firm size was measured by the number of employees on a 5-point scale: according to Shabs, (2006). The firm age was measured by the number of total years passed since the firm was launched (Camisón & Villar-López, 2014).

The dependent variables for a firm’s organizational innovation subtypes (organizational innovation in: management practice, workplace organization, and external relations) were developed based on previous studies (Eurostat, 2012).

The scales for the openness and staff trading latent variables were developed based on the metrics proposed in studies conducted by Griese et al. (2012).

The final version of the questionnaire also included questions regarding the physical characteristics of the firm and the background questions on the respondents. A t-test procedure was applied to the data collected to check for non-respondent bias (randomness of the data). The data sets collected in Russia and Latvia demonstrated no significant difference at the level of  $p \leq 0.05$ .

## 4.6 Data analysis

The data has been analyzed using structural equation modelling method which is a causal modelling method that applies cause–effect information to statistical data and as the result provides quantitative data describing the interrelation of the latent and manifest variables (Fornell & Larcker, 1981). The method is based on confirmatory approach and the empirical validation of the direct and indirect relations between the variables can be made. It also assesses the measurement error and the quality related parameters of a model. In this study STATA and AMOS SPSS software have been employed. Before applying regression analyses as well as exploratory factor analyses, the data was examined in order to ensure that these techniques could be applied. The data was checked for outliers, missing values and invalid responses and for conformity to the normal distribution. During this stage visual checks, plotting histograms, and valuation of numerical summaries of skewness and kurtosis were used.

A confirmatory factor analysis (CFA) was employed to check the goodness-of-fit of the measurement scales. CFA also computes the correlation for given factors and the values of constructs (Fornell & Larcker, 1981; Anderson & Gerbing, 1988). CFA is often used for testing measurement scale properties (e.g., Rao et al., 1999; Schroeder et al., 2002; Tippins & Sohi, 2003). According to Montoya-Weiss & Calantone (1994) it can also be used for assessing the validity constructs and measurement instrument reliability.

## 4.7 Data triangulation

The validity of data, reliability, and generalization are critical if the study is carried at the level of the firm. In this kind of study applying a triangulation approach can increase its quality and reduce or eliminate potential bias (Easton, 2010).

Denzin (1978) proposed four types of triangulation. The first type is triangulation of the data. This type of triangulation deals with matters related to physical aspects of the data collection, for example time periods, geography, and the interviewers. The next type is triangulation of the researchers, which considers who the researchers are and how many of them take part in the study. Theory triangulation suggests using more than one theoretical framework. Lastly, methodological triangulation recommends using different data collection methods.

To follow the principals of triangulation, the data was collected in two different ways. The first means was to approach the potential respondents by sending an e-mail with the questionnaire followed up by a telephone conversation to assure that the respondent had received the document and were willing to fill it in. The second means of collecting the data was to interview the respondents by telephone or during a face-to-face meeting. In the last case the questionnaire form was filled in by the interviewer during the conversation. Further, to eliminate subjective bias, a few different interviewers carried out the job. The data was collected in two countries and was similar regarding its structure and characteristics.

The data was processed by an international team of investigators. The team included 7 members. Two of them were allocated in Finland, three in Russia, and two in Latvia. The main investigator and decision maker was the author of the dissertation. However, the other team members gave feedback on the data collecting and processing, staying in close contact and taking part in continuous discussions throughout the study. Four investigators were involved in the calculation process using three different software programs (AMOS SPSS, Stata, Statistica).

As for the theory and methodological triangulation, the relationships between organizational learning and a few different dimensions of organizational learning were analyzed based on the data obtained. For many dimensions the calculations were made by using different software programs and by different members of the research team. The results obtained by these calculations has demonstrated a high level of coherence.

## 5 Description of publications

This study comprises five separate publications that investigate the phenomenon of the impact of various organizational factors on organizational innovation. The publications are interconnected, providing the answers to the main RQ and the four SQs presented in Section 2.5. Figure 2 shows the relationships between the publications, methodologies, the main theoretical concepts and the levels of analysis. All the publications are based on the analysis of data received from the same survey carried out in two countries. The first publication investigates organizational innovation dependence on a firm's physical characteristics, while the four others deal with the impact of organizational learning dimensions on organizational innovation.

The publications aim to answer the main research question from two different perspectives. In all the publications the analysis was provided at the level of the organizational innovation subtypes. In turn each of the organizational innovation subtypes was described by a number of indicators. Organizational learning concept was also broken down into a number of dimensions, that are commitment to learning, open-mindedness, openness, staff training, and data sharing.

The first perspective of the study was to discuss the relationship between organizational innovation subtypes and the physical characteristics of the firm. The firm's age, size, and country of operation were considered as physical characteristics. The physical characteristics were discussed in publications one, three, four and five. Publication one discussed the problem of the relationship between the subtypes of organizational innovation and a firm's age and size, while publications three, four and five discussed the problem of the country context by carrying out a comparative study in Russia and Latvia.

The second perspective of the study was to discuss the relationship between organizational innovation subtypes and organizational learning dimensions. This perspective was considered in publications two, three, four, and five. The structure of the publications along with the theoretical framework and their contribution is summarized in Figure 2 and Table 2.

### 5.1 Publication 1. How do a firm's age and size affect its organizational innovation?

**Objectives.** The first publication describes the study of the relationship between a firm's organizational innovation and its physical characteristics. For the purpose of this study the organizational innovation was presented in three subtypes, namely innovations in: management practices, the workplace organization, and external relations. As physical characteristics the firm's age and size were considered. There was also a narrower second objective of the study. As there have not been many studies carried on organizational innovation among Russian firms, there was a special interest to

investigate whether there were any specifics regarding companies operating in a transition economy environment such as Russia.

**Data collection.** The data collection for this study was provided in Russia during the second half of 2016. The population consisted of firms based in the Central Region of Russia. All the respondents at the time of the survey held top managerial positions (CEO, CFO, or similar). As a result of the field work 123 companies were selected for this study.

**Findings.** The study found evidence that the age of a firm considerably impacts each of the organizational innovation subtypes. However, it was not found that the size of a firm had any significant impact on the organizational innovation. The study provided evidence that free access of employees to non-codified external knowledge is a very important factor for the active introduction of organizational innovation. The fact that the innovation in management practices positively depends on a firm's age probably means that firms evolve various information systems as they grow. According to the obtained results, the continuous implementation of new practices in learning and knowledge sharing as well as new workplace organizing methods reducing administrative and internal transaction costs are also important factors for introducing organizational innovation and these practices and methods are applied more often as a firm becomes older. Innovation in external relations was also associated with a firm's age.

Many related studies argue that a firm's age negatively influences its ability to innovate (Van de Ven, 1986; Damanpour, 1987; Kelly & Amburgey, 1991; Huergo & Jaumandreu, 2004; Coad et al., 2016). On the other hand, there are also a considerable number of studies that take up a contrary position (e.g., Audretsch & Mahmood, 1995; Sapprasert & Clausen, 2012). The findings of this study align with ones of the second group that have reported positive impacts of a firm's age on its ability to innovate. The study suggests that as a firm matures it develops organizational innovations more actively. This can probably be explained by increasing capacity to generate more knowledge, to implement more sophisticated management systems, and to be more active in establishing external relations.

Another important factor that influences the innovation process is a firm's size (Vaona & Panta, 2008). A number of studies reported a positive relation between a firm's size and organizational innovation (e.g., Sapprasert & Clausen, 2012). However, it should be noticed that previous studies have mainly investigated technological innovation in the context of relations between a firm's size and the intensity of introducing innovations (Blau & McKinley, 1979; Camison-Zornoza et al., 2004). As for organizational innovation these relations should be studied in more detail (Damanpour, 1992, 1996; Camison-Sullivan & Kang, 1999; Zornoza et al., 2004). In this regard our study has found no considerable impact of a firm's size on organizational innovation and its subtypes. Based on this finding and the contradictory results of the previous studies the

conclusion can be made that a firm's size is not really an antecedent for organizational innovation.

**Main contribution.** The study contributes to organizational innovation theory by learning about the affect of the firm's physical characteristics such as age and size on the organizational innovation subtypes. In general, studies that aim to understand the relationship between a firm's age and size and its innovation related behaviour play a significant role in learning about the mechanism of introducing organizational innovations (Huerger & Jaumandreu, 2004). In this context the study goes into more detail and provides knowledge on how the age and size of an organization impact the subtypes of organizational innovation. The study was carried out based on sample of companies operating in Russia. Russia as a country which not often appears in the studies related to the innovation theme. In this connection our study contributes additional knowledge covering research of an economy that has not been in the spotlight so far.

## 5.2 **Publication 2. Impact of a firm's commitment to learning and open-mindedness on its organizational innovation among Russian manufacturing firms**

**Objectives.** The second publication, as well as the following ones, concentrates on investigating the relationship between a firm's organizational innovation and the various dimensions of organizational learning. In particular, the publication aims to understand the relationship between a firm's commitment to learning and open-mindedness with its activity in introducing organizational innovations. For the purpose of this study the organizational innovation was presented in two subtypes, namely innovation in management practices and innovations in the workplace organization. The second publication also addresses the problem of investigating organizational innovation based on the data collected in Russia.

**Data collection.** The data collection for this study was provided in Russia during the second half of 2016. The population consisted of firms based in the Central Region of Russia. The dataset was the same as it was for the study described in the first publication. All the respondents at the time of the survey held top managerial positions (CEO, CFO, or similar). As a result of the field work, 123 firms were selected for this study.

**Findings.** Commitment to learning and open-mindedness have a considerable impact on the organizational innovation performance in a firm. The results show that both the investigated subtypes of organizational innovation experienced a positive influence from a commitment to learning and open-mindedness, though the degree of that influence differs.

According to the study, both subtypes are positively influenced by organizational learning constructs which in this case were commitment to learning and open-

mindedness. A few previous studies have obtained the similar results (e.g., Camisón & Villar-López, 2011; Sinkula et al., 1997). At the same time, the degree of impact of these dimensions on the subtypes of organizational innovation varies. This result is in line with findings by Damanpour & Aravind (2011).

The findings of the study also suggest that the innovation associated with business management practices prevail in the overall organizational innovation in a firm. This can be explained by the fact that this type of innovation enhances knowledge flows in firms (OECD, 2005; Armbruster et al., 2008). The study once again demonstrated the importance of creating an efficient learning environment in a firm to increase the introduction and adoption of organizational innovations. This result has also been suggested by other scholars (e.g., Lin, 2007).

**Main contribution.** The contribution of thesis study to organizational innovation theory consists of investigating the relations between organizational innovation and dimensions of organizational learning. Apart from elaborating the research question in general, the study explores the specific context related to the manifestation of the organizational innovation phenomenon in the transition economy of Russia.

The current research does not provide solid evidence the relationship between organizational learning and organizational innovation in a firm (Freeman and Soete, 2012). This study is focused only on two specific dimensions of organizational learning. These are a commitment to learning and open-mindedness. The study brings evidence of the high importance of organizational learning in introducing organizational innovation and proves that the last should be regarded as a multidimensional concept as organizational learning impacts various subtypes of organizational innovation differently. Vice versa it was found that a specific organizational innovation contract experiences different impacts from each organizational learning construct.

On the whole, organizational learning is crucial for innovation activity in an organization but the studies of this field deal mostly with considering product and process innovation (Henderson & Clark, 1990; Sinkula et al., 1997; Calantone et al., 2002; Liao et al., 2008; Griese & Kleinaltenkamp, 2012; Mothe et al., 2015). The novelty of this study was that it breaks down organizational innovation into subtypes to consider each of the part as a variable, namely innovation in management practices and innovation in workplace organization.

The study was carried based on the sample of companies operating in Russia. Russia as a country does not often appear in studies related to the innovation theme. In this connection our study contributes additional knowledge covering research of an economy that has not been in the spotlight so far.

### 5.3 Publication 3. Openness and staff training as antecedents of administration and management innovation: a cross-country study

**Objectives.** The third publication investigates the dependence of a firm's organizational innovation on such organizational characteristics as openness and staff training. For the purpose of this study, organizational innovation was presented in two subtypes, namely innovation in management practices and innovations in the workplace organization. Another objective of the study was to provide a comparative study based on data collected in two countries. Comparative studies related to organizational innovation quite rarely appear in the literature.

**Data collection.** The data collection was conducted in two countries: Russia and Latvia during the second half of 2016 and the beginning of 2017. In Russia, the population consisted of SMEs mostly operating in the service-based sector in the Central Region of Russia. All the respondents at the time of the survey held top managerial positions (CEO, CFO, or similar). In Latvia the data was collected by the University of Latvia based in their own databases. The studied Latvian companies were also mostly operating in the service sector.

**Findings.** The results obtained demonstrated the positive impact of openness and staff training on the for the organizational innovation performance of a firm, though the values for this impact were found significantly different for the two countries.

**Main contribution.** The study was based on a sample of small and medium-sized Latvian and Russian enterprises and contributes to the knowledge on organizational innovation by investigating the impact of openness and staff training on organisational innovation. The conclusion was made that openness and staff training in a firm positively relate to innovation in management practices and innovations in the workplace organization. This was also confirmed for example in a study by Çömlek et al. (2012) suggesting that the efficient organizational learning in a firm positively relates to innovation. The process of continuous developing human capital also has a positive impact on innovation (Almeida & Fernandes, 2008).

The methodological aspects of developing the study have shown that the comparative approach in studies of organizational innovation can be an efficient mechanism for obtaining knowledge on organizational innovation. Since organizational innovation in a firm differs, depending on the cultural context in which the firm operates, the comparison of companies' behaviour in different countries can provide knowledge on a more general level as well as on more specific characteristics of organizational innovation. Obviously, the roots of running a business are deeply related to national traditions, and no external impact could ruin them completely. By taking into consideration such countries as Latvia and Russia, the study also demonstrated that cultural traditions persist in a society, regardless of any circumstances artificially created for business by outside forces over a long period. The study has shown that the

roots of traditions in doing business are deeply related to a nation's originality, and no external impact could ruin them completely. These results find support in findings by Hutchings & Michailova (2006).

#### 5.4 Publication 4. A firm's organizational innovation and organizational learning abilities

**Objectives.** The fourth publication touches upon the problem of the relationship between two organizational learning dimensions of a firm and its organizational innovation performance. For the organizational learning constructs knowledge generation and creativity were taken. The study also aimed to provide a comparative study based on data collected in two countries.

**Data collection.** The data collection was conducted in two countries: Russia and Latvia during the second half of 2016 and the beginning of 2017. In Russia, the population consisted of SMEs mostly operating in the service sector in the Central Region of Russia. All the respondents at the time of the survey held a top managerial positions (CEO, CFO, or similar). In Latvia the data was collected by the University of Latvia based in their own databases. The Latvian companies were also mostly operating in the service sector. A quantitative study of more than 150 small and medium-sized enterprises from various industries was conducted simultaneously in Russia and Latvia. The questionnaire was developed based on an adaptation of most of the questions from the previous studies.

**Findings.** This research provides evidence that both the dimensions of organizational learning considered in the study namely, knowledge generation and creativity, positively influence organizational innovation activity. In general the study found that knowledge generation was rated less than creativity. The results also suggest that Latvian and Russian companies differ in terms of their organizational learning intentions. Latvian companies had stronger knowledge generation abilities and processes. Innovation in the workplace organization and external relations was less common in Russian companies, while innovation in management practices was less common in Latvian companies.

**Main contribution.** This study contributes to the theory of organizational innovation by answering the question of what impact organizational learning has on organizational innovation performance. The study is based on a comparative analysis which has not often been applied in studies related to organizational innovation. Many studies (e.g., Argyris & Schön, 1978) consider an organization as the place where collective learning process takes place and suggest that organizational learning has a positively strong impact on innovation (e.g., Nonaka & Takeuchi, 1995). However, the majority of the studies elaborating this idea and related problems consider product and process innovations. In this respect the study contributes to the innovation literature by investigating organizational innovation. The study proves that all the types of organizational innovation should be considered separately. This statement is based on a

number of findings of the study. Thus, for example, the knowledge generation dimension of organizational learning can be regarded as a key factor that influences innovation in the workplace organization and innovation in management practices, while it is not the case for innovation in external relations. These findings are supported by other studies (e.g., Delgado-Verde et al., 2011) that argue that knowledge generation is a substantial driver for developing innovation in a firm.

### **5.5 Publication 5. A firm's organizational innovation and organizational knowledge management abilities**

**Objectives.** The fifth publication examines the relationship between a firm's organizational innovation and its characteristics pertaining to organizational learning such as knowledge generation, knowledge transfer and the ability to learn. The purpose of this study was also to provide a comparative study based on data collected in two countries. Comparative studies related to organizational innovation quite rarely appear in the literature.

**Data collection.** The data collection was conducted in two countries: Russia and Latvia during the second half of 2016 and the beginning of 2017. In, the population consisted of SMEs mostly operating in the service sector based in the Central Region of Russia. All the respondents at the time of the survey held a top managerial positions (CEO, CFO, or similar). In Latvia the data was collected by the University of Latvia based on their own databases. The Latvian companies were also mostly operating in the service sector. A quantitative study of 134 small and medium-sized enterprises from various industries was conducted simultaneously in Russia and Latvia. Most of the questions for the questionnaire were adapted from the previous studies.

**Findings.** The research confirmed that learning ability, knowledge generation, and knowledge transfer positively and significantly influence organizational innovation. The results also suggest that the Latvian companies demonstrated significantly better performance in organizational learning in comparison to the Russian companies.

**Main contribution.** The study contributes to the theory of organizational innovation by finding the answer to the question of what impact learning ability, knowledge generation, and knowledge transfer have on organizational innovation. One of the theoretical contributions of the study was that analysis was made separately for three organizational innovation subtypes. These were innovations in management practices, innovations in the workplace organization, and innovations in external relations. Thus, the results contribute to the understanding on how each of these organizational subtypes relate to organizational innovation and dimensions of organizational learning. The study also demonstrated that organizational innovation is a complex concept and that is why each of its constructs should be investigated as an independent type of innovation. Companies revealed different behaviour towards each of the organizational innovation subtypes. The comparative analysis made for the two countries suggests that companies operating in certain economies could behave differently towards the same type or

subtype of innovation. These results are in line with findings by Hutchings & Michailova (2006). This study also confirmed the results of other studies (e.g., Delgado-Verde et al., 2011) that knowledge generation and knowledge transfer ability play a considerable role in the organizational innovation intensity in a firm.

Table 2 presents the results of the publications. The aggregated structure of the dissertation is presented in Figure 2.

Table 1. The results of the publications

Sub-question	Publication	Objectives	Primary Data	Main Findings	Main Contribution of the Thesis
<b>SQ1:</b> What is the relationship between a firm's organizational innovation performance and its age and size?	<u>Publication 1</u>  How do a firm's age and size affect its organizational innovation?	1. Investigation of the relationship between a firm's organizational innovation and its age and size.  2. To investigate companies operating in a transition economy environment.	Collected in the Central Region of Russia without any focus on a specific industry.	The age of a firm considerably impacts each of the organizational innovation subtypes. There was no evidence found that the size of a firm has any significant impact on the organizational innovation. The behaviour of companies operating in Russia is in line with the trends suggested by other studies that were based on samples collected in other countries.	Knowledge on how the age and size of a firm impacts subtypes of organizational innovation. The study focused on a country considered as a transition economy country.

Sub-question	Publication	Objectives	Primary Data	Main Findings	Main Contribution of the Thesis
<p><b>SQ2:</b> What is the relationship between a firm's organizational innovation and its organizational learning performance?</p>	<p><u>Publication 2</u></p> <p>Impact of a firm's commitment to learning and open-mindedness on its organizational innovation among Russian manufacturing firms.</p>	<p>1. Investigating the relationship between a firm's organizational innovation performance and a firm's commitment to learning and open-mindedness.</p> <p>2. To investigate companies operating in a transition economy environment.</p>	<p>Collected in the Central Region of Russia with a focus on manufacturing firms.</p>	<p>Commitment to learning and open-mindedness have a considerable impact on organizational innovation performance in a firm, though the degree of that influence differs.</p>	<p>Additional knowledge on the relations between organizational innovation performance and commitment to learning and open-mindedness of a firm. The study focused on a country considered as a transition economy country.</p>
<p><b>SQ2:</b> What is the relationship between a firm's organizational innovation and its organizational learning performance?</p> <p><b>SQ3:</b> Is there a country-related context influencing the relationship between a firm's organizational innovation and organizational learning performance?</p>	<p><u>Publication 3</u></p> <p>Openness and staff training as antecedents of administration and management innovation: a cross-country study.</p>	<p>1. Investigating the relationship between a firm's organizational innovation performance and a firm's openness and staff training performance.</p> <p>2. To provide a comparative study based on data collected in different countries.</p>	<p>Collected in Latvia and the Central Region of Russia with a focus on companies operating in the service sector.</p>	<p>The impact of staff training and openness on the innovation performance of a firm is positive, though the values were found to be significantly different for the two countries.</p>	<p>Additional knowledge on the relations between organizational innovation performance and openness and staff training performance in a firm. The evidence that traditions in doing business are related to a nation's originality, and no external impact could ruin them completely.</p>

Sub-question	Publication	Objectives	Primary Data	Main Findings	Main Contribution of the Thesis
<p><b>SQ2:</b> What is the relationship between a firm's organizational innovation and its organizational learning performance?</p> <p><b>SQ3:</b> Is there a country related context influencing the relationship between a firm's organizational innovation and organizational learning performance</p>	<p><u>Publication 4</u></p> <p>A firm's organizational innovation and organizational learning abilities</p> <p><u>Publication 5</u></p> <p>A firm's organizational innovation and organizational knowledge management abilities.</p>	<p>1. Investigating the relationship between a firm's organizational innovation and a firm's organizational learning, knowledge generation and knowledge transfer performance.</p> <p>2. To provide a comparative study based on data collected in different countries.</p>	<p>Collected in Latvia and the Central Region of Russia with a focus on companies operating in the service sector.</p>	<p>The impact of organizational learning, knowledge generation and knowledge transfer on innovation performance of a firm is positive, though the values were found significantly different for the two countries.</p>	<p>Additional knowledge on the relations between organizational innovation and organizational learning, organizational knowledge generation and knowledge transfer performance in a firm. The evidence that traditions in doing business are related to a nation's originality, and no external impact could ruin them completely.</p>

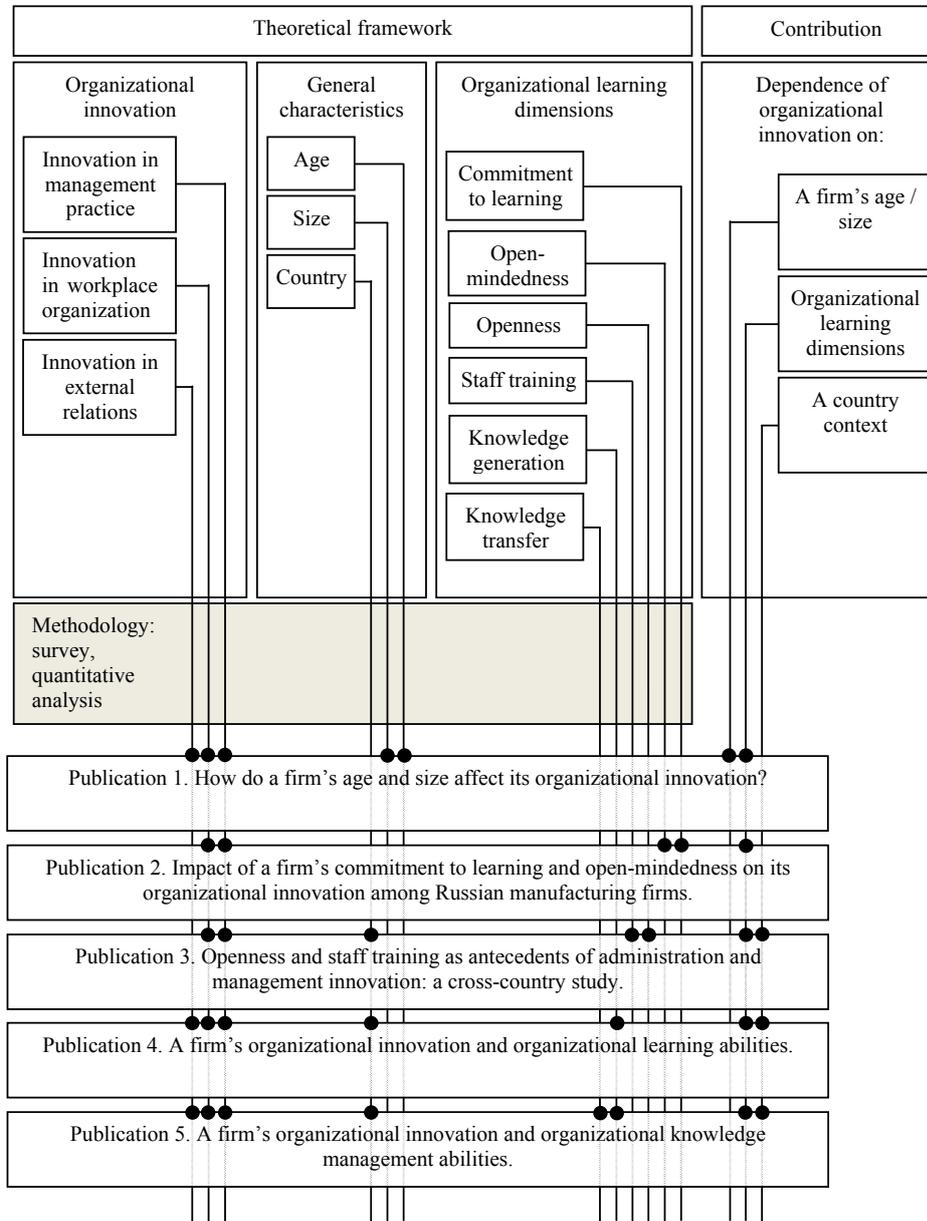


Fig.2. Aggregated structure of the dissertation

## 6 Discussion

### 6.1 General overview of the results

The main aim of this thesis was to provide new insights into the literature on organizational innovation. The following research question was set to guide this thesis through the research process:

RQ: What is the impact of age, size and the antecedents associated with organizational learning on organizational innovation performance in a firm?

The main research question was divided into three sub-questions (SQ) that investigate the problem in a few various contexts. The SQs are studied in the five research publications which cover the SQs and the general RQ as the core question. These SQ are as follows:

SQ1 What is the relationship between a firm's organizational innovation performance and its age and size?

SQ2: What is the relationship between a firm's organizational innovation and its organizational learning performance?

SQ3: Is there a country-related context influencing the relationship between a firm's organizational innovation and organizational learning performance?

The answer to the main research question is compiled from the answers to the sub-questions provided in the findings of the five separate publications presented in this thesis. These publications address the research gaps identified in the literature that elaborate organizational innovation. They also created an opportunity to advance the theory and to develop further the methodology of the field.

First of all, this thesis deepens the knowledge on organizational innovation, especially by investigating the relationship of organizational innovation subtypes considered one by one with organizational learning dimensions. The findings made clear the dependence of organizational innovation activity in a firm on how the knowledge flow is organized. Numerous studies (e.g., Sinkula et al., 1997; Calantone et al., 2002; Vera & Crossan, 2004; Lloréns Montes et al., 2005; Lopez et al., 2006; Liao et al., 2008) have been devoted to the same problem and have focused on technological innovation. In this regard, organizational innovation has not much been the focus of scholars.

Second, the thesis advances the research methodology on organizational innovation by probing quantitative methods for the analysis of organizational innovation subtypes. Employing quantitative methods such as a regression analysis and SEM the thesis aimed to increase the understanding of what approaches can be seen as the most suitable, precise, and informative when considering cause and effect relations in the

context of organizational innovation (Cunningham et al., 2000; Buchanan & Bryman, 2007).

Third, the thesis made an attempt to investigate a country-specific impact on a firm's organizational innovation behaviour. Likewise, some large scale national wide surveys (e.g., Schmookler, 1966; Pavitt, 1984; Mansfield, 1986; Levin et al., 1987; Eurostat, 2012) have addressed problems related to different types of innovation in the surveyed countries, while this study considered the problem in more detail touching upon only organizational innovation, only two countries, and only certain dimensions of organizational learning and knowledge management. The implications for the theoretical and managerial contributions are elaborated in the following paragraphs.

## 6.2 Theoretical Contribution

This exploratory study examined organizational innovation. Organizational innovation as such in comparison with technological innovation has been much less considered by scholars. Therefore, the main contribution of the study is the input into increasing the understanding of the theory of organizational innovation. The findings of this study suggest a few ways to increase the intensity of organizational innovation in a firm. The focus of the study was on the problem of how the physical and organizational characteristics of a firm affect its organizational innovation subtypes. The physical characteristics consisting of a firm's age and size were considered and the organizational characteristics consisting of a number of dimensions related to organizational learning and knowledge management were investigated. As a part of the study, a comparative study between Russian and Latvian companies was carried out. The study contributes to the organizational innovation literature in several ways.

First, despite of the numerous studies that investigate the organizational innovation concept considering it at different levels of aggregation, studies that break down organizational innovation into subtypes to analyze it in parts are rare. Along this line, to a certain extent organizational innovation is broken down in the international longitude CIS study and studies carried at a national level (Camisón & Villar-lópez, 2011). At the same time, the concept of organizational innovation is quite complex (Damanpour, 1996; Damanpour & Aravind, 2006) and there is a demand for knowledge of how each of the organizational innovation subtypes is influenced by various factors linked to a firm's performance (Wang & Xu, 2018). In this context, this study contributes to understanding of how organizational innovation can be analyzed at the level of organizational innovation subtypes, or, in other words, the study provides some input into methodological issues related to investigating organizational innovation. By breaking down organizational innovation into subtypes, the opportunity to provide more focused research increases. As the study has demonstrated, a single specific subtype of organizational innovation in general manifests differently in comparison to other subtypes. These results are in line with several other studies (e.g., Camisón & Villar-lópez, 2011, CIS). In addition, the study has shown that even the same subtype of

organizational innovation can manifest itself differently depending on the outside context, for example, the external environment. For example, the results suggest that Latvian companies demonstrate a stronger influence of knowledge generation and knowledge transfer on each of the subtypes of organizational innovation in comparison to Russian companies.

Second, the study deals with the three subtypes of organizational innovation namely, innovation in business management practice, innovation in workplace organization, and innovation in external relation. These three subtypes are very much in line with the currently existing conventional understanding of the nature of organizational innovation (e.g., Battisti & Stoneman, 2010; Camisón & Villar-López, 2010, 2011, 2014; Eurostat, 2011). The study increases the understanding of the dependence of each of these three subtypes of organizational innovation on various physical and organizational factors that describe a firm's performance.

Thus, for example, the study provides evidence that innovation in business management practice and innovation in workplace organization are positively influenced by commitment to learning, open-mindedness, openness, and staff training. In this regard the results are similar to those reported in a few other studies (e.g., Sinkula et al., 1997; Camisón & Villar-López, 2011), although from the methodological point of view, the approaches of the studies have not been absolutely identical. Another example of the results that related to the separate consideration of the organizational innovation subtypes is that according to the study innovation in business management practices prevails in the overall organizational innovation in a firm.

Third, as various countries historically have different traditions in business development, and management practices and styles (Hutchings & Michailova 2006; Balabanova et al., 2018) it can be assumed that the influence of the physical and organizational factors characterizing the performance of a firm have a different impact on organizational innovation. This means that the development of organizational innovation in firms operating in different countries would vary on average. There are a few examples in a country context of large scale studies investigating the degree of innovation intensity in general as well as related to organizational innovation in particular (e.g., Eurostat, 2012). However, these studies do not consider organizational innovation at the level of particular practices. In this context, this study makes an attempt to compare the practices related to organizational innovation in two countries. For example, among other results, the study found significant differences between companies operating in Russia and Latvia in relation to the impact of organizational learning dimensions on organizational innovation. Another example is that innovation in the workplace organization and innovations in external relations were less common in Russian companies, while innovation in management practices was less common in Latvian organizations. Thus, the conclusion can be made that for organizational innovation, which involves very much the aspect of human behaviour and relations between individuals, it is crucial to report the results in the context of the specific environment in which the study has been undertaken. The fact that studies are carried

out in different countries might be partly the reason for the high variance in the reported results as it was discussed in some other studies (e.g., Evangelista & Vezzani, 2012).

The fourth contribution deals with the problem of investigating how companies deal with organizational innovation in Russia. Not many studies that investigate innovation in general and organizational innovation in particular have focused on Russian companies. At the same time, transition economies offer a broad field for testing new forms of business management development. The comparison between companies operating in the West and in Russia could generate many new ideas in terms of how innovation could be evolved. Concerning Russia, according to Gokhberg (2003), companies that convert knowledge into innovation of all the types are not common. Russian companies do not give a high priority to activities in innovation. Not many local companies aim to penetrate foreign markets due to not often having a competitive product. At the same time, activity in the internal market does not demand many cases from firm to be good in terms of innovation performance (Gokhberg & Kuznetsova, 2011). Nevertheless, despite the results provided by the mentioned studies, our study demonstrated notable organizational innovation performance of Russian companies.

Fifth, despite the fact that there have been a lot of studies devoted to the problem of how a firm's age and size influence its innovation-related behaviour (OECD/Eurostat, 2005, 2018) these kind of studies still play an important role (Huergo & Jaumandreu, 2004). The scholars carrying out research in the field of innovation have obtained contradictory results. A number of studies (e.g., Van de Ven, 1986; Kelly & Amburgey, 1991; Huergo & Jaumandreu, 2004; Damanpour, & Aravind 2012; Acemoglu et al., 2013; Cucculelli, 2014; Coad et al., 2016) have found that a firm's age has a negative impact on innovation, while there are other stances (e.g., Audretsch & Mahmood, 1995) that suggest the opposite. However, most of these studies focus on technological innovations rather than on organizational ones. This study suggested that the age of Russian firms considerably impacts each of the organizational innovation subtypes. However, it was not found that the size of a firm in Russia has any significant impact on the organizational innovation.

### 6.3 Practical implications

The results of the study have demonstrated that the investigated dimensions of organizational learning such as devotion to continuous learning, openness, staff training, and open-mindedness play a considerable role in the process of management practice change. The study also suggests a number of practical implications for innovation management.

The dependence of innovation in business management practice on organizational learning and knowledge management dimensions was found stronger on average than for workplace organization. Partly this might be explained by the fact that firms tend to prioritize improvement in management-related practices and make changes in operation routines a second priority (Murphy, 2002). That is the issue that managers should pay

attention to and keep their eyes not only on changes that directly affect the strategic important areas but also on the less strategic important short-term routines. In the context of organizational learning strategies it could be an evidence of an unbalance between exploratory and exploitative learning approaches. It could be assumed that the process of introduction of new innovation in business management practice implies employing mostly the exploratory learning approach and the double-loop learning concept while innovation in workplace organization tend to be more associated with the exploitative approach and the single-loop learning concept. These results should encourage managers to develop both the approaches of learning.

Based on the study it becomes obvious that a firm that is aiming at fast development based on organizational changes should be committed to continuous learning, continuously train its staff, and be focused on creating an open-minded internal culture. According to several studies (e.g., Brix, 2017, 2019a,b; Peronard & Brix, 2018) in order to be efficient in innovation a firm should to a large extent be devoted to the principle of ambidexterity implementing the changes that underlie both the short- and long-term strategic goals. In this context such a firm should be also concentrated on developing activities associated with the exploratory and exploitative learning. These activities encompass continuously surveying external sources for new forms of partnerships with customers, partners, and suppliers developing and thereby implementing not only new technological processes but also new organizational forms along with advanced competitive strategies including functional innovation strategies.

Several studies (e.g., Le Mens et al., 2014) have not found a positive relation between a firm's age and its innovation intensity. However, the majority of these studies were investigating technological innovation. The results of this study brought evidence that the organizational innovation intensity increases as a firm matures. It could be a logical response of a firm to accumulate bureaucratic inertia over time. Geroski (1995) suggested that the barriers to the future growth of a firm increase with age. Since a firm that entered the market place a long time ago is forced by the continuously changing market to develop it needs to change its organizational settings. On the other hand the managers of a young firm should realize that they must design and implement a special process of introducing organizational innovation rather than wait till circumstances of the external environment would force the firm to implant new organizational structures. In this context, one way of getting a firm be more active in organizational innovation is to get it to implement an open innovation approach as a way to exploit external knowledge (Torkkeli et al., 2009). A firm's size in contrast to e.g. Sappasert & Clausen (2012) was found a factor that does not impact the process of introducing organizational innovation. From the managerial perspective that probably means that regardless a firm's size there are always internally going processes in it that introduce various organizational innovations and the task of the managers is to intensify those processes.

## 6.4 Limitations

The limitations of the study first originate from the study design and the limited resources allocated to the data collection.

The data for the analysis was collected based on specific criteria in terms of territory and industrial sector. In Russia the data was collected only in two the most developed regions of Russia and in Latvia the focus was on IT and related companies. That is why the findings cannot be directly approximated to all companies in Russia or Latvia. However, in terms of the territory in Russia the findings can be applied to companies operating in the Central and North-West regions of Russia and in Latvia to companies operating over the whole country. In terms of the industrial sectors the comparative studies pertained only to companies involved in service. The comparative study was made only for small and medium sized companies. In order to explore further potential findings, it would be good to collect more sectorial oriented data to investigate the behaviour related to organizational innovation performance of companies operating in various industries. It also might be interesting to have more specific size-related strata.

The analysis of firms' organizational innovation performance like in many innovation performance surveys (e.g., Eurostat, 2011, 2013) is traditionally based on the time period of three years. However, organizational innovation can be described by a high degree of inertia (Damanpour & Schneider, 2006). It might be interesting to enlarge the period of time that is investigated in order to make sure that all the latest organizational and structural changes are taken into account.

The number of indicators for each of the scales was limited and the questions asked about only a few management practices. This number could be increased to obtain more precise measurements. However, that would assume enlarging the number of observations.

The results provide knowledge regarding the direction of the relation between innovation intensity and its antecedents. However, there is interest in learning what might be the shape of the function that underlies one or another relation. For example, the market-entry stage of an average company is usually characterized by introducing a considerable amount of innovation (Audretsch & Mahmood, 1995).

As years pass, the intensity of innovation might go down and after some time up again up. This would mean that if the relationship of a parameter X and a firm's age is hypothetically a U-shaped function the quantitative methods for investigating the relation must allow taking into consideration the shape of the function as well.

The fact that the study was based on a sample that represents firms operating only in Russia and Latvia limits the generalization of the results in the worldwide context. As Nelson & Winter (1982) argue the circumstances for a firm's survival depend on the technological and organizational environment. This statement has been supported by the

findings of a number of large-scale international surveys (Eurostat, 2012) that provided evidence that there could be a significant difference in the results linked to the innovation intensity obtained for companies operating in different countries.

One of the limitations of this study was that certain relations were considered based on the sample addressing firms operating only in Russia. According to Balabanova et al., (2018) and Hutchings & Michailova (2006) firms operating in transition economies differ in some respects from, e.g., companies operating in the West. For example, they might differ in their corporate behaviour. This should be taken into account when interpreting the results of the study.

## 6.5 Research avenues

To further develop the research in this area the theoretical aspect of complexity might be involved when investigating the relationship between the intensity of introducing innovations and a firm's age and size. Damanpour (1996) proposed that structural complexity was a direct antecedent for organizational innovation. Structural complexity increases as the firm matures and this probably explains partly how the age and size of a firm impact organizational innovation. In case of potential implementation of this approach a set of variables linked to structural complexity should be introduced and could be used instead of a firm's age and size.

An interesting development of this research might be simultaneous consideration of technological innovation under the same circumstances as organizational innovation in order to investigate whether they tend to follow the same trends in performance.

One of the interesting continuations of this research might be to investigate the relationship between organizational innovation and various antecedents as a firm matures. Presumably, at different stages of a firm's life cycle the organizational innovation performance would demonstrate dissimilar values. The results obtained by different studies regarding the relations between a firm's age and its organizational innovation performance and especially the negative influence of this relationship in the context of technological innovation (e.g., Kelly & Amburgey, 1991; Cucculelli, 2014; Coad et al., 2016) would be an interesting topic for further research in more detail. The organizational innovation might not follow the same trends as other types of innovation, as was demonstrated by Bianchini et al. (2018) in regards to the impact of corporate governance on technological innovation. To investigate the dependents of innovation further on a firm's age it would be interesting to consider the change in dynamics of organizational and technological innovation performance as a function of a firm's maturity.

The study found differences between Russian and Latvian companies in the context of innovation behaviour. For further development of this study it would be good to investigate the differences between Russian and Latvian firms in a more qualitative way. It would be also productive to enlarge the sample to consider various sectors and

size strata. The number of organizational learning and knowledge management dimensions could also be increased.

The development of the research could also go in the direction of further developing the problem of the relationship between organizational innovation and corporate culture. The part of the dissertation focusing on a comparative study between organizational innovation performance in Russia and Latvia demonstrated the differences in this performance in accordance with the culture of doing business in a certain economy. A deeper investigation of the given relationship could bring forth more evidence of what the main drivers that are underlying the process of introducing organizational innovation in different cultures. According to Balabanova et al. (2018), a company launched in a certain environment exhibits certain features of organizational culture which are characteristic for that environment. Thus it would be interesting to undertake a large comparative study that involves many economies. Such a study would involve companies with various backgrounds and would bring more insights on intrinsic mechanisms of launching organizational innovation. In the context of comparative studies there might be also some interest in exploring the organizational innovation performance more of companies operating in transition economies and developed economies as well as making a comparison between companies operating in various industries.

The exploratory nature of this study constrains the broadness of the obtained results by definition. Complementing the design of the research with other appropriate research methods would probably deliver more comprehensive results.

Several studies (e.g., Hutchings & Michailova, 2006) have reported trends of Russian companies to some extent implementing management practices or management styles that are broadly used in Europe, the USA, or Japan. However, according to Balabanova et al. (2018), this phenomenon mostly characterizes privately owned firms, while those owned by the states keep continuing along with an old fashion management style, and not, for example, aiming at developing an open internal environment or an efficient knowledge flow. Thus, it might be an interesting research area to go deeper into a comparison of the organizational innovation performance between private and the state owned companies.

Organizational innovation related to external relations could be an interesting topic for investigation. In this context the relationship between the organizational innovation in the external relations of a firm and the efficiency of organizational learning seems to be a very strongly tied as the latter is based very much on the information coming from outside the organization. It would probably be interesting to look into how crucial organizational innovation is in external relations for one or another industry. This would provide a cross-industrial pattern of how important the information flow for various industries is.

## 6.6 Conclusion

This study examined a few antecedents of organizational innovation in the firm. The focus was on what impact a commitment to learning, open-mindedness, openness, staff training, knowledge generation, and knowledge sharing have on the organizational innovation performance in a firm. For the purpose of the study organizational innovation was broken down into three subtypes: innovation in business management practice; innovation in workplace organization, and innovation in external relations. The study provided evidence that organizational innovation performance in a firm is exposed to dimensions of organizational learning as well as to a firm's age. The findings support the hypothesis that organizational learning dimensions are crucial for a firm that aims to achieve efficient organizational innovation performance. The results can be useful for firms' managers and policymakers for better understanding how to make a company more efficient in terms of innovation performance



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## **Appendix A: The questionnaire**

The appendix presents the questionnaire that was used in the study.

Dear participant! I would like to invite you to participate in the survey that was administrated among a few dozen firms in different countries. The purpose is to investigate what makes a firm innovative. In particular the interest is focused on organizational competences of top-managers. To fill in the survey takes 20 minutes.

Your answers will remain anonymous and the results of the survey will be reported in a way that any single respondent cannot be identified. Nevertheless if you want to receive the report based on the collected data analysis please indicate your e-mail address (and name).

Thank you very much in advance for you time spent on answering my questions.

Sincerely,  
Igor Dukeov,  
Researcher,  
Lappeenranta University of Technology

Optional: your e-mail address: \_\_\_\_\_

**G1. In what industry does your firm operate?**

**Production**

- Mining
- Oil&Gas
- Electricity generation
- Metals
- Chemical
- Machinery
- Construction
- Textiles and Apparel
- Agriculture
- Food production
- Forestry
- Pharmaceutical

**Service**

- Wholesale & Retail
- Hotels & Restaurants
- Travel
- Logistic & Transportation
- IT (Hard and Software)
- Finance & Insurance
- Real estate
- Consulting
- Education
- Health
- Media
- Entertainment

Other industry (please specify)

\_\_\_\_\_

**G2. How many years has your firm been operated in that industry?**

Number of years

< 1     1-3     3-5     5-10     10 <

**G3. How many people work in your firm?**

Number of people

<50     50-150     150-500     500-1000     1000 <

**G4. What is the dynamic of your firm staff growing within the last three years, %?**

- Our firm has got a little increase (<10%) of the
- Our firm has got some increase (5-20%) of the
- Our firm has significantly increase (<50%) of the staff
- The number of people practically has not changed (+\ - 5
- Our firm has got a little decrease (5 -20%) of the
- Our firm has got some decrease (10-50%) of the
- Our firm has significantly decreased (<50%) the staff during the last three years

Other, please specify \_\_\_\_\_

**G5. What was the approximate annual turnover of your firm during the last three years in thousand euro?**

Thousand euro

< 20     20-100     100-500     500-1000     1000 <

**G6. What was the average annual turnover growth dynamic in your firm during the last three years in percent?**

Percent

< 20     20-50     50-100     100-200     200 <

Other, please specify \_\_\_\_\_

**G7. Which of the following descriptions fits the best for the situation in your firm?**

The CEO is assisted by individuals with different responsibilities that may be easily re-assigned dynamically according the current situation. There are no divisions or functional departments

There are separate departments or functions (i.e. engineering, marketing, production, personnel)

Separate groups for similar products, markets, or geographic regions

There are formal procedures and functional regulations. All the staff members follow them strictly

The company got matrix or project oriented structure. All the staff members clearly realize the responsibilities as well as authorities of matrix/project managers and functional managers

The company got matrix or project oriented structure, but the staff members sometimes are mixed up which manager they should approach to solve a specific issue

Other, please specify \_\_\_\_\_

**G8. Who makes the final decision on the actions in the following areas? (Enter the number of the appropriate approval level)**

For your information the levels in question are:

- |                                       |  |
|---------------------------------------|--|
| 0 - Direct Worker                     | 3 - Division head (over several functions) |
| 1 - Foreman, or first line supervisor | 4 - President, or chief executive manager  |
| 2- Department head/Project manager    | 5- Board of directors                      |

- Promotion of a direct worker
- Addition of a new product or service
- Unbudgeted expenditures (\$500-\$ 1000)
- Selection of type or brand of new equipment
- Dismissal, or firing of a direct worker

**G9. How the strategic decisions in your firm are usually made by top management?**

- Always one individual makes decisions based on personal judgment
- Frequently one individual makes decisions based on personal judgment
- Always first the functional specialists make decisions based on expertise and analytical tools
- Frequently the specialists make decisions based on expertise and analytical tools
- All above mentioned approaches are used in about the same ratio

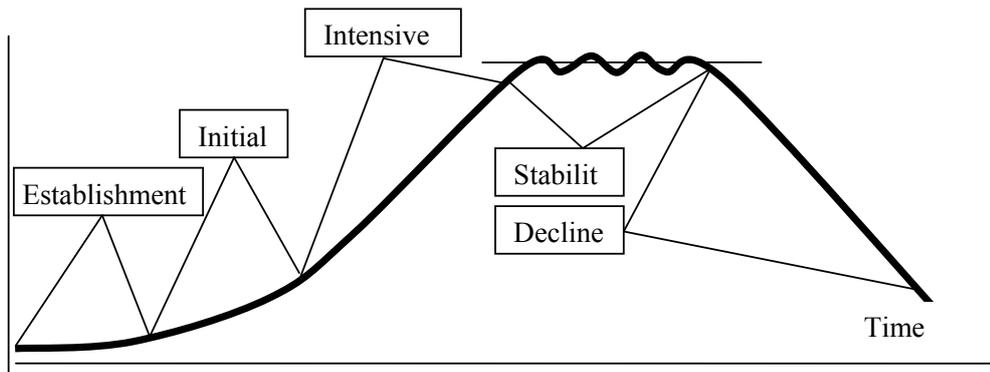
Other, please specify \_\_\_\_\_

**G10. Using the 7 point scale please evaluate how much you agree with the following statements (1 - absolutely disagree, 7 - absolutely agree):**

In your firm

	Absolutely disagree							Absolutely agree
Formal policies and procedures guide most decisions	1	2	3	4	5	6	7	
Important communications between departments are documented by memo	1	2	3	4	5	6	7	
Formal job descriptions are maintained for each position	1	2	3	4	5	6	7	
The top management team is comprised of specialists from each functional area (e.g., marketing, engineering, production)	1	2	3	4	5	6	7	
Reporting procedures are formally defined	1	2	3	4	5	6	7	
Lines of authority are specified in a formal organization chart	1	2	3	4	5	6	7	
Rewards and incentives are administered by objective and systematic criteria	1	2	3	4	5	6	7	
Capital expenditures are planned well in advance	1	2	3	4	5	6	7	
Plans tend to be formal and written	1	2	3	4	5	6	7	
Formal operating budgets guide day-to-day decisions	1	2	3	4	5	6	7	
Everyone can easily approach the CEO any time	1	2	3	4	5	6	7	

**G11. How would you describe the present life cycle stage of your firms? Please put the mark (X) on the curve in the chart below as you see that stage.**



**II. Using the 7 point scale please indicate how strongly you agree or disagree with the following statements (1 - absolutely disagree, 7 - absolutely agree):**

Our firm in comparison with the main competitors during the LAST THREE YEARS is very active in the introduction of

Absolutely disagree

Absolutely agree

**a product or a service that is new or significantly improved** with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new or significantly improved production process.**

This includes significant changes in techniques, equipment and/or software

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new or significantly improved delivery method.** This includes significant changes in techniques, supply chains, equipment, software

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new marketing method** involving **significant changes in product design or packaging**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new product placement**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new product promotion**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new pricing**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new method** that **reduces administrative/transaction costs**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new approach** of **improving workplace satisfaction**  
(and thus labour productivity) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a system** that enables the employees **gain access to non-codified external knowledge**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**a new marketing method of reducing costs of supplies**

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**new practices of improving learning and knowledge sharing** within the firm e.g. establishing databases of best practices, lessons and other knowledge, so that they are more easily accessible to others, education and training systems 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**new management systems** for general production or supply operations, such as supply chain management systems, business reengineering, lean production, and quality-management systems 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**new methods for distributing responsibilities and decision making** among employees for the division of work within and between firm activities (and organizational units), as well as new concepts for the structuring of activities, such as the integration of different business activities, centralization or decentralization 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**new methods in a firm's external relations** that involve the implementation of new ways of organizing relations with other firms or public institutions, such as the establishment of new types of collaborations with research organizations or customers, new methods of integration with suppliers, and the outsourcing or subcontracting for the first time of business activities in production, procuring, distribution, recruiting and ancillary services 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

**I2. Using the 7 point scale please indicate how strongly do the members of the top management team usually agree or disagree with each other on the following matters** (1– the managers strongly disagree, 7 – the managers strongly agree):

	The managers strongly disagree		The managers strongly agree				
The members of the top management team usually agree/disagree with each other on the <b>best way to maximize</b> the firm’s long term <b>profitability</b>	1	2	3	4	5	6	7
what the firm’s <b>goal priorities</b> should be	1	2	3	4	5	6	7
the best way to ensure the firm’s <b>long-run survival</b>	1	2	3	4	5	6	7
<b>which organizational objectives</b> should be considered <b>most important</b>	1	2	3	4	5	6	7

**C0. Using the 7 point scale please evaluate how much you agree with the following statements** (1 - absolutely disagree, 5 - absolutely agree):

<u>In your firm</u>	Absolutely disagree		Absolutely agree				
Employees participate at <b>communication trainings</b>	1	2	3	4	5	6	7
Employees participate at <b>conflict management trainings</b>	1	2	3	4	5	6	7
We plan to implement <b>new information and communication systems</b>	1	2	3	4	5	6	7
We initiate <b>creative dialogues</b>	1	2	3	4	5	6	7
We initiate the <b>exchange of ideas</b>	1	2	3	4	5	6	7
We initiate the exchange of <b>individual positions and opinions</b>	1	2	3	4	5	6	7
Our organization rewards people for <b>creativity and innovation</b>	1	2	3	4	5	6	7

- We create and sustain **cross-functional groups** of energetic and opinionated people 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers do not want their **”view of the world“ to be questioned**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We place a high value on **open-mindedness**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers encourage employees to think **“outside of the box“**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We openly discuss the **ideas within the teams**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We have the system of **new idea generation**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Original **ideas are highly valued**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- All the **tasks are solved** in the most effective way 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers basically agree that our organization’s ability **to learn is the key** to our competitive advantage 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- The basic values include **learning as key** to improvement 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- The sense in our firm is that employee **learning is an investment**, not an expense 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Learning is seen as a key commodity** necessary to guarantee organizational survival 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our managers often participate in various **learning courses/seminars/conferences**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We often get together to discuss the **reasons of our success**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We often get together to discuss the **reasons of our fails**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We are not afraid to **reflect critically** on the shared assumptions we have made about the way we do business 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our managers know all the **technical processes** in the company very well 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company possess **excellent company knowledge** (e.g. product range) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company possess **excellent knowledge about our strategic goals** (e.g. business objectives) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We constantly **check the quality of our knowledge** concerning customers, competitors, and markets (e.g. actuality, completeness) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We systematically identify the **need of knowledge** relevant to manage our competitive position 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We define strategic goals for the **generation of knowledge** concerning customers, competitors, and markets 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- We schedule the deployment of the **appropriate analytical methods** for data preparation (e.g. SWOT-analysis, data mining) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We check if our **knowledge base is reasonably extended through the new generated knowledge**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- All employees are trained extensively concerning the **utilization of commonly used information**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We formally organize the **exchange of knowledge, insights, and know-how** (e.g. communities of practice, expert groups) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We check if employees involved in data collection and preparation constantly **share their knowledge and know-how**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We use know-how from successful **conflict resolutions** as a basis for staffing and leadership 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- We schedule the deployment of the appropriate storage **systems for data collection** (e.g. data bases, data warehouse, intranet) 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company know all the **needs of our main customer segments** very well 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company possess **excellent market knowledge**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company possess **excellent skills in analyzing information** gained from single customers with regard to its utility for our company 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our company seeks out **new ways to do things**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our company **is creative** in its methods of operation 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- There is a **total agreement** on our firm vision across all levels, functions, and divisions 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- There is a well-expressed **concept of who we are and where we are going** as a firm 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- All employees are committed** to the goals of our organization 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Top management believes in **sharing its vision** for the firm with the lowest levels 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Employees **view themselves as partners** in charting the direction of the firm 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- All the **meetings start and end** at the scheduled time 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- General **meetings are always scheduled well in advance** to let the participants get prepared and plan their time 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

- We have **the system of following the task implementation**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our **managers control only the end results** of the subordinates but not the intermediate steps 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- The **tasks are often corrected** during the execution 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Every **manager is responsible for his/her own time**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company **listen the opinion of other people** and only then express their own opinion 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company are fully able **to put themselves in the position of other people**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Managers of our company are able to recognize **conflicts in time**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Nobody is afraid of **expressing their own opinion**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- The **newcomers receive great help** in terms of getting into their professional responsibility quick 

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Our company always uses **transparent way of doing business**

1	2	3	4	5	6	7
---	---	---	---	---	---	---
- Giving bribes** to gain some questionable benefits cannot be accepted in our company 

1	2	3	4	5	6	7
---	---	---	---	---	---	---

What competences should the managers in your firm bring to a higher level?

And a few personal questions at the end.

**P1. What is your position in the firm?**

- Owner, Board member, President
  - CEO
  - Function Director: Director on Finance, Commercial Director, Marketing Director.
  - Department Head
  - Project manager
- Other, please specify \_\_\_\_\_

**P2. Your age?**

Years old

< 30     30-40     40-50     50-60     60<

**P3. How long have you been working in your company?**

Years

< 1     1-3     3-7     7-10     10<



## **Publication I**

Dukeov, I., Bergman, J., Heilmann, P., Platonov, and Jaschenko, V.  
**How do a firm's age and size affect its organizational innovation?**

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## How do a firm's age and size affect its organizational innovation?

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**Abstract.** This research explores the impact of the firm characteristics of size and age on organizational innovation (ORI). The study is based on data gathered from a sample of manufacturing companies from the central region of Russia. To make the research more specific, the ORI is broken down into three subtypes, namely, innovation in management practices, innovation in workplace organization, and innovation in external relations. The ORI subtypes demonstrate various levels of dependence on a firm's size and age. The study did not find evidence that the size of a firm has any significant impact on the ORI, while the age impacts each of the ORI subtypes. The study contributes to the ORI literature by advancing the concept of the ORI investigating the impact of a firm's characteristics on the ORI.

**Keywords.** Organizational Innovation; Innovation Management; Firm Characteristics; Size; Age.

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## 1 Introduction

A significant part of a firm's overall strategy is innovation management. The innovation activity in a firm aims to increase the productivity of each business function of the firm (Nandakumar et al., 2011; Forsman, 2009; Wang and Ahmed, 2004; Dukeov, 2008). A successful firm must always consider the business environment as a dynamic and continuously changing system (Bergman et al., 2006). To adapt the firm to a changing environment often requires introducing innovations. These could be new products, processes, management systems or elements of corporate culture (Damanpour, 1992). Different kinds of innovations within a firm are often closely interrelated. The introduction of technological innovation, which encompasses product and process innovation, is complementary to the adoption of non-technological innovation, which encompasses marketing and organizational innovation (ORI) (Koren and Palcic, 2015).

According to many studies, technological innovation acts as a driver for non-technological innovation within a firm (Henderson and Clark, 1990; Dougherty, 1993; Danneels, 2002). These studies usually suggest that non-technological innovation is the consequence of technological innovation which forces a firm to change its performance (Armbruster et al., 2008). However, to be successful in innovation management in general, firms must continuously develop appropriate non-technological innovation, and ORI in particular, to transform the overall effect of innovation activity into profit (Teece, 2010). Some researchers have stated that ORI underlies the efficient implementation of other types of innovation and is regarded as one of the most significant factors increasing competitive advantages for the firm (Geels and Schot, 2007; Lokshin et al., 2009).

Various research on ORI topic has been conducted for about four decades. Nevertheless, numerous related matters have not still found solid explanations, and a high level of inconsistency in the results seems to characterize the studies in this field (Damanpour and Daniel Wischnevsky, 2006). There are a few reasons why the ORI attracts the interest of scholars. First of all, a deeper understanding of the role that ORI plays in the context of the overall innovation activity of a firm is demanded. Secondly, from a managerial perspective, it would be good to know what the antecedents of ORI are, in order to raise the level of ORI activity in a firm. Nowadays technology often moves ahead of organizational trends and meets barriers created by these out-of-day trends (Apsalone et al., 2017).

A number of studies (e.g., Rosenbusch et al., 2011; Bradley et al. 2012; Laforet 2011) proved that ORI played a significant role in firm development. There have also been various discussions in the literature on how to identify and measure ORI in firms (Armbruster et al., 2008). In any case, regardless of the research focus, ORI is considered to have a crucial impact on the overall ability of a firm to innovate.

Among a number of factors that have an impact on the innovation of firm, are firm characteristics such as the firm's age and size (e.g., Heimonen, 2012; Gopalakrishnan and Damanpour, 2000).

The impact of a firm's age and size on the ORI is much less covered in the literature compared to this impact on technological innovation (e.g., Alabbas and Abdel-Razek 2016). At the same time, the ORI theory suffers from a lack of supporting studies in general, and in particular, ones exploring the impact of a firm's characteristics on ORI (Camisón and Villar-López, 2014).

In spite of the fact that there exist some studies that focus on the relation between a firm's characteristics and ORI (Damanpour, 1991; Wolfe, 1994; Van de Ven et al., 2000), a strong relationship between ORI and a firm's characteristics has not always been confirmed and needs to be further explored (Koren and Palcic, 2015). Drazin and Schoonhoven (1996) proposed that inconsistency in the results of innovation studies have appeared because many of them do not specify the context and types of innovation under consideration and have generalized the conclusions to a large extent (Gopalakrishnan and Damanpour, 1997). Thus, more research in the area of ORI and its determinants is needed (Armbruster et al., 2008).

This study examines the relationship between ORI and a firm's characteristics. Our study contributes to the theory of ORI by considering this relation in the context of ORI components to answer the question as to what impact the latter could have on ORI development in a firm. The study is based on a sample of 123 industrial firms from the central region of Russia. Our work is also in line with Eurostat (2012) studies and other studies (e.g., Heimonen, 2012; Yildiz et al., 2013; Le Bas et al., 2015; DeTienne and Koeborg, 2002; Damanpour, 1987; Gopalakrishnan and Bierly, 2006) that have been carried out in the same area.

## 2 Conceptual framework and research hypotheses

### 2.1 Organizational innovation

At the beginning of the 20th century, Joseph Schumpeter (Schumpeter, 1934) introduced the term "new industrial organization". According Schumpeter's theory, there are five types of innovations: the introduction of new goods, the introduction of new methods of production, the implementation of a new supply source of raw materials or half-manufactured goods usage, the opening of new markets, and new forms of industrial organization. The latter is nowadays understood as organizational innovation (ORI). In the innovation management literature, ORI has gained a minor role in studies as it is a relatively new concept to be researched and implemented (Klette and Kortum, 2004). Therefore, it still represents a broad concept which deals with issues covered by strategic management, human resource management, knowledge management and other non-technological areas of firm control and evolution (Gera and Gu, 2004). All these areas can be considered indicators of the internal diffusion of various practices and elements of knowledge management. (Armbruster et al., 2008). In comparison with product or marketing innovations, ORI is not directly implemented in the market place. Nevertheless, the effect of ORI may be visible as the increasing level of competitiveness of a firm that introduces product, process, or marketing innovations supported by simultaneously introduced ORI. This simultaneous introduction of different types of innovations may lead to the synergy of various effects (Som et al., 2012).

Scholars have provided various classifications of organizational innovation in an attempt to explain and specify their characteristics in different contexts (Lam, 2004). Thus, quite a large number of definitions for ORI can be found, not to mention interpretations of the term (e.g., Mothe and Thi, 2010). One can also consider different levels of ORI. For example, these may take the form of appropriate solutions on the level of particular departments or functions of a company. They can also relate to the overall structure or the functional principles of the firm.

They may well be innovations that have an impact the firm's relationship with its environment (Wengel et al., 2002).

Despite many studies arguing that ORI should be considered as a firms' response to technological innovation forming a pre-condition environment for it, ORI can also play its own independent role in a firm's development and can be considered a distinct form of innovation (Tidd et al., 2005).

Firstly, ORI might aim at implementing new procedures in processes, operations, or behaviour in a firm (Som et al., 2012). These procedures could be the first introduction of a total quality management system or a PDCA cycle, or could involve just-in-time or teamwork practices that directly impact the organizational performance of the firm (Wheelwright and Clark, 1992; Reed et al., 2000; Ichniowski et al., 1997). The crucial criterion here is that the introduction should be for the first time (OECD-EUROSTAT 2005, p.51).

Often these are called procedural ORIs in comparison to structural ORIs which deal with increasing the efficiency of responsibilities, accountability, divisional structure of functions, and knowledge dissemination in a firm on its various levels (Som et al., 2012). Thirdly, ORI might reduce the organizational barriers of the external environment, thus facilitating enlarging the scale of the firms' external relations with customers, suppliers, research organizations, and governmental and non-governmental institutions (Heidenreich, 2009; Rammer et al., 2009).

In our paper, we will adhere to the OSLO Manual definition of ORI: "An organizational innovation is the implementation of a new organizational method in the firm business practices, workplace organization or external relations," (OECD-EUROSTAT 2005, p.51). According to this document, ORI may be intended to increase a firm's performance by reducing administrative or transaction costs, enhancing labour productivity by improving workplace satisfaction, gaining access to non-tradable assets (such as non-codified external knowledge), or reducing the costs of supplies. An organizational innovation should be based on strategic decisions taken by the management of the firm to implement organizational methods in business practices, workplace organization or external relations which are new for the firm.

## 2.2 Subtypes of ORI

As it was shown in the previous paragraph, ORI can be broken down into a few specific innovation subtypes that relate to business practices, workplace organization or external relations. Many studies on ORI (e.g., Murphy, 2002; Uhlaner et al., 2007; Eurostat, 2012), in accordance with the OSLO Manual, consider three subtypes of ORI. Often, the studies are dedicated to specific forms of ORI. For instance, Mothe and Thi (2010) focus on management practice and production approaches. Dukeov et al. (2017) consider an external relation subtype form of ORI.

### 2.2.1 Internally oriented subtypes of organizational innovation

The first subtype of ORI is related to innovations in management practices (IMP). These deal with the introduction of new management practices. IMP means the implementation of methods for organizing work routines that are new for the firm. These methods deal with the first introduction of, among other things, knowledge management related approaches, Total Quality

Management, Lean Production, Six Sigma, the Theory of Constraints, Kaizen or supply system elements, e.g. first implementation of practices for codifying knowledge, e.g. “establishing databases of best practices, lessons and other knowledge, so that they are more easily accessible to others” (OECD-EUROSTAT, 2005, p.51). According to many scholars (e.g., Prahalad and Hamel, 1990; Grant, 1996; Spicer and Sadler-Smith, 2006), knowledge management related practices in general enhance firms’ competitiveness and ability to innovate and in turn their ORI. Firms are more active in introducing innovations when a firm effectively absorbs knowledge from outside as well as when it makes it circulate intensively within the internal environment (Nonaka and Takeuchi, 1995).

The second subtype of ORI is linked with innovations in the workplace organization (IWO). These innovations focus on new methods of organizing the work of employees, e.g. centralization, decentralization or re-organizing the organizational structure, as well as integration or diversification of different business activities (OECD-EUROSTAT, 2005; Som et al., 2012). An example of an IWP “is the first

implementation of an organizational model that gives the firm’s employees greater autonomy in decision making and encourages them to contribute their ideas” (OECD-EUROSTAT, 2005, p.52). This subtype of ORI aims to improve the overall performance and results by increasing work efficiency (Mothe and Thi, 2010). However, there is variation between the results of studies that focus on IWO. For example, Ichniowski et al. (1997) propose that the overall impact of this subtype of ORI on the overall performance is positive, whereas, e.g., Bresnahan et al. (2002) argue that it is not that obvious, and IWO can be efficient only in combination with other types of innovation or technologies. Mothe and Thi, (2010), proved a strong positive relationship between IWO and the propensity of a firm to perform well.

### 2.2.2 Externally oriented subtypes of organizational innovation

The external relation subtype (IER) of ORI encompasses “new ways of building relations with a firm’s external environment including other firms, public institutions, research organizations, customers and suppliers in order enhance the efficiency of production, procuring, distribution, recruiting and ancillary services” (OECD-EUROSTAT, 2005, p.52). The IER demonstrates how a firm is able to make use of networking activities, which can be a crucial capability in the context of the knowledge-based global economy (Mothe and Thi, 2010; Sapprasert and Clausen, 2012). External relations provide a firm with potential access to partners’ complementary skills and that might create synergy in production and management areas (Kogut, 1988; Kogut and Zander, 1993; Cassiman and Veugelers, 2002), or exclude duplication in R&D activities, reduce risks involved in venture projects (Jacquemin, 1988; Sakakibara, 1997), promote benefits from economies of scale or scope (Kogut, 1988), and facilitate receiving new scientific and technological knowledge for the firm’s own R&D activities (Sakakibara, 1997, 2001). Despite the recognized effects of IER, studies have demonstrated controversial results on what impact this subtype of ORI has on the overall performance of the firm and its innovation activity. Some have shown positive relations between a firm’s cooperation with universities (Belderbos et al., 2004; Lööf and Heshmati, 2002), whereas Mothe and Thi, (2010) observed a slightly negative interconnection between supplier related ORI and a firm’s overall performance. Klomp and van Leeuwen (2001)

presented evidence of a positive impact of client relation activities on the overall performance of a firm.

### 2.3 Organizational innovation and firm characteristics

By and large, the subtypes of ORI are different in their nature and depend on firm characteristics, for example, the age and size of the firm (Som et al., 2012). Due to this, it is important to see how firm-level characteristics are related to organizational innovation and, in turn, how they influence the firm's performance by means of ORI. The relationship between a firm's characteristics, in particular its age and size, and their effect on innovation activity has been debated for a long time (Damanpour, 2006). Some have used these variables to come up with conceptual conclusions regarding the relationship between a firm's level of innovation activity and its age and size (e.g., Reger et al., 1992). Nevertheless, there is no consensus as yet and several independent studies have found controversial insights (DeTienne and Koberg, 2002). Gopalakrishnan and Damanpour (1997) argue that inconsistency in the results may appear because ORI is considered in many studies as an indivisible concept, while age and size might have differentiated impacts on specific subtypes of ORI.

Appendix 1 demonstrates findings and the empirical characteristics of relevant prior studies

#### 2.3.1 Firm age and organizational innovation types

The literature has demonstrated arguments both for the negative and the positive dependence of innovation intensity on the firm age. For example, Damanpour (1987), found that the older a firm is, the less flexible its organizational structure becomes, and the more such a firm becomes inertial in its management system implementation. The level of bureaucracy in a firm increases over the years, new and strong formal procedures appear, and authority becomes centralized (Kelly and Amburgey, 1991). According to Van de Ven (1986), as a firm ages, internal barriers that prevent innovation grow. Studies on the business life-cycle have proposed that the development of a young firm involves the innovative development of the organization (Churchill, 2000; Davidsson and Delmar, 1997; Scott and Bruce, 1987).

In contrast, there are many older companies that are highly innovative and demonstrate a very high level of performance (Huergo and Jaumandreu, 2004). Studies of those firms might provide new insights into how a firm can go through the process of economic and technological change within the firm over a long period (Hafkesbrink and Schroll, 2014).

As ORI comes to be essential for a firm that struggles for its competitiveness, IMP is a key factor in the creation and diffusion of new knowledge (Montoro-Sanchez, 2011). The development of knowledge management systems, organizational learning approaches, and the introduction of new management approaches, (e.g., Total Quality Management, Lean Production, Six Sigma, the Theory of Constraints, Kaizen) as it was mentioned above are more often characteristics of more mature firms as young firms often have neither resources nor the time to implement these systems and approaches (Temtime, 2003). Thus, we propose the following hypothesis.

***H1a. Firm age has a positive effect on innovations in the management practices (IMP) in the firm.***

In order to survive in the market place, older firms are forced to develop innovations in their workplace organisation (IWO), which is a subtype of overall organisational innovation (ORI). In the literature, employee satisfaction is considered a powerful mechanism for increasing the overall performance of a firm. The level of employee satisfaction in older firms is lower than in younger firms (Antoncic and Antoncic, 2011). Thus, older firms in comparison to young ones need to be more active in maintaining their level of employee satisfaction. This level can be maintained in numerous ways, such as by running training programmes, implementing knowledge sharing systems, increasing flexibility, reducing formalities in decision-making processes, eliminating some formal procedures (Tansel and Gazioglu, 2014; Hafkesbrink and Schroll, 2014). Taking into consideration these considerations, we propose the next hypothesis.

**H1b. Firm age has a positive effect on innovations in the workplace organization (IWO) in a firm.**

Nevertheless, firms can hardly innovate in isolation. This means that in order to receive new knowledge, old firms are forced to continuously elaborate their network (Montoro-Sanchez, 2011), which increases the probability of elaborating their ORI in the area of external relations (Dufour and Son, 2015).

Compared to younger firms, older ones more actively try to establish relations with partners in the area of research and development (Coad et al., 2016). Younger firms often have insufficient experience to process the weak signals that they receive from the business environment in order to adjust their external relations to the forthcoming situation. For this reason, they do not come with appropriate innovations external relations (IER) in time (Ismail, N. and Jenatabadi, H., 2014).

According to Gopalakrishnan and Bierly (2006), young firms that focus on developing their technological competences are active in enlarging their external connections to gain access to niche-based knowledge, although older firms are active in all kinds of external relations. This allows us to articulate the following hypothesis:

**H1c. The firm age has a positive effect on innovations in external relations (IER) in a firm.**

### 2.3.2 Firm size and organizational innovation types

Firm size is another characteristic of a firm that numerous scholars have approached in an attempt to prove Schumpeter's proposition that large firms are more active in technological innovation because they have more resources available, including financial, human, organizational, and intellectual resources (Acs and Audretsch, 1988; Bhattacharya and Bloch, 2004; Freeman and Soete, 1997; Santarelli and Piergiovanni, 1996; Tether, 1998). When compared to small firms, larger ones are more active in receiving patents for engineering solutions (Brouwer and Kleinknecht, 1999; Damanpour, 1987). As some studies argue, the firm size is among the most important determinants for innovation activity (Blau and McKinley, 1979; Camisón-Zornoza et al., 2004; Damanpour, 1996).

However, Wagner, E. and Hansen, E. (2005) studied the wood industry and found that firm size does not influence a firms' ORI activity.

Nelson (1993) found that small firms demonstrate a very high level of R&D activities. Tether (1998) argues that large firms introduce a considerable number of high-value innovations while small firms are active in the introduction of lower-value innovations.

Damanpour (1996) suggested that in large and more complex firms size stimulates knowledge flows within the firm, thus accelerating innovation. Large firms have more access to information regarding innovation which in turn allows them to select appropriate innovations to adapt from a broad selection (Fennel, 1984).

Many scholars have proved a positive relationship between the size of a firm and the rate of adoption of innovations in the broad sense of this term (Aiken et al., 1980; Kim, 1980). Large firms have more resources in terms of both scale and scope overall, which allows them to be more active in introducing all types of innovations (Damanpour, 1987).

In an intensive literature review we found that discussions on firm age in ORI were scarce. Nevertheless, Kimberly and Evanisko (1981); Zmud (1984); and Damanpour (1987) argue that size has a positive impact on both technological and organizational innovation. At the same time, there are some researchers who did not find any evident impact of firm size on innovation activity (Mohr, 1969; Utterback, 1974). The complexity of large firms might create barriers to implementing innovations, as well as extending the way from innovation identification to its adoption, thus reducing the positive effect of a firm's size on innovation (Kohn and Scott, 1982). To our best knowledge, the studies that investigate the relationship between a firm's size and organizational innovation do not investigate in detail the relationship between the firm size and different subtypes of organizational innovation.

As far as the IMP subtype of innovation is considered, Temtime (2003) found that large firms implement TQM practices more intensively compared to small firms, although the relation between firm size and TQM practice implementation is not very strong. This result goes along with Hajjem (2017) and Youssef et al. (2002). DeTienne, D. and Koberg, C. (2002) who found that the size of industrial firms has no any significant influence on management practices. The greater resources of larger firms sometimes cover the potential loss of profit due to their passiveness in innovation (Downs and Mohr, 1976). Besides the above-mentioned findings, Gopalakrishnan and Damanpour, 1997, argue that the complicated organizational structure of some large firms might reduce the dynamics of information flows. Thus, the impact of firm size on its IMP seems to be multidirectional and the following hypothesis is proposed:

**H2a. Firm size has effect on the innovations in management practices (IMP) in a firm.**

Damanpour (1992) found that large firms experience greater needs regarding innovations in the workplace organisation because small and medium sized firms in general have a more flexible structure. In large firms, the level of employee satisfaction is lower compared to smaller ones, which is evidence of the neglect of employee-care policies in large firms (Tansel and Gazioglu, 2014). Medium-size firms are less bureaucratic in making decisions on implementing IWO, as the risks negative effects resulting from changes are less costly (Damanpour, 1992; Kimberly et.al., 1988). The organizational structure of a small firm is usually less sophisticated compared to a large one. Thus, it could dynamically relocate resources if needed to be innovative in some areas of IWO (Van de Ven et al., 2000). The controversial insights we found in the literature allow us to propose the following hypothesis:

***H2b. Firm size has effect on innovations in the workplace organisation (IWO) in a firm.***

The literature lacks evidence on the impact of firm size on the IER subtype of ORI. The evidence that has been released is highly contradictory. According to Anwar and Hasnu (2017) firms' external relations moderate more by the specific industry then by the firm size.

Kalkan et al. (2011) and Campos-Climent and Sanchis-Palacio (2015), carrying out their research in different contexts, found that there is no relation between size and firm performance including any innovation activity.

Coad et al., (2016) found that smaller firms have neither the need or the resources for placing orders with outsourced partners for research and development, thus they fall behind larger firms in their IER activities.

Youssef et al. (2002), stated that because the majority of small and medium size firms lack well developed TQM and Customer Relationship Management (CRM) systems they usually are more limited compared to large firms in establishing new forms of relationships with their customers. These findings are supported by Lun and Quaddus (2011) and Fort et al., (2013), who argued that IER in the context of customer relations are more sophisticated and better developed in many aspects in large firms compared to smaller ones because small firms have a lower capacity to establish relations with customers and consumers. Medium-sized and large firms are more likely to make use of e-business related IER in establishing new forms of customer relations (Bordonaba-Juste, 2012). In contrast, Kilenthong et al., (2016) has shown that smaller firms are slightly more active compared to large firms in IER related to customer relations.

As for other kinds of cooperation, the larger a firm is the more actively it cooperates technologically with its suppliers (Minguela-Rata et al., 2014) and with R&D partners (Badillo et al., 2017). Small firms cannot easily establish international cooperation because usually they suffer from a lack of resources (Zhou, 2018).

To be active in IER, a firm has to experience a need for network development (Gopalakrishnan and Bierly, 2006). On the other hand, it seems that no substantial evidence that a comprehensive network has a direct link with IER activity exists. Ono and Stango, (2005) found that outsourcing models differ for large and super-large firms, which points to differences in network patterns. They suggested that the decisions on which pattern to choose depend on a combination of factors rather than only the characteristic of firm size. Thus, the influence of firm size on innovations in external relations does exist to a certain extent but it is not obvious in its direction. We thus propose the following hypothesis:

***H2c. Firm size has an effect on innovations in external relations (IER) in a firm.***

### 3 Methodology

The data analyzed in this paper results from a survey conducted in Russia during the second half of 2016. The survey investigated the relationship between organisational innovations (ORI) on one side and firm characteristics on the other.

The population consisted of manufacturing firms based in the Central Region of Russia. The

questionnaire was administrated in electronic form to every tenth firm on the list which made a total of 550 firms. All the respondents at the moment of the survey held a top managerial position (CEO, CFO, or similar). After two weeks, a reminder was sent to those who had not replied by that time. As a result of the field work 145 completed surveys were collected. Twenty-two surveys were discarded because the answers to some questions were missing, which would not allow those questionnaires to be processed completely. The overall response rate was slightly above 25 per cent.

We employed a survey method for our study. We developed the dependent variables measuring ORI performance based on the definitions presented in the Oslo Manual (OECD-EUROSTAT, 2005). The scales for measuring ORI were taken from the previous studies with minimal adaptation. Similar scales for measuring ORI were used by Eurostat (2012), Kam Sing Wong (2013), Camisón and Villar-López (2014), Merono-Cerdan and Lopez-Nicolas (2013), Mothe and Thi, (2010). Respondents were asked to compare the innovation performance of their firm in comparison with the innovation performance of their competitors using a seven-point Likert scale, where 1 corresponds to “strongly disagree” and 7 corresponds to “strongly agree”, (Camison, 2014; Eurostat, 2012; Dadura and Lee, 2011). A firm size was measured by the number of employees on a 5-point scale: 1 = fewer than 50; 2 = 50–150; 3= 150–500; 4 = 500–1000; 5 = more than 1000 (e.g., Damanpour, 2006). The firm age was measured by the number of years since the foundation of the firm (Camison, 2014).

While designing the questionnaire, a few intensive interviews with both academicians and practitioners were conducted in order to check the presented concepts and the way in which respondents perceive the questions.

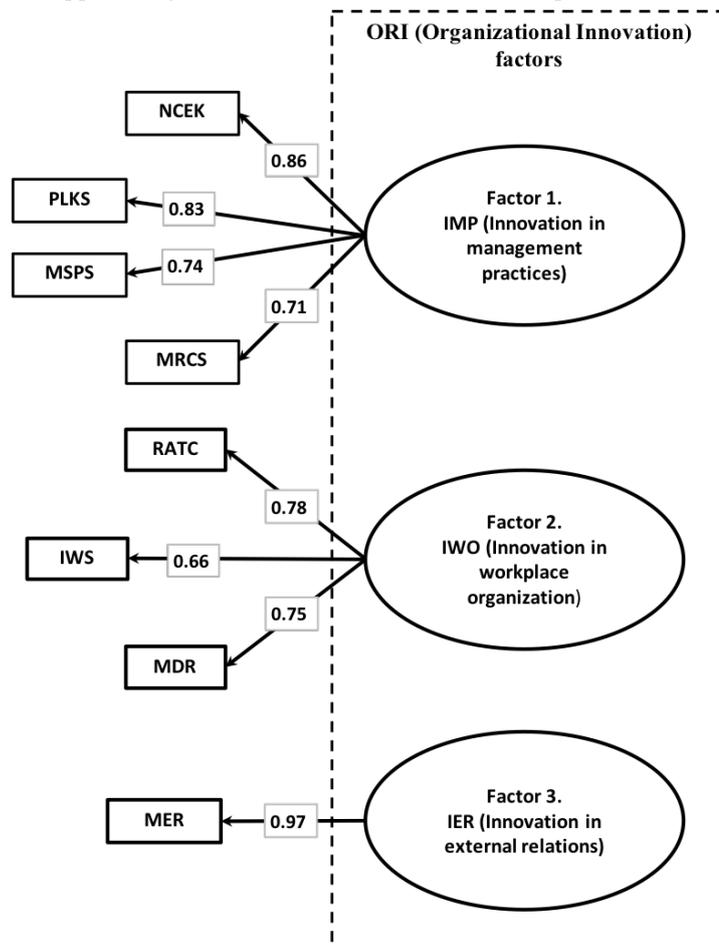
## 4 Results

An exploratory factor analysis was applied in the first stage of the data analysis to combine the observed variables used for measuring ORI into factors. We interpreted the obtained factors as ORI subtypes. To test the hypotheses on factorial validity of the identified factors a confirmatory factor analysis was carried out. The results of the confirmatory factor analysis proved the validity of the identified factors. At the last stage of the analysis, regression equations were calculated to determine the relations between firm size and age on the one side and the ORI subtypes on the other.

Before applying the exploratory factor analysis, the Kaiser-Meyer-Olkin (KMO) test was run for the sample. The KMO value obtained for the data set was 0.91, which demonstrates more than adequate quality for processing by factor analysis (Cerny and Kaiser, 1977). The exploratory factor analysis demonstrated that a 3-factor solution provided the best fit. The first factor (4 items) includes items which are related to innovation in management practices. These are: a system that enables the employees to gain access to non-codified external knowledge (NSEC); new practices of improving learning and knowledge sharing within the firm (PLKS); new management systems for general production or supply operations (MSPS); new methods that reduce costs of suppliers (MRCS). The second factor (3 items) includes items related to innovation in the workplace organization. The items associated with it are: a new workplace organizing method that reduces administrative and internal transaction costs (RATC); a new approach of improving

workplace satisfaction (IWC); new methods for distributing responsibilities and decision making among employees for the division of work within and between firm activities (and organizational units), as well as new concepts for the structuring of activities (MDR). The third factor includes only one item and it deals with innovation in external relations. This item was articulated as new methods in a firm external relations that involve the implementation of new ways of organizing relations with other firms or public institutions (MER).

The result of the exploratory factor analysis is illustrated in Fig.1 and Table.1. Three subtypes of ORI have been indicated initially. The exploratory factor analysis demonstrated that these three ORI subtypes are supported by different items. The cumulative explanation factor is 75.6.



**Fig. 1.** The graphical model of the exploratory factor analysis

To test the hypotheses for the factorial validity of the identified factors, a confirmatory factor analysis was carried out. The results of an exploratory factor analysis (3 factors, 8 items) were

used as an a priori hypothetical structure of the scales. The values for the model fit measures are as follows: Chi-square/df = 1.77; CFI = 0.86; GFI = 0.936; AGFI = 0.87; SRMR = 0.98; RMSEA = 0.04; PCLOSE = 0.96. These measures indicate an acceptable model fit (Hair et al. 2010).

Further, the scale reliability was tested for internal consistency by using the Cronbach's alpha method. The Cronbach's alpha for the data set equals 0.87 which suggests high reliability of the scales in terms of their internal consistency ( DeVellis, R.F., 2012). In addition to the calculation of the Cronbach's alpha for each scale, the Cronbach's alpha ratio was calculated for each of the scale provided one item masked. The results showed scale reliability as none of the items were superfluous.

Table 2 demonstrates the results of a correlation and regression analysis that was applied in order to determine the impact of firm age and size on ORI activities. A linear regression model was calculated for each pair of considered variables.

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**Table 1.** Organizational Innovation. Results of the factor analysis applied to OI variables.

ORI sub-type	Factors					
<b>Innovation in management practices</b>	IMP	Mean	Std. Dev.	1	2	3
A system that enables employees gain access to non-codified external knowledge	NCEK	4.07	1.86	0.86		
New practices improving learning and knowledge sharing within the firm	PLKS	4.10	1.68	0.83		
New management systems for general production or supply operations	MSPS	4.11	1.64	0.74		
New methods that reduce costs of suppliers	MRCS	3.95	1.64	0.71		
<b>Innovation in workplace organization</b>	IWO					
A new workplace organizing method that reduces administrative and internal transaction costs	RATC	3.97	1.65		0.78	
A new approach to improving workplace satisfaction	IWS	3.80	1.65		0.66	

New methods for distributing responsibilities and decision making among employees for the division of work within and between firm activities (and organizational units), as well as new concepts for the structuring of activities	MDR	3.43	1.63	0.75	
<b>Innovation in external relations</b>		IER			
New methods in a firm's external relations that involve the implementation of new ways of organizing relations with other firms or public institutions	MER	4.29	1.61		0.97
<b>% Total</b>				54.41	11.38 9.84
<b>Cumulative</b>				54.41	65.79 75.63

Further, the scale reliability was tested for internal consistency by using the Cronbach's alpha method. The Cronbach's alpha for the data set equals 0.87 which suggests high reliability of the scales in terms of their internal consistency (DeVellis, R.F., 2012). In addition to the calculation of the Cronbach's alpha for each scale, the Cronbach's alpha ratio was calculated for each of the scale provided one item masked. The results showed scale reliability as none of the items were superfluous.

Table 2 demonstrates the results of a correlation and regression analysis that was applied in order to determine the impact of firm age and size on ORI activities. A linear regression model was calculated for each pair of considered variables.

The results prove that firm age impacts some ORI subtypes. Nevertheless, this impact is not very strong and for some relations the regression coefficients do not demonstrate significant values.

Among the ORI subtypes that encompass the "innovation in management practices" factor (IMP), the highest value of regression coefficient (0.67) received the item that deals with systems that enable employees to gain access to non-codified external knowledge. This could mean in general that the older firm is, the more information systems are put into use. Obviously, those systems being implemented have a positive impact on the ORI activities in the firm. The next ORI item, "new practices of improving learning and knowledge sharing within the firm" scored a regression coefficient of 0.56.

We did not find any significant relationship between firm age and the two other items of the IMP, namely "new management systems for general production or supply operations" and "new methods that reduce the costs of suppliers". This is evidence that firms do not develop systems and methods on a systematic basis by getting older.

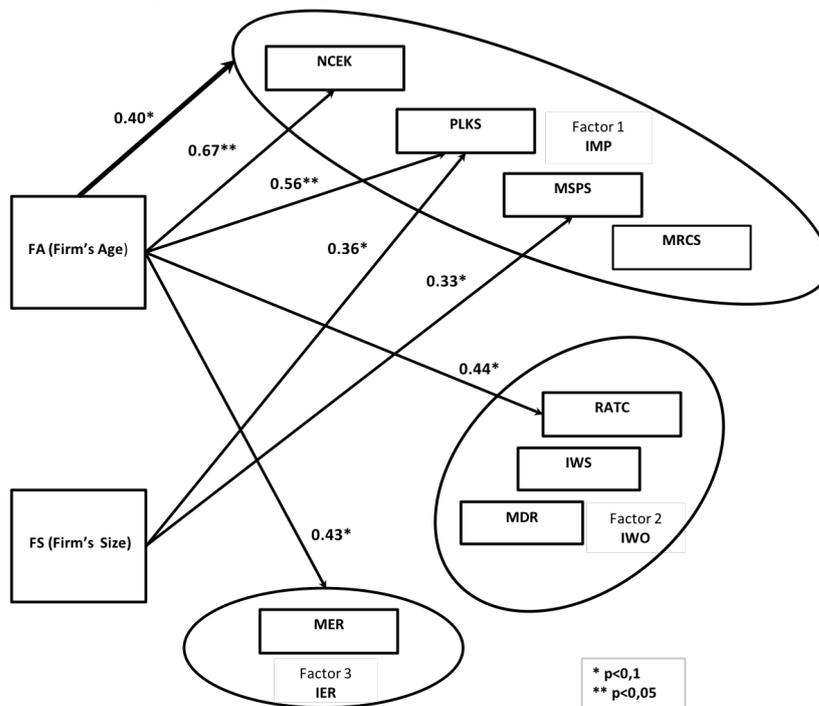
As for the value of the IMP calculated as an average of the incorporated items (NCEK, PLKS, MSPS, and MRCS), the regression coefficient of the relationship between a firm's age and IMP received a value of 0.4 ( $p < 0.1$ ).

As for the second ORI subtype "innovation in workplace organization" (IWO), the only item

of ORI that proved to have a statistically significant impact from the firm age variable with a regression coefficient of 0.44 was the item “new workplace organizing method that reduces administrative and internal transaction costs”. As for the value of the IWO calculated as an average of the three incorporated items (RATC, IWC, and MDR), no substantial relation was found between the firm’s age and IWO.

Finally, the third ORI factor “innovation in external relations” that encompasses only one variable “new methods in a firm’s external relations that involve the implementation of new ways of organizing relations with other firms or public institutions” received a regression coefficient of 0.43 ( $p < 0.1$ ).

The ORI subtypes do not experience strong influence from firm size. Only two subtypes of ORI out of eight demonstrated statistically significant relation with a firm size. They are “New practices of improving learning and knowledge sharing within the firm” and “New management systems for general production or supply operations” with the regression coefficient 0.56. Thus, is the evident that a firm’s size has very limited impact on ORI as a whole. Graphically, the significant relations are presented in Fig.2.



**Fig. 2.** Graphical model of the significant relations found.

Based on the results of the analysis, we can state that the proposed hypotheses:

*H1a. Firm age has a positive effect on innovations in the management practices (IMP) in the firm - accepted.*

*H1b. Firm age has a positive effect on innovations in the workplace organization (IWO) in a firm – accepted.*

*H1c. The firm age has a positive effect on innovations in external relations (IER) in a firm – accepted.*

*H2a. Firm size has effect on the innovations in management practices (IMP) in a firm – rejected.*

*H2b. Firm size has effect on innovations in the workplace organisation (IWO) in a firm – rejected.*

*H2c. Firm size has an effect on innovations in external relations (IER) in a firm. - rejected.*

**Table 2.** Results of the correlation and regression analysis.

		Structural path	Correlation coefficient	Regression coefficient	t-value	p-value
<b>IMP (Factor 1)</b>	FS (Firm's Size)	<b>FA → IMP</b>	<b>0,209</b>	<b>0,402</b>	<b>1,925</b>	<b>0,058</b>
		<b>FA → NCEK</b>	<b>0,262</b>	<b>0,669</b>	<b>2,442</b>	<b>0,017</b>
		<b>FA → PLKS</b>	<b>0,246</b>	<b>0,559</b>	<b>2,286</b>	<b>0,025</b>
		FA →MSPS	0,137	0,110	1,246	0,216 n.s.
		FA →MRCS	0,043	0,091	0,386	0,701 n.s.
	FA (Firm's age)	FS → IMP	0,124	0,213	1,127	0,263 n.s.
		FS →NCEK	0,086	0,196	0,777	0,439 n.s.
		<b>FS → PLKS</b>	<b>0,179</b>	<b>0,362</b>	<b>1,639</b>	<b>0,095</b>
		<b>FS →MSPS</b>	<b>0,174</b>	<b>0,329</b>	<b>1,593</b>	<b>0,100</b>
		FS →MRCS	-0,019	-0,036	-0,172	<b>0,864 n.s</b>
<b>IWO (Factor 2)</b>	FA (Firm's Age)	<b>FA → IWO</b>	<b>0,182</b>	<b>0,319</b>	<b>1,664</b>	<b>0,100</b>
		<b>FA → RATC</b>	<b>0,198</b>	<b>0,436</b>	<b>1,817</b>	<b>0,073</b>
		FA → IWS	0,141	0,295	1,278	0,205 n.s.
		FA → MDR	0,107	0,226	0,964	0,338 n.s.
	FS (Firm's Size)	FS → IWO	0,132	0,206	1,198	0,235 n.s.
		FS →RATC	0,138	0,270	1,250	0,215 n.s.
		FS →IWS	0,056	0,105	0,508	0,613 n.s.
		FS →MDR	0,129	0,243	1,169	0,246 n.s.
<b>IER (Factor 3)</b>	FA (Firm's Age)	<b>FA → MER</b>	<b>0,197</b>	<b>0,427</b>	<b>1,806</b>	<b>0,075</b>
	FS (Firm's Size)	FS →MER	-0,031	-0,060	-0,281	0,780 n.s.

## 5 Discussion

The main contribution of the study is in investigating the relation between a firm's age and size and its ORI. It should be noticed that unlike the largest part of the literature on innovation, our study focuses on organizational innovation. For the purpose of our study, the ORI activity was considered at the level of the ORI subtypes.

Studies on how the probability of innovation depends on a firm's age and size play an important role in understanding ORI behavior (Huelgo and Jaumandreu, 2004).

Some of the studies that have dealt with the problem of the impact of a firm's age on its ability to innovate (Van de Ven, 1986; Damanpour, 1987; Kelly and Amburgey, 1991; Huelgo and Jaumandreu, 2004; Acemoglu et al., 2013; Cucculelli, 2014; Coad et al., 2016) have reported this relation as negative. On the other hand, Audretsch and Mahmood (1995) suggest that innovation provides heterogeneous mechanisms that ensure a firm's survival as they mature. The research has underlined the role of organizational change to implement new organizational forms and management practices to ensure a firm's survival and its further development (Freeman and Perez, 1988). For example, Sappasert and Clausen (2012) reported a positive relation between a firm's age and its organisational innovation (ORI) supporting the proposition by Audretsch and Mahmood (1995). Our findings are coherent with these studies though they come from a different industrial and national context. We found that the intensity of the organisational innovation relates positively to the firm's age.

Firm size is usually considered an important factor in the innovation process (Vaona and Panta, 2008). Furthermore, contrarily to our findings, several studies have found a positive relation between ORI and firm size (e.g. Sappasert and Clausen, 2012). However, it is technological innovation that the majority of studies in this field consider in the context of firm size (Blau and McKinley, 1979; Camison-Zornoza et al., 2004). Due to this, the evidence on the relationship between a firm's size and its ORI activity is not complete (Damanpour, 1992; Damanpour, 1996; Camison-Sullivan and Kang, 1999; Zornoza et al., 2004). Our findings show that a firm's size has no impact or has a very weak impact on the ORI subtypes. This supports those scholars who argue that firm size does not significantly influence the ORI (Mohr, 1969; Utterback, 1974; Kohn and Scott, 1982) and/or its subtypes (Downs and Mohr, 1976; Tansel and Gazioglu, 2014). Due to the ambiguity of the results for firm size and age these variables have sometimes applied as control variables in innovation research (Roxas et al., 2014).

Alternative explanation for a positive relationship between a firm's age and the ORI in contrast to a negative relationship between a firm's age and technological innovation can be derived from the finding by Bianchini et al. (2018). Surprisingly, they found a strong reverse effect of the quality of corporate governance on technological innovation. The former, like our results, refers to the organizational rather than the technological domain and corporate governance strengthens with the maturity of a firm. Hence these findings support the negative relationship between a firm's age and technological innovation. We could assume that our research outcome indicates organizational consolidation as a firm matures in the case that this consolidation involves ORI activity. Mature firms have often gained the capacity to develop more management systems, generate more knowledge, and are more active in developing external relations. Consequently, we may assume that that organisational innovation (ORI) can be described by three subtypes. These three ORI subtypes are known as ORI in management practices, ORI in workplace or-

ganization, and ORI in external relations. The three subtypes singled out are very much in line with the existing conventional understanding of the nature of ORI (e.g., Murphy, 2002; OECD-EUROSTAT, 2005; Uhlaner et al., 2007)

Our study also provides practical implications for innovation management. On the one hand, the importance of innovation for the progress of particular firms and specific industries, and, on the other hand, the inverse relationship between the age of the firm and the intensity of innovation that was revealed in some studies, can be considered as the starting point for developing practical recommendations aiming at stimulating innovation. Possibly the most radical proposal based on this assumption is the suggestion by Acemoglu et al. (2013) to tax the mature firms which are considered less innovation-intensive and then to relocate collected funds to more innovative recent entrants. In the light of our results, such a proposal might be counterproductive as our study indicates that the intensity of ORI increases along with organizational maturity. Moreover, it is a response to the challenge of offsetting the barriers to future growth that have been accumulated by aged firms. The existence of such barriers was postulated by Geroski (1995), who considered them to be stronger than those to market entry. Hence one can expect, a significant economic impact from ORI activity in mature enterprises because these entities, and not new entrants, account for the bulk of economic output and employment.

Some studies (e.g., Le Mens et al., 2014) argue that a firm's adaptive capacity decreases with age. Our findings in the context of the ORI subtype "innovation in external relations" suggest the opposite. The factor corresponding to the given subtype is represented by a single but a significant variable and is well associated with a firm age. Based on these findings, openness can be considered as an important strategy for survival of complex aged organizational systems with increased entropy. It provides another rationale for open innovation that has gained its share of attention in mature economies over the last 15 years. From this perspective, open innovation should be approached by older firms as a kind of external arrangement for survival as it should be facilitated primarily for the exploitation of external knowledge rather than more traditionally to acquire external knowledge (Torkkeli et al., 2009).

This study has some inherent limitations that are worth noting. Despite the relatively limited number of responses collected the results are indicative. On the other hand, to develop the results, comparative data from firms of specific industries should to be examined. The analysis of firm ORI performance covered a time period of three years. In order to strengthen the findings, the period of time for the analysis could be enlarged. The number of indicators for each of the scales should be increased. However, our study increases the understanding on the shared theory of ORI and firm performance.

One more limitation is that the results only provide knowledge about the direction of the innovation intensity change but not the shape of the function that underlies it. For example, this function might be U shaped. According to Audretsch and Mahmood (1995) the initial stage of a firm's development is by definition innovation-intensive. Juxtaposing the assumption that ORI is intensive in the initial stage with our results would produce a U-shaped function that is likely skewed to the one or another side.

This study provides several research avenues to understanding the mechanisms underlying the positive relationship between ORI and a firm's maturity, as well as its influence on a firm and industrial dynamics.

The first research avenue is to address the issue of complexity, which is generally missed in

the research into the relationship between innovation and a firm's age and size. This issue could be addressed by the incorporation into the research model of structural complexity, which Damanpour (1996) proposed as a candidate as a direct antecedent of organizational innovation. In this case, a firm's age, and probably also its size, have an impact on organizational innovation because structural complexity increases as the firm matures. If developing this approach, a set of dependent variables of structural complexity instead of age and size as proxies should be considered as independent variables of the ORI subtypes applied in the our study.

The second research direction could be to clarify barriers to firm survival (Geroski, 1995) which organisational innovation is most probably intended to offset. The conclusions based on the results of our study could also be enriched with an account of idiosyncratic characteristics of an industry and a country. The inherent limitation of our study was set by the sample representing only Russian manufacturing firms. Following the evolutionary approach by Nelson and Winter (1982), conditions for survival depend on the technological and industrial context. Particularly, for a better understanding the role of the ORI and its subtypes in offsetting barriers to a firm's survival, we need to have a better understanding of organizational change occurring in day-to-day operations. In this respect, a firm's age in relation to the ORI could be considered just as a proxy for the dynamics of the routine regime.

An interesting extension of this research direction would be to simultaneously model the dynamics of organizational and technological innovation in consistency with the firm's life-cycle. We can assume that at different stages, the intensity of ORI activity would vary. The discrepancy between our findings related to the positive impact of a firm's age on its ORI activity and the negative character of this impact in the case of technological innovation (e.g. Kelly and Amburgey, 1991; Cucculelli, 2014; Coad et al., 2016) requires alternative explanations which should be tested. The first is that the intensity of ORI may be contrary to that of technological innovation, similar to the negative relation found by Bianchini et al. (2018) regarding corporate governance and technological innovation. To prove this means to challenge the existence of a close association or even symbiotic relationship between organizational and technological innovation. The alternative explanation that should be tested is that ORI simply fails to offset the negative influences on technological innovation accumulated as a firm ages.

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## Appendix 1. Findings and the empirical characteristics of relevant prior studies.

Table 1. Companies and institutions interviewed

A Source	Research type	The main results pertained to the study	Research base
Acs and Audretsch, 1988	Empirical	Large firms compare to SMEs are more active in technological innivation	Analysis of 4476 innovations occurred in the U.S. manufacturing industries in 1982
Aiken et al., 1980	Empirical	The relation between the size of a firm and the rate of innovation adaption is positive	750 questionnaires administered to managers of various firms in Belgium
Antoncic and Antoncic, 2011	Empirical	The level of employee satisfaction in older firms is lower than in younger firms	149 firms in Slovenia
Anwar and Hasnu, 2017	Empirical	Firms' external relations are moderating more by the specific industry then by the firm size	Empirical analysis of seven years financial data of 307 joint stock firms from 12 industries
Badillo et al., 2017	Empirical	Regarding research and development activities small firms cooperate less frequently than big ones	The data from the surveys done in 2010 and 2013 by the Technological Innovation Panel
Bhattacharya and Bloch, 2004	Empirical	Firm's size, market structure, profitability and growth have strong impact on innovative activity in small to medium sized manufacturing businesses	The sample includes 1213 business units of Australian manufacturing firms
Blau and McKinley, 1979	Empirical	Firm's size is among the most important determinants for innovation activity having the positive impact on it	The sample consists of 77 large firms of Manhattan

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Bordonaba- Juste, 2012	Empirical	Medium-sized and large firms are more likely to use e-business in establishing new forms of customer relations	3272 e-business firms from 9 countries
Brouwer and Kleinknecht, 1999	Empirical	When compared to small firms, large ones are more active in formalizing TI, e.g. receiving patents for engineering solutions	The sample of 1728 manufacturing businesses in Europe
Camison-Zornoza et al., 2004	Meta-analysis	The firm's size is among the most important determinants for innovation activity having the positive impact on it	The sample was made up of 87 correlations drawn from 53 empirical studies published in the most important journals on business administration.
Campos-Climent and Sanchis-Palacio, 2015	Empirical	Results show the absence of a significant positive relationship between size and performance in agro-food firms.	Agro-food firms in Spain
Coad et al., 2016	Empirical	Compare to the younger firms, older ones more actively try to establish relations with partners related to research and development. Small firms have neither need no resources for placing orders with outsourced partners for research and development.	The data source is the Technological Innovation Panel between 2004 and 2012 of Spanish manufacturing and service firms
Damanpour, 1984	Empirical	Libraries adopt technical innovations at a faster rate than administrative innovations. The degree of organizational innovation is inversely related to organizational performance. Organizational and technical innovations have a higher correlation in high-performance organizations than in low-performance organizations. The adoption of administrative innovations tends to trigger the adoption of technical innovations more readily than the reverse.	The sample of 85 public libraries in the U.S.

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Damanpour, 1996	Meta-analysis	In large and more complex firms size as such stimulates knowledge flow within the firm, thus accelerating innovation.	21 studies that include 36 correlations
Damanpour, 2006	Empirical	Each a firm organizational characteristics accounts for unique variance in the adoption of innovation. There is no difference in the direction of effects of any antecedent, but did find differences in the significance of effects of several antecedents, on the phases of innovation adoption	The sample of approximately 1200 public organizations in the U.S.
Damanpour, 2008	Empirical	The both innovation characteristics and manager characteristics influence the adoption of innovation; however, they do not reveal significant moderating effects of manager characteristics on the relationship between innovation characteristics and innovation adoption	The sample of 1276 managers/chief administrative officers of municipalities with populations of 10000 or more in the U.S.
Damanpour, 2010	Meta-analysis	The firm's size has the impact on some of innovation types, but the influence is primarily due to the effect of size on process, not product, innovations	28 independent samples from the 20 primary studies
Davidsson and Delmar, 1997	Empirical	The development of a young firm involves the innovative development of the organization	8562 firms that in November 1996 were in the private sector of Sweden and had at least 20 employees
DeTienne and Koberg, 2002	Empirical	characteristics influence the adoption of innovation; however, they do not reveal significant	192 managers across the U.S.
Dufour and Son, 2015	Case study	In order to receive new knowledge, old firms are forced to elaborate continuously their network, which increases the probability of elaborating organizational innovation in the area of external relations	Case study

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Fennel, 1984	Empirical	Large firms have more access to information regarding innovation that allows them to select appropriate ones to adapt from the broader selection	The sample of 173 firms of the State of Illinois, U.S.
Fort et al., 2013	Empirical	Small firms have lower capacity in establishing relations with the customers and consumers	The U.S. Census Bureau's dataset
Gopalakrishnan and Damanpour, 1997	Empirical	Age and size have differentiated impacts on specific subtypes of the organizational innovations. The complicated organizational structure of some large firms might decrease the dynamics of information flow	1075 reported innovations from commercial banking industry
Gopalakrishnan and Bierly, 2006	Empirical	Young firms that focus on developing their technological competences are active in enlarging their external connections to gain access to niche-based knowledge, though the old firms are active in all kinds of external relations. A firm's size and age influences the success of firm knowledge strategies	The population of 27 firms from the drug delivery sector of the pharmaceutical industry
Hafkesbrink and Schroll, 2014	Conceptual	Employee satisfaction is considered as a powerful mechanism for increasing the overall performance of a firm.	n/a
Hafkesbrink and Schroll, 2014	Conceptual	Studies of those firms might provide new insights on how a firm could go through the process of economic and technological changes within the firm over a long period	n/a
Hajjem, 2016	Empirical	The size of industrial firms has no any significant influence on management practices	47 Tunisian firms certified or undergoing certification according to ISO 9001: 2000

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Huergo and Jaumandreu, 2004	Empirical	The probability of innovating widely varies according a firm's activity. Small size of a firm reduces the probability of innovation. Young firms demonstrate the highest probability of innovation while the aged firms tend to show lower innovative probabilities	The panel includes 582 firms in Spain surveyed during the years of 1991-1998
Ismail and Jenatabadi, 2014	Empirical	Younger firms often have no experience enough to process the weak signals that they receive from the business environment in order to adjust their external relations to forthcoming situation	30 airline companies that have being operated in the Asia Pacific region in 2006–2011.
Kalkan et al. 2011	Empirical	There is no relation between size and firm performance	125 firms which use information technologies in their operations in Isparta, Turkey
Kelly and Amburgey, 1991	Empirical	The level of bureaucracy in a firm increases over the years, new and strong formal procedures appear, as well as authority becoming centralized	136 air carriers in the U.S.
Kilenthong et al., 2016	Empirical	Smaller firms are slightly more active compare to large firms in establishing some activities related to customer relations. Age of a firm does not matter in a firm's activity with customers	752 business owner structured interviews
Kim, 1980	Empirical	The relation between the size of a firm and the rate of adoption of innovation is positive	The sample consists in 31 manufacturing organizations
Kimberly and Evanisko, 1981		A firm's size has a positive impact on both TI and NTI. Medium-size firms are less bureaucratic in taking decisions on implementing IWO, as the risks of having negative effect from changes are less costly	The sample of approximately 1000 U.S. hospitals

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Kohn and Scott, 1982.	Conceptual	The complexity of large firms might create barriers to implementing innovation as well as extending the way from innovation identification to its adoption, thus reducing the positive effect of a firm's size upon innovativeness	n/a
Lun and Quaddus, 2011	Empirical	Customer relations in many aspects are more sophisticated and developed in large firms compare to small ones.	98 container transport operators in Hong Kong
Minguela-Rata et al., 2014	Empirical	The larger a firm is the more active it cooperates technologically with suppliers	1952 companies representing the Spanish manufacturing industries
Mohr, 1969	Empirical	There is no impact of firm size on innovation activity	94 agencies full-time local health departments in Illinois, Michigan, New York, Ohio, and Ontario (U.S.)
Montoro - Sanchez, 2011	Empirical	Organizational innovation related to management practices is the key factor in the creation and diffusion of new knowledge. In order to receive new knowledge, old firms are forced to elaborate continuously their network which increases the probability of elaborating organizational innovation in the area of external relations).	The sample is based on the CIS survey and includes 784 European companies
Ono and Stango, 2005	Empirical	Outsourcing models differ for large and super-large firms, which points to differences in network patterns. Large companies are much active in outsourcing in comparison to small ones.	The sample of approximately 10000 Credit Units operating in the U.S. in 1994-2003 according the National Credit Union Administration
Reger et al., 1992	Empirical	A firm's age and size has a strong effect on innovation activity.	The sample of 530 bank holding companies of the U.S.

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Santarelli and Piergiovanni, 1996	Empirical	Firm size is another characteristic of a firm that numerous scholars approached in trying to prove Schumpeter's proposition that large firms are more active in TI as they have more resources available, including financial, human, organizational, and intellectual.	The database(PRODIN89) comprises all innovations reported in the complete 1989 volume of a sample composed by 25 Italian technical firms
Som at al., 2012	Empirical	Age and size of a firm have the strong impact on organizational innovation activity though the effect of the impact depends on the organizational innovation sub-type.	CIS Europe-wide study carried in the years of 2010-2012 with the sample of 127674 firms
Tansel and Gazioglu, 2014.	Empirical	Aged firms are forced to develop the Organizational innovation related to working place improvement. In large firms, the level of employee satisfaction is on a lower level compared to smaller ones, which is evidence of the underestimation of management-employee approaches and the neglect of employee-care policies in large firms	The study uses the data from the 1998 Workplace Employee Relations Survey (WERS), of the Department of Trade and Industry in Britain.
Temtime, 2003	Empirical	The large firms implement TQM practices more intensively compared to small firms, though the relation between firm size and TQM practice implementation is not very strong	54 SMEs in the Republic of Botswana

<b>A Source</b>	<b>Research type</b>	<b>The main results pertained to the study</b>	<b>Research base</b>
Tether, 1998	Empirical	argues that large firms introduce a considerable amount of high-value innovations while small firms are active in the introduction lower-value innovations. Firm size is another characteristic of a firm that numerous scholars approached in trying to prove Schumpeter's proposition that large firms are more active in TI as they have more resources available, including financial, human, organizational, and intellectual	The database of significant innovations introduced in the UK during the 1980s
Van de Ven, 1986,	Conceptual	The internal barriers that prevent innovation activity grow, as a firm ages	n/a
Vaona and Panta, 2008	Empirical	A firm's size has positive impact on innovation process	The sample is based on CIS 2 data at the industry level for 22 manufacturing sectors in 8 European countries.
Wagner and Hansen, 2005	Empirical	The firm size does not influence firms' ORI activity	35 U.S. firms based in different states
Walker, 2010	Empirical	Organizational innovation does not have a direct impact on organizational performance.	136 respondents from unitary and upper tier authorities in the UK
Zhou, 2018	Empirical	Small firms cannot easily establish international cooperation because usually they experience lack of the resources	535 manufacturing firms
Zmud, 1984	Empirical	The size has a positive impact on both TI and non-technological innovations	57 software development manager who were responsible for managing an internal software group

BiographyPage

## Biographies



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## **Publication II**

Dukeov I., Bergman J.-P., Heilmann P., and Nasledov A  
**Impact of a firm's commitment to learning and open-mindedness on its  
organizational innovation among Russian manufacturing firms**

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# **Impact of a firm's commitment to learning and open-mindedness on its organizational innovation among Russian manufacturing firms.**

## **Abstract**

**Purpose** – During the last decade, a firm's ability to innovate has gained substantial attention in the literature devoted to innovation and strategic management. This study aims to discuss the relationship of a firm's commitment to learning and its open-mindedness in its activity in introducing organizational innovation. Data collection was conducted in Russia. To make the research more specific, organizational innovation is broken down into two subtypes: innovation in management practices; and innovation in workplace organization.

**Design/methodology/approach** – The study is grounded in data obtained by the surveying of 123 Russian senior managers working in manufacturing firms. Structural equation modeling was applied to investigate the impact of a firm's commitment to learning and open-mindedness on its organizational innovation.

**Findings** – The results indicate that the commitment to learning and open-mindedness have considerable impact on the organizational innovation activity in a firm. The findings also provide evidence that both the investigated subtypes of organizational innovation are positively influenced by the commitment to learning and open-mindedness, although the degree of this influence differs.

**Originality/value** – The literature traditionally focuses largely on technological innovation, with organizational innovation the focus of scant research. In this respect, the study contributes to the theory of organizational innovation by elaborating its relations with organizational learning dimensions. Apart from the investigation of the research question at a general level, the study explores the specific context related to the phenomenon's manifestation in Russia's transition economy.

**Keywords** Organizational innovation, Innovation management, Organizational learning, Commitment to learn, Open-mindedness.

**Paper type** Research paper

## **Introduction**

The current business environment requires continuous implementation of new management approaches and organizational forms. This study seeks to investigate organizational innovation (ORI) in the context of its relationship with organizational learning (OL). The study follows the definition of the OSLO manual (OECD, 2005) proposed for organizational innovation. Creating

new ways of improving a firm's performance is a critical issue in a rapidly changing world, and many studies therefore focus on factors that underlie organizations' overall efficiency (e.g. Aragón-Correa *et al.*, 2007; Jiménez-Jiménez and Sanz-Valle, 2011). In this respect, one acknowledged concept is the theory of innovation. The ultimate reason for promoting innovation usually relates to the problem of increasing a firm's competitiveness. A good innovation strategy is traditionally considered a way for a firm to obtain an advantage over its rivals and secure its internal growth (Damanpour and Aravind, 2011). Academics and practitioners reveal a consensus in sharing the idea that an efficient firm should uninterruptedly innovate (e.g. Bierly *et al.*, 2000; DeCarolis, 2003). However, the source of innovation is not always obvious (Coccia, 2016).

The literature traditionally focuses more on technological innovation, with organizational innovation the object of less research (Freeman and Soete, 2012). However, during the last decade, an increase in studies devoted to non-technological innovation has been noted (e.g. Amarakoon *et al.*, 2016; Birkinshaw *et al.*, 2008; Damanpour and Aravind, 2011). There appears to be a need for further research into both the essence of organizational innovation and its antecedents, and the processes employed for the generation and adoption of ORI (Guest, 2011).

Numerous studies have shown that the relationship between processes associated with a firm's innovation activity and its organizational learning is positively strong (e.g. Argyris and Schön, 1978). Many scholars argue that a firm can be considered an entity in which collective learning takes place. Most of these studies consider the interconnection between innovation and organizational learning from the perspective of a product or process innovation (Delgado-Verde *et al.*, 2011). This can partly be explained by the fact that the very concept of organizational innovation was not developed to the extent as technological innovation. This is also the reason for an unsettled terminology base, metrics, and definitions in studies focusing on non-technological innovation (Lam, 2004).

This study contributes to the research field of organizational innovation by investigating how it is influenced by two dimensions of organizational learning. The study is therefore based on two different concepts: organizational innovation; and organizational learning. The two dimensions of organizational learning considered in the study are commitment to learning and open-mindedness. The latter is studied very broadly in OL and the innovation-related literature (e.g. Calantone *et al.*, 2002; Griese and Kleinaltenkamp, 2012; Sinkula *et al.*, 1997). However, the relationship between them and ORI has yet to be broadly addressed.

This article is structured as follows. The theoretical background of organizational innovation, commitment to learning, and open-mindedness is discussed in the next section. Based on the proposed theoretical framework, the hypotheses are articulated, followed by a section that

explains the methodology, the data collection procedure, the data analysis, and the results. The final section discusses the findings and concludes the paper.

## **Theoretical background**

### *Organizational innovation.*

A firm's ability to innovate is one of the factors that characterize its sustainability and potential for growth (O'Reilly *et al.*, 1991). Numerous studies on how a firm innovates, the antecedents of innovation, and the kinds of business environment that enhance the innovation are based on the assumption that individuals display the most efficiency when they are placed in an environment in which the person-situation interaction fits their own aspirations, and they are supported by the internal processes of that business environment (O'Reilly *et al.*, 1991).

In investigating internal processes in organizations, this study is based on the OECD (2005, p. 51) definition of organizational innovation: "An organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations." Organizational innovation in the given terminology originated in Joseph Schumpeter's (1934) concept of a "new industrial organization." The literature suggests various definitions and interpretations of ORI (e.g. Lam, 2004; Mothe *et al.*, 2015). Since the concept of ORI was introduced at the beginning of the twentieth century, it has been little studied (Klette and Kortum, 2004), and the literature sheds light on few of its distinctive features. To some degree, ORI and the effect of its introduction deeply involve human relations (O'Reilly *et al.*, 1991). The sense of ORI is easy to understand theoretically, but it is often difficult to recognize it without a familiarity with the processes within a given firm (Lam, 2004). ORI cannot easily be transferred from one organization to another, because its nature greatly depends on a specific organizational structure (Bierly *et al.*, 2000; Wolfe *et al.*, 2006). The latter greatly depends on an organization's strategic or operational goals (O'Reilly and Tushman, 2008), and plays an increasing role in a firm's sustainable development (Armbruster *et al.*, 2008). Thus, ORI embedded in organizational structure and aiming to generate and adapt new business practices is a powerful source of competitive advantage which is difficult to copy (Wolfe *et al.*, 2006).

Studies on organizational innovation consider a number of research areas, such as the organizational consequences of the introduction of different ORI subtypes (e.g. Damanpour *et al.*, 2009; Damanpour and Aravind, 2011; Birkinshaw *et al.*, 2008), the antecedents of ORI and its subtypes (e.g. Dukeov *et al.*, 2017; Griese and Kleinaltenkamp, 2012), the effects of the simultaneous introduction of several management practices and workplace reorganizations (e.g. Cappelli and Neumark, 2001; Hung *et al.*, 2011), the generation and adoption of human resource management practices (Laursen and Mahnke, 2001), and new ways of establishing external

relations (Henderson, 2006). In addition, the research has provided rare insights into organizational innovation related to Lean production, quality management, reengineering, subcontracting, and outsourcing (Mothe, *et al.*, 2015).

Although many studies (e.g. Amarakoon *et al.*, 2016; Beblavý *et al.*, 2012) have shown the benefits a firm can derive from generating and adapting ORIs, only a small portion of these firms focus their activities on introducing organizational innovation on a continuous basis. The extent of this introduction also varies considerably (Oeij *et al.*, 2011).

In line with the OECD (2005), ORI aims to improve a firm's performance by enhancing the efficiency of its management system. It is assumed that ORI reduces administrative and transaction costs, intensifies labor productivity, ameliorates workplace satisfaction, and simplifies access to non-tradable assets, such as non-codified internal and external knowledge. ORI can also serve to reduce external environmental barriers to enlarge the number of business connections with suppliers, customers, governmental and non-governmental organizations, R&D, and other organizations (Heidenreich, 2009; Rammer *et al.*, 2009). Despite the fact that organizational innovation is by definition based on the strategic decisions of a firm's management, many scholars suggest that ORI has only a supportive function in technological innovation, providing it with the conditions for its efficient introduction (Tidd *et al.*, 2005).

The OECD (2005) stresses the complex nature of ORI and divides the concept into three innovation subtypes, dealing with business management practices, workplace organization, and external relations. Many scholars (e.g. Murphy, 2002; Uhlaner *et al.*, 2007) have grounded their studies in this OECD (2005) classification, selecting only specific subtypes of ORI for their research. This study focuses on innovation in business management practices and workplace organization, while omitting the external relations subtype.

Innovation in business management practices (IMP) aims to introduce new elements to a firm's behavior. IMP involves a new way of organizing work routines in a firm through implementing new management processes, procedures, and operations and making other changes in management routines that are new for the firm. This subtype of ORI is also known as procedural ORIs (Som *et al.*, 2012). In practical terms, the first implementation of the Total Quality Management system, PDCA cycle, Lean production, Six Sigma, and the Theory of Constraints are examples of potential IMPs. The first implementation of practices related to knowledge management or IT systems can also be considered IMPs. These are, for example, the introduction of new databases for codifying knowledge or best management practices, the diminution of barriers to accessing these databases, and the implementation of new approaches for accessing non-codified knowledge. Thus, IMP plays a strong role in enhancing the dissemination of knowledge in organizations (Armbruster *et al.*, 2008, OECD, 2005).

The second subtype of organizational innovation is called innovation in workplace organization (IWO), or structural organizational innovation (OECD, 2005; Som *et al.*, 2012). It deals with organizational models that are new to a firm. These models must focus on changing the organizational structure to bring it to a more efficient level. Any changes in responsibilities, accountability, the divisional structure of functions, knowledge flows, centralization or decentralization, and integration or diversification can be considered ORIs if they are implemented in a firm for the first time.

To perform successfully both in strategy implementation and the carrying out of operations, a firm must continuously implement new organizational business structures and practices. In other words, it must constantly generate and/or adapt to organizational innovation (Damanpour and Aravind, 2011). Furthermore, to find new business practices and structures, a firm must possess several capabilities, especially for organizational learning. However, a failure in introducing a new business structure or business practice may prompt an increase in learning in order to propose another, potentially more successful, organizational pattern (O'Reilly and Tushman, 2008). Since organizational innovation addresses organizational structures and business practices, it is important to understand that the process of introducing ORI depends on organizational learning. The problem of the ability to innovate as a function of organizational learning has been the focus of numerous studies (e.g. Argyris and Schön, 1978; Delgado-Verde *et al.*, 2011; O'Reilly and Tushman, 2008). Several of these studies argue that organizational learning has a strong direct impact on innovation (e.g. Aragon-Correa, *et al.*, 2007; Hung, *et al.*, 2011; Inkinen *et al.*, 2015; Rothaermel and Deeds, 2004; Weerawardena *et al.*, 2015). For example, Baker and Sinkula (1999, 2002) state that innovation depends in many respects on a firm's ability to organize the learning process efficiently. However, to the best of our knowledge, few studies deal with organizational innovation as a specific type of innovation.

According to the study by O'Reilly *et al.* (1991), OL in many respects deals with the problem of increasing the fitness of an individual in the organizational context, as well as with enhancing a person's performance efficiency in specific areas. Since organizational innovation on the one hand requires by its nature many managerial related activities provided by individuals, and on the other, OL ability can be associated with the potential to adapt to innovation, including ORI, it is logical to assume that there should be a significant relationship between OL and ORI. In this case, an individually focused response might convert the external knowledge obtained by the firm into various forms of organizational activity, including innovation activity (O'Reilly *et al.*, 1991).

### | *Organizational learning*

The concept of organizational learning became of great interest among scholars only in the 1970s (Jyothibabu and Farooq, 2010). The literature suggests numerous definitions of OL, considering it at individual, group, or organizational levels (Bappuji and Crossan, 2004). Generally, OL is understood as the number of a firm's capabilities that evolve its competences to meet the challenges of continuous change to the external environment (Eisenhardt and Martin, 2000). The concept is broadly considered an element of innovation management that could and should be employed in building a firm's competitive advantage by fostering its ability to innovate continuously (Liao *et al.*, 2008; Lloréns Montes *et al.*, 2005; López *et al.*, 2006; Vera and Crossan, 2004). Indeed, it deals with the dilemma posed by the urges to continue to do things as they have always been done or to switch to exploring new opportunities (March, 1991). OL supports the process of improving a firm's innovation performance through adsorbing new knowledge (Baker and Sinkula, 1999; Hung, *et al.*, 2011). The extensive studies related to organizational structures also provide an understanding of a firm's ability to introduce organizational innovation by employing a learning process. For its part, OL is often associated with adsorbing knowledge from the external environment by approaching the advanced outside actors that are more competitive in certain matters (Lam, 2010). Thus, organizational learning as a component of a firm's organizational culture plays a crucial role in many aspects of its performance, especially in the process of introducing innovation (Baker and Sinkula, 2002; Henderson, 2006; O'Reilly *et al.*, 1991).

The OL process supports a firm's management in the reconfiguration of organizational assets to meet the demands of the dynamically changing business environment. It also reinforces a firm's ability to integrate, rebuild, and develop the competences that pertain to its sustainable growth by changing critical organizational structures and business practices (O'Reilly and Tushman, 2008). In turn, the organizational structural change can provoke the further learning process that leads to a cumulative change in technologies. Coccia (2017) argues that the efficiency of a firm's innovation management substantially depends on the ability to use the learning process to obtain new knowledge for research and development. Thus, the learning process accumulates, analyzes, and advances knowledge, resulting in the introduction of various kinds of innovation, including both technological and organizational. In this case, organizational innovation takes the form of new business structures of various forms of cooperation, for example, the cooperation of established firms with new entrances.

Today's perspective of the OL concept is multidimensional and cannot be easily described by a single theory (Antonacopoulou, 2008). Each of its dimensions plays an important role in the overall success of the learning process in a firm. The literature provides a variety of frameworks

for describing the dimensions that vary in both number and definition. For example, Sinkula *et al.* (1997) propose three dimensions for the organizational learning construct: commitment to learning; open-mindedness; and shared vision. Calantone *et al.* (2002) posit four dimensions of OL: commitment to learning; shared vision; open-mindedness; and intra-organizational knowledge sharing. Numerous OL models share the same two constructs, namely, commitment to learning and open-mindedness, or very similar ones. For example, commitment to learning is very close to what Park *et al.* (2014) and Marsick and Watkins (2003) refer to as “continuous learning.” Open-mindedness has much in common with what Jerez-Gómez *et al.* (2005), Jiménez-Jiménez and Sanz-Valle, (2011), and Pérez López *et al.*, (2004), for example, refer to as “openness and experimentation,” and to some extent with what Moshabaki (2008) refers to as “knowledge sharing.”

As studies on organizational learning have shown, commitment to learning may play a significant role in introducing innovation in a firm (Calantone *et al.*, 2002; Griese and Kleinaltenkamp, 2012; Sinkula *et al.*, 1997). Open-mindedness is also shown as a key feature of an innovation-active firm (Griese and Kleinaltenkamp, 2012; Liao *et al.*, 2008; Mothe *et al.*, 2015; Sinkula *et al.*, 1997). We have therefore chosen these two constructs for further exploration in the context of their relationship with organizational innovation.

#### *Commitment to learning*

According to Dixon (1992), the firms that continuously work on their development by seeking new opportunities are to a great degree committed to the learning process. In the literature, commitment to learning is considered the extent to which a firm appreciates the value of the learning process, supports its continuous nature (Sinkula *et al.*, 1997), and secures an internal learning oriented environment (Norman, 1985). Sinkula, *et al.* (1997) state that commitment to learning is shown by the firms that constantly analyze the effect of its action, and continuously learn and reflect based on the obtained knowledge.

Galer and van der Heijden (1992) suggest that a firm’s commitment to learning underlies the process of adequately understanding the external and internal environments, which is essential for innovation activity. In line with this, Dixon (1992) argues that commitment to learning facilitates the obtaining and processing of information about the business environment to develop and capture competitive advantages. This means, for example, handling the information of the firm’s internal changes, its successes and failures, and production and administrative processes, as well as of its customers, competitors, technologies, and other dimensions of the external environment. In this context, commitment to learning influences the information the firm seeks, accepts, or rejects, as well as the process of transforming the obtained information

into knowledge (Argyris and Schön, 1978; Calantone *et al.*, 2002; Dixon, 1992). In turn, the accumulated knowledge triggers all kinds of innovation, and firms that demonstrate a high level of commitment to learning tend to accomplish superior results in innovation performance (Ussahawanitchakit, 2008). Senge (1990) supports this statement by arguing that commitment to learning is a fundamental principle in an innovative organization.

The mutual interrelation of commitment to learning and innovation activities was also suggested in the studies of Nonaka (1993) and Von Hippel (1988), for example. Norman (1985) and Sackmann (1992) argue that if a firm invests little in developing its learning process, it is probable that the firm will be unable to evolve innovative strategies. In their study of architectural innovation, Henderson and Clark (1990) claim that the efficiency of the innovation process largely depends on a firm's commitment to learning, but a specific type of innovation demands an appropriate type of organizational learning. On the practical side, a firm that is committed to learning regards the learning process as a long-term investment in its future success (Calantone *et al.*, 2002). The greater a firm's commitment to learning, the more intensive is the learning that takes place within it (Sinkula *et al.*, 1997; Slater and Narver, 1995).

Furthermore, Calantone *et al.* (2002) argue that in firms that are committed to learning, employees are encouraged by management to scale up their learning above the level demanded by their job responsibilities. The last statement matches the concept proposed by O'Reilly and Tushman (2008), who argue that organizational learning successfully evolves only if the firm's organizational culture fosters this process by considering organizational learning one of its core values and focuses on the individual competence development of key personnel.

Consequently, commitment to learning characterizes the degree to which a firm is satisfied with the knowledge it possesses for executing operations, including the introduction of innovation (Tobin, 1994).

Griese and Kleinaltenkamp (2012) state that a firm is innovative when it integrates skills at organizational level through continuous use of the learning process. Tohidi *et al.* (2012) have shown that commitment to learning positively and significantly impacts a firm's innovation activity in the broad sense of this term.

Having assumed that the organizational innovation process is a component of the overall innovation activity in a firm, the following hypothesis is proposed:

H1. Commitment to learning positively relates to organizational innovation.

### *Open-mindedness*

To secure survival, continuous development, and a firm's long-term competitive advantage, its management team must be open to accepting new ideas related to potential products and

processes, as well as to organizational models (e.g. Baker and Sinkula, 2002). Open-mindedness implies a firm's ability to absorb new ideas (Sinkula *et al.*, 1997) or critically analyze its experience to generate new knowledge pertaining to the current situation (Senge, 1990; Verona, 1999). Vătămănescu *et al.* (2017) noted that a firm's capability to innovate is greatly shaped by the internal context of the organization, which includes open-mindedness. The serendipity and sagacity of the management team that are important for a firm to be innovative and successful in strategy development are based on managers' knowledge and curiosity, as well as on open-mindedness and the ability to investigate new areas (Taramigkou *et al.*, 2017).

The generation and adoption of innovation that relate to various organizational processes such as management, manufacturing, and marketing substantially depend on how easily information is disseminated within the firm (Henderson and Clark, 1990). If a firm's management has a conservative thinking that prevents organizational learning, it is unlikely that it will be active both in technological and non-technological innovation (Calantone, *et al.*, 2002, Sinkula, *et al.*, 1997). The ability to unlearn as an element that curtails open-mindedness is also an essential characteristic of a firm if it is to be capable of receiving new ideas and finding the most appropriate innovative strategies and solutions (Sinkula *et al.*, 1997; Nystrom and Starbuck, 1984).

According to Velo and Mittaz (2006), open-mindedness is a crucial attribute if a firm is to develop new organizational forms to be successful in international markets. In their study of the hospitality business, they concluded that open-mindedness was one of the key abilities that helped a firm to find new organizational forms and adapt to a new international environment. For the sake of company development, it is often more efficient to hire new potentially open-minded staff than train existing personnel to be open-minded. This proposition also finds support in the studies of Hsu *et al.* (2013), Nielsen and Nielsen (2011), and Vătămănescu *et al.* (2017) in the context of new organizational forms pertaining to international expansion. On the other hand, Peng and Lin (2017) suggest that an internationally active firm has more opportunities to innovate both in the technological and organizational fields. Consequently, open-mindedness fosters a firm's potential to innovate by developing its networking abilities for using all kinds of open channel to secure the continuous inflow of vitally important information for creating new forms of business (Vătămănescu *et al.*, 2017).

Henderson and Clark (1990) suggest that the successful performance of cross-cultural teams that introduce various types of innovation can be understood and described from the perspective of the open-mindedness environment. Peng and Lin (2017) support this in claiming that open-mindedness is one of the constructs of organizational learning that positively influences a firm's research and development capability. New path-breaking technologies supported by research and

development processes are increasingly based on learning in practice (Morlacchi and Nelson, 2011). Nelson (2008) argues that professional knowledge is acquired in almost all technological fields through learning by doing and is associated with practical activities. In turn, technological innovation in an industry affects the networking process, which results in innovative business practices and structures. Overall, this means that open-mindedness supports the change of business by introducing ORI. An open-mindedness firm is active in establishing external relations with partners to obtain external knowledge for developing technologies and advanced organizational structures (Vera and Crossan, 2004). This is in line with Lazonick (2010), who demonstrated that firms with open-mindedness cultures are characterized by their implementation of aggressive strategies that are always accompanied by the development of new organizational patterns.

Specific characteristics of a firm's open-mindedness environment, such as discussing and accepting failure, ease of knowledge flow, and the ability to integrate knowledge, are basic and life-and-death elements for implementing new business practices through organizational innovation (O'Reilly and Tushman, 2008). We have therefore assumed that a firm's open-mindedness as a major construct of organizational learning affects the firm's activity in the area of organizational innovation, because the last of these characteristics deals with promoting new organizational structures and business practices. As a result, the following hypothesis is proposed:

H2. Open-mindedness positively relates to organizational innovation

### **Research methodology**

As suggested by numerous scholars (e.g. Henderson, 2006; O'Reilly *et al.*, 1991), this study hypothesizes that a relationship exists between organizational innovation activity in a firm and its organizational learning process. At the same time, the source of organizational innovation is not always obvious and requires further investigation by different research fields (Coccia, 2017). The research's methodology is grounded in a deductive study that addresses incumbent firms, chosen based on geographical and industrial principles. Concerning the geographical principle, firms in the Central and Northwestern Economic Regions (CNWER) of Russia were chosen for data collection. The central cities of these regions are Moscow and Saint Petersburg. More than 25% of Russian citizens live in the CNWER, and more than 80% are urban dwellers. Production requiring highly skilled human resources and low energy consumption is very well developed in the CNWER. Around 30% of all manufacturing industry is metalworking production and machinery. A considerable share of production accounts for electronics and instrument engineering, as well as road, railway, and water transportation. Production of chemicals, textile,

construction materials, and food and beverages are also among the other well-developed industries of the CNWER (ROSSTAT, 2019).

Five hundred and fifty target companies with more than 25 employees and operating in the market for more than three years were chosen randomly from the list of manufacturing companies in the directory of industrial companies for the target area. The questionnaire was distributed electronically to the 550 respondents holding a top managerial position (CEO, CFO, or similar) during the second half of 2016. After two weeks, a reminder was sent to those who had not replied. As a result of the fieldwork, 145 completed surveys were collected, and 22 were discarded, because answers to some questions were missing. The overall response rate was therefore slightly above 25%.

Based on the hypothesis, the study investigated the impact a firm's commitment to learning and open-mindedness had on its organizational innovation (Fig. 1). The investigated problem was limited to studying only two subtypes of organizational innovation and only two dimensions of organizational learning. The dependent variables for organizational innovation (ORI) performance measurement were developed based on the definitions proposed in the Oslo Manual (OECD, 2005), as well as in studies conducted by Eurostat (2012) and Dadura and Lee (2011). The first ORI factor, IMP, included four items that were used to measure innovation in business management practices. These were: 1) a system that enabled employees to gain access to non-codified external knowledge (NCK); 2) new practices for improving learning and knowledge sharing within a firm (PLK); 3) new management systems for general production or supply operations (MSP); 4) new methods reducing supplier costs (MRC). The second ORI factor, IWO, included three items that were used to measure innovation in workplace organization. The items associated with IWO were: 1) a new workplace organizing method that reduced administrative and internal transaction costs (RAC); 2) a new approach to improving workplace satisfaction (IWS); 3) new methods for distributing responsibilities and decision making among employees for the division of work within and between firm activities (and organizational units), as well as new concepts for the structuring of activities (MDR).

The latent variables related to commitment to learning and open-mindedness were measured, based on the metrics proposed in studies conducted by Griese and Kleinaltenkamp (2012) and Zortea-Johnston (2011). One question was self-operationalized. The open-mindedness factor, OMN, included five items, and the commitment to learning factor, LEN, included four.

A firm's size (SZF), measured by the number of employees, was considered an exogenous variable and was used as a control variable (Amarakoon *et al.*, 2016; García-Morales *et al.*, 2006; Jyothibabu and Farooq, 2010). A considerable number of studies has been devoted to the problem of the impact a firm's size has on organizational innovation (Dukeov *et al.*, 2018;

García-Morales *et al.*, 2006). Many studies have proven the positive relationship between a firm's size and its activity in introducing innovation (Aiken *et al.*, 1980; Kim, 1980). This positive relationship is explained by the fact that the larger a firm is, the more resources it can invest in introducing all kinds of innovation (Damanpour and Aravind, 2011).

The description of the variables and the exploratory factor analysis loadings is presented in Table 1.

The questions were articulated in such a way that respondents compared each of the characteristics of their firm with the same characteristic of their firm's main competitor. A seven-point Likert scale (where 1 corresponds to "strongly disagree" and 7 corresponds to "strongly agree" (Dadura and Lee, 2011; Eurostat, 2012) was used in the questionnaire for the basic questions. To rely on model fit indices, the sample size needed to satisfy the condition of  $N > 5T$ , where N was the number of elements in the sample, and T was the number of variables under consideration (Byrne, 2010; Kline, 2011). As in the sample for the study,  $N=123$ , it was possible to rely on obtained model fit indices and use the Structural Equation Modeling (SEM) method. Statistical analysis was conducted by means of IBM SPSS Statistics & AMOS version 25.

Concerning data analysis, exploratory factor analysis was applied in the first step to decrease the data dimension. The nine independent variables, OMN1...OMN5 and LEN1...LEN4, determined two factors: open-mindedness (OMN); and commitment to learning (LEN). The factor loadings are shown in Table 1.

After applying exploratory analysis, confirmatory factor analysis (CFA) was applied to seven dependent variables describing the two organizational innovation subtypes to confirm the scale structure in the model for measuring ORI. The results obtained by CFA confirmed that the dependent variables NCK, PLK, MSP, and MRC could be used as indicators for

TO INSERT TABLE 1 ABOUT HERE

the IMP subtype of organizational innovation, while the dependent variables, RAC, IWS, and MDR, could be used as indicators for the IWO subtype of organizational innovation. Figure 1 demonstrates the structure of the scales in the model for measuring ORI. When SEM was applied, the result of the confirmatory factor analysis (2 factors, 7 items) was used as a hypothetical structure of the scales in the model for measuring ORI, and the factors IWO and IMP were considered indicators for the latent variable "organizational innovation" (ORI).

TO INSERT FIG. 1 ABOUT HERE

The goodness of fit of the SEM was evaluated using the following criteria: CMIN/df < 2.0; p-value of CMIN ( $p$ ) > 0.05; Goodness of Fit Index (GFI) > 0.90; Comparative Fit Indices (CFI) > 0.85; the Root Mean Square Error of Approximation (RMSEA) < 0.05 with the closeness of fit ( $P_{\text{close}}$ ) > 0.40 (Byrne, 2010). The values for the model fit measures were as follows: CMIN = 9.683; df = 12;  $p$  = 0.644; GFI = 0.979; AGFI = 0.950; RMSEA = 0.00;  $P_{\text{close}}$  = 0.836. These measures demonstrated the very high level of the model fit. All the regression weights, covariance, and variances for the latent variables were statistically significant ( $p$  < 0,001).

The factor analysis therefore confirmed the usability of two scales (OMN and LEN), based on nine independent variables for measuring two dimensions of organizational learning, as well as two other scales (IMP and IWO), based on seven dependent variables for measuring the subtypes of organizational innovation (Table 1).

The next step was to check the reliability of each of the scales for the internal consistency of the contained items. For the scales OMN, LEN, IWO, and IMP, the calculated Cronbach Alpha was 0.93, 0.91, 0.78, and 0.82. The high values of the Cronbach Alpha for each of the scales grounded the possibility of computing the values of the scales as a mean of the contained items. Based on the obtained scales, a prior structural model was proposed that linked the dependent and independent variables (Fig. 2) to check its fit with data collected through the SEM method.

TO INSERT FIG. 2 ABOUT HERE

As the requirement of multivariate normality was met (Multivariate Kurtosis = 2.202; C.R.= 1.46) the maximum likelihood method of SEM analysis was applied (Byrne, 2010; Kline, 2011). However, the values for the model fit demonstrated an unsatisfactory level (CMIN = 8.265; df = 3;  $p$  = 0.41; GFI = 0.979; AGFI = 0.872; RMSEA = 0.120;  $P_{\text{close}}$  = 0.094). To improve the model fit, the relationship between SZF and ORI was added. The final model obtained is shown in Figure 3. The values for the model fit measures are as follows: CMIN = 2.320; df = 2;  $p$  = 0.313; GFI = 0.993; AGFI = 0.944; RMSEA = 0.036;  $P_{\text{close}}$  = 0.417. These measures demonstrated the very high level of model fit. All the regression weights and variances obtained for the final model were statistically significant at the level of  $p$  < 0.001 (Hair *et al.*, 2010).

TO INSERT FIG. 3 ABOUT HERE

Based on the obtained results, ORI experienced a strong impact from a firm's commitment to learning. ORI also received a statistically significant impact from open-mindedness and positively depended on the size of an organization. A firm's size positively influenced its commitment to learning and negatively influenced its open-mindedness corporate culture. The aggregated impact of independent variables LEN, OMN, and SZF explained 57% of the dependent variable ORI variance. Both the proposed hypotheses were therefore supported:

**1) Commitment to learning positively relates to organizational innovation;**

**2) Open-mindedness positively relates to organizational innovation.**

In addition, the model provided results concerning the constructs of the latent variable ORI. A firm's ability to introduce organizational innovation depended strongly on both the considered subtypes of ORI. However, its impact on IMP was stronger (96% of variance) than on IWO (50% variance).

## **Discussion**

Although numerous studies are devoted to the phenomena of both organizational innovation and organizational learning, the theoretical framework for innovation theory does not provide sufficient evidence for the relationship between organizational innovation and the learning process in a firm (Freeman and Soete, 2012). This study contributes to the literature on innovation management by investigating a problem on how a firm's organizational innovation is influenced by the two specific dimensions of organizational learning, which are commitment to learning and open-mindedness. The paper not only underscores the role of OL in ORI-related activities but suggests a new perspective that considers organizational innovation a multiplex concept. In this vein, the relationship between the two subtypes of the ORI variable and OL has been analyzed.

The literature regards organizational learning as a process that is crucial for innovation activity in a firm (Calantone *et al.*, 2002; Griese and Kleinaltenkamp, 2012; Henderson and Clark, 1990; Liao *et al.*, 2008; Mothe *et al.*, 2015; Sinkula *et al.*, 1997). However, most of these studies address only technological innovation. In this context, this study makes a contribution to the concept of organizational innovation by exploring how the evolution of new business practices and organizational structures is supported by organizational learning, which in turn reinforces a firm's technological development (Coccia, 2017).

The study contributes to the innovation theory literature in two ways. First, although numerous studies address various features of the organizational innovation concept, they do not break down organizational innovation into subtypes to consider it in parts. At the same time, some scholars (e.g. Wang and Xu, 2018) claim there is a need for research on the relationship between

different subtypes of organizational innovation and various factors that determine organizational performance. In this light, our research dealt with two subtypes of organizational innovation: innovation in management practices; and innovation in workplace organization. The findings provide evidence that both IMP and IWO are positively influenced by a commitment to learning and open-mindedness, although the degree of this influence differs. The difference in influence supports the statement of Damanpour and Aravind (2011) that specific subtypes of organizational innovation experience an unequal impact from various antecedents, because each has its own nature. The prevailing role of the innovation associated with business management practices in the overall ORI can be explained by the fact that IMP enhances flows of knowledge in firms (Armbruster *et al.*, 2008, OECD, 2005), while the innovation in workplace organization relates more to tactical matters (OECD, 2005; Som *et al.*, 2012). The two IMP items are related to the learning process that takes place in a firm. The first variable is NCK (a system that enables employees to access non-codified external knowledge). The second is PLK (new practices of improving learning and knowledge sharing within the firm). The importance of organizational innovation in developing an efficient learning environment in a firm becomes obvious. This is also confirmed by other studies addressing the problem of the relationship between the learning process in a firm and its innovation activity (e.g. Lin, 2007).

Second, the study investigates the link between organizational innovation and two dimensions of organizational learning: commitment to learning; and open-mindedness. The results indicate that both dimensions have a considerable impact on a firm's organizational innovation activity. The result is coherent with prior studies (e.g. Camisón and Villar-López, 2011; Sinkula *et al.*, 1997), which have demonstrated the strongly positive impact of organizational learning on organizational innovation. The obtained result also supports the findings of Calantone *et al.* (2002) and Sinkula *et al.* (1997), who claim that organizational learning is essential for creating new organizational forms to secure a firm's sustainable development. Thus, commitment to learning and open-mindedness may drive an organization to develop its management processes and renew its organizational forms. In other words, this means increasing a firm's activity in introducing organizational innovation as organizational knowledge increases. However, according to the obtained results, the commitment to learning has a stronger impact on ORI compared with open-mindedness. This result corresponds with the studies of Keskin (2006) and Sinkula (1997) and can be considered evidence that new knowledge plays a crucial role in introducing organizational innovation to a firm, while an open-minded culture has a supportive function. Nevertheless, without an appropriate organizational culture that supports a firm's learning process, innovation activity will be inefficient, as O'Reilly and Tushman (2008) also state.

Besides its academic contribution, this study offers practical implications for innovation management. As the results show, the role of innovation in business management practice is much greater than it is in workplace organization. This output may be driven by the priority of continuous improvements in efficiently organizing all kinds of management-related activity over changing organizational operational processes (Som *et al.*, 2012). Firms should develop their organizational structures and management systems with a high level of open-mindedness and devotion to continuous learning. In turn, this may enhance their organizational innovation activity to allow the latter to play its own role in a firm's development processes (Damanpour and Aravind, 2011). The results indicate that a firm should be committed to continuous learning and the development of an open-minded corporate culture, constantly renewing its business processes by responding to the challenges of the current business environment. The findings should also inspire decision makers to observe the mechanism that enables the inception of new organizational forms and processes, as well as designing new strategies to drive the organizations toward a digitalized business environment.

One of the limitations of this study was conditioned by the sample representing only manufacturing firms based in Russia. The sample therefore referred to a single country and some industries. Firms operating in transition economies have some specifics in their corporate culture (Balabanova *et al.*, 2018; Hutchings and Michailova, 2006) that may influence the results in matters related to open-mindedness, for example.

Consequently, this study provides new knowledge on organizational innovation and opens up new research avenues in the field. A new research direction might be to investigate the parallels between organizational learning in transition and developed economies, as well as to consider firms from industrial sectors other than manufacturing. To increase the results' generalizability, data from various industries might be collected and analyzed. Despite its sufficient empirical data, the study is limited by its exploratory nature and could consider only some aspects of organizational innovation. This may open up new research avenues for comparative and longitudinal studies. As the data was collected from a single country, the economic and cultural context may also have some effect on the results (Balabanova *et al.*, 2018).

Several studies (e.g. Hutchings and Michailova, 2006) have observed that the management behavior of organizations in modern Russia adapts Western-oriented management practices to some extent. Balabanova *et al.* (2018) argue that this phenomenon relates only to privately owned companies, whereas most organizations strongly retain a Soviet management style. For example, it is typical for Russian employees to avoid being open and sharing knowledge readily within their firm, because they are afraid of being punished for doing so. The heritage of the

Russian economy means it might be interesting to study whether innovation performance differs between privately owned and state companies.

A final – and certainly no less important – area for future studies might be to consider another subtype of organizational innovation, external relations innovation. Organizational learning constructs probably also have a strong impact on the external relations innovation, because the knowledge acquired from outside a firm plays a considerable role in its development.

### **Conclusion**

This exploratory study examined organizational innovation. Its focus was on the problem of how commitment to learning and open-mindedness affect a firm's organizational innovation activity. In turn, organizational innovation was broken down into two subtypes: innovation in business management practice; and innovation in workplace organization. The findings of this study reveal that a firm's organizational innovation activity and both its subtypes are greatly exposed to commitment to learning and open-mindedness. In turn, commitment to learning affects open-mindedness. In sum, the findings support the proposition that organizational learning plays a significant role in a firm involved in the process of introducing organizational innovation. The results should also inspire firms and policymakers to observe the mechanism that drives a firm's development and design new strategies to propel organizations' innovation activity.

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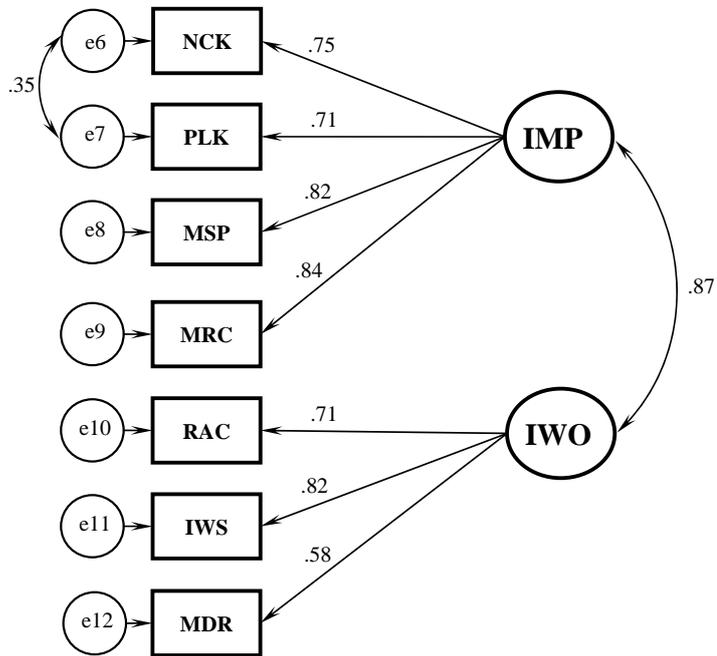
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CMIN = 9.683; df = 12; p = 0.644; GFI = 0.979; AGFI = 0.950; RMSEA = 0.000; P<sub>close</sub> = 0.836

Figure 1. Structure of the scales in the model for measuring ORI

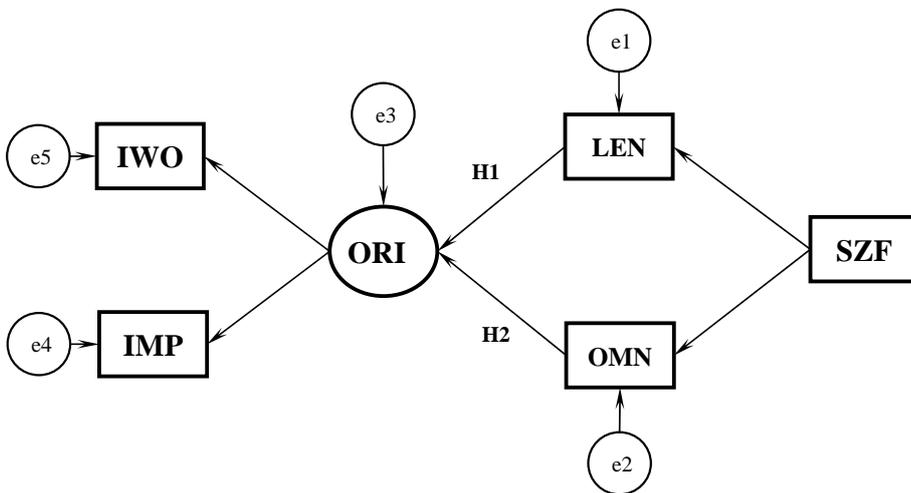
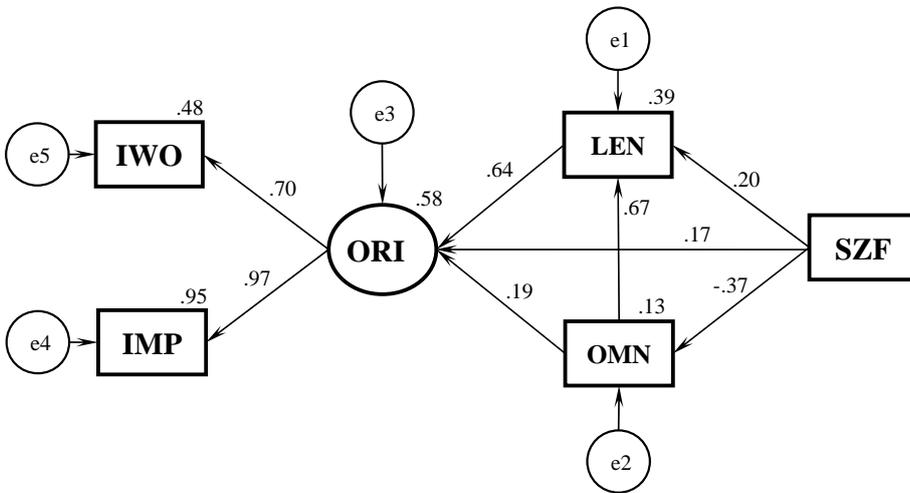


Figure 2. The proposed model



CMIN = 2.320; df = 2; p = 0.313; GFI = 0.993; AGFI = 0.944; RMSEA = 0.036; P<sub>close</sub> = 0.417

Figure 3. The final model obtained

Table 1. Variable description

Variable description	Variable sign	Variable type	Factor loadings	Reference
<b>Organizational innovation</b>	<b>ORI</b>	Latent, Dependent variable	-	Dadura and Lee (2011), Eurostat (2012), OECD (2005).
<b>Innovation in management practices</b>	<b>IMP</b>	Scale, Dependent variable	-	
A system that enables the employees gain access to non-codified external knowledge	NCK	Item	0,86	
New practices of improving learning and knowledge sharing within the firm	PLK	Item	0,83	
New management systems for general production or supply operations	MSP	Item	0,74	
New methods that reduce costs of suppliers	MRC	Item	0,71	
<b>Innovation in workplace organization</b>	<b>IWO</b>	Scale, Dependent variable	-	
A new workplace organizing method that reduces administrative and internal transaction costs	RAC	Item	0,78	
A new approach of improving workplace satisfaction	IWS	Item	0,66	
New methods for distributing responsibilities and decision making among employees for the division of work within and between firm activities (and organizational units), as well as new concepts for the structuring of activities	MDR	Item	0,75	
<b>Open-mindedness</b>	<b>OMN</b>	Scale, Independent variable	-	
We initiate the exchange of individual positions and opinions	OMN1	Item	0,80	
We initiate exchange of ideas	OMN2	Item	0,77	
We place a high value on open-mindedness	OMN3	Item	0,80	
Original ideas are highly valued	OMN4	Item	0,73	
Managers encourage employees to think "outside of the box"	OMN5	Item	0,74	
<b>Commitment to learning</b>	<b>LEN</b>	Scale, Independent variable	-	
Learning is seen as a key commodity necessary to guarantee organizational survival	LEN1	Item	0,70	
The basic values include learning as key to improvement	LEN2	Item	0,72	
Our managers often participate in various learning courses/seminars/conferences	LEN3	Item	0,85	Self-operationalized
We systematically identify the need of knowledge relevant to manage our competitive position	LEN4	Item	0,74	Griese and Kleinaltenkamp (2012).
<b>Firm's size</b>	<b>SZF</b>	Exogenous variable / Control variable	-	Amarakoon <i>et al.</i> (2016), García-Morales <i>et al.</i> (2006), Jyothibabu and Farooq (2010).



## **Publication III**

Dukeov, I., Jaschenko, V., Apsalone, M., and Heilmann, P.

**Openness and staff training as antecedents of administration and management innovation: a cross-country study**

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## **Openness and staff training as antecedents of administration and management innovation: a cross-country study**

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**Abstract:** A firm's ability to innovate has gained continuously increasing attention among scholars and practitioners. This study aims to discuss the relationship of a firm's openness as an element of organisational culture and staff training as an element of organisational learning to its activity in introducing administration and management innovation in two countries. Data collection was conducted in Latvia and Russia. To make the research more specific, organisational innovation is broken down into two categories: innovation in management practices; and innovation in workplace organisation. The result obtained demonstrated the positive impact of staff training on innovation activities and openness on staff trading, though the values were found significantly different for the two countries. The study has also shown that the roots of traditions in doing business were deeply related to a nation's originality, and no external impact could ruin them completely. At the practical level, in terms of comparable management theory, this means that cultural traditions persist in a society, regardless of any circumstances artificially created for business by outside forces over a long period.

**Keywords:** administration and management innovation; innovation management; organisational learning; comparative management; organisational culture; openness; staff training.

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## 1 Introduction

Learning and openness are crucial factors for the innovation development in a firm being reinforced by the pertained organisational culture and the organisational climate (Poesche et al., 2019). Nevertheless, only few studies consider an innovation process in complex as a multidimensional activity, and further research must be done in order to have the comprehensive understanding of the phenomena. On the other hand, in many vases a firm’s behaviour can be explained based on the cultural aspects of the society (Poesche, 2019). Cultural differences play a tremendous role in how a business should be run in

any country. In this context, this study considers innovation's dependence on openness and learning. The study compared two countries that have been united for a long time at different historical periods and were again separated about 25 years ago. Despite the fact that these countries were incomparable in size, the research proved that the bigger country has not managed to develop full dominance of the smaller one and absorb it completely in terms of business culture and business climate. 75 years of coexistence have not ruined the national peculiarities of traditions at least related to the ways of doing business. In terms of the comparative management literature, the study delivers new intelligence about some intrinsic values underlying the process of innovation that relate to a firm's organisational culture and share climate (Anderson and Gerbing, 1984).

Although many studies (e.g. Beblavý et al., 2012) demonstrate the benefits that Administration and Management Innovation (AMI) brings to organisations, only a small portion of them consciously develop it on a systematical basis and study the conditions that cause such innovation to flourish. The extent of firms' efforts to introduce AMI also varies considerably (Oeij et al., 2011; Pot, 2011). This may partly be explained by the fact that investment in AMI brings long-term benefits, while firms may not see this or prioritise the alternative implementation of more short-term goals.

Numerous studies focus on how various antecedents influence a firm's ability to innovate (Lam, 2010). However, to the best of our knowledge, few studies deal with the problem of how a firm's AMI activity relates to the processes associated with the elements of organisational culture and organisational learning.

A firm's openness as one of the dimensions of organisational culture is an important characteristic contributing to its innovation activities. For example, a collaborative culture, trust, and open-mindedness encourage new initiatives and ideas (Hunter et al., 2007). Organisational culture can enhance participative decision making, increase organisational resilience, and deepen attitudes towards social equality (Throsby, 2001).

Dukeov et al. (2019) argued that organisational learning is one of the factors that positively contributes to innovation. Organisational learning improves the competences and skills of individual employees, and contributes to strategic knowledge management and the development of an innovative organisation. Argyris and Schön (1978) and Nonaka and Takeuchi, (1995) considered a firm as subject to a collective learning process, arguing for the strongly positive impact of this process on innovation. However, non-technological innovation as AMI is still relatively novel and less studied in the given context, and few studies address the link of AMI activity in a firm and its learning process. Nevertheless, scholars agree that the extent of the introduction of innovation in a firm depends on the effectiveness of the internal processes of learning and the organisational culture perspective as a whole for a given business environment (Argote, 1999; Argyris and Schön, 1978; Senge, 1990). Hutchings and Michailova (2006) supported this paradigm by suggesting that the analysis of the processes related to learning in a firm cannot be separated from the cultural and institutional context, and certain competences and skills relate to the multidimensional cultural space in which a firm functions. Dimmock et al. (2003) found skills and attributes of employees depend greatly on their job responsibilities. In turn, the latter depends heavily on cultural differences, because employees' skills and attributes are valued differently in specific countries.

This study investigates the impact of openness and staff training on the administration and management innovation activity of a firm. The study is based on a comparative analysis of small and medium-sized firms operating in Latvia and Russia.

Before 1991, both countries were Union Republics within the Soviet Union. The business environment of firms in the Soviet Union at that time was largely defined by the planned economy. Many aspects of the organisational culture and organisational learning have emerged only within the last 30 years. The very terms “organisational culture” and “organisational learning” as such were not used in Soviet companies. After the Soviet Union collapsed, each country chose its own track for further development.

The Russian approach to doing business is very much inherited from the Soviet past. However, after the Soviet Union collapsed, Russia’s economy grew quickly (Rosstat, 2015, 2016).

At the same time, the country was changing and abandoning some features of the Soviet style in the business environment as it moved from a planned to a market economy.

After its separation from the Soviet Union, Latvia embarked on a new development path based on the EU mainstream. As an ex-communist state, the country started to converge with the developed European Union members, whose focus is on emancipative values (Li and Bond (2010). Organisational culture in Latvian SMEs is mostly team and development oriented, characterised largely by trust and cooperation (Apsalone, 2018). The culture is relatively development-driven and inclusive. Yet employees are generally probably less than eager to start new initiatives and propose new ideas.

The literature investigating the ability of economies to innovate distinguishes countries according to the level of their development in various spheres (Wilson et al., 2020). It would therefore be interesting to learn how much divergence in innovation activities has occurred in the firms of the two countries in the thirty years that have elapsed since they began to develop independently. This study’s main research question is to identify the impact of staff training and openness on administration and management innovation in two different countries which were once merged, and whether this succeeded in eliminating variety in the sphere of non-technological innovation implementation.

Many studies of innovation suggest that its very essence is the generation and implementation of ideas (Glynn, 1996; Woodman et al., 1993), and the ability of the firm’s staff to learn efficiently (Argyris and Schön, 1978; Argote, 1999; Senge, 1990) and generate knowledge that is new for the firm (Cohen and Levinthal, 1990; Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka and Von Krogh, 2009). Whitley (2000) and Lazonick (2004) argued that since it is social nature that underlies innovation processes in a firm, they depend considerably on the organisational structure and culture of the company, because the process of knowledge dissemination greatly depends on how the informational flows are organised within the firm. Nevertheless, the elements of organisational culture, organisational learning, and innovation are not often studied in terms of their interrelations (Cameron and Quinn, 2011).

Most of the studies that focus on innovation deal with product or process types of innovation. In contrast, this study aims to consider the administration and management type of innovation. It hypothesises that a relationship exists between administration and management innovation activity in a firm and openness as an element of the corporate culture (e.g. Olsen, 2016), as well as with the staff training process as part of the learning process (e.g. Henderson, 2006; O’Reilly III et al., 1991). Besides investigating the relations between AMI and the elements of organisational culture and organisational

learning, the study seeks to distinguish these relations in two countries that used to be part of a single bigger country, but that were placed into different cultural contexts some decades ago.

The article is structured as follows. The theoretical background of organisational innovation, openness, and staff-training is discussed in the next section. The hypotheses are proposed based on the elaborated theory. Sections on methodology, data analysis, and the results follow. A discussion of the findings concludes the paper.

## **2 Administration and management innovation**

The challenges of today's business environment demand continuous change and adaption to markets from various firms around the globe. The efficiency of these activities cannot be seen apart from the process of introducing all kinds of innovation (De Carolis, 2003; Hult et al., 2004). Contemporary megatrends of the business world such as globalisation, urbanisation, and climate change mean companies must find new approaches to developing new products and services, as well as to introducing new organisational models, if they are to survive. Scholars therefore frequently focus on theories that underlie various aspects of a firm's performance (Aragón-Correa et al., 2007; Jiménez-Jiménez and Sanz-Valle, 2011). Many exploit and evolve the theory of innovation.

In the first half of the twentieth century, Schumpeter (1934) introduced the term "new industrial organisation." Since Schumpeter's time, various studies have considered the concept of innovation, dealing with change in organisational structures in different contexts, as well as proposing a variety of definitions, such as administrative innovation, management, or managerial innovation (Birkinshaw et al., 2008; Daft, 1978; Damanpour and Aravind, 2011; Lam, 2005). OECD/Eurostat (2005) referred to innovations related to the new organisational method in business practices, workplace organisations, or external relations as organisational innovation.

In this study the focus was made only on two categories of the Administration and Management type of Innovation (AMI). These two categories are also aligned with the classification introduced in the previous third edition of the Oslo Manual (OCDE/Eurostat, 2005).

The first category encompasses new procedures in processes and operations (OCDE/Eurostat, 2005; Som et al., 2012). It aims to improve or change management practices. Som et al. (2012) also refer to such innovation as procedural AMI. Innovation in Management Practices (IMP) assumes the implementation of new organisational structures and administrative procedures, as well as the first introduction of such systems as quality management, risk-management, Lean production, new databases for codifying knowledge or best management practices, and non-codified knowledge systems, for example (e.g. Ichniowski et al., 1997; Lin and Chen, 2007; OCDE/Eurostat, 2005; Reed et al., 2000). IMP focuses on new management processes, procedures, and operations to bring the efficiency of a firm's day-to-day work to a higher level. IMP can be seen as an element of a knowledge transfer framework in a firm (Armbruster et al., 2008, OCDE/Eurostat, 2005).

The second subtype of administration and management innovation we consider in this study deals with workplace organisation methods. It can also be referred to as structural administration and management innovation (OCDE/Eurostat, 2005; Som et al., 2012).

Innovation in Workplace Organisation (IWO) aims to improve the working environment to increase a firm's performance efficiency (Mothe and Thi, 2010; Scott and Bruce, 1994).

Both the subtypes of innovation are firmly tied to the various dimensions of a firm's corporate culture, because management practices and activities in improving the working environment at the workplace level must deeply involve the employees to be successful (Shane, 1994; Tan, 2002).

AMI can be applied at different levels and departments of an organisation, as well as relating to its overall structure or functions. Tidd et al. (2005) suggested seeing AMI as a firm's response to technological innovation or playing a distinct role in its development.

The literature on innovation often states that this response can be successfully and continuously introduced in a firm if it possesses certain combined characteristics (e.g. Damanpour and Aravind, 2011). Lorenz and Lundvall (2011) argued that firms active in innovation usually invest in employee education and ensure they can function independently and creatively in many ways in carrying out their tasks. The process of introducing innovation is much broader than merely research and development activities; indeed, it is a combination of aggregated knowledge and competences within various areas with an open organisational culture that secures the conversion of the obtained knowledge into a beneficial output. The efficiency of individuals in providing creative ideas in general does not directly depend on the characteristics of individuals. Rather, it is a function of the serenading environment (Amabile et al., 2004). On the other hand, a specific set of employees' soft skills underlies the open organisational culture. These soft skills are also obtained via special training. Training activity and openness should therefore also be connected (Perry-Smith and Shalley, 2003; Reiter-Palmon and Illies, 2004). In this context, this study considers the relationships of openness, staff training, and AMI.

### **3 Openness**

Any innovation is a combination of ideas, knowledge, capabilities, and resources. The intensity and efficiency of ideas and knowledge generation in a firm essentially depends on its organisational culture, as well as on a shared climate (Anderson, 1992). Organisational culture plays a central role in the process of obtaining and disseminating knowledge within the organisation, as well as their conversion into innovation (Taleghani and Talebian 2013), while the organisational climate is a factor in securing the efficiency of team work (Anderson and Gerbing, 1984). A specific organisational culture can inspire employees actively to introduce innovations (Valencia et al., 2010).

Among various characteristics of organisational culture and the organisational climate, openness plays a considerable role, because it is essential for introducing innovation in a firm. By sharing knowledge in an open culture, organisational learning occurs (Hislop, 2013).

Many studies claim that openness, which can manifest itself in various ways, has a certain impact on different types of innovation. This effect has been found not only at the level of the firm, but at the industry and even economy level. Openness has a positive impact on enlarging creativity and increasing tacit knowledge (e.g. Gambardella et al., 2009; González-López and Fernández-Montoto, 2017; Niebuhr, 2010). It is one of the paradigms underlying the theory of innovation (Paasi et al., 2013). The literature suggests

various definitions of openness (Dahlander and Gann, 2010; Maxwell, 2006). By openness, this study means “ease of knowledge flow” (Lichtenthaler and Lichtenthaler, 2009; Valkokari et al., 2012).

Many studies demonstrate that the corporate culture of an actively innovative company must be able to provide efficient information and knowledge transfer (Banutu-Gomez, 2004; Garvin, 1993; Goh, 2003; Lin, 2008; Wick and Leon, 1993). At the same time, a shared climate, which is by definition very close to the concept of openness as such, provides the circumstances for teams to be creative (Anderson and Pineros, 1990).

According to Day (1994), if the generated or received knowledge is to be used efficiently, it must be disseminated among all the internal stakeholders of a firm. The process of knowledge generation requires constant information flow and ease of dissemination. Knowledge transfer includes a number of activities that employ the firm’s networks and various databases as vehicles for the transfer process. Knowledge transfer includes a number of activities that employ the firm’s networks and various databases as vehicles for the transfer process (e.g. Haas and Hansen, 2007; Hansen et al., 1999).

Knowledge can be disseminated in two ways (Griese and Kleinaltenkamp, 2012). The first is dissemination by means of individuals’ direct communication within an organisation. This refers to context-specific knowledge sharing at the personal level, and it can be used when some individuals in a firm need to transfer their tacit and non-codified knowledge to other staff members. Jerez-Gomez et al. (2005) defined the ability of an organisation to transfer knowledge as creating the internal circumstances that allow an individual to acquire knowledge from another individual through various kinds of communication within the organisation.

The principal of openness also suggests that a firm regularly introduces AMI, ensuring the ability of the employees to communicate with each other and have access to the firm’s broad range of tacit and non-codified knowledge (Olsen, 2016).

The synergy of individuals’ skills and knowledge within an organisation supports the generation of new knowledge and therefore the introduction of innovation (Madhavan and Grover, 1998). For example, knowledge received from customers and suppliers is of great importance for the introduction of AMI (Soosay et al., 2008).

Polanyi (1966) stated that a considerable element of organisational knowledge is tacit and subjective. This means the only way it can be transferred is through individuals’ communication via open channels. Numerous studies argue for the importance of free social interaction for learning, new knowledge generation, and the introduction of innovation. These interactions underlie the development of common cognitive schemes (Argyris and Schön, 1978; Bartel and Garud, 2009; Brown and Duguid, 1991; Lave and Wenger, 1991).

The second way of disseminating knowledge in a firm is sharing documents or databases in digital or written form. Such knowledge transfer does not demand the communication of individuals. However, it also greatly depends on the level of openness in the firm (Haas and Hansen, 2007).

Based on the results of previous studies on the relationship between openness and innovation, the following hypotheses regarding administration and management innovation are proposed:

*H1: Openness is positively related to innovation in management practices (IMP).*

*H2: Openness is positively related to innovation in workplace organisation (IWO).*

#### **4 Staff training as a dimension of organisational learning**

Organisational learning is the process whereby information received from the environment and the organisation's own experience is converted into codified and non-codified knowledge (March, 1991; Weick, 1979). Ulrich et al. (1993) stated that ease of knowledge flow due to an organisational culture based on openness is a prerequisite for organisational learning, because an efficient learning process is based on a broad range of opinions and experiences of individuals. The more knowledge a firm obtains of the organisational learning process, the more likely it is that the number of innovations will be higher (McGill et al., 1993).

Numerous scholars associate the innovation process with learning, along with all the dimensions and characteristics this term suggests (Lundvall, 1992; Olsen, 2016). Cohen and Levinthal (1990) and Nonaka and Takeuchi (1995) argued that innovation is based on knowledge that is generated by organisational learning.

Theories of organisational cognition and learning understand innovation and learning processes as strongly related (e.g. Bartel and Garud, 2009; Glynn, 1996). Lam (2010) argued that knowledge creating and learning are essential cognitive-related processes for the efficient introduction of innovation in a firm (Grant, 1996; Liao et al., 2008). Administration and management innovation activities in an organisation are associated with the introduction of new organisational forms, which are often considered to offer potential for an organisation to adapt to the continuously changing business environment. To demonstrate a good innovation performance, a firm must harmonise various internal actors' activities and maximise the efficiency of its exploitation of its functions, including its organisational learning function (Van de Ven et al., 2000).

Many studies have shown a strong positive relationship between innovation activity in a firm and its staff development (Cohen and Levinthal, 1990). Wang and Wang (2012) argued that a firm's innovation activity depends on employees' skills. Staff training, as part of organisational learning, in many ways enforces innovation activity in a firm (Olsen, 2016; Simpson et al., 2007). To be effective, staff training, apart from the directly related professional knowledge and skills, should also focus on various complementary aspects which depend on the context of the firm's operating activities. These could be culture, sustainability, or innovation (Olsen, 2016).

Organisations learn through individuals. While staff training does not guarantee organisational learning, no organisational learning can happen without it (Senge, 1990). However, since innovation is a firm-wide process, employees play a significant role in making this process happen and be efficient. Previous studies (e.g. Börner et al., 2012) emphasise the critical role of well-trained and committed staff in the success or failure of business process improvement initiatives. Staff training provides new skills and competences that are crucial for introducing innovation in the firm, as well as contributing to increasing the degree of the employee's openness and their personal change and development (Prange and Pino, 2017; Zhang and Merchant, 2020). Staff training thus contributes to the enhancement of professional and/or social skills. To foster organisational learning and the innovation process, staff should be able to handle the technical requirements to process and integrate knowledge: the use of appropriate analytical methods for data processing; the efficient utilisation of the knowledge the firm processes in its operations; and the understanding of the strategic essence of the novel

management systems to be implemented in the organisation. At the same time, appropriate social skills are needed for efficacious interactions with colleagues and external networking actors, constructive knowledge sharing between employees, general communication, and resolving (Griese et al., 2012).

From the given perspective, the link between organisational learning, openness, and innovation is becoming obvious. The theory of organisational learning enables us to propose the following hypotheses regarding the relationship of administration and management innovation and staff training:

*H3: Staff training is positively related to innovation in management practices (IMP).*

*H4: Staff training is positively related to innovation in workplace organisation (IWO).*

*H5: Openness is positively related to staff training.*

## **5 The difference between Latvian and Russian firms**

According to World Economic Forum studies (Schwab, 2019), Latvian firms are more active in staff training than Russian firms. In 2019, Latvia received a score of 57.1 out of a maximum 100 points for the “extent of staff training” indicator, ranking 42nd out of 141 economies. At the same time, Russia received a score of 48.7 and was ranked 74th. Latvia’s “skillset of graduates” indicator score was 53.9, making Latvia 58th among 141 countries; for Russia, the score and the ranking were 50.1 and 77th. In the “commercialisation of innovation” indicator, Latvia received a score of 64.9 and was ranked 44th; Russia scored more modestly, with 53.7 and 77th. The higher levels for staff training activity and innovation commercialisation obtained for Latvia suggest that to achieve equal results in terms of innovation activity growth, Russian firms would need to apply less effort compared to Latvian firms. The following hypothesis can therefore be proposed:

*H6: The value of staff training impact on AMI in Russian firms is higher than in Latvian firms.*

In general, the business culture in Latvian companies is more open and more innovative. According to World Economic Forum studies (Schwab, 2019), Latvia ranked 40th out of 141 economies with a score of 62.7 in willingness to “delegate authority,” compared with 55.6 and 72nd for Russian companies. The values for the “growth of innovation companies” and “companies embracing disruptive ideas” indicators for Latvia were 55.3 and 49.0, with ranks of 40th and 47th; for Russia, the values were 45.6 and 44.0, with ranks of 96th and 71st. According to the study of Akaliyski and Welzel (2019), compared with Russians, the Latvians more appreciate values related to participation in decision making in economic and political life, tolerance, environmental protection, and gender equality. In contrast, the Russians more appreciate values related to authority, family traditions, and religion (Inglehart et al., 2014).

According to several studies (Almeida and Fernandes, 2008), Caselli and Coleman II, 2001; Clarke, 2001; Keller, 2004), the more developed institutions are in a country, the higher the impact of openness on innovation and related activities. The following hypotheses are therefore proposed:

*H7: The impact of openness on AMI in Latvian firms is higher than in Russian firms.*

*H8: The openness impact on staff training in Latvian firms is higher than in Russian firms.*

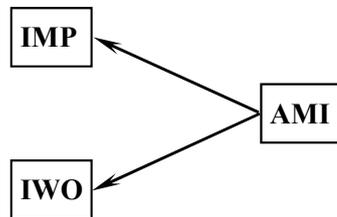
## 6 Research methodology and results

The research’s methodology is grounded in a deductive study that addresses incumbent SMEs, chosen based on geographical and industrial principles. Concerning the geographical principle, firms in Latvia and the Central and Northwestern Economic Regions (CNWER) of Russia were chosen for data collection. In terms of industrial principle, production and service companies were chosen in both countries.

The questionnaire was distributed electronically to 650 respondents holding a top managerial position (CEO, CFO, or similar) during the second half of 2016. After two weeks, a reminder was sent to those who had not replied. As a result of the fieldwork, 176 completed surveys were collected. Twenty-two were discarded, because answers to some questions were missing. The overall response rate was therefore slightly above 27%.

Based on the developed hypotheses, the study investigates the impact of a firm’s Staff Training Activity (STR) and openness (OPN) as an element of its organisational culture on two categories of administration and management innovation. These are innovation in business management practices and innovation in workplace organisation (OECD/Eurostat, 2005, 2018). The two categories of AMI are presented in Figure 1.

**Figure 1** The two categories of administration and management innovation considered in the study

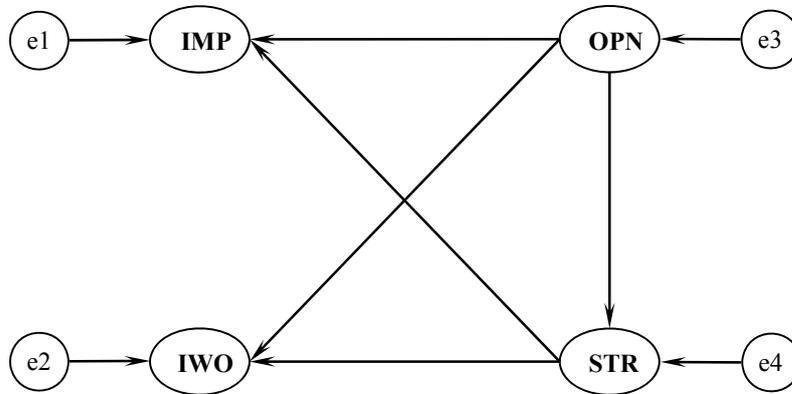


A prior structural model that links dependent and independent variables is presented in Figure 2.

The dependent variables for a firm’s IMP and IWO performance measurement were developed based on the definitions proposed in the Oslo Manual (OECD/Eurostat, 2005, 2018), as well as in studies conducted by Eurostat (2012) and Dukeov et al. (2018).

The scales for the OPN and STR latent variables were developed based on the metrics proposed in studies conducted by Griese and Kleinaltenkamp (2012). One question was self-operationalised.

**Figure 2** The proposed model



The questions were phrased to allow the respondents to compare the situation in their firms with the situations in a firm of their direct competitor. For each of the questions, a seven-point Likert scale was suggested for evaluation.

Exploratory factor analysis was applied as the first step of the data processing. At this stage, 10 indicators (OP1 ... OP5 and ST1...ST5) were identified for two latent variables, OPN and STR. For the IMP and IWO dependent variables, five indicators (MP1...MP3 and WO1, WO2) were identified.

The description of the STR and OPN independent variables and the related factor loadings are presented in Table 1. Table 2 presents a description of the IMP and IWO dependent variables, with the associated factor loadings.

**Table 1** The description of the independent variables STR and OPN

Variable	Variable type	Factor loadings	References
Openness	OPN Latent		
We place a high value on open-mindedness	OP1 Manifest	0.75	(Griese, 2012)
Managers encourage employees to think “outside the box“	OP2 Manifest	0.79	
We openly discuss ideas within the teams	OP3 Manifest	0.73	Self-operationalised
Original ideas are highly valued	OP4 Manifest	0.70	(Griese, 2012)
We have a new idea generation system	OP5 Manifest	0.73	
Staff training	STR Latent		
Employees often participate in communication trainings	ST1 Manifest	0.73	(Griese, 2012)

**Table 1** The description of the independent variables STR and OPN (continued)

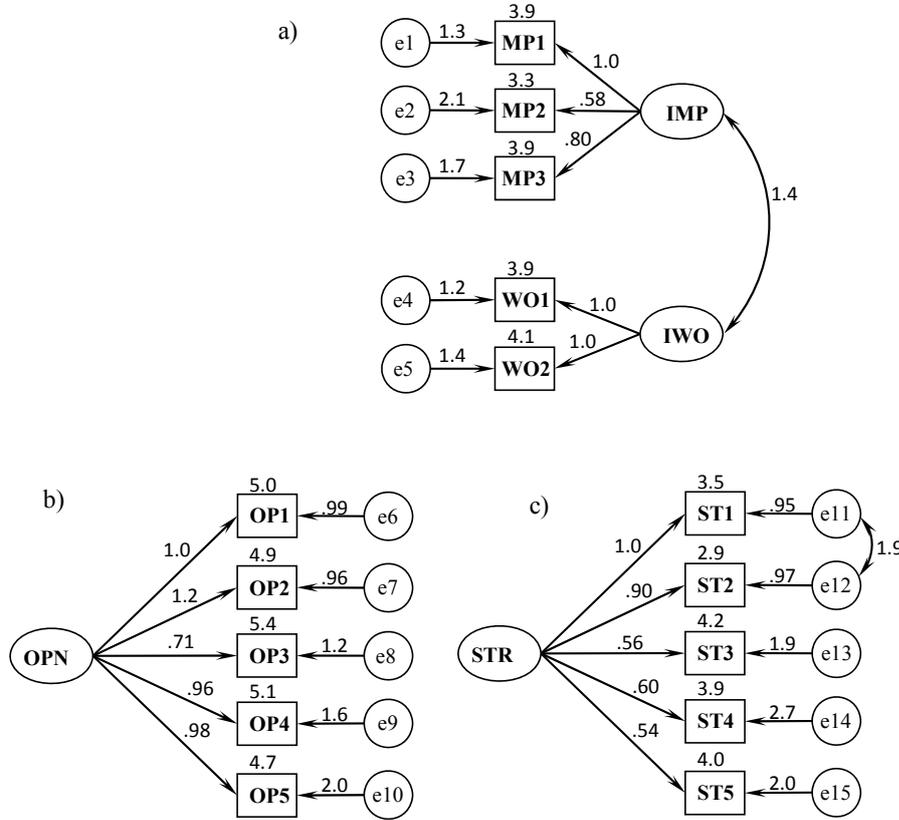
<i>Variable</i>		<i>Variable type</i>	<i>Factor loadings</i>	<i>References</i>
Employees participate in conflict management trainings	ST2	Manifest	0.81	
We systematically identify the need of knowledge relevant	ST3	Manifest	0.76	
Employees receive training on the deployment of the appropriate analytical methods for data preparation (e.g. SWOT analysis, data mining)	ST4	Manifest	0.80	
All employees are trained extensively concerning the utilisation of commonly used information	ST5	Manifest	0.71	

**Table 2** The description of the dependent variables IMP and IWO

<i>Variable</i>		<i>Variable type</i>	<i>Factor loadings</i>	<i>References</i>
Innovation in management practices	IMP	Latent		
A system that enables the employees to gain access to non-codified external knowledge	MP1	Manifest	0.74	
New practices of improving learning and knowledge sharing within the firm	MP2	Manifest	0.84	(OECD/Eurostat; 2005, 2018; Eurostat, 2012; Dukeov et al., 2018)
New management systems for general production or supply operations	MP3	Manifest	0.73	
Innovation in workplace organisation	IWO	Latent		
A new workplace organising method that reduces administrative and internal transaction costs	WO1	Manifest	0.74	
A new approach to improving workplace satisfaction	WO2	Manifest	0.81	

As the next step, for each of the scales, the reliability was checked for the internal consistency of the contained items. The scales were checked based on all three data sets. These are: 1) the entire data set containing all the responses from both countries; 2) the set containing responses only from Latvian firms; and 3) the set containing responses only from Russian firms. The structures of the scales used to measure IMP and IWO, as well as OPN and STR, for the dataset of Latvian and Russian companies are presented in Figures 3. Table 3 presents the Alpha Cronbach values for the scales of all three data sets.

**Figure 3** The scales for measuring: a) IMP and IWO, b) OPN and c) STR for the case of Latvian and Russian companies



**Table 3** Alpha Cronbach values for the scales obtained for the three data sets used in the study

Scales	Dataset containing firms from		
	Latvia and Russia	Latvia	Russia
IMP/IWO	0.86	0.81	0.88
OPN	0.85	0.79	0.88
STR	0.83	0.84	0.84

For all the scales, the Alpha Cronbach value was within a range of 0.79...0.88, and the Kaiser-Meyer-Olkin value was within 0.77...0.82. This proves the reliability of the scales for internal consistency. The results confirmed that the MP1...MP3 manifest dependent variables along with WO1 and WO2 can be used as indicators for IMP, and the WO categories for administration and management innovation respectively. The OP1...OP5 and ST1...ST5 manifest independent variables can be used as indicators for the OPN and STR latent variables respectively.

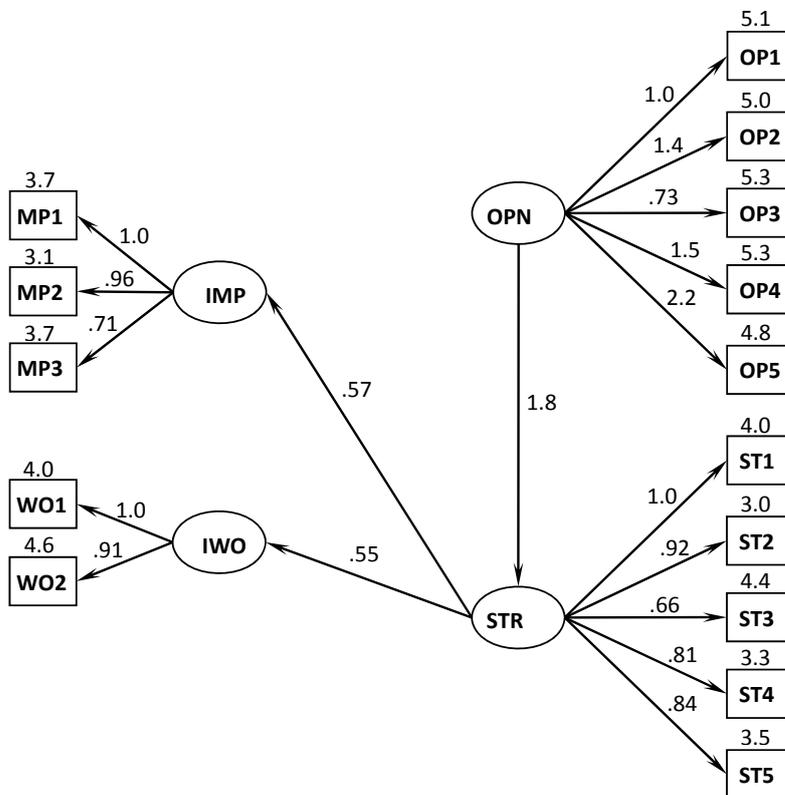
To compute the models for Latvian and Russian firms, the SEM analysis maximum likelihood method was applied (Byrne, 2010; Kline, 2011). The goodness of fit of the SEM was evaluated using the following criteria:  $\chi^2(df)/df < 2.0$ ;  $p$ -value of

$\chi^2(p) > 0.05$ ; Comparative Fit Index (CFI)  $> 0.9$ ; Root Mean Square Error of Approximation (RMSEA)  $< 0.08$ ; Closeness of Fit ( $P_{close}$ )  $> 0.20$ ; Tucker-Lewis Index (TLI)  $> 0.9$ ; Coefficient of Determination CD  $> 0.85$ . (Bollen, 1989, Byrne, 2010, Hair et al., 2010, Schumacker and Lomax, 2004).

Figures 4 and 5 present the computed models. The values for the model fit measures for the dataset of the Latvian firms are as follows:  $\chi^2(df)/df = 1.26$ ;  $p$ -value of  $\chi^2(p) = 0.06$ ; CFI = 0.92; RMSEA = 0.078; ( $P_{close}$ ) = 0.20; TLI = 0.91; CD = 0.87.

The values for the model fit measures for the dataset of the Russian firms are as follows:  $\chi^2(df)/df = 1.10$ ;  $p$ -value of  $\chi^2(p) = 0.25$ ; CFI = 0.99; RMSEA = 0.035; ( $P_{close}$ ) = 0.70; TLI = 0.98; CD = 0.86.

**Figure 4** IMP/IWO model for Latvian firms

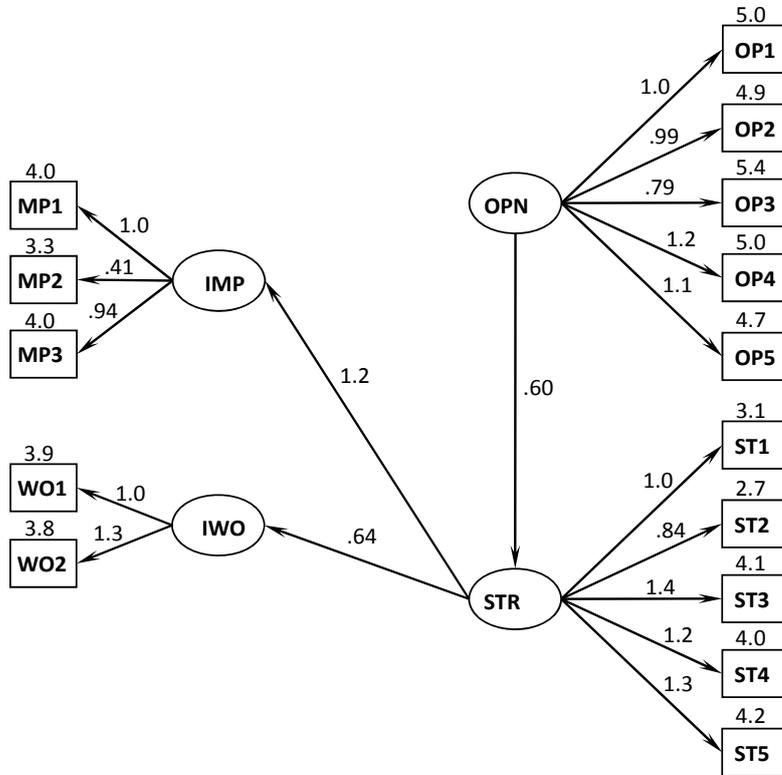


Notes:  $\chi^2(df) = 99.6$ ; RMSEA = 0.078;  $P_{close} = 0.19$ ; CFI = 0.92; TLI = 0.89; CD = 0.85

These measures demonstrated a satisfactory level of model fit. All the regression weights and variances obtained for the final model were statistically significant at the level of  $p < 0.05$  (Hair et al., 2010).

The outcome of the analysis is presented in Table 4.

Figure 5 IMP/IWO model for Russian firms



Notes:  $\chi^2(df) = 87.1$ ; RMSEA = 0.035;  $P_{close} = 0.70$ ; CFI = 0.99; TLI = 0.98; CD = 0.86

Table 4 The results of the study

Hypothesis	Outcome
H1. Openness is positively related to innovation in management practices (IMP)	Rejected
H2. Openness is positively related to innovation in workplace organisation (IWO)	Rejected
H3. Staff training is positively related to innovation in management practices (IMP)	Proved
H4. Staff training is positively related to innovation in workplace organisation (IWO)	Proved
H5. Openness is positively related to staff training	Proved
H6. The value of the staff training impact on AMI in Russian firms is higher than in Latvian firms	Proved
H7. The openness impact on AMI in Latvian firms is higher than in Russian firms	Rejected
H8. The openness impact on staff training in Latvian firms is higher than in Russian firms	Proved

## 7 Discussion

### 7.1 Theoretical contribution

Our findings emphasise the importance of applying a comparative approach in studies of administrative and management innovation. The study's main results explicitly demonstrate that the efficiency of the administration and management innovation in a firm differs, depending on the culture in which the firm operates. Scholars investigating the innovation process in a specific country should therefore consider that in a different culture, the antecedents of administration and management innovation might be different. To gain a comprehensive picture of a problem in question, scholars would benefit from a comparative technique in their research. It is impossible to explain a certain phenomenon based on a study of only a single country with a solid culture. As our study has shown, a comparative approach may also be very useful in conducting research into firms in emerging markets.

This study's contribution also lies in its investigation of the relationship of openness and staff training ability with a firm's administration and management innovation. The study is based on a sample of small and medium-sized Latvian and Russian enterprises. Few studies focus on administration and management innovation, and their connection with organisational culture, organisational climate, and organisational learning elements. At the same time, the concrete organisational manifestations of organisational behaviour must always be considered in the context of the country's cultural and institutional specifics where the firms operate (Hutchings and Michailova, 2006). From this perspective, the study suggests a comparative analysis based on the sample of firms operating in both countries. Based on the research results, the study concludes that openness and staff training activity in a firm are positively related to both categories of administration and management innovation.

Organisational learning capacity positively affects firms' innovative performance (Çömlek et al., 2012). Firms with developed human capital tend to be more active in introducing innovation (Almeida and Fernandes, 2008). Skilled operational staff contribute to reducing the cost of new technologies development (Almeida and Fernandes, 2008). Staff training leads to higher involvement in innovation activities, and new workforce skills are often required when introducing innovation (Prange and Pino, 2017; Zhang and Merchant, 2020). However, many managers do not realise the necessity of having a staff training system in their firms (Desjardins et al., 2016). This may partly explain the low absolute values of staff training of AMI in the proposed model. The problem of training itself also seems ambiguous (Dogra and Karim, 2005). Dogra and Vostanis (2007) argued that the precise kind of training and its organisation should also be based on cultural specifics. This poses a separate question concerning whether different cultures' training outcomes can even be compared.

Collaborative, trusting, and open-mindedness-oriented organisational cultures encourage new initiatives and ideas (Hunter et al., 2007). However, the majority of previous studies deal with technological innovation. If they do consider administration and management innovation, in most cases, they take it as an indivisible whole. In this study, we analysed two specific categories of organisational innovation – innovation in management practices and innovation in workplace organisation. This approach allowed us to receive narrower and more precise results. The two categories singled out are very

much in line with the existing conventional understanding of the nature of administration and management innovation (e.g. OECD/Eurostat, 2005, 2018; Uhlaner et al., 2007).

Many scholars who have dealt with the problem of the impact of a firm's organisational learning on introducing innovation have found it to be positive (Daft and Weick, 1984; Huber, 1982; Huber, 1991). Our results are in line with this strand of studies, though we conducted our research in different industrial and national contexts. Our comparison of Latvian and Russian companies shows that the deviation in the values of the impact of staff training on IMP and IWO was not especially great. Nevertheless, the analysis reveals a slightly higher value of this impact in Russian firms than in Latvian ones. This may be explained by the fact that the staff in Russian companies are generally less trained than in Latvian firms. Staff training may therefore be seen as a more powerful mechanism to increase innovation activity in Russian SMEs.

Our study provides no evidence of a relationship between a firm's openness and administration and management innovation. The results may be explained by the fact that the study considered SMEs rather than large companies. These findings are in line with the study of Laforet (2016), who argues that a trusting organisational climate and open communication do not lead to higher organisational innovation performance in small enterprises. Corporate culture in small firms tends to be more open than in large firms. However, this does not serve as a significant predictor of innovation activities. Restricting the sample to SMEs meant that we did not see great variation in openness, and we therefore identified no impact of openness on innovation activity. Further research might explore this phenomenon.

The study provides evidence of a significant difference between the two countries in relation to the impact of openness on staff training. For Latvian companies, the impact was more than two and a half times as much as for Russian ones. This may indicate that openness as an element of a firm's organisational culture enhances organisational learning, including staff training. This proposition is supported by numerous studies (e.g. Taleghani and Talebian, 2013).

The research results indicate that Russian firms are more creative, while Latvian firms have stronger knowledge generation abilities and processes, leading to more intensive organisational innovation in workplace organisation among Latvian firms. At the same time, Russian firms are more active in innovation related to management practices.

## *7.2 Practical implications*

The study also suggests practical implications in the area of innovation management. The importance of administration and management innovation for firms' development and the direct positive relationship between a firm's staff training and its organisational structure evolution can be considered a starting point for elaborating practical recommendations aiming for a functional innovation strategy design. This should be borne in mind by practitioners when working on the efficiency of a firm's performance. Managers should also consider cultural traditions as a potential enabler of a specific activity related to innovation.

### 7.3 *Limitations of the study*

This study has some limitations. First, only two countries were compared. Conclusions can therefore only be drawn regarding two countries that used to be the republics of the former Soviet Union.

Second, the study is limited by analysing only two categories of administration and management innovation. Other categories of AMIs not considered in this research can be further investigated.

Third, one element of organisational culture and one element of organisational learning were selected. Obviously, this provides too narrow a pattern if the impact of organisational culture and/or organisational learning as such is considered.

Fourth, the study deals only with SMEs and does not focus on large organisations. Nevertheless, previous studies do not provide a consolidated view of the relationship between a firm's size and its innovation activity. While Almeida and Fernandes (2008) argue that SMEs are less active in innovation than large companies – explained by several reasons – Dukeov et al. (2018) found no statistically significant impact of a firm's size on its AMI-type innovation activity. The innovation process in a small firm differs from that in a large company. For example, in a small firm, it greatly depends on the vision of the CEO or owner (Slevin and Terjesen, 2011).

### 7.4 *Further research perspective*

The above findings and limitations provide a perspective for further research to enlarge the knowledge of the relationship between administration and management innovation and organisational culture.

Further elaboration of the differences in organisational culture between Latvian and Russian companies could contribute to a new understanding of the mechanisms that drive innovation-related activities, as well as how the organisational structures in both countries' firms evolve. Given the assumption that each of the domestically launched firms in a country reflect its cultural heritage (Balabanova et al., 2018), a deeper analysis of the potential of organisations in the context of cultural particularities could be undertaken. It would also be interesting to cross-compare state- and privately owned companies, and to increase the number of countries to learn how the research problem manifests itself in countries with different cultures and historical backgrounds.

The next research avenue might be to address the problem of structural complexity. Damanpour (1996) argued that structural complexity tends to increase as the business environment surrounding a firm becomes more sophisticated. This clearly means that as the components of organisational learning and organisational culture become more developed in a firm, the degree of that firm's overall structural complexity increases. In turn, a firm's structural complexity could be considered a direct antecedent of AMI. If this is the case, the set of variables for measuring the relationship that is the focus of the study might be different and chosen based on other grounds.

## 8 **Conclusion**

This exploratory study examined administration and management innovation. Its focus was on the problem of how staff training and openness affect a firm's AMI activity. In

turn, AMI was broken down into two categories: innovation in business management practice; and innovation in workplace organisation. The study's findings reveal that a firm's AMI activity and both its categories are greatly exposed to organisational learning, but not to openness. In turn, staff training is affected by openness. In sum, the findings support the proposition that staff training plays a significant role in a firm involved in the process of introducing AMI. The results should also inspire firms and policymakers to observe the mechanism that drives a firm's development and design new strategies to propel organisations' innovation activity.

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## **Publication IV**

Dukeov, I., Apsalone, M., Baumanė-Vitolina, I., Bergman, J.-P., and Sumilo, E.  
**A firm's organizational innovation and organizational learning abilities**

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## A FIRM'S ORGANIZATIONAL INNOVATION AND ORGANIZATIONAL LEARNING ABILITIES

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**Abstract.** Many recent studies are dedicated to the problem of innovation as a mean of improving a firm's overall performance. Various kinds of innovation in a firm usually are closely interrelated with each other. While the majority of studies focus on technological - product and process - innovation, the investigation of non-technological - marketing and organizational - innovation (ORI), has increasingly attracted the interest of researchers during the last decade. Organizational culture and organizational learning are important drivers of such innovation. For instance, a collaborative culture, trust and open-mindedness encourage new initiatives and ideas, while learning helps not just to improve skillsets and abilities of individual employees, but can also greatly contribute to strategic knowledge management and building a resilient, innovative organization.

This study examines the relationship between a firm's organizational learning ability and its organizational innovation performance. The authors consider such factors as Learning Intention – seeing learning as a key investment and organizational commitment to it, and Openness - open-mindedness and organizational culture open to new ideas and worldviews. This study contributes to the theory of ORI by finding the answer to the question what impact these factors could have on ORI development in a firm.

The findings are based on a quantitative analysis of more than 150 small and medium-sized enterprises surveyed in Russia and Latvia. The survey questions measuring ORI performance were developed in line with the widely used definition introduced in the OECD - Eurostat Oslo Manual. The scales for organizational learning were adopted from the previous studies elaborated this area of a firm activity. The survey compared a firm's innovation performance to that of its closest competitors.

This research demonstrates that some of the elements of organizational learning positively influence ORI activity. The results also suggest that Latvian companies differ from Russian ones in terms of their organizational learning intention.

**Key words:** *innovation, organizational innovation, organizational learning, knowledge management, organizational culture*

**JEL code:** D83, O31

### Introduction

Many recent studies are dedicated to the problem of innovation as a mean of improving a firm's overall performance. Different kind of innovation in a firm usually are closely interrelated with each other. While the majority of studies focus on technological - product and process - innovation, the investigation of non-technological - marketing and organizational - innovation (ORI), has increasingly attracted the interest of researchers during the last decade. Organizational culture

(OC) and organizational learning are important drivers of such innovation.

For instance, a collaborative culture, trust and open-mindedness encourage new initiatives and ideas. OC through collective values, behaviors and practices can significantly impact long-term thinking, risk-taking abilities and understanding of responsibility, thus increasing the innovation activity of a firm (King, 2007; Turró et al., 2014). It can also influence attitudes towards independence, risk and the distribution of power (Shane, 1994; Tan, 2002; Alvarez and Urbano, 2012). Culture can affect productivity through decision-making process, increasing organizational resilience and forming attitudes towards social equality (Throsby, 2001). Finally, culture shapes the form and effectiveness of leadership (Aktas et al., 2015).

And organizational learning helps not just to improve skillsets and abilities of individual employees, but can also greatly contribute to strategic knowledge management and building a resilient, innovative organization. Numerous scholars (e.g., Argyris & Schön, 1978) consider a firm as the entity for collective learning process and argue that the impact of organizational learning on innovation is positively strong (e.g., Nonaka & Takeuchi, 1995). However, the majority of these studies were investigating the phenomenon of the technological innovation. The non-technological innovation, which is a relatively new concept despite of its introduction in the beginning of the last century (Schumpeter, 1934) has not been attracting attention of researchers for a long period probably because of its unclear definition and various concepts that were associated with it.

In a previous study, the authors concluded that organizational learning and knowledge creation are positively related to organizational innovation and that those factors amongst Latvian and Russian companies could be explored further (Apsalone et al., 2017; Dukeov et al., 2018).

Thus, this study examines the relationship between a firm's organizational learning ability and its organizational innovation performance. The authors consider such factors as knowledge generation and learning intention – seeing learning as a key investment and organizational commitment to it, and creativity - openness - open-mindedness and organizational culture open to new ideas and worldviews. This study contributes to the theory of ORI by finding the answer to the question what impact these factors could have on ORI development in a firm.

### Conceptual background and framework development

**Organizational Innovation.** Previous studies have demonstrated that innovation provides companies competitive advantage (Damanpour et al. 1989; Schulz and Jobe 2001). For this study, organizational innovation (ORI) is defined according to the “Oslo Manual” by OECD and EUROSTAT as “*the implementation of a new organizational method in business practices, workplace organization or external relations*” (OECD-EUROSTAT, 2005: 51). Thus, an organizational innovation shall be based on strategic management decisions to implement new organizational methods in business practices, improve workplace organization or external relations.

Organizational innovation has been broadly studied and number of definitions exist (e.g., Mothe and Thi, 2010). ORI can be applied at different levels and departments, ORI can also relate to the overall structure or the functional principles of the firm (Wengel et al., 2002). Some studies suggest ORI as firms' responses to technological innovations. Nevertheless, ORI can play an independent role for firm's development as a distinct form of innovation (Tidd et al., 2005).

Three main types of ORI can be distinguished - business practices, workplace organization (distribution of responsibilities) and external relations.

Firstly, ORI might implement new procedures in processes and operations (Som et. al., 2012). These are innovations in management practices (IMP). IMP innovations include quality management, lean, risk-management systems that

directly impact the organizational performance. (Wheelwright and Clark, 1992; Reed et al., 2000; Ichniowski et al., 1997; OECD-EUROSTAT, 2005). IMP refers also to new organizational structures and administrative procedures enhancing firm's capabilities to take risks, as well as transparency to new internal and external ideas (Han et al., 1998; Lin and Chen, 2007).

Secondly, ORI might implement new methods in workplace organization (IWO) (OECD-EUROSTAT, 2005; Som et al., 2012). IWO aims at improving business performance through know-how and creative working environment (Scott and Bruce, 1994; Mothe and Thi, 2010). IWO is also closely linked to the organizational culture, as certain working practices foster innovation by shaping attitudes towards independence, risk and the distribution of power (Shane, 1994; Tan, 2002; Alvarez and Urbano, 2012).

Thirdly, ORI include innovations in external relations (IER) by decreasing organizational barriers of the external environment and supporting the interaction with external environment (Heidenreich, 2009; Rammer et al., 2009). IER demonstrates, how a firm is making its network activities (Mothe and Thi, 2010). According to the OECD-EUROSTAT (2005: 51), ORI can be *“intended to increase a firm's performance by reducing administrative or transaction costs, enhancing labor productivity by improving workplace satisfaction, gaining access to non-tradable assets (such as non-codified external knowledge), or reducing costs of supplies”*.

**Organizational Learning Ability.** Several studies stress the crucial role of knowledge generation in innovation activity development of a firm (Lam, 2000; Lam and Lundvall, 2006). Lam (2010) argues that due to the fact that conditions underlying the innovation processes in a firm are social, they considerably depend on the organizational structure and the processes taken place within the firm. Many studies related to innovation consider the very process of innovation as one based on creativity (Glynn, 1996), as well on ability to learn effectively (Argote, 1999; Senge, 1990; Agyris and Schon, 1978) and generate knowledge that is new for the firm (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka and von Krogh, 2009). Lam (2010) states that the efficiency of the innovation process is very much based on the knowledge that a firm can absorb from the external environment. On the other hand, if innovation is a tool of converting knowledge into added value, continuous knowledge acquisition is the essential process for innovation. That also means the firms with high innovation activity should learn on how to learn as they must experience the constant necessity on new knowledge obtaining (Senge et al., 1990).

Knowledge generation, in turn, is closely related to creativity (e.g., Baker and Sinkula, 1999; Calantone et al., 2002). A firm that established its orientation on learning should continuously looking for the new forms of organizing this learning process and knowledge generation (Biemans, 1995; Jaworski and Kohli, 1993; Stathakoulou, 1998).

Creativity is the process of making new things by using the existing knowledge in a new way Maley (2003). The process of creativity means to create an additional value. Many scholars tried to define creativity by focusing on particular aspects. According to Barron (1955) creativity has to be effective and original. The opposite view was expressed by Corazza (2016), who argued that it is not necessary for the creativity to have as the end product something original or effective and suggested that creativity is something that is perceived not as a routine-like action or matter. Previous studies show that creativity is often a precondition for innovation, as it underlies the process of thinking “outside-the-box” as well as enhances thinking on how to do the things in a new way and create a value at the same time (Zhou & George, 2001; Liu et al., 2017).

Thus, the authors propose two constructs to describe organizational learning processes in a company: knowledge generation and creativity, and propose the following hypotheses:

- H1a: Knowledge generation is one of the main factors positively influencing IMP;
- H1b: Knowledge generation is one of the main factors positively influencing IWO;
- H1c: Creativity is one of the main factors positively influencing IMP;

H1d: Creativity generation is one of the main factors positively influencing IWO.

**Organizational Culture.** OC can be defined as *“a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”* (Schein, 1985: 17). Culture explains the way, how a group of people commonly decide and solve problems, culture also includes past learnings that are shared with new members of the group (Louis, 1980). Previous studies have listed OC as a significant factor for knowledge management – it influences generation of knowledge and affects the relations between individual and organizational knowledge (David and Fahey, 2000). Empowering and inclusive culture helps to develop trust between individuals and groups (ibid), thus fosters sharing of ideas and knowledge (Davenport and Prusak, 1998). OC can also provide basis for participation in organizational learning that requires a high degree of commitment (Gupta et al, 2000).

López et al (2004) encouraged enterprises to create favorable working environments with a collaborative culture - long-term vision, communication and dialogue, trust, teamwork, empowerment, ability to tolerate ambiguity, risk assumption as well as respect and diversity – in order to improve organizational learning.

To assess the impact of the OC on organizational learning and ORI, the culture was structured using four dimensions adopted from the competing values framework by Denison and Spreitzer (1991). It demonstrates dilemmas between stability and change on one hand and internal and external environment on another. The framework consists of two axes – centralization vs decentralization and competition vs the maintenance of the sociotechnical system (Denison and Spreitzer, 1991). Thus, four dimensions of the OC can be developed – human relations model (the team), open systems model (the adhocracy), rational goal model (the firm) and internal process model (the hierarchy). This study adopted them as the team, development, result, as well as consistency orientation.

Thus, the authors propose the following hypotheses:

H2a: Team orientation of a firm is one of the main factors positively influencing IWO;

H2b: Team orientation of a firm is one of the main factors positively influencing IER;

H2c: Development orientation of a firm is one of the main factors positively influencing IWO;

H2d: Development orientation of a firm is one of the main factors positively influencing IER;

H2e: Result orientation of a firm is one of the main factors positively influencing IWO;

H2f: Consistency orientation of a firm is one of the main factors positively influencing IMP.

### Methodology of the study

A structured, closed-ended questionnaire was developed to test the research questions. Questionnaire items measuring organizational learning were adopted from studies of Griese, Pick and Kleinaltenkamp (2012) and Zortea-Johnston (2012). Creativity was measured using such indicators as the value of open-mindedness, encouraging to think “outside of the box,” rewarding people for people for creativity and innovation, building and supporting cross-functional expert teams and initiating creative dialogues. Another learning indicator – knowledge generation – was measured through seeing learning as an investment not as an expense, seeing learning as a key necessity for organizational survival, considering learning as a key value for improvement, systematically identifying the need of knowledge relevant to manage the competitive position, checking, whether the knowledge base is reasonably extended through the new generated knowledge and defining strategic goals for generation of knowledge concerning customers, competitors, and markets.

Questionnaire items measuring organizational culture were mainly self-operationalized. Questionnaire items measuring innovation performance were developed based on the definitions provided in the Oslo Manual (OECD-

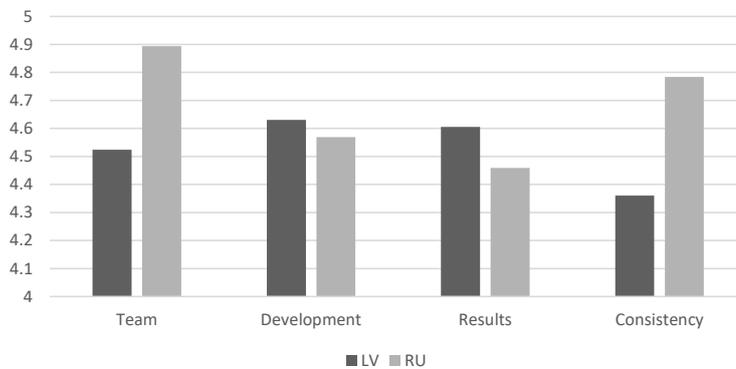
EUROSTAT, 2005), as well as from other studies (Eurostat, 2012; Dadura and Lee 2011). The authors respondents to compare innovation performance in their company to the innovation performance by their competitors using a seven-point Likert scale (where 1 corresponds to “strongly disagree” and 7 corresponds to “strongly agree”). Given that only meaning on the end-points was provided, the authors assume that the variables are measured on a continuous scale.

Few background questions were also included to understand the profile of companies, such as the annual turnover and number of employees. Profile variables were measured using a nominal scale. This study included enterprises with no more than 1000 employees. Such an approach allowed to include more businesses in the scope of analysis, at the same time excluding large industry leaders with different factors affecting innovation processes. In total 134 completed questionnaires were collected.

### Research results and discussion

Assessing organizational learning indicators in the surveyed companies, this study concludes that both creativity and knowledge generation were rather common, however creativity was more highly rated than knowledge generation – 4.8 vs 4.3 in a scale from 1 to 7. Russian companies were more creative, while Latvian companies had stronger knowledge generation abilities and processes.

When assessing organizational culture, this study concludes that Latvian companies have a stronger tendency towards development and results, while Russian companies – towards team and consistency (Fig. 1). Three dimensions, describing team, development and result organization of an organizational culture, were rather closely related to each other. Thus, companies with stronger orientation towards team, had stronger orientation towards development and achievements. Orientation towards consistency was moderately linked to the other dimensions.



Source: authors' calculations based on survey data

Fig. 1. Dimensions of organizational culture

All organizational culture indicators were linked to organizational learning indicators (Table 1). Team and development orientation had the strongest relation to creativity (Pearson Correlation .698 and .871 respectively), while result orientation and consistency – to knowledge generation (Pearson Correlation .684 and .523).

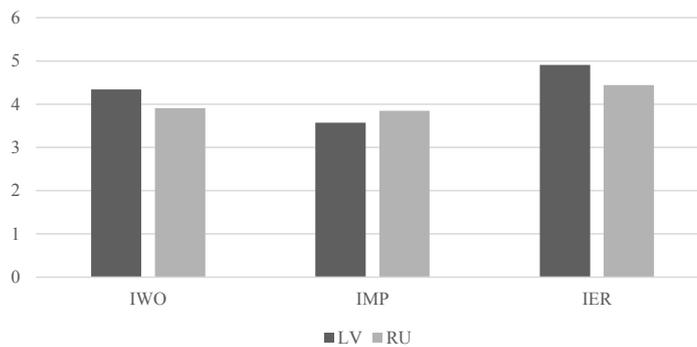
Table 1

**Relations between organizational culture and learning indicators**

		Team	Development	Results	Consistency
<b>Creativity</b>	Pearson Correlation	.698**	.871**	.632**	.250**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00
	N	131	131	131	131
<b>Knowledge generation</b>	Pearson Correlation	.638**	.761**	.684**	.523**
	Sig. (2-tailed)	0.00	0.00	0.00	0.00
	N	130	130	130	130

Source: author's construction based on survey data

Organizational innovation in workplace organization and external relations was more common in Latvian companies, while innovation in management practices – in Russian companies. From the innovation indicators, IWO and IER were more developed in the surveyed companies, compared to IMP (Fig. 2). All types of organizational innovation were positively related to organizational learning and all dimensions of organizational culture.



Source: authors' calculations based on survey data

Fig. 2. **Organizational innovation performance**

The relationship between organizational culture, organizational learning and organizational innovation performance is further assessed, using multiple linear regression analysis. The assumptions for the analysis are the following: dependent and independent variables are measured on the continuous scale (for this analysis the authors consider the scale as interval, considering that only endpoints were indicated), and the observations are independent (assessed with Durbin-Watson for each of the regression models).

By using a multiple linear regression model with stepwise variable entry method (criteria: Probability-of-F-to-enter  $\leq$  .050, Probability-of-F-to-remove  $\geq$  .100), IWO can be seen as a function of knowledge generation and result orientation that explain 34% variation in the IWO performance (Table 2). Durbin-Watson statistic is in a range from 1.5 to 2.5, and the corresponding ANNOVA analysis indicates that the model is good fit for the data ( $F(2, 121) = 31.626, p < .0005$ ).

Table 2

**IWO Regression Model**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.586	.343	.332	1.153	.046	8.461	1	121	.004	1.964

Predictors: (Constant), result orientation, knowledge generation, dependent Variable: IWO  
 Source: author's construction based on survey data

Considering this, the hypotheses H1b and H2e can be accepted as proposed in the paper.

IER can be seen as a function of development orientation, the model explains 17.5% variation in the IER performance (Table 3). Durbin-Watson statistic is in a range from 1.5 to 2.5, and the corresponding ANNOVA analysis indicates that the model is good fit for the data (F (1, 124) = 26.321, p < .0005).

Table 3

**IER Regression Model**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.418	.175	.168	1.546	0.175	0.175	1	124	.000	1.806

Predictors: (Constant), development orientation, dependent Variable: IER  
 Source: author's construction based on survey data

Considering this, the hypotheses H1b and H2e can be accepted as proposed in the paper. Considering this, the hypothesis H2d can be accepted as proposed in the paper.

IMP can be described as function of knowledge generation and consistency. The model explains 42.7% of the variation in IMP (Table 4). Durbin-Watson statistic is in a range from 1.5 to 2.5, and the corresponding ANNOVA analysis indicates that the model is good fit for the data (F (2, 123) = 45.909, p < .0005).

Table 4

**IMP Regression Model**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.654	.427	.418	1.017	.046	9.887	1	123	.002	1.902

Predictors: (Constant), knowledge generation, consistency orientation, dependent Variable: IMP  
 Source: author's construction based on survey data

Considering this, the hypotheses H1b and H2e can be accepted as proposed in the paper. Considering this, the hypotheses H1a and H2f can be accepted as proposed in the paper.

Even though creativity has positively related to all organizational innovation indicators, according to this analysis it was not amongst the main factors influencing any particular sub-type, thus H1c and H1d cannot be supported. Similarly, team organization was positively related to all types of organizational innovation, while this dimension was not one of the main factors influencing any particular sub-type, thus H2a and H2b cannot be supported by this analysis. Finally,

development orientation of a firm was strongly positively related to IWO, however was not amongst the main factors influencing it, thus H2c cannot be supported by this analysis as well.

### **Conclusions, proposals, recommendations**

This study aimed at exploring the relation between organizational culture, organizational learning and organizational innovation based on the sample of small and medium-sized enterprises from Latvia and Russia. There are not much studies focusing on organizational innovation and its connection to organizational culture as well as to organizational learning. At the same time all the aspects related to a firm's knowledge management processes and corporate culture cannot be considered without putting them in context of cultural and institutional specifics of the country where the firm operates (Hutchings & Michailova, 2006). From this perspective our research delivers the results tied to culture of two countries which allowed the authors to come up with some comparative analysis.

The results provided evidence that:

1. Organizational culture has strong, positive influence on both organizational learning and organizational innovation evolution in a firm.
2. Organizational culture and organizational learning could partly explain all sub-types of organizational innovation. In particular, the knowledge generation ability was one of the key factors influencing IWO and IMP while the development orientation was one of the key factors influencing IER, and the result orientation was one of the main factors influencing IWO and consistency was one of the main factors influencing IWO.
3. The surveyed companies demonstrate the best performance on IWO and IER sub-type of organizational innovations, though performance on IMP sub-type of organizational innovations was relatively lower. Latvian companies demonstrated a better performance in IWO and IER, while Russian companies were stronger in implementing IMP sub-types of organizational innovation.

Based on the research results, the authors consider organizational culture as a cornerstone for developing creative and knowledge generating organizational environment. Such, in turn, positively contributes to organizational innovation performance.

For further research the authors recommend elaborating on differences between Latvian and Russian companies, assessing them in a broader context of main business activities and environment of their work. Base on the findings that a firm reflects to a certain degree the cultural heritage (Balabanova at al., 2018) it would be interesting to compare the state and privately owned companies. It would be valuable also to increase the number of the companies in the study and to consider the organizational innovation performance of companies in other countries of the region.

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## **Publication V**

Dukeov, I., Apsalone, M., Baumanė-Vitolina, I., Bergman, J.-P., and Sumilo, E.  
**A firm's organizational innovation and organizational knowledge management  
abilities**

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## A FIRM'S ORGANIZATIONAL INNOVATION AND ORGANIZATIONAL KNOWLEDGE MANAGEMENT ABILITIES

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**Abstract.** In advanced economies, ability to manage innovation, knowledge and organizational learning are firms' key assets for fostering long-term competitive advantage and sustainable development. The overall innovation activity depends on the synergy between introducing technological innovation and organizational innovation (ORI).

This study examines the relationship between a firm's innovation ability, in the context of ORI, and its organizational culture as well as knowledge management factors. Organizational culture is assessed through four dimensions – orientation towards team, development, results and consistency, while knowledge management is assessed through ability to generate, transfer and implement knowledge, as well as intention to learn. The study aims at contributing to the missing link between organizational culture, knowledge management and organizational innovation by finding the answer to the question, what impact these factors could have on ORI development in a firm.

A quantitative study of 134 small and medium-sized enterprises from various industries was conducted simultaneously in Latvia and Russia. The results provide evidence that organizational culture has strong, positive influence on both the knowledge management and ORI evolution in a firm. Nevertheless the surveyed firms demonstrated different performance in context of the specific sub-types of the ORI. The relations between these ORI sub-types, dimensions of organizational culture and different knowledge management activities also varies.

**Key words:** *innovation, organizational innovation, knowledge management, organizational learning, knowledge implementation, organizational culture.*

**JEL code:** M14, O31

### Introduction

A significant part of a firm's overall strategy is innovation management. Innovation management strategy is a functional-level process aiming at increasing productivity of each business function of a firm, e.g. production, service, networking, R&D, finance (Nandakumar et al., 2011; Forsman, 2009; Wang and Ahmed, 2004; Dukeov, 2008). Different kinds of innovations within a firm are often closely interrelated with each other. According to OECD-EUROSTAT (2005) the introduction of technological innovation, which encompasses product and process innovation, is complementary with the adoption of non-technological innovation, which encompasses marketing and organizational innovation (ORI).

According to many studies (e.g., Damanpour, 1987) to be successful in innovation management, firms must continuously develop appropriate ORIs to multiply the overall effect of innovation activity into profit. Some researchers stated that ORI underlie the efficient implementation of the other types of innovation as well as associates with one of the most significant factors increasing competitive advantages of a firm (Damanpour, 1996).

The term “new industrial organization” was introduced by Joseph Schumpeter (1934) in the beginning of the 20th century. Despite of that, organizational innovation has yet not attracted attention of the majority scholars and the most of the studies deal with product or process innovation leaving the ORI concept out of being researched and implemented (Klette et al., 2004; Sapprasert and Clausen, 2012). The scholars elaborating this area provided various definitions and classifications of ORI term evolving the understanding of the concept. Some researchers (e.g., Fagerberg et al., 2012) stressed the role that ORI plays in the theory of innovation. In this context generation, diffusion, and exploitation of knowledge play a central role in a firm development (OECD-EUROSTAT, 2005). Many studies have proved that knowledge generation and its accumulation as well as the process of organizational learning in a firm, affect positively the firm’s overall performance. (Wu et al., 2006).

ORI is affected by many diverse organizational aspects, amongst those organizational culture. Organizational culture (OC) can play an important role fostering long-term thinking, risk-taking abilities and individual responsibility, thus increasing the innovation activity of a firm (King, 2007; Turró et al., 2014). Previous studies have demonstrated that organizational culture affects attitudes towards independence, risk and the distribution of power (Shane, 1994; Tan, 2002; Alvarez and Urbano, 2012). It also influences productivity by shaping decision-making process, increasing the ability to adjust to changes and forming attitudes towards social equality (Throsby, 2001). Culture affects tightness and effectiveness of leadership (Aktas et al., 2015).

Our study examines the relationship between a firm’s innovation ability, in the context of ORI, and its organizational culture and knowledge management factors. We consider such factors as Knowledge Generation Ability, Knowledge Transfer, Knowledge Implementation and Learning Intention. It aims at contributing to the missing link between knowledge management and organizational innovations by finding the answer to the question, what impact these factors could have on ORI development in a firm.

### Conceptual background and framework development

Knowledge is often viewed as a crucial driver of economy growth as well as for innovation flourishing (Delgado-Verde et al., 2011). Thus, knowledge management as a relatively new discipline is still building up its theoretical framework (Darroch, 2005). Knowledge management (KNM) can be seen as a process of creating, sharing, using and managing the knowledge in an organization (Girard and Girard, 2015). In our study we define them as knowledge generation (KNG), knowledge transfer (KNT) and knowledge implementation activities (KNS). Additionally, KNM can be considered as an enabler of organizational learning (Sanchez, 1996). In the knowledge-based economy innovation is one of the key concepts. Despite this fact and the broadly acknowledged perception of innovation as a complex phenomenon, it is not fully known, how knowledge affects innovation (OECD-EUROSTAT, 2005). Griese et al. (2012) stated that KNG has strong impact on innovation activity of a firm as well as in its turn provokes evolvement of the learning function (LEN) in the firm and KNS that positively influence the elaboration of ORI.

**KNM and OC.** Previous studies have listed OC as the most significant factor for effective KNM (David and Fahey, 2000). Schein defines OC as “*a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems*” (Schein, 1985: 17). It reflects the way, in which one group of people solves problems and makes choices, including the accumulated learnings that are further passed on to new members (Louis, 1980). As the OC is the underlying system of a firm, it further influences most of the internal and external processes. OC influences knowledge generation, shaping assumptions and relationships between individual and organizational knowledge (David and Fahey, 2000). Empowering and inclusive OC creates trust between individuals and groups (ibid), thus further encouraging dialogues and sharing of ideas and knowledge (Davenport

and Prusak, 1998). And organizational learning requires a high degree of commitment, where culture can provide basis for involvement and participation (Gupta et al, 2000).

López et al (2004) listed several attributes of a collaborative OC enhancing KNM and organizational learning: long-term vision, communication and dialogue, trust, teamwork, empowerment, ability to tolerate ambiguity, risk assumption as well as respect and diversity, and encouraged firms to create working environments that are favorable for progress.

To assess the impact of the OC on KNM and ORI, we structure the OC using four dimensions adopted from the competing values framework, developed by Denison and Spreitzer (1991). This framework explains the dilemmas between stability and change, and between internal and external environment. It is organized around two axes – centralization vs decentralization and competition vs the maintenance of the sociotechnical system (Denison and Spreitzer, 1991). Thus four dimensions of the OC emerge from this framework – human relations model (the team), open systems model (the adhocracy), rational goal model (the firm) and internal process model (the hierarchy). We’ve adopted them as the team, development, result, as well as consistency orientation to fit the interests of our research, refocusing the internal process model from hierarchy to consistency.

Thus, we propose the following hypotheses:

H1a: Team orientation of a firm has positive effect on KNG

H1b: Team orientation of a firm has positive effect on KNT

H1c: Development orientation of a firm has a positive effect on KNG

H1d: Result orientation of a firm has a positive effect on KNS

H1e: Consistency orientation of a firm has a positive effect on KNS

**Organizational Innovation.** Previous studies provide solid evidence that the innovation in general is a reliable source a firm’s competitive advantage (Damanpour et al. 1989; Schulz and Jobe 2001). In 2005 OECD-EUROSTAT in the document titled “Oslo Manual” introduced the definition of organizational innovation that is widely used in the modern theory of innovation. This document understands by organizational innovation “the implementation of a new organizational method in business practices, workplace organization or external relations” (OECD-EUROSTAT, 2005, p.51). The ORI should be based on strategic decisions taken by the management of a firm to implement a new for the firm organizational methods in business practices, workplace organization or external relations.

The interest towards the problem of what impact organizational innovation has on the performance of a firm is continuously increasing. Quite a large number of definitions for ORI as well as interpretation of the term can be found in the literature (e.g., Mothe and Thi, 2010). There can be different levels of ORI - for instance, appropriate solutions on the level of particular departments or functions of a company. ORI can also relate to the overall structure or the functional principles of the firm (Wengel et al., 2002).

Many studies argue that ORI are firms’ responses to technological innovations underplaying the success of the last. Nevertheless, ORI can also have independent role in firm development as a distinct form of innovation (Tidd et al., 2005).

Firstly, ORI might be aiming at implementing new procedures in processes, operation, or behavior in a firm for the first time (Som et. al., 2012). These ORI are related to innovations in management practices (IMP). As an example of such innovations one can consider a total quality management, lean, risk-management systems that impact directly on organizational performance of the firm. (Wheelwright and Clark, 1992; Reed et al., 2000; Ichniowski et al., 1997; OECD-EUROSTAT, 2005). IMP refers to new approaches in changing organizational structure or administrative procedure enhancing by that a firm’s ability to take the risk and its transparency to new ideas originated both in the internal and external environment (Han et al., 1998; Lin and Chen, 2007)

The second subtype of ORI deals with innovations in workplace organization (IWO) in order to support the implementation of new workplace organizing methods (OECD-EUROSTAT, 2005; Som et al., 2012). The ultimate goal

of introduction the IWO is to improve the overall performance of a firm by introducing the innovations that refers to the process of providing new ideas, know-how and organizing more creative working environment in a firm (Scott and Bruce, 1994; Mothe and Thi, 2010). IWO is also closely linked to the OC – certain working practices will foster certain dimensions of innovation, through shaping attitudes towards independence, risk and the distribution of power (Shane, 1994; Tan, 2002; Alvarez and Urbano, 2012).

The third type of ORI deals with decreasing the organizational barriers of the external environment facilitating the firm's interaction with the external environment (Heidenreich, 2009; Rammer et al., 2009). It can be considered as an external relation subtype of ORI (IER). The IER is an indicator of how a firm is making its network activities (Mothe and Thi, 2010).

According to the OECD-EUROSTAT (2005, p.51), ORI can be “intended to increase a firm's performance by reducing administrative or transaction costs, enhancing labour productivity by improving workplace satisfaction, gaining access to non-tradable assets (such as non-codified external knowledge), or reducing costs of supplies”.

Only a few studies (e.g. Camiso'n and Villar-Lo'pez, 2011; Apsalone et al., 2017) out of numerous ones on innovation focus on how knowledge management practices influence ORI activity of a firm.

**KNM and ORI.** Innovation activities are based on the firm's readiness and willingness to change. Griese et al. (2012) argues that if a firm aims at achieving a high level of innovation activities in product, process, or business models, it should focus on building knowledge generation competence within the firm. Many studies proved a very strong relation between knowledge generation, transfer and accumulation on one side and innovation process on the other (Nonaka and Takeuchi, 1995; Diaz et al., 2006)

According to many scholars (e.g., Prahalad and Hamel, 1990; Grant, 1996; Spicer and Sadler-Smith, 2006), knowledge management related practices in general enhance firms' innovation activity in general and the ORI in particular. Firms are more active in introducing innovations, when they effectively absorb knowledge from outside as well as when they make it circulate intensively within the internal environment (Nonaka and Takeuchi, 1995). In particular the IWO sub-type of organizational innovation significantly depends on knowledge transfer (Som et al., 2012). The need in knowledge generation and transfer enhances the demand in having internal vehicles for facilitating building relations with a firm's external environment including other firms, public institutions, research organizations, customers, suppliers in order enhance efficiency of production, procuring, distribution, recruiting and ancillary (OECD-EUROSTAT, 2005; Sappasert and Clausen, 2012). Thus, a firm evolving knowledge management systems should most likely intensively introduce all sub-types of ORI.

Thus:

H2a: Knowledge generation ability of a firm has a positive effect on IMP

H2b: Knowledge generation ability of a firm has a positive effect on IWO

H2c: Knowledge generation ability of a firm has a positive effect on IER

H3a: Knowledge transfer ability of a firm has a positive effect on IMP

H3b: Knowledge transfer ability of a firm has a positive effect on IWO

H3c: Knowledge transfer ability of a firm has a positive effect on IER

**Organizational Learning.** Many studies (e.g., Sinkula, 1994; Sinkula et al., 1997; Baker and Sinkula, 1999; Calantone et al., 2002). Mavondo et al. (2005) emphasize that knowledge generation is closely related to organizational learning. The demand in knowledge generation enhances learning activities in the firm (Argyris and Schön, 1978; Dixon, 1992). The employees in a firm act as agents that make it learn (Dodgson, 1993; Kim, 1993). The critical aspects of

learning depend very much on organizational approaches in a firm (Senge, 1990; Sinkula, 1994). A firm that established its orientation on learning should continuously looking for the new forms of organizing this learning process (Biemans, 1995; Jaworski and Kohli, 1993; Stathakoloulos, 1998). In particular, new management practices and further development of working palaces to get them adapted to the purposes of facilitating the process of learning should continuously evolve.

Thus,

H4a: Learning abilities of a firm have positive effect on IMP

H4b: Learning abilities of a firm have positive effect on IWO

H4c: Learning abilities of a firm have positive effect on IWO

In order to test the hypotheses, this study used a structured, closed-ended questionnaire. Most of the questions were adopted from previous studies carried by Griese (2012) and Zortea-Johnston (2012). In addition, some of the questions were self-operationalized.

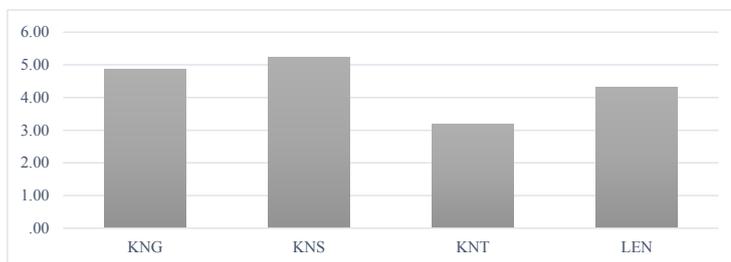
We developed the dependent variables measuring innovation performance based on the definitions in the Oslo Manual (OECD-EUROSTAT, 2005), as well as from other studies (Eurostat, 2012; Dadura and Lee 2011). Respondents were asked to compare the innovation performance of their company in comparison to the innovation performance of their competitors using a seven-point Likert scale (where 1 corresponds to “strongly disagree” and 7 corresponds to “strongly agree”). Given that only meaning on the end-points was provided, we assume that the variables are measured on a continuous scale.

Few background questions were also included to understand the profile of organizations, such as annual turnover and dynamics, as well as the number of employees and the related changes. These variables were measured using a nominal scale. This study included firms with no more than 1000 employees. Such an approach allowed to include more businesses in the analysis, while still excluding very large businesses, who might be industry leaders and thus might have different factors affecting innovation processes.

We administrated the questionnaire amongst senior managers of Russian and Latvian companies in the second half of 2016. Participants were selected using a “snowball” method. In total, 134 completed questionnaires were collected - 45 Latvian companies and 89 Russian companies from various industries took part in the research.

### Research results and discussion

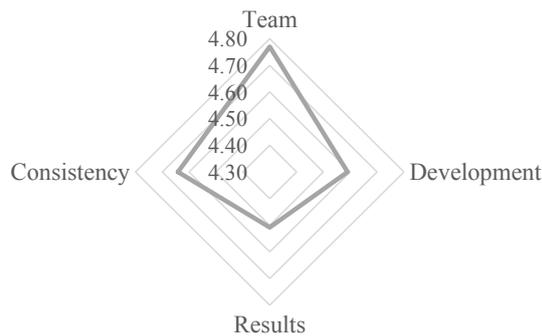
Assessing the average knowledge indicators in the surveyed companies, a conclusion can be made that KNG and KNS were the most developed amongst the surveyed companies, while KNT was the lease developed (Fig. 1). Organizational learning (LEN) was rated on average slightly lower than KNG.



Source: authors' calculations based on survey data

Fig. 1. Knowledge indicators and organizational learning

And, by assessing the OC, team dimension was on average the strongest amongst the surveyed companies, while the result orientation was the weakest (Fig. 2). Similarly the dimensions of OC were positively linked to each other, not as originally foreseen in the competing values framework. The knowledge indicators were also positively related to each other, especially KNG and LEN (Pearson Correlation .629), KNG and KNT (Pearson Correlation .359) and KNT and LEN (Pearson Correlation .519) – all of those statistically significant at the 0.01 level (2-tailed). Considering this, the hypotheses H1a to H1e can be accepted as proposed in the paper.



Source: authors' calculations based on survey data

Fig. 2. Dimensions of organizational culture

From the innovation indicators, IWO and IER were more developed in the surveyed companies, compared to IMP. IWO and IER were positively related to KNG, Team, Development and Result orientation. And IMP was positively linked to all 4 dimensions of culture.

By using multiple linear regression models, IWO can be seen as a function of result orientation that explains 33% variation in the IWO performance (Fig. 3).

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.575	.331	.297	.960	.331	9.876	1	20	.005	2.027

Predictors: (Constant), RES, dependent Variable: IWO  
Source: author's construction based on survey data

Fig. 3. IWO regression model

IER can be seen as a function of KNG and result orientation, the model explains 21% variation in the IER performance (Fig. 4).

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.458	.210	.198	1.613	.040	6.676	1	131	.011	1.774

Predictors: (Constant), KNG, dependent Variable: IER  
Source: author's construction based on survey data

Fig. 4. IER regression model

IMP is a function of LEN, consistency orientation and KNT. The model explains 42.9% of the variation in IMP (Fig. 5).

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
				R Square Change	F Change	df1	df2	Sig. F Change	
.655 <sup>a</sup>	.429	.416	1.019	.025	5.504	1	128	.021	1.947

Predictors: (Constant), LEN, CONS, KNT, dependent Variable: IMP  
 Source: author's construction based on survey data

Fig. 5. IMP regression model

Considering this, the hypotheses H2a to H2c can be accepted as proposed in the paper as well. Finally hypotheses H3a and H3c can be accepted as proposed, but H3b can be rejected – this study did not find a significant evidence that knowledge transfer ability of a firm would have a positive effect on IWO.

### Conclusions, proposals, recommendations

In our study was aiming at finding relation between organizational culture, knowledge management and organizational innovation based on the sample of small and medium-sized enterprises of Russia and Latvia. The results provided evidence that:

1. Organizational culture has strong, positive influence on both the knowledge management activities and organizational innovation evolvement in a firm.
2. The knowledge generation ability is a crucial function for development of all three organizational innovation sub-types that are IMP, IWO and IER.
3. The knowledge transfer ability of a firm positively affects IMP and IER sub-types of organizational innovation. We did not find any considerable relations between knowledge transfer ability and IWO sub-type of organizational innovation.
4. KNS does not seem to have any statistically significant impact on any type of the assessed organizational innovation.
5. Organizational culture and knowledge management indicators could partly explain all sub-types of organizational innovation.
6. The surveyed companies demonstrate the best performance on IWO and IER sub-type of organizational innovations, while relatively lower performance on IMP sub-type of organizational innovations.
7. Stronger organizational culture positively contributes to knowledge management and organizational innovation processes.

Based on the study, we propose to consider organizational culture in a firm as an essential component for creating trusting environment and flourishing knowledge management evolvement. The last in its turn strongly affects organizational innovation related activities in that firm.

For further studies we would, firstly, recommend to assess the differences between Latvian and Russian companies in a more qualitative way by, in particular enlarging the sample. Secondly, it would be valuable to consider interrelation between large number of knowledge management components and organizational innovation. Thirdly, as the current

study is limited to Latvia and Russia, it would be valuable to extend the geographical scope collecting the surveys in other countries. Finally, it would be interesting to compare the results amongst different industries and between SMEs and large companies to learn how differently the firms perform regarding the organizational innovativeness depending on their antecedents.

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