UNIVERSITY OF SARAJEVO
SCHOOL OF ECONOMICS AND BUSINESS

PHD DISSERTATION

INNOVATION IN SMALL AND MEDIUM ENTERPRISES IN BOSNIA AND HERZEGOVINA: CONCEPTUAL FRAMEWORK AND EMPIRICAL ANALYSIS OF INNOVATION BEHAVIOUR

Sarajevo, 12.06.2024. LAMIJA KRNDŽIJA

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INNOVATION IN SMALL AND MEDIUM ENTERPRISES IN BOSNIA AND HERZEGOVINA: CONCEPTUAL FRAMEWORK AND EMPIRICAL ANALYSIS OF INNOVATION BEHAVIOUR

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Sarajevo, 12.06.2024. LAMIJA KRNDŽIJA

SAŽETAK

Opstanak i rast MSP-a zavise od inovacija, višestrukog pokretača kojim upravljaju faktori kao što su preduzetnička orijentacija i saradnja. Prevazilaženje ograničenja resursa i neizvjesnosti na tržištu, efikasna podrška vlade i okviri politike podstiču okruženje pogodno za inovacije MSP-a, što je ključno u oblikovanju organizacione konkurentnosti i globalnog poslovanja. Izazovi kao neadekvatno obrazovanje zaposlenih, ograničeno učešće osoblja i nedostatak fokusiranja kompanije na inovacije, ometaju inovacije MSP. Osim toga, pitanje odliva mozgova u BiH otežava borbu za zadržavanje osoblja, utičući na razvoj poslovanja i inovativne ideje u MSP.

Koristeći analizu mješovitih metoda, uključujući intervjue i anketu, ovo istraživanje je spojilo sveobuhvatne perspektive kako bi se razumjeli stavovi MSP prema inovacijama. Nadalje, SLR je identifikovao interne (kultura orijentisana na inovacije organizacije, orijentacija na liderstvo, saradnja) i eksterne (državna podrška, tehnološka orijentacija, orijentacija na tržište) determinante koje oblikuju inovativno ponašanje, dajući informaciju konceptualni model.

Konkretno, intervjui sa MSP-ima u BiH istakli su kompleksan prikaz unutrašnjih i vanjskih inovacijskih barijera, naglašavajući potrebu za zajedničkim naporima između vladinih tijela, obrazovnih institucija, industrijskih partnera i malih i srednjih preduzeća. Stvaranje kulture orijentirane na inovacije, ulaganje u ljudski kapital i njegovanje omogućavanja ekosistema pokreću ekonomsku ekspanziju i inovacije u BiH.

U istraživanju su korišteni indikatori iz validiranih empirijskih studija za mjerenje konstrukta, procijenjeni kroz testove valjanosti sadržaja i konstrukta. Studija je uključivala odgovore od 265 menadžera MSP u BiH. Analiza je potvrdila četiri od sedam hipoteza, što je značajno doprinijelo razumijevanju dinamike koja utiče na inovativno ponašanje i poslovni učinak u MSP. Istaknute determinante kao što su saradnja, menadžerska orijentacija i tržišna orijentacija pojavile su se kao ključni faktori koji podstiču inovativno ponašanje u MSP. Veličina kompanije se pojavila kao značajan faktor koji utječe na inovativno ponašanje, dok obim kompanije ili izvozne aktivnosti nisu značajno objasnili varijacije u poslovnim performansama ili inovativnom ponašanju.

Ovi rezultati naglašavaju kompleksnu interakciju između determinanti inovativnog ponašanja i poslovnog uspjeha, naglašavajući potrebu za holističkim pristupom kako bi se ti faktori iskoristili i poboljšali poslovni rezultati MSP. Studija kulminira u sveobuhvatnom konceptualnom modelu koji integriše različite determinante, nudeći razumijevanje njihovog utjecaja na inovacije MSP i poslovne performanse u današnjem ekonomskom okruženju u tranziciji.

Ključne riječi: inovativno ponašanje, mala i srednja poduzeća, determinante inovacija, poslovne performanse, ekonomije u usponu

ABSTRACT

The survival and growth of SMEs hinge on innovation, a multifaceted driver steered by factors such as entrepreneurial orientation and collaboration. Overcoming resource constraints and market uncertainties, effective government support and policy frameworks foster an environment conducive to SME innovation, pivotal in shaping organisational competitiveness and global business performance. Permeability challenges, including inadequate employee education, limited staff involvement, and a lack of company focus on innovation, hinder SME innovation. Additionally, the issue of brain drain in BiH compounds the struggle for staff retention, impacting business development and innovative ideas within SMEs.

By employing a mixed-method analysis, including interviews and a survey, this research amalgamated comprehensive perspectives to understand SME attitudes toward innovation. Moreover, a SLR identified internal (organisational innovation-oriented culture, leadership orientation, collaboration) and external (government support, technology orientation, market orientation) determinants that shape innovative behaviour, informing a conceptual model.

In particular, interviews with BiH SMEs highlighted a complex landscape of internal and external innovation barriers, emphasising the need for collaborative efforts among government bodies, educational institutions, industry partners, and SMEs. Creating an innovation-oriented culture, investing in human capital, and fostering an enabling ecosystem drive economic expansion and innovation in BiH.

The research used indicators from validated empirical studies for construct measurement, evaluated through content and construct validity tests. The study involved answers from 265 SME managers in BiH. The analysis confirmed four of the seven hypotheses, contributing significantly to understanding the dynamics affecting innovative behaviour and business performance within SMEs. Highlighted determinants such as collaboration, managerial orientation, and market orientation emerged as crucial factors fostering innovative behaviour within SMEs. Company size emerged as a significant factor influencing innovative behaviour, while the scale of the company or export activity did not significantly explain variations in business performance or innovative behaviour.

These findings underscore the intricate interplay between determinants of innovative behaviour and business success, emphasising the need for a holistic approach to leverage these factors and enhance SME business performance. The study culminates in a comprehensive conceptual model integrating various determinants, offering a nuanced understanding of their influence on SME innovation and business performance in today's transitioning economic landscapes.

Keywords: innovative behaviour, SMEs, innovation determinants, business performance, emerging economies

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LIST OF ABBREVIATIONS

APIF – Agency for intermediary, IT and financial services
AVE – Average Variance Extracted
BiH – Bosnia and Herzegovina
BD – Brčko District
CFA – Confirmatory Factor Analysis
CFI – Comparative Fit Index
CIs – Confidence intervals
CR – Composite Reliability
EM – Expectation-Maximisation
EU – European Union
FBiH – Federation of Bosnia and Herzegovina
FIA – Financial and information agency
GDP – Gross Domestic Product
GII – Global Innovation Index
GOF – Goodness of fit indices
I&E – Innovation and entrepreneurship
IO – Innovation-oriented
IT – Information technology
KM – Convertible marks
MEE – Ministry of Economy and Entrepreneurship
MoFTER - Ministry for Foreign Trade and Economic Relations
MRPO – Ministry of Development, Entrepreneurship and Crafts
MVA – Missing Value Analysis
NFI – Normed Fit Index
NPM – New Public Management
OECD – Organisation for Economic Cooperation and Development
PLC – Product's life cycle
PPP – Public-private partnerships
R&D – Research and Development
RBV – Resource-Based View
RMSEA – Root Mean Square Error of Approximation
RS – Republika Srpska
SDGs – Sustainable Development Goals
SEM – Structural Equation Modeling
SLR – Systematic literature review
SMEs – Small and Medium Enterprises
SQRT AVE - Square root of the AVE
SRMR – Standardised Root Mean Residual
VIF – Variance Inflation Factor
VRIN – Valuable, Rare, Inimitable, Non-substitutable
WoS – Web of Science Core Collection

1. INTRODUCTION

This chapter presents an introduction of the overall thesis. It introduces the foundation and points out the justification and rationale behind this research. Moreover, it outlines the research problem, research objectives, questions, and hypotheses, after which a brief description of the conceptual model and methodological framework is given. Finally, the contributions and a concise outline of the thesis structure are presented.

1.1. Research problem

Innovation is widely recognised as the key factor which enables enterprises to survive in the nowadays supremely globalised environment (Lizarelli, de Toledo and Alliprandini, 2021). Moreover, innovation is closely related to the development of new products and services, and the improvement of organisational outcomes. Because of the significance of enduring adjustments and innovation in enterprises, research of determinants which influence innovation behaviour is very important (Kör, 2016). Some researchers have analysed this question from the employee perspective and others from the organisational perspectives (Bin Saeed *et al*., 2019; Cao, Le and Nguyen, 2022). Furthermore, due to the still ambiguous determinants of innovative behaviour in small and medium enterprises (hereinafter: SMEs), researchers have to analyse the mechanisms which enhance innovative behaviour and their interaction with other organisational variables (Rank, Pace and Frese, 2004).

Contemporary research of the theory of the firm have broadened the existing resource-based firm view with the idea of dynamic capabilities, as for example innovation capabilities. Throughout this, a firm's capability to develop its resources and skills, with the aim to adjust to the changing business environment, was explained (Teece, Pisano and Shuen, 1997). A firm with greater business performance can achieve competitive advantage on ground of its valuable resources and unique capabilities, and it can sustain its competitive advantage on ground of its innovative capacity (Barney, 1991; Day and Wensley, 1988; Porter, 1980). Moreover, in order to enhance innovation, it is necessary to examine the impact of the external and internal determinants of innovation (Hjalager, 2010; Moreno, García-Morales and Llorens Montes, 2013; Neely *et al*., 2001; Zirger and Maidique, 1990).

An enterprise's growth relies on its capability to innovate (Wadho and Chaudhry, 2018; Hossain, 2015; Varis and Littunen, 2010). Due to the highly competitive business environment all around the world, enterprises require a novel driver of their performance and growth. According to Schumpeter (1950), innovation is one of the key solutions to this challenge. Particularly in the context of SMEs, the Organisation for Economic Co-operation and Development (2010) (hereinafter: OECD) underlines the vital importance of innovation for business progress.

SMEs with a proactive approach to innovation, customer orientation, and more service quality, are said to be the ones with most profit and productivity (Miles *et al*., 1978).

Nevertheless, there is a very limited number of studies concerning the relationship of SMEs innovative behaviour and business performance (Forsman and Temel, 2011). A firms' innovation capacity is a focal factor of its competitive advantage, and consequently it may enhance the business performance of the firm (Angelo, 2012; Calantone, Cavusgil and Zhao, 2002; Mone, Mckinley and Barker Iii, 1998; Talke, Salomo and Kock, 2011). In most cases, innovation is associated to enhanced business performance in regards of efficiency, productivity, and profitability (Forsman and Temel, 2011; Shefer and Frenkel, 2005; Tidd, 2001). Nevertheless, the relationship of innovation and business performance is rather interdependent, than elementary (North and Smallbone, 2000).

Novel ideas and employee behaviour make the core of innovation in any organisation. Those employees, individually or in teams, develop, promote, modify and implement these creative ideas (Scott and Bruce, 1994). Moreover, creativity has been universally seen as the fundamental ingredient of innovation (Amabile, 1996; Çokpekin and Knudsen, 2012; Mumford, 2000; Shalley, Zhou and Oldham, 2004) in this manner, organisations are contingent on the innovative engagement and creativity of their employees. A lot of contemporary research has been directed towards the role of creativity and research and development (hereinafter: R&D) (Yu *et al*., 2014) in innovation performance of enterprises. Even though plenty of qualitative studies have analysed the aspect of less tangible determinants of enterprise's innovation performance, as brainstorming and teamwork, quantitative analysis has been rarely performed (Wadho and Chaudhry, 2018).

Firm specific competences have recently become crucial in the analysis of factors of enterprise innovation activity and their connection to enterprise performance (Aralica, Račić and Radić, 2008). Numerous studies outline the significance of R&D and organisational capabilities for the process and profitability of enterprise innovative activities (Mowery and Rosenberg, 1989; Teece, 1977, 1986). SMEs' innovativeness is determined by industry-, enterprise- and innovation-specific factors (Aralica, Račić and Radić, 2008; Hausman, 2005). Furthermore, within an SMEs it appears that entrepreneurial behaviour is the key factor influencing innovation activities (Caird, 1994; Kickul and Gundry, 2002; Lipparini and Sobrero, 1994).

1.1.1. SMEs innovation challenges

According to Naudé *et al*. (2014), SMEs have a critical role in the development of any economy, and thus it is an imperative to evaluate their performance. The contemporary analyses of SMEs performance encounter several disadvantages. For instance, the SMEs are analysed as a homogenous group, where important factors as size, location, and sector type, are neglected. Whereas, Hossain (2015) also underlines that SMEs innovative behaviour differs due to the type of innovation, size of SMEs, etc. Moreover, they are often regarded as closed systems, hence the relevance of networking and promotion as a manner of enhancing SMEs performance is undermined. Additionally, the effect of SME's innovation activities is frequently neglected (Naudé *et al*., 2014).

SMEs represent a backbone for many economies. However, most of them lose out to large enterprises and do not approach innovation management in a highly systematic manner due to limited resources (Hossain, 2015). According to (Hoffman *et al*., 1998) most researchers have focused on innovative behaviour of large enterprises, though many innovations are developed by SMEs.

In order to achieve and maintain competitiveness on turbulent markets, firms need to effectively address rapid technological and market specific changes by continuously generating innovation. For companies in emerging economies, like those in Western Balkan countries, this is a great challenge. They face poor ground infrastructure, lack of IT support (Pradhan, 2012), ethnic divisions in multi-ethnic societies (Biggs and Shah, 2006), lack of networking knowledge (Salman, 2004), poor legislation and regulation (Eid, 2006), risk of innovation from the standpoint of consumers, environmental aspect, antitrust measures (Madrid-Guijarro, Garcia and Van Auken, 2009), limited information sources, and poor communication with partners, customers, and suppliers (Vrgović *et al*., 2012). Moreover, they are confronted with various cultural, trust and legal issues.

Even though, it is focal for SMEs to increase their contributions to innovation (Stoffers, Van der Heijden and Jacobs, 2020), unfortunately, until this moment, most SMEs direct far less attention to innovation activities compared to large firms. Beside rather limited funds, SMEs are also confronted with personnel challenges in terms of inadequately qualified workforce. Employee innovative behaviour is crucial in order to enhance the existing production processes and to create novel products and services (Stoffers, Van der Heijden and Jacobs, 2020). Conventional behaviour does not generate the necessary changes in processes, thus in order to attain a stream of innovation, employees have to possess the innovation-oriented attitude. Moreover, innovative behaviour is (Onne, 2000) among other factors, influenced by the employees' expertise. Overall, the SMEs innovative behaviour relies on the employee mind-set which in addition influences the extent of innovation (Brink, 2014; Sarasvathy, 2008; Hossain, 2015; Trettin and Welter, 2011).

Improving innovation capabilities and thus the overall productivity of SMEs is a mayor policy issue. However, SMEs are often labelled as resource- and capability-scarce entities. They face lack of resources such as financial, human, technology and knowledge. Given their financial constraints they cannot afford expensive highly skilled workforce with the latest knowledge. SMEs are not attractive working environment for graduated employees. Furthermore, SMEs lack steady and sufficient cash flow, but generally access to finance (Salman, 2015).

Although SMEs have rapid and flexible adaptation to market demands, small firms cannot adopt and manage rapid technological changes by themselves. Precisely, because SMEs have fewer resources, their capabilities and routines to combine and exploit those resources become crucial in order to successfully innovate and thus to gain competitive advantage

(Salman, 2015). Therefore, identification of innovation routines of SMEs is an essential prerequisite for increasing their innovative performances and thus their competitiveness. Moreover, collaborating with externals such as customers, suppliers and research institutions, SMEs can overcome their smallness and limitations and unlock their innovation potential (Chaston and Scott, 2012; Kafouros and Forsans, 2012). Considering that emerging SMEs in BiH are usually resource-scarce (in material and immaterial sense), their embeddedness in the innovation eco- system and strong collaboration and co-creation become crucial in their business activities.

Nevertheless, in order to stay competitive, according to Aziz and Samad (2016) enterprises have to be able to adjust to changing conditions, in which their ability to innovate is a key prerequisite. Beside internal obstacles as lack of funds, labour knowledge, and managerial skills, SMEs also rely upon the extensive innovation ecosystem in which they operate (Love, Roper and Du, 2009). Moreover, this encompasses the infrastructure, an effective research system and a legal and institutional framework, and a well-established system of innovation-associated actors.

Furthermore, most studies have focused on technological and scientific aspect of business innovation, whereas there is as well a growing discussion that innovation is associated to business management, not only product and technology improvement (Dickson and Hadjimanolis, 1998; Maryann and David, 1999). In a vast number of research, innovation is limited to the development of new products. Lowe (1995) underlined that; previous studies have merely provided a limited understanding of the entire innovation process in enterprise. SMEs usually regard innovation as a process of high risk and with uncertain earnings. Innovation is a contested and frequently misrepresented term due to the fact that various factors, in different sectors, can influence the innovation process (Pachouri and Sharma, 2016; Hossain, 2015). Some consider it as a varying creative action, others solely refer it as a process of idea creation.

Sometimes, enterprises are motivated to innovate and think out of the box by some barriers they encounter, as high cost of technology or lack of funds (Pachouri and Sharma, 2016, Hossain, 2015). A proper analysis of the origin and nature of innovation barriers is of great importance to all managers of top enterprises. Many work characteristics are said to be related to innovation barriers. Among others, these characteristics include the size, department, age, competition, technological intensity, financial resources for innovation, R&D expenses, etc (de Paiva Duarte 2015).

1.1.2. SMEs innovation and growth

The importance of innovation for the performance of enterprises has been extensively acknowledged (Aralica *et al*., 2008; Griffith *et al*., 2006). In terms of value addition, employment, and profitability, enterprise performance is impacted by innovation activities.

(Lööf and Heshmati, 2002). Nevertheless, when it comes to the factors which determine the innovation activity, various views and approaches exist.

Sivageahnam *et al.* (2015) explained that SMEs are the entry point for entrepreneurs, offering a place for expanding novel concepts and an employment opportunity for overly abundant and unskilled employees. The essential sources of SMEs competitive advantages and development arise from novel innovation implementation (Alyahya'ei *et al*., 2020).

In particular, innovation enables the creation of novel and differentiating market opportunities and also competitive advantage is gained through innovation (Hossain, 2015; Unsworth *et al*., 2012). The term innovation has been given various meanings. Economists defined innovation as something directly impacting the economic level of a country (Schumpeter, 1939, 1950). Even though several innovation types exist, the innovating process is the same for all. Innovation commences with an invention, continues with its development, and finally a new product or process is introduced at the market (Hossain, 2015).

Schumpeter (1950) explains that innovation includes the recombination of resources in a production process which may result in enhanced business performance and growth. The introduction of novel products or services, utilisation of novel production technologies, and conceiving novel marketing and business management approaches, can result in innovation (OECD, 2005). Innovative behaviour empowers enterprises to create value by means of new changes in their performance and production (Schumpeter, 1950). This new value created through innovation enables enterprises to increase their market share, open new markets, and lower their management and production expenses (Chandy and Tellis, 2000; Hill and Rothaermel, 2003; Rothaermel and Hess, 2007). In context of developing countries, innovation is a determinant of economic growth, a mean of increasing employment, and a way of addressing various socio-economic issues (OECD, 2012).

Furthermore, a central question prevailing many policy discussions across the world has been how to enhance economic development through SMEs (Liedholm *et al*., 1994; Robson and Bennett, 2000). SMEs are particularly important in the context of developing countries as they contribute to employment, and moreover as they employ abundant and unskilled labour force in those countries (Larson and Shaw, 2001; Phillips and Bhatia-Panthaki, 2007). In order to improve the knowledge on SMEs needs and factors which influence their growth, these enterprises have to be studied further. According to Norman (2008), such knowledge would enable researchers, and policy-makers to create reliable backing for SME strategies.

According to Pavitt (2006), more-innovative countries have rather higher income and productivity rates compared to those countries with lower levels of innovation. For that reason, and because enterprises possess specific resources and processes, studies of innovation in SMEs are pivotal for national growth (Thaci, 2012).

Considering that innovation is one of the key factors of business development, good innovative practices offer a way for the development and implementation of policies. Still, insufficient research has been completed on this subject (Hoffman *et al*., 1998; Hossain, 2015; Soderquist *et al*., 1997). According to Raymond and Magnenat-Thalmann (1982) SMEs are often hindered by limited resources and the fact that they depend on few individuals. Furthermore, Laforet and Tann (2006) suggest that these characteristics are alike to SMEs in all service sectors.

In order to stay competitive and respond to ever-changing customer needs, enterprises hastily need to use and take advantage of novel high-tech opportunities (Verhees, 2005). These dynamic environmental factors strongly underline the increasing relevance of product innovation for enterprises. According to Caloffi *et al*. (2015) SMEs need a consistent innovation stream to accomplish their business goals. The European Commission (2002) emphasises that innovation and continuous process refining, especially in terms of product innovation, is important for both public and private sector.

Growth in business performance is seen as the accomplishment of firms' strategic objectives and those regarding profitability, sales growth, and market share growth (Hult *et al*., 2004). The link between innovation and business performance has been researched in the past with mixed final results (Forsman and Temel, 2011; Gunasekaran *et al*., 2000; Han *et al*., 1998; Heunks, 1998; Swierczek and Ha, 2003). When it comes to novel products and services, innovation is related to sales growth, and productivity concerning new processes (Avlonitis and Salavou, 2007; Cainelli *et al*., 2006). Innovation is significantly related with improved business performance in regards of profitability, productivity, and efficiency (Forsman and Temel, 2011; Shefer and Frenkel, 2005; Tidd, 2001). Accordingly, a firms innovative behaviour enhances the business performance.

1.1.3. Importance of innovation determinants

Innovation is an indispensable element of a business strategy. Nevertheless, in the context of SMEs, innovation is focused more on establishing novel ways of working than developing new products. Innovative enterprises aim to find solutions to their obstacles, so that even those obstacles assist SME's development and innovation process (Hadjimanolis, 1999; Piatier, 1988).

Mulkay (2019) claims that innovation is normally seen as the main determinant of an enterprise's performance and thereupon of a country's growth. Various characteristics of an enterprise, as product type; management efficiency; employee effectiveness; enterprise leadership, can result in innovation behaviour. Nevertheless, these characteristics are usually not observed at the enterprise level but are significantly correlated over some time period. Hossain (2015) claims that the main factors influencing innovativeness are market expectation, focus on customer needs, and the dedication of managers in creation of a novel product.

Through the systematic literature review (hereinafter: SLR) the most relevant research on SME innovation determinants were recognised and accordingly outlined in table in Appendix A4. Accordingly, the factors which are through the literature most mentioned include the government support, cooperation, technology orientation, managerial orientation, organisational IO culture and market orientation.

In particular, the concept of government support referees overall to policies, institutional support, and public infrastructure. Public policies, especially those related to innovation and entrepreneurship, may encourage innovative business and market environment (Radaš and Božić, 2009). According to in order for an innovation to be successful, continuous process of policy creation, implementation, and monitoring has to be initiated. The government develops policies and incentives which promote competitive advantage of a country, and its technological development, which in turn allows firms to innovate and to gain competitive positions (Hadjimanolis, 1999).

Firms networking and establishing of well-developed collaboration with the public and private sector organisations is a pivotal mechanism for new capability development and accomplishment of competitive advantage (Batonda and Perry, 2003; Hoffmann and Schlosser, 2001). The concept of cooperation is especially important for SMEs which have limited capacities and internal resources (Starr and MacMillan, 1990). Innovation in SMEs is enhanced through the creation of effective alliances, cooperation, and higher level of communication (Freel, 2003; Hadjimanolis, 1999; Yang *et al*., 2022). Furthermore, SMEs may also engage in collaborative agreements as a way of seizing strategic advantages and improving their innovation capacities (O'Dwyer *et al*., 2011; Stuart, 2000).

Technology is a pivotal element of firm's success in terms of both, accomplishing competitive advantage and innovation (Henard and Szymanski, 2001; Simon, 1996). Technology can also determine the direction and pace of innovation (Nemet, 2009). Moreover, a technologically orientated firm uses its resources and capacities to grasp on novel technological opportunities and uses its technological background to create new products (Gatignon and Xuereb, 1997). It is the firm's technological capacity, in developing new products and services which will fit the consumer and market needs, that results in improved and successful innovation (García-León, 2016; Cooper, 1994; Laforet and Tann, 2006; Zhou, Yim and Tse, 2005). Furthermore, SMEs technology orientation may impact the success of its technology leadership, product differentiation, competitive advantage, and overall business performance (Cumming, 1998; Gatignon and Xuereb, 1997; Prahalad and Hamel, 2009).

Furthermore, the basic managerial capabilities and competences are key indicators of innovation potential (Smith *et al*., 1986; Snow and Hrebiniak, 1980). As opposed to large firms, SMEs usually mirror in their day-to-day business the personalities of their managers and/ or owners (Nooteboom, 1994). Moreover, their strategic objectives reflect the strategic

orientation and business practices of a SME (Dandridge, 1979; Gatignon and Xuereb, 1997). Management orientation directly determines and impacts SMEs innovation (Baldridge and Burnham, 1975; Cannon, 1985; Webster, 1988). For an innovation to be successful it is important to have strong managerial support (Cromer *et al*., 2011). Managers of high-performing firms may engage in various strategies to improve internal processes and overall growth, as for example output- oriented or throughput-oriented backgrounds (Christensen, 2003; Thomas *et al*., 1991).

Organisational culture and internal learning within SMEs can impact innovation and encourage employees to be less risk averse, not afraid from mistakes, and make new learning opportunities and innovative solutions (Forsman and Temel, 2011; Martins and Terblanche, 2003; Peebles, 2003; Xu *et al*., 2007). Thaci (2012) claims that an enterprise which incorporates innovation as part of its organisational culture can accomplish long-term success. Moreover, a IS supportive culture may enhance value creation and result in new innovative manner of approaching and resolving problems (Martins and Terblanche, 2003). In order to encourage innovation, a firm has to support employees' empowerment, limit hierarchy and create flexible working structure and teams, advocate for effective communication, and adopt performance-based incentives (Davenport and Bibby, 1999; Ghobadian and Gallear, 1997; Teece, 2010). Furthermore, organisational learning can improve SMEs creativity and their capacity to recognise innovation and innovative opportunities (Freel, 2003; Jimenez-Jimenez *et al*., 2008; McKee, 2003; Van de Ven, 1986).

Finally, the concept of market orientation implies obtaining novel knowledge about relevant market participants, especially customers, distributing that knowledge through the organisation, and finally acting on that knowledge and delivering greater customer value (Slater, 1997). An enterprise can increase the knowledge to make actions and ease the innovation process through the outward focus which market orientation has on the customers and competition (Day and Wensley, 1988; Dibrell *et al*., 2011; Gray *et al*., 1998; Tajeddini *et al*., 2006; Varadarajan and Jayachandran, 1999). A number of former studies analysed and confirmed a positive relationship between market orientation, innovative behaviour, and business growth performance (Baker and Sinkula, 2007; Han, Kim and Srivastava, 1998; Lee and Tsai, 2005; Tajeddini *et al*., 2006). By answering to market demand in a new or different manner, market orientation contributes to innovative behaviour (Jaworski and Kohli, 1993). Furthermore, this contributes to a greater connection between managers and the business environment, which results in innovative business solutions (Hult, Hurley and Knight, 2004). SMEs with a strong market orientation can easier recognise and understand customer needs, and are in turn more innovative, and perform better (Henard and Szymanski, 2001; Iyer *et al*., 2006; Keskin, 2006; Lin, 1998; Morris and Lewis, 1995).

1.2. Purpose and research objectives

Through following the logic of the research context, as well as the theoretical foundation of the thesis, the main aim of this dissertation is to explore the determinants of innovative

behaviour of SMEs to support business growth performance. More precisely, the logic of the relationship between innovation drivers and business performance of SMEs is analysed. The purpose of the thesis is to contribute to the development of SMEs business performance through innovation and to illustrate the significance of embracing a complete approach to innovation management through combining both the external and internal environmental contexts. Since innovation practices and routines are „deeply rooted with the culture of a particular location" (Hossain, 2015) this study intends to investigate whether SMEs' innovative behaviour in developing economies is different in comparison to their developed counter-parts. Accordingly, the objectives of this thesis are:

- to identify the research themes/ trends within the SMEs innovation drivers field;
- to systematically review the drivers of innovative behaviour of SMEs in the literature;
- to identify the nature of the main drivers of innovative behaviour of SMEs;
- to gather in depth and context specific insights into innovation behaviour of SMEs in BiH;
- to contextualize the survey design;
- to pilot the survey questions;
- to examine the challenges faced by the SMEs in developing innovation;
- to analyse the relation of government support and innovative behaviour of SMEs;
- to analyse the relation of cooperation and innovative behaviour of SMEs;
- to analyse the relation of technology orientation and innovative behaviour of SMEs;
- to analyse the relation of managerial orientation and innovative behaviour of SMEs;
- to analyse the relation of organisational IO culture and innovative behaviour of SMEs;
- to analyse the relation of market orientation and innovative behaviour of SMEs;
- to analyse the relation of innovative behaviour of SMEs and business growth performance.

1.3. Research questions

Based on the defined scope of research, and referring to the objectives of the thesis, the subject of research and theoretical assumptions, the following research questions are addressed:

- What are the main drivers of SMEs innovation behaviour?
- What is the nature of the main SMEs innovation behaviour drivers?
- Whether and in what way does government support influence innovative behaviour of SMEs?
- Whether and in what way does cooperation influence innovative behaviour of SMEs?
- Whether and in what way does technology orientation influence innovative behaviour of SMEs?

- Whether and in what way does managerial orientation influence innovative behaviour of SMEs?
- Whether and in what way does organisational IO culture influence innovative behaviour of SMEs?
- Whether and in what way does market orientation influence innovative behaviour of SMEs?
- Whether and in what way does SMEs innovative behaviour influence business performance?
- Wheather and in what way innovation behaviour of SMEs in BiH differs compared to past empirical research, and what are main insights for further research with respects to obtained empirical findings?

1.4. Research hypotheses

Based on the literature review, a conceptual model is created with the following hypotheses:

- H1: Government support influences innovative behaviour of SMEs
- H2: Cooperation influences innovative behaviour of SMEs
- H3: Technology orientation influences innovative behaviour of SMEs
- H4: Managerial orientation influences innovative behaviour of SMEs
- H5: Organisational IO culture influences innovative behaviour of SMEs
- H6: Market orientation influences innovative behaviour of SMEs
- H7: Innovative behaviour of SMEs influences business performance

The research hypotheses are the result of the above mentioned SLR, which was performed in three stages of planning, conducting and reporting the literature review, according to Wahono (2015). In the first step, the literature review requirements were determined, by defining the search phrase ((TITLE: (innov*) AND TOPIC: (behaviour OR behaviour) AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies) and selecting the appropriate database for finding relevant articles (Web of Science Core Collection (hereinafter: WoS)). Within the second step, the review was conducted according to previously established rules and resulted in the identification of articles (87 article). Finally, the content of the articles was analysed in order to determine the situation of the research area, and the conceptual model was identified.

1.5. Conceptual model

The conceptual model was identified in accordance with the purpose of the thesis, and the defined research goals, in order to provide answers to the research questions. As explained previously, after conducting bibliometric mapping, published articles were collected with the aim to answer the set questions in the line with the theoretical foundation of the thesis. As a result of the conducted SLR, a conceptual model was created, based on the innovation

theory and theory of the firm. A table of the primary papers included in the content analysis in order to identify the conceptual model is presented as Appendix A of the thesis. The conceptual model of this thesis is presented on figure in Appendix A5.

1.6. Methodological framework

When it comes to the research methodology, this thesis adopted a deductive approach, indicating that the research begins with a theory, and consequently the conclusion arises from an array of theory-derived premises (Saunders, Lewis and Thornhill, 2019). Accordingly, the theoretical foundation of this research model, as already mentioned, is the innovation theory and the theory of the firm. Specifically, the research problem and research questions of this thesis are addressed in accordance with the existing literature, and afterwards through primary data collection, a conceptual model, as an answer to those research questions, is tested.

The research philosophy on which this research is based is positivism. This research philosophy relates to the rational viewpoint of a scientist and involves the observation of social reality in order to generate law-like generalisations. Positivism underlines the positivist focus on solely objective empiricist method created to generate facts and pure data unbiased by human interpretation (Saunders, Lewis and Thornhill, 2019).

In order to perform this research, at the beginning, secondary data was obtained through bibliometric mapping (1,051 identified studies) and an extensive SLR (87 articles) on SMEs innovation in the country, region and the world. Afterwards, the research will be completed through a mixed method approach, which will require both qualitative and quantitative analysis in order to explore the concept of innovation in SMEs. In order to obtain an exhaustive understanding of the SMEs and the personal attitudes toward innovation, a combination of these views will be required. Moreover, this structure enables an easier access toward the perceptions and knowledge of the staff and management.

In order to test the conceptual model, primary data is collected through the survey method and a questionnaire. The respondents were high-level managers of SMEs in BiH. The list of companies was obtained from the financial and statistical agencies of BiH, as well as Agency for intermediary, IT and financial services (hereinafter: APIF) and Financial and information agency (hereinafter: FIA) agencies. The invitation to participate in the research was sent via an email address that will contain a link to the online questionnaire. The goal of the research was to collect a minimum of 200 answers, which is an adequate sample size for the multivariate analysis (Hair *et al*., 2018). Also, semi-structured interviews were conducted with the management until the saturation point has been reached.

The research instrument consists of several sections, which reflect the measurement constructs, and additionally the demographics of the respondents and the enterprise are included. All measurement scales are taken from relevant and validated studies.

The data collected through the survey is analysed in several steps by using different statistical methods. Afterwards, the conceptual model is evaluated through the two-step approach, by assessing the reliability and validity of the measurement model, and by testing the theoretical model (Anderson and Gerbing, 1988). Specifically, confirmatory factor analysis (hereinafter: CFA) is used to test the reliability and validity of the measurement model, and structural equation modelling (hereinafter: SEM) will be used to test the proposed hypotheses.

1.7. Contribution

The outlined literature review indicates the importance of SMEs for the development of BiH. Even though, SMEs innovation is a popular research topic all around the world, there is currently very little research on SMEs innovative behaviour in BiH. The produced results, therefore, act as groundwork for more innovative research to build on. Based on an empirical mixed-method approach, this research allows gaining a deeper understanding of external and internal-driven factors which inspire SMEs innovation. Furthermore, it develops a better comprehension of the significance of innovation behaviour and business performance. Besides empirical evidence, the thesis also contributes theoretically, as the relation of innovation determinants and business performance are analysed by combining the perspectives of the innovation theory and theory of the firm.

Whereas several previously mentioned studies, all around the world, have been conducted in the field of innovation behaviour in SMEs, this study is among the first to explore the innovation behaviour of SMEs in BiH. Through this thesis the benefits and areas in which innovation performance and innovative behaviour can impact the growth and development of BiH are analysed. The study makes another significant contribution by proposing a grounded conceptual model reflecting the factors which influence innovation in SMEs. The research will be primarily directed toward the factors, recognised in relevant academic literature, which influence organisational innovativeness and innovative behaviour at their workplace in general.

Furthermore, a broad empirical base is missing for analyses of the innovation behaviour of the different type of companies in BiH. In particular, empirical evidence is missing to understand the structural drivers and barriers of innovative activities. Accordingly, the aim was to, first, develop and implement a unique survey in innovative behaviour addressing companies. This survey was designed based on relevant and validated theoretical frameworks and models, with adequate adaptation to the context of research in BiH, considering all its specifics, but also the specifics of SMEs.

Based on these unique and representative data, the research provides reliable empirical evidence on innovation inputs and sources as well as innovation outputs of the analysed companies and their innovation network. In addition to the survey, also an in-depth qualitative study based on a literature review and interviews with actors of the BIH

innovation eco-system were designed and conducted. The purpose is to contribute to the understanding of the innovation related challenges and needs of SMEs in BIH.

The current research efforts in SMEs' innovativeness have been predominantly focused on highly developed companies in western economies, rather than small transition economies. This research offers a very important insight into SMEs' innovation practices and challenges beyond well-researched developed countries. In practical terms, the findings have also important implications for SME managers seeking to improve creativity and innovation in their firms. For example, by developing an incentive system along with leadership and team development programs, which can help shape the suitable context for behaviours that stimulate innovation in SMEs. In addition, the thesis helps leaders understand that they can continually adapt these behaviours to achieve the best fit with climates that support innovation in dynamically changing contexts.

By tapping into the industry world, the research helps properly capture the voice of SMEs and understand their exact needs. The results enable intermediary organisations, including business associations, the chamber of commerce, technology transfer offices or incubators to increase their knowledge base regarding the different pattern of SME innovation behaviour (including their strength, weaknesses and their function within the innovation system).

The research expands the systematic knowledge and grant support in combatting limited understanding of innovative behaviour in the SMEs and innovation management in general. Furthermore, some ideas on the daily work improvement through innovation are given. Beside the methodological contribution, this research contributes to the enhancement of the innovative behaviour in this sector, as an opportunity to improve their overall performance and efficiency. The research offers some specific recommendations and ideas on the innovation-oriented development of BiH.

1.8. Thesis structure

This doctoral dissertation consists of six chapters. In order to elaborate on a particular part of the dissertation more closely, each chapter contains more subchapters.

The first chapter provides an overview of the problems and subjects of research and identifies the basic advantages of innovative behaviour in SMEs and their importance for business growth. Considering the objectives of the work, the subject of the research and the theoretical background, six research questions are established. Furthermore, in order to provide answers to these research questions, a conceptual framework and hypotheses are presented. Subsequently, the research methodology and expected theoretical and practical contributions of this dissertation are outlined.

The second chapter provides an overview of the literature in which all constructs are presented separately. The notions of certain factors related to innovative behaviour, which

directly or indirectly affect the business performance of SMEs, are also presented. Furthermore, the process and results of conducting bibliometric analysis and SLR in order to establish a conceptual model are clarified. Based on this analysis, the measurement model used in the dissertation is presented and the measurement models are operationalised.

The third chapter presents a detailed overview of each of the eight hypotheses, with a special focus on the research context of SMEs in BiH and the way in which the data was collected. Furthermore, the conceptual model and research methodology are explained in detail.

The fourth chapter presents an analysis of the data after the interview, as well as of the data collected through the distributed questionnaire. A theoretical overview of certain statistical topics is provided, and they will be used for data analysis, and obtained results are presented.

In the fifth chapter, the obtained results and the results of hypothesis testing are analysed and discussed. Through discussion and critical review, the impact of certain factors on the innovative behaviour of SMEs and the impact of such behaviour on the growth of business performance is further clarified.

In the sixth chapter, the details of the work are presented in the form of a conclusion. The theoretical and managerial implications of the research results are presented. Finally, the limitations of the research and recommendations for future research are stated.

2. LITERATURE REVIEW

In this chapter, the theoretical concept of innovations in SMEs will be presented, with an emphasis on studies that enable a review of the literature in the field of SMEs innovative behaviour. More precisely, the theoretical assumptions of the concept of innovative behaviour of a company, as well as its measurement, determinants and role in organisational success, will be investigated. Furthermore, within the framework of innovative behaviour, the factors of government support, cooperation, technology, managerial orientation, organisational IO culture, and market orientation will be analysed. Also, existing knowledge and research on business performance, as well as the respective influence of innovation, will be presented.

2.1. Innovation and SMEs

SMEs are vital components of the global economy, contributing significantly to job creation, economic growth, and innovation. In recent years, innovation has emerged as a critical driver of SMEs success, enabling them to adapt to rapidly changing markets and seize new opportunities. SMEs constitute the backbone of many economies, contributing significantly to job creation, economic growth, and innovation. In today's competitive business landscape, the ability to innovate is paramount for SMEs. (Dasgupta, 2023)

There are several types/ dimensions of innovation. One of the primary dimensions of innovation within SMEs is product innovation. This involves the development of new products or improvements to existing ones, allowing SMEs to respond to evolving customer needs and stay competitive in the market (Afuah and Tucci, 2003). The agility of SMEs often enables them to introduce innovative products more swiftly than larger competitors. Such innovations not only attract new customers but also allow SMEs to command premium prices, thus bolstering profit margins and ensuring a competitive edge. Moreover, Hossain (2015) claims that in order to comprehend the innovative behaviour in context of product innovations, it is immensely important to comprehend the product's life cycle (hereinafter: PLC). Particularly, following the initial introduction, a product goes through a cycle of transformation and enhancement, and afterwards through the growth, maturity and decline phase. Consequently, the PLC theory implies that product development happens usually in the initial phases of the product's life. Nevertheless, Utterback and Abernathy (1975) underlined that in case of process development this usually occurs at the maturity stage of the PLC.

Furthermore, process innovation is equally vital for SMEs. Process innovation focuses on enhancing internal operational processes, workflows, and supply chain management. Through process innovation, SMEs can streamline their operations, reduce costs, and increase overall competitiveness (Damanpour, 1991). This adaptability is particularly crucial for SMEs, as it enables them to offer competitive pricing, ensuring long-term market survival.

Finally, SMEs also innovate in marketing strategies and organisational structures. For instance, they may adopt digital marketing techniques, embrace data analytics, or implement flexible work arrangements to enhance productivity and adapt to market dynamics (Iqbal *et al*., 2020; Pascual-Fernández *et al*., 2021). Particularly, by embracing digital marketing techniques and harnessing data-driven insights, SMEs can tap into new customer segments, both domestically and internationally, facilitating growth. Organisational innovation, encompassing changes in structure and culture, is instrumental in managing growth. This perspective is echoed by Löfsten and Lindelöf (2002), who highlight the importance of innovation in optimising internal structures. Organisational innovation enables SMEs to scale efficiently while maintaining a cohesive workforce, supporting sustainable growth.

Radical innovations forge substantial, global changes, while incremental innovations repeatedly fill in the process of development. Particularly, Schumpeter (1950) explains that innovation may take various forms, as a novel product being introduced or improved; a new market being opened; change in business organisation, etc. In most cases, innovations which happen in SMEs are process innovations. The indicated is usually due to lack of skilled employees or financial resources or even due to the short PLC (Pachouri and Sharma, 2016; Hossain, 2015). An additional common aspect on innovation is related to change management in business (Jin, 1999), and regards innovation as a management process, and thus a crucial managerial obstacle (Soderquist, Chanaron and Motwani, 1997).

In particular, depending on the typology of an enterprise and the extent of its operational capabilities, diverse classifications of business innovation are discernible (Varis and Littunen, 2010). However, according to the research conducted by Reichstein and Salter (2006), the prevailing taxonomies encompass these categories:

- Incremental Innovation: This category involves the systematic refinement of extant products and services through iterative and incremental improvements.
- Process Innovation: This classification centres on the meticulous optimisation of manufacturing and delivery procedures with the overarching objective of augmenting organisational productivity, efficiency, efficacy, capabilities, and product quality.
- Service Innovation: This facet pertains to the amelioration of the customer journey and experience via the enhancement of customer relations, interaction channels, and post-sale services.
- Business Model Innovation: This strategic domain revolves around the radical reconfiguration of the value-creation model and the associated value proposition.
- Resource Innovation: This paradigm is characterised by the endeavour to accomplish more with fewer resources by embracing minimalist methodologies and emerging trends, thereby enabling the exploitation of resources to engender novel products or services without necessitating substantial capital infusion.

These diverse manifestations of business innovation exhibit applicability contingent upon the specific industrial sector. It is imperative to emphasise that enterprises are not compelled to concurrently integrate all categories of business innovation; instead, the pursuit of commercial pre-eminence through judicious innovation is paramount (Meyer *et al*., 2018). The comprehensive research undertaken by Hamdan and Alheet (2020) has underscored the profound ramifications of innovative endeavours on organisational performance. As postulated by Berisha *et al*. (2020), the consequences of innovation are further manifested in the cultivation of favourable employee conduct and heightened performance.

Moreover, in the contemporary milieu, the synergistic fusion of the concepts of "innovation" and "sustainability" has culminated in the inception of the paradigm of sustainable innovation (Dasgupta 2023). This genre of innovation, dedicated to the creation of ecologically responsible products, services, and processes, necessitates comprehensive integration within an organisation's innovation framework, spanning ideation, development, and eventual commercialisation (Geissdoerfer *et al*., 2017).

Innovations are a crucial component of SMEs' competitive strategies. Typically, this process operates differently from the innovation process in large businesses. While introducing innovation boosts businesses' capacity to penetrate international markets and create distinctive goods, it demands a higher resource intensity from SMEs than from large corporations (Kliuchnikava, 2022). According to several studies, SMEs must be creative in order to successfully compete on a global scale. Geldres-Weiss *et al*., 2016) underline that the company can get a competitive edge over other businesses in the market and increase the

pool of potential clients in this way. There are SMEs with a high research intensity, but most of the time, SMEs confront significant obstacles based on their size: a lack of financial resources, a limited selection of products, challenges implementing new technology.

According to Kliuchnikava (2022), the SME sector is the primary tool for lowering income inequality, enhancing societal well-being, and strengthening ties between the socially, economically, and geographically varied economic sectors. Modern SMEs frequently seek to engage in activities that provide them a competitive edge over rivals in order to increase their market position.

However, SMEs are more likely than their larger rivals to encounter a variety of difficulties and dangers as a result of their small size and frequent lack of financial and human resources (Prange and Pinho, 2017). Additionally, SMEs frequently struggle with a shortage of cash or inadequate start-up capital, which might endanger their operations. However, due to their small size, SMEs are more adaptable in their decision-making about the development plan of their business, according to Kliuchnikava (2022). Before an invention is incorporated into the model, the firm's efficiency is directly impacted by organisational capital, as is innovation more generally. As a result, this may help to alter the course of growth and embark on a novel venture.

The productivity of businesses is also greatly boosted by the incorporation of innovation into the company model and management. According to Anwar and Ali Shah (2020) research, businesses with strong, creative business models do better than those with conventional management strategies in terms of efficiency and profitability. Moreover, the company's export activity enables it to assume a higher and more competitive position in the market. Innovation may help businesses enter these new markets by streamlining the bank loan application procedure.

SMEs must plan how to use the competitive advantage and modify their business model to fit the needs of the export market in order to conduct business internationally. According to a study by Saridakis *et al*. (2019), companies with innovative goods or services are more likely to internationalize than companies without innovations by 8% points. In order to help the business, get through the crisis, exporting might be a great way to expand into new markets and attract new clients.

Furthermore, SMEs are less likely to be able to make the essential breakthroughs without a program of governmental innovation aid since they have limited resources. It is highlighted that the impact of such initiatives is far greater on SMEs than on large corporations. The research of Mancusi *et al*. (2017) supports the idea that a company's capacity for innovation is a crucial component in exports, but they also mention the theory that businesses learn from exports, which holds that exports are a kind of feedback for innovations. However, research by Freixanet (2014) found that it would be strategically wise for governments to support export aid, prioritising, for instance, supporting and boosting innovation in SMEs so that

better goods and advances might be successful and outperform their competitors' international barriers.

Government policies and support mechanisms play a pivotal role in shaping the innovation landscape for SMEs. Initiatives such as grants, tax incentives, and the establishment of innovation hubs can provide the necessary resources and incentives for SMEs to innovate and compete effectively (Arundel, 2007). Encouraging a supportive ecosystem that facilitates innovation is crucial for SMEs to thrive amidst evolving market dynamics. Furthermore, Shrivastava (1995) underlined that companies can produce a completely new, differentiated product, or decrease their production cost, or increase the existing product value through innovation. Moreover, this product or process differentiation improves the innovative behaviour of SMEs.

To remove obstacles to the nation's inventive efficiency, foster inter-firm collaboration, and enable the economy of the nation to become more competitive, the state must create an active investment policy. As a result, according to the Ye *et al*. (2022), business anticipates government actions and business recovery strategies. Innovative businesses typically have a more adaptable management approach, which makes it simpler for them to respond to difficult situations, such as pandemics. In order for businesses to survive and remain competitive, the pandemic or other crisis may drive them to adjust to new circumstances more quickly.

Moreover, organisations rely heavily on the innovative behaviour of their staff to adapt to changing conditions (Yasir and Majid, 2020). In order to maintain a competitive edge and ensure the long-term survival of all types of organisations, innovative work behaviour of organisational personnel is essential (Yasir *et al*., 2023). The same is true for SMEs, whose efficient operations rely heavily on employees' creative behaviour (Raymond and St-Pierre, 2010).

Strong evidence on the contributions of SMEs to economic growth, significant employment potential, and income production can be found in the current literature on SMEs (Rasheed *et al*., 2019; Yasir *et al*., 2023). In light of this, academics are paying increasingly close attention to the significant contributions that SMEs make to the growth of economies. Aside from the significant contribution that SMEs provide to both developed and developing countries, the failure rate of SMEs continues to be concerning. In the early phases of their operations, many new SMEs, according to Wadho and Chaudhry (2018), fail. Additionally, the knowledge economy's rise and the technology industry's quick advancements provide new problems for business organisations and put pressure on them to innovate their company procedures.

In a sense, there is a knowledge gap in the innovation literature about the factors that influence innovations in small enterprises. A "one-size-fits-all" framing of small businesses within the traditional innovation model may result in inaccurate perceptions about the innovation performance of these companies because small businesses develop activities and

innovation outcomes that are fundamentally different from those found in big, high-technology enterprises (Silva and Di Serio, 2021).

Furthermore, innovation enhances SMEs resilience in the face of economic shocks and disruptions. The study by Teece (2010) emphasises that diversified business models and strategies, often born out of innovation, enable SMEs to pivot swiftly in response to changing market conditions. This adaptability is vital for SMEs to weather economic downturns and uncertainties. Innovative SMEs are better equipped to identify emerging market trends and customer needs. This foresight allows them to proactively adjust their product offerings and strategies, staying ahead of the competition and maintaining market relevance.

2.1.1. SMEs innovation challenges and barriers

The contemporary global economy is characterised by a set of dynamic factors including globalisation, economic fluctuations, shortened product lifecycles, expanded production capabilities, heightened market competition, the advent of Industry 4.0, and rapidly evolving consumer preferences. Within the Industry 4.0 framework, the emphasis is on establishing intelligent production processes that enable factories to meet the demands for rapid product development, flexible production, and adaptability in complex environments. (Brettel, 2014; Horvat *et al*., 2018; Krndžija and Pilav-Velić, 2022)

In small developing economies, a significant portion of all business firms consists of SMEs. These companies face a dual challenge of reducing costs while simultaneously introducing innovative products and services to maintain their competitiveness. This becomes particularly difficult when external shocks like wars or global pandemics occur, necessitating substantial changes in their business operations (Bailey and Breslin, 2021) and a transformation in their organisational structure. Nevertheless, such challenges, according to George, Lakhani and Puranam (2020) also create new opportunities for innovation management. Essentially, the survival and success of these SMEs depend greatly on their ability to adapt and innovate.

According to the literature on strategic and innovation management, firms must possess ambidextrous capabilities to navigate through uncertain environments. This involves both actively seeking external opportunities and efficiently utilising their internal capabilities to respond effectively to market changes and external threats (Andriopoulos and Lewis, 2009; Hall *et al*., 2016). However, when an external shock disrupts the entire entrepreneurial ecosystem of a small developing economy, SMEs must also prioritise resilience to confront the new and uncertain circumstances (Sawalha, 2015). In this context, existing research highlights the critical importance of organisational resilience, not only for resolving immediate crises, but for emerging stronger from such external shocks.

Furthermore, Audretsch and Belitski (2021) emphasise that resilience is a crucial organisational characteristic for both survival and mitigation of the impact of external shocks. Empirical evidence also underscores the significance of SME resilience and agility

in dealing with complex knowledge environments and for the overall firm performance. Particularly, it moderates the effect of managerial capabilities and inter-organisational collaborations on innovation and the overall performance of firms (Audretsch and Belitski, 2021; Duchek, 2020). Even though innovation is a cornerstone of competitiveness and growth for SMEs, they often encounter a complex web of challenges that hinder their innovation efforts. These challenges can be categorised into resource constraints, external environmental factors, and internal capability issues.

When it comes to resource constraints, Davila, Foster and Gupta (2003) explain that SMEs typically operate with limited access to financial resources compared to larger firms. As a result, they often struggle to allocate sufficient funds for R&D and innovation projects. Securing capital for innovation can be especially challenging during economic downturns. Moreover, a shortage of skilled personnel with expertise in innovation and technology is also a common challenge for SMEs. Attracting and retaining talent in highly competitive markets can be difficult. Additionally, training and upskilling employees to align with innovation goals require time and resources. Finally, access to advanced technology and digital infrastructure is indispensable for innovation. Many SMEs lack access to cutting-edge technology and digital infrastructure. Especially, SMEs, in traditional industries or rural areas, may lack the necessary technological infrastructure, tools and skills to engage in innovation activities (Audretsch and Keilbach, 2007). This technological lag can hinder their ability to innovate, particularly in industries where technology is a driving force.

In terms of external environmental challenges, SMEs frequently grapple with market uncertainty due to limited resources for market research and analysis. In particular, they struggle to navigate rapidly changing market dynamics and evolving customer preferences (Roper and Love, 2002). This unpredictability, or market uncertainty, can deter them from investing in innovative initiatives, as the uncertainty may dissuade SMEs from allocating resources to projects with uncertain outcomes (Teece, 2010). The risk of investing in a product or service that fails to gain traction is a constant concern. Furthermore, SMEs often struggle with market entry, expanding their customer base, and effectively competing with larger corporations. Limited marketing budgets and intense competition constrain their reach and penetration of target markets (Gnyawali, Fan and Penner, 2010).

Hueske, Endrikat and Guenther (2015) emphasise that SMEs also frequently compete with larger, resource-rich firms. Balancing innovation efforts with cost-competitive pricing strategies can be a delicate act. SMEs may find it difficult to allocate resources for innovation while simultaneously fending off competitive pressures. Finally, complex regulations and intellectual property protection requirements can divert SMEs' resources away from innovation activities (Love, Roper and Du, 2009). Compliance demands, legal expenses, and navigating patent rights can be resource intensive.

Lastly, internal capabilities may also challenge SMEs innovation, in terms that they may struggle to absorb external knowledge and effectively integrate it into their innovation processes (Cohen and Levinthal, 1990). This can result in missed opportunities to leverage

external expertise and insights. Also, complex regulations and administrative burdens can divert SME resources away from innovation and toward compliance efforts (Baptista and Swann, 1998). These hurdles can hinder SMEs' ability to allocate resources effectively for innovation. Moreover, ingrained organisational cultures that resist change can hinder the adoption of innovative practices within SMEs (Birkinshaw and Gupta, 2013). Employees and managers may be hesitant to depart from established routines and methods. Finally, SMEs often exhibit risk aversion when it comes to innovation investments (Lichtenthaler and Ernst, 2009). The uncertainty associated with the returns on investment in innovation often deters SMEs from allocating resources to new projects.

To effectively respond to this evolving economic landscape, enterprises must undertake strategic initiatives involving both organisational and technological innovations. These innovations are instrumental in creating a competitive edge and sustaining competitiveness (Mosey, Clare and Woodcock, 2002). It is worth noting that fostering innovation not only benefits individual enterprises but also plays a pivotal role in shaping new management standards, with innovative enterprises serving as pioneers in this regard. As Liu and Cheng (2018) underline, in contemporary business contexts, innovation is increasingly recognised as the driving force behind both enterprise growth and broader economic advancement, underscoring the need for its strategic management.

Moreover, the presence and magnitude of innovation barriers within an economy exert a significant influence on its overall performance and competitiveness in the global market. Innovation obstacles are subject to dynamic shifts over time and are contingent upon the nature of an enterprise's operations (Hadjimanolis, 1999). Numerous scholars have highlighted several significant barriers to innovation, particularly within SMEs. These include formidable financial barriers associated with innovation, inadequately skilled and disengaged human resource departments, a corporate culture that does not foster employee innovation, bureaucratic impediments imposed by governmental entities, ineffective information dissemination, and government policies (Demirbas, Hussain and Matlay, 2011).

On a contrasting note, Hueske, Endrikat and Guenther (2015) claim enterprises that swiftly discern these barriers are better positioned to devise strategies for their elimination. Consequently, the endeavour to pinpoint the primary obstacles to innovation has become the focal point of extensive research efforts.

In particular, SMEs confront a diverse array of barriers that can be systematically understood through various lenses, including financial, regulatory, market-related, human resource, technological, infrastructure, networking, and globalisation dimensions. From a financial perspective, SMEs often encounter difficulties in accessing sufficient capital and credit. This hampers their ability to invest in critical assets and operations, thereby limiting their growth potential. The complex regulatory environment represents another significant barrier, consuming valuable time and resources, particularly for compliance. (Jiménez, de la Cuesta-González and Boronat-Navarro, 2021)

Human resource barriers manifest in skills shortages and the associated recruitment costs. Particularly, employee training and development can be lacking (Horvat, Dreher and Som, 2019). On the technological front, SMEs may face challenges in adopting advanced technologies and they may be vulnerable to cybersecurity threats (Chidukwani, Zander and Koutsakis, 2022). The process of digital transformation, involving the integration of digital processes and e-commerce, can be complex for SMEs (Kassar, 2023).

Infrastructure-related issues may impede SME operations, including inadequate physical infrastructure, and access to utilities such as electricity and water. Networking and collaboration barriers can limit growth opportunities for SMEs, including restricted access to valuable business networks. Additionally, globalisation adds complexity, with trade barriers and cultural differences Particularly, globalisation barriers affect SMEs looking to expand internationally. International trade can be complicated due to trade barriers and cultural differences (Kassar, 2023), necessitating export financing and risk mitigation (Brown and Manson, 2014).

To address these barriers comprehensively, a multifaceted approach is essential. Policymakers and support organisations should work together to enhance SMEs' access to financial resources, streamline regulatory processes (Mithas and Lucas, 2014), and foster an environment conducive to technological adoption (Chidukwani, Zander and Koutsakis, 2022). Strategies aimed at market diversification, branding, and marketing effectiveness are vital (Chow, 2006), as are initiatives to bridge skill gaps and enhance cybersecurity preparedness (Harris Jr, 2023). By examining SME barriers through these various dimensions and considering the cited research, it becomes evident that addressing these challenges is crucial for enabling the growth and sustainability of SMEs, which play a vital role in economic development.

2.1.2. Developed versus developing country context

In the highly competitive business environment, SMEs have frequently been the engine of countries' economic and technological process growth (Bruque and Moyano, 2007). However, for SMEs to stay efficient and competitive in the global market they need to constantly work on improvement and of their processes and introduction of innovation (Vrgović *et al*., 2012). However, as already mentioned, there is no single definition of innovation. It is rather a dynamic term that has changed an evolved over time (Bashir, Naqshbandi and Farooq, 2020).

SMEs are believed to be the major source of innovation, and those who unquestionably contribute to growth of any economy. Furthermore, in order to survive, they are used to react to external business factors (Hossain, 2015). According to Sternberg and Arndt (2001), numerous researchers have focused on the idea of innovation and innovation management, as a key factor responsible for enterprise's growth. Nevertheless, when it comes to the

developing country context there is a lack of research on SMEs innovation and a significant literature gap regarding innovation routines, innovative behaviour of SMEs.

Even though analysis of innovation and innovation systems had its "ups" and "downs" in terms of number of published articles, analysis conducted by Cui, Lim and Song (2022) showed that scholars are yet increasingly interested in the systematic approach to innovation. In addition, authors suggest that innovation and outputs it produces have much to offer especially when speaking about developing countries where the innovation processes are still not understood or not being adequately applied. In addition, measurement of innovation in the developing countries has its specificities and passed through many changes during the years (Cui, Lim and Song, 2022).

At first innovation has been observed only through the perspective of the introduction of new product and processes or R&D activities. With publication of expanded Oslo Manual (2005) marketing and organisational innovation which are parts of non-tech perspectives of innovation have been introduced, which is of high importance for developing countries with low level of tech capabilities. (Haug *et al*., 2023)

Furthermore, while western companies are driven by the need to sustain competitive advantage under familiar market conditions, companies in former socialist countries are forced to enter free market conditions, unfamiliar to their management and employees (Stata, 1989). Therefore, for these companies their ability to innovate, with very limited resources and in very different market conditions, according to Stata (1989), become a matter of survival.

Taking above in mind, the question of what the key sources of differences in innovation between are developed and developing countries, arises. Developing countries are characterised by passive and rather week interactions between economic agents and between industry and academia. This relationship is crucial, and existing literature finds that the contribution to innovation development from science and technology is not on the satisfactory level (Bashir, Naqshbandi and Farooq, 2020). This results in many difficulties when it comes to absorption of new technologies and also leads to the low level of scientific trainings (Chesbrough, 2010; Cui, Lim and Song, 2022).

Together with weak intellectual property legal framework that is present in the developing countries and low purchasing power, innovation activities produce outputs that are rather incremental and imitative, with low level of investments. When discussing open innovation, which has the potential to significantly benefit SMEs on a large scale, there is limited knowledge or understanding of its application in developing countries. (Vrgović *et al*., 2012). In addition, as Das, Kundu and Bhattacharya (2020) underline, the majority of SMEs in developing or in transitional countries are facing with many obstacles such as obsolete technologies, funding shortages, increasing competition, unstable business environment etc.

2.1.3. Innovation and expert diaspora

As already mentioned, SMEs often face resource constraints and limited access to expertise. This is where the concept of expert diaspora, a dispersed community of highly skilled individuals, often residing abroad, has an especially significant role. Expert diaspora can be a valuable resource for SMEs, offering knowledge, networks, and fresh perspectives to fuel innovation (Saxenian, 2023).

One of the primary advantages of engaging with expert diaspora is the access to a diverse pool of knowledge. These individuals often have exposure to various industries, international best practices, and cutting-edge technologies. For SMEs striving to find innovative solutions to complex challenges, this collective expertise can be invaluable (Andonova *et al*., 2023; Saxenian, 2023). Expert diaspora members are often well-connected both within their host countries and back in their home countries. Their extensive networks can open doors to potential partners, investors, and collaborators. SMEs can leverage these networks to gain access to markets, funding, and valuable industry contacts, thereby facilitating innovation (Saxenian, 2023; Sternberg, 2023).

SMEs that engage with expert diaspora benefit from cross-cultural perspectives and insights. These individuals bring a unique blend of cultural and professional experiences to the table, which can lead to creative problem-solving and innovative approaches. SMEs can tap into this diversity to gain a competitive edge in the global market (Ferdous, 2023; Saxenian, 2023). Moreover, expert diaspora can help SMEs overcome resource constraints, particularly in terms of human resources. By collaborating with diaspora members remotely or by bringing them back as consultants or advisors, SMEs can access specialised skills and expertise that they might not have in-house. This can be a cost-effective way to drive innovation initiatives (Ferdous, 2023).

In order to assess innovative practices within firms, researchers usually focus on new products and/or services, R&D investments, size of the company and its access to funds needed to support innovative projects. The element they often forget to take into account is that innovation is intrinsically social in nature (Filipović, Devjak and Putnik, 2012). Networks of social relations among firms or individuals may be also an important factor influencing innovation, and that is the point where diaspora plays a major role. From the synergic participation of home countries and diaspora, wide range of projects, ideas, new products or services and different approaches is being born.

The role of experts from diaspora may be of crucial importance for both country innovation creation, and adoption, but also for knowledge sharing. They are the source of valuable potential, new knowledge which is necessary to create innovation (Filipović, Devjak and Putnik, 2012). Particularly, there are different approaches to innovation, that can be applied either separately, or as a combination: creation and commercialisation of new knowledge and technology (with the help of diaspora); and/ or the acquisition of knowledge and

technology from abroad (for example through the diaspora networks) that will be locally used and/or adapted to reflect country needs.

Finally, Filipović, Devjak and Putnik (2016) in their study on the role of expert diaspora in knowledge-based economy, innovation and talent management confirmed that expert diaspora members play a crucial role in the process of identifying new opportunities and converting them into sustainable prosperity for their homelands. In addition, results of the study confirmed that countries with catastrophic brain drain indicator, need to work on retaining its talented young people, but also to make an additional effort and attract talented, educated and skilled people from diaspora. Those diaspora experts can certainly benefit to countries technology innovation, help foster value-added industries, and introduce global management techniques that will consequentially contribute to sustainable growth.

2.1.4. SMEs resilience

Withers, Drnevich and Marino (2011) underline that size is a substantial factor, which influences enterprise's innovative behaviour. Additionally, financial resources are also an important factor which can especially be noticed on the example of large enterprises that have more resources for the advancement of their performance (Sundbo and Fuglsang, 2002). Large enterprises are also in a superior position to innovate due to the size factor, especially as economies of scale can be used to spread the cost of innovation management. Nevertheless, SMEs are said to be flexible, compelling, and very innovative in recognising environmental opportunities. Also, SMEs are usually excelling in innovation management, because of various knowledge and financial barriers (Camisón-Zornoza *et al*., 2004; Rogers, 2004).

Despite the significance of SMEs in numerous global economies, there is substantial evidence indicating that SMEs are comparatively less equipped than their larger counterparts to cope with disruptions in their business environment (Lerch *et al*., 2022). This discrepancy arises from the volatile and resource-constrained operational context within which SMEs typically function (Ballesteros and Domingo, 2015). SMEs often confront limitations in accessing a diverse array of coping strategies and are generally ill-prepared to address disruptions. They are also characterised by informality and non-compliance with industry norms and regulations, which curtails their ability to adopt risk management tools and expand their customer and supplier networks (Ballesteros and Domingo, 2015).

For SMEs, resilience becomes an integral component of their short-term tactical operational planning, particularly in the context of developing countries (Ballesteros and Domingo, 2015). As pointed out by Linnenlueck and Griffiths (2010), an organisation's resilience is closely related to its scale. For instance, a disruption affecting the operations of a local branch may appear minor from the perspective of a large, global organisation but can be profoundly impactful for a small enterprise that operates in only a few locations. Given that SMEs employ between 10 and 250 individuals and account for 70% of global production,

their influence on the resilience agenda is substantial (Ates and Bititci, 2011; Kamalahmadi and Parast, 2016; Singh *et al*., 2012). Within the European Union (hereinafter: EU), SMEs are defined as companies with fewer than 250 employees and/or turnover less than EUR 50 million. Their significance within the EU economy is notable, as "SMEs represent 99% of all businesses in the EU" (European Commission, n.d.).

Nevertheless, SMEs grapple with two primary challenges: 1) their vulnerability to disruptions and 2) their capacity to recover from disruptions. SMEs typically concentrate on specific product offerings, targeting particular industry sectors or niche markets, a strategic choice that renders them susceptible to supply chain disruptions affecting those specific products or customer markets (Terziovski, 2010). Additionally, SMEs often lack the tangible resources and capabilities, such as financial and technological assets, that are instrumental in facilitating recovery. Furthermore, when compared to larger firms, SMEs tend to be less adept at harnessing innovation (Kanadlı, Torchia and Gabaldon, 2018) and frequently exhibit weak or unstructured decision-making processes (Gupta, Mortal and Yang, 2018). Their larger counterparts possess the capability to allocate significant time and resources to strategic sourcing and business continuity planning, evaluating suppliers not solely based on price but also on risk levels, thus mitigating their exposure to disruptions. In contrast, SMEs possess fewer tangible assets that bolster their resilience.

2.1.5. Dynamic capabilities

In the dynamic and competitive business landscape, SMEs need to continuously adapt and evolve. The concept of dynamic capabilities has gained prominence as a theoretical framework to understand how firms, including SMEs, can effectively respond to changing environments and innovate. In particular, dynamic capabilities refer to a firm's ability to integrate, build, and reconfigure internal and external resources to adapt to rapidly changing environments (Teece, Pisano and Shuen, 1997).

In the context of SMEs, dynamic capabilities can be broken down into the following key components; sensing, seizing and reconfiguring. More precisely, SMEs must have the ability to detect changes and opportunities in their external environment. This includes monitoring market trends, customer preferences, and emerging technologies (Teece, 2007). Furthermore, once opportunities are identified, SMEs need to be capable of seizing them effectively. This involves making strategic decisions, allocating resources, and taking action to exploit opportunities (Eisenhardt and Martin, 2000). Finally, SMEs must be flexible and capable of reconfiguring their internal resources and processes to align with new opportunities or challenges. This may involve changes in organisational structure, technology adoption, or partnerships (Helfat and Winter, 2011).

More importantly, dynamic capabilities are closely tied to innovation within SMEs. The ability to sense market changes and seize opportunities is fundamental to the innovation process. SMEs that excel in dynamic capabilities can drive innovation in by continuously

sensing customer needs and market trends and introduce new or improved products and services (Wang and Ahmed, 2004). Also, dynamic capabilities enable SMEs to reconfigure their internal processes for greater efficiency, cost-effectiveness, and quality improvement (Roberts at al., 2012). Accordingly, SMEs can adapt their business models to changing market conditions, opening up new revenue streams and competitive advantages (Teece, 2010).

Furthermore, the development of dynamic capabilities in SMEs is influenced by various factors. Firstly, visionary leadership and an entrepreneurial mindset are crucial for driving dynamic capabilities within SMEs (Helfat and Peteraf, 2003). Secondly, SMEs often face resource limitations, and managing these constraints effectively is essential for the development of dynamic capabilities (Zollo and Winter, 2002). Also, collaborations with other firms, research institutions, and industry associations can provide SMEs with access to external knowledge and resources, fostering dynamic capabilities (Cohen and Levinthal, 1990). Finally, a culture that encourages learning, experimentation, and adaptation is conducive to the development of dynamic capabilities (Teece, 2007).

Moreover, a company that is ambidextrous may take use of its existing strengths and look for new business prospects. A company may also improve its performance and competitiveness by becoming ambidextrous (Vrontis, Bresciani and Giacosa, 2016). Ambidexterity only becomes a dynamic capability, according to Rafailidis, Trivellas and Polychroniou (2017), when exploitation and exploratory innovation activities are combined.

Organisational ambidexterity, as emphasised by Turner, Swart and Maylor (2013), necessitates both the investigation of the novel and the utilisation of the current competencies. According to numerous studies (Jansen, Van Den Bosch and Volberda, 2006; Benner and Tushman, 2015), exploitative competences rely on existing knowledge, existing products, and existing services for existing customers and markets. In contrast, explorative competences focus on new technologies, knowledge, new products, and services for new markets and customers. As a result, the explorative perspective is frequently linked to organisational effectiveness, the development of a distinctive knowledge base, and technological competences, all of which assist businesses in keeping up with the pace of a dynamic environment and providing them with active competitive advantages (Tamayo-Torres, Gutierrez-Gutierrez and Ruiz-Moreno, 2014).

The efficiency, process improvements, and current company performance of exploitative operations are interlinked. Specifically, findings have been made by Ojha *et al*. (2018), who found that exploitative learning improves operational efficiency while lowering redundant work and systemic mistakes. In other words, exploitation refers to incremental and progressive advancements, whereas exploration is associated to dramatic innovations (Chang and Hughes, 2012). Finally, Rafailidis, Trivellas and Polychroniou (2017) found that exploitation and exploration both improve a firm's performance in terms of innovation.

Finally, SMEs may find it challenging to foresee risks and unforeseen events in light of the notion that resources are few. In order to effectively respond to external opportunities and dangers, they must thus make use of a variety of resources and competencies in dynamic contexts like small emerging economies (Sullivan-Taylor and Branicki, 2011).

2.1.6. Innovative behaviour measurement model

In accordance with the definition of innovative behaviour and the input from SLR, as well as its goals and characteristics, it was decided to use a first order measurement scale, as shown in Table 1, to measure innovative behaviour. Articles that contain in their title a word related to this concept were found using primarily the WoS database and other pertinent databases, as shown in Table 1.

Table 1 Search string for operationalisation of innovative behaviour

Variables	**Search string**
Innovative behaviour	*TITLE: ("innovation attitude" OR "innovative behavio*r" OR "innovation behavio*r") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*

Source: Author's work.

As already mentioned, in order to develop a comprehensive measurement model for innovative behaviour of SMEs, this research drew upon relevant literature from various sources. Particularly, in order to decide regarding the adoption of the measurement model, the aforementioned definition of the variable was analysed in detail. Accordingly, indicators measuring innovative behaviour of SMEs relevant to the subject research are listed in the table in Appendix A1. This research will employ the classifications shown in Table 2, appropriating the scale from Pervan, Al-Ansaari and Xu (2015), which is based on the overview of the dimensions from Appendix A1. These indicators cover most important aspects of innovative behaviour which was recognised in the theoretical framework and will be used to quantify innovation behaviour (Hamdan and Alheet, 2020; Iqbal *et al*., 2020).

Table 2 Classifications for innovative behaviour

Variables	**Authors of the measurement scale**	**Questions**
Innovative behaviour	Pervan, Al-Ansaari and Xu (2015).	*Our firm frequently tries out new ideas*
		Our firm frequently introduces new products, or services, or processes, or organisation/ management systems
		Our firm is a pioneer to market with new products or services
		Our management seeks out new ways to do things
		Our firm is creative in its methods of operation

		Our firm uses up-to date technologies
		Our firm develops new market segments
		Our firm is regularly looking for new marketing methods
		Our firm is regularly looking for new ways of establishing relationships with customers
		Our firm spends resources on R&D for new products
		Our firm spends resources on R&D for new services
		Our firm spends resources on R&D for new processes

Source: Author's work.

In particular, during the development of the measurement model for innovative behaviour, Pervan, Al-Ansaari and Xu (2015) defined innovative behaviour in SMEs as the proactive pursuit of new ideas, practices, or products. Their research emphasised its role in enhancing business performance. They found that fostering a culture encouraging innovation correlates with greater adaptability and competitiveness. Successful implementation of these innovative ideas, alongside leadership support and a conducive environment, contributes significantly to SMEs' success. Their study highlighted the positive impact of innovative behaviour on profitability, market share growth, customer satisfaction, and overall organisational effectiveness within SMEs.

Moreover, the research highlighted that innovative behaviour within SMEs transcends mere creativity or idea generation; it encompasses the successful implementation and execution of these novel concepts. The ability to translate innovative ideas into tangible products, services, or processes played a pivotal role in determining the business outcomes. The findings underscored the critical role of leadership, organisational culture, and resource allocation in fostering and sustaining innovative behaviour within SMEs. Pervan, Al-Ansaari and Xu (2015) emphasised the need for a supportive environment that nurtures creativity, incentivises risk- taking, and facilitates collaboration among employees to stimulate and harness innovative potential.

Regarding its impact on business performance, the study revealed a positive correlation between innovative behaviour and various performance indicators. Furthermore, this study provided valuable insights into the antecedents and consequences of innovative behaviour, thereby offering a comprehensive view of its dynamics within organisational settings. These contributions not only enriched our understanding of innovative behaviour but also served as a sturdy foundation for constructing a measurement model tailored to the unique challenges and opportunities faced by SMEs, thus advancing the field of innovation research. This model, underscored by its multifaceted nature, captures the interplay between innovation culture and orientation, innovation outputs and investments in innovation.

2.2. Innovation determinants

When it comes to some major factors influencing SMEs innovation, mostly, resource limitations, including financial, human, and technological resources or factors, are considered to be the common challenges faced by SMEs in their pursuit of innovation. Paradoxically, these constraints can stimulate creativity and incentivise SMEs to seek cost-effective innovation solutions (Löfsten and Lindelöf, 2002). Also, collaboration with other firms, research institutions, and government agencies is a pivotal factor in promoting innovation within SMEs (OECD, 2010). By leveraging external expertise and resources, SMEs can overcome inherent limitations and accelerate their innovation efforts. Moreover, the entrepreneurial mindset of SME owners and managers is a critical driver of innovation (Wiklund and Shepherd, 2003). A willingness to take calculated risks, explore new opportunities, and adapt to changing market conditions is often associated with higher levels of innovation within SMEs.

Particularly, according to Odei *et al*. (2023) there are internal and external factors which impact enterprise' innovation. Internal factors encompass those activities within the enterprise which have the potential to spur innovations. These innovation activities include, i.e., in- house R&D, investments to acquire new knowledge, or expenditure to buy new technologies. Through R&D activities, enterprises can generate new knowledge which facilitates overcoming technical glitches and increases the likelihood of successful innovation and introduction of a new product. Enterprises may also invest in buying new modernised machinery and technologies which will improve their products or services. Furthermore, when an enterprise realises that their internal activities cannot produce enough in-house knowledge, they obtain knowledge through collaboration with external organisations. Enterprises may also make investments into innovation training of their employees. These can be performed internally within the enterprise or contracted externally. (Odei *et al*., 2023)

However, different researchers all around the world have tried to associate innovation with various enterprise characteristics, as the size, existing skill set, demand and supply factors (Hossain, 2015). Some studies have also analysed the factors influencing product innovation in small enterprises in western countries (Brouwer and Kleinknecht, 1996; Freel, 2003; Rogers, 2004). Nevertheless, also in this regard, there is paucity of research in developing country context regarding the determinants of innovation in SMEs.

2.2.1. Government support

As previously mentioned, SMEs frequently contend with a constellation of challenges, including limited resources, risk aversion, and the formidable expenses associated with R&D endeavours. In this context, government support emerges as a cornerstone, endowing SMEs with a pivotal role in the cultivation of innovation (Hall *et al*., 2016). This comprehensive exploration delves into the multifaceted role of government support in catalysing SME

innovation, encompassing financial incentives, policy frameworks, and capacity-building initiatives.

For example, government-initiated financial incentives assume the role of vital sustenance for SME innovation. Through a spectrum of mechanisms, governmental bodies provide the financial fortitude SMEs require to embark on innovative expeditions. Tax incentives, typified by R&D tax credits, substantially alleviate the fiscal encumbrances associated with innovative undertakings (Hall *et al*., 2016). These incentives, frequently structured as deductions or credits against taxable income, render innovation a financially enticing venture for SMEs, thereby spurring their investments in R&D. Additionally, grants and subsidies tendered by governmental entities make direct contributions to SME innovation. These financial resources, judiciously earmarked for research, development, and experimentation, not only ameliorate the financial perils associated with innovation, but also kindle a culture of experimentation within SMEs (Fagerberg, Mowery and Nelson, 2005). As SMEs access these grants, they find themselves better equipped to undertake calculated risks and embrace innovative initiatives.

The government support factor is integral to understanding how external factors can influence innovation within SMEs. Najib, Abdul Rahman and Fahma (2021) in their study underscored the pivotal role that government support plays during challenging circumstances. Their research unveiled that government support took multifaceted forms, including financial aid, tax relief, and regulatory measures explicitly designed to stimulate innovation. For instance, the study highlighted instances where government-backed grants and subsidies were channelled specifically into R&D activities within SMEs, resulting in the introduction of novel products, services, and operational processes. These empirical findings underscore the significance of government support as an enabler of innovation within the SME landscape. Moreover, the study demonstrated through quantitative data that SMEs receiving government support exhibited a significantly higher rate of innovation activity, corroborating the link between government backing and innovation prowess. This paper provided evidence of government interventions acting as a lifeline for SMEs, enabling them to not only survive, but also innovate during crises.

Furthermore, governmental policy frameworks and regulations wield considerable influence as instruments shaping the innovation landscape for SMEs. These policies craft an environment that either fosters or impedes innovation within SMEs. For instance, governments that champion the protection of intellectual property furnish SMEs with the reassurance they require to invest in innovation. Robust intellectual property protection safeguards the inventions and creations of SMEs, assuring them that their intellectual assets remain secure (Maskus, 2000). This assurance empowers SMEs to introduce innovative products and services to the market without apprehension of intellectual property theft. Also, government policies promoting market entry and competition cultivate an environment wherein SMEs can not only endure, but also flourish and innovate. By diminishing entry barriers, fostering competitive dynamics, and curbing monopolistic practices, governments stimulate innovation within SMEs (Hall *et al*., 2016; Najib, Abdul Rahman and Fahma,

2021). These policies swing open the doors for both neophytes and established SMEs to engage in experimentation, innovation, and excellence within a dynamic marketplace.

Moreover, government-sponsored capacity-building initiatives serve as the launchpad for the innovation capabilities of SMEs. These initiatives encompass a broad spectrum of offerings, ranging from training programs to innovation hubs and research networks. For instance, training programs underwritten by governments equip SMEs with the skills and knowledge imperative for innovation (Burgelman, Christensen and Wheelwright, 2008; Hoque, 2018). These programs span from enhancing technological acumen to imparting innovative management practices, thereby cultivating a knowledgeable workforce capable of steering innovation initiatives.

Importantly, incubators and innovation hubs, often bolstered by government funding, extend to SMEs more than mere physical spaces. They provide mentorship, access to networks of experts, and a collaborative ecosystem where SMEs can freely exchange ideas (Zhang, Gao and Zhang, 2022). These environments nurture a culture of innovation by affording SMEs the requisite support and resources they need to thrive. Additionally, government support extends to facilitating SME participation in research networks and consortia (Hemmelgarn, Glisson and James, 2006). Through these collaborative ventures, SMEs gain access to the expertise of academic institutions and industry partners. Such partnerships facilitate technology transfer, joint R&D efforts, and access to cutting-edge knowledge.

The conceptualisation of government support within the framework of this research draws from the findings and definitions provided by key authors in the field. One of the pivotal studies that informed the construction of the government support factor was conducted by Najib, Abdul Rahman and Fahma (2021) and Thongsri and Chang (2019). In their comprehensive literature review authors underscored the pivotal role of government support as a catalyst for fostering innovation within SMEs, particularly during challenging economic periods. Their research discovered that government support, in the form of policies, grants, and initiatives, played a significant role in empowering SMEs to embark on innovative endeavours.

Also, the insights from Hoque (2018) enriched the framework by emphasising the multifaceted nature of government policies within the context of innovation. Hoque's research underlined how government policies could not only serve as direct drivers of innovation but also function as crucial moderators in the broader innovation equation. This holistic perspective highlights the intricate interplay between government support and the innovative behaviour of SMEs, underscoring the need to account for the nuanced roles that policies and initiatives can play in shaping the innovation landscape.

Accordingly, the measurement model employs a set of tailored questions to quantify the impact of government support on SME innovation and integrates insights from Thongsri and Chang (2019) to capture the diverse ways in which government policies influence innovation, both directly and as moderators. This comprehensive approach provides a robust

foundation for assessing the complex relationship between government support and the innovative behaviour of SMEs within the research framework.

The prior research findings collectively demonstrated a clear and positive relationship between government support measures, such as policies, grants, and initiatives, and the promotion of innovation and innovative behaviour within SMEs, underscoring the pivotal role played by government interventions in fostering a culture of innovation in these organisations. To incorporate these valuable insights into the measurement model, a series of meticulously designed questions were crafted, which will be presented in subchapter 2.2.7. *Operationalisation of innovation determinants measurement model*. These questions are specifically geared towards assessing the extent to which SMEs receive government support for initiatives related to innovation. By doing so, the model aims to quantitatively capture the tangible impact of government policies and grants on the innovation behaviour of SMEs.

2.2.2. Cooperation

Innovation rarely thrives in isolation, but rather finds its most fertile ground in the milieu of collaboration and cooperation. This is true not only within the networks of SMEs but also in inter-industry and cross-border contexts. Cooperative endeavours, according to Smith and Romeo (2012), play a pivotal and foundational role in the innovation process for SMEs, as they provide an environment conducive to the exchange of knowledge, pooling of resources, and collective innovation initiatives.

Within SME networks, cooperation often materialises through the formation of industry clusters, which represent geographic concentrations of firms operating within the same sector, as discussed by Ketels (2003). These clusters serve as dynamic ecosystems, enabling SMEs to readily exchange knowledge, combine resources, and engage in collective innovation initiatives. An exemplary illustration of such a dynamic ecosystem is Silicon Valley, renowned globally for hosting a concentration of technology-oriented SMEs. These SMEs benefit from close proximity, facilitating the cross-fertilization of ideas and access to a highly skilled workforce (Salavou *et al*., 2004).

Cooperation is rooted in the premise that SMEs do not operate in isolation; rather, they thrive through collaborative efforts. Salavou, Baltas and Lioukas (2004) in their study highlighted the significance of strategic orientation and cooperative relationships in promoting innovation within SMEs. Their research clarified how SMEs that strategically oriented themselves towards cooperative endeavours reaped substantial benefits in terms of innovation. Detailed case studies demonstrated that SMEs that actively engaged in cooperative ventures with partners, suppliers, and even competitors exhibited a greater propensity for innovation. In particular, Salavou, Baltas and Lioukas (2004) provided empirical evidence that SMEs fostering strategic alliances were more likely to introduce

ground-breaking products or services to the market. This substantiates the notion that cooperative relationships serve as catalysts for innovation.

Segarra-Blasco and Arauzo-Carod's (2008) study added to this body of knowledge by highlighting the pivotal role of industry-university interaction in driving innovation. Their research showcased instances where SMEs' collaboration with academic institutions resulted in ground-breaking research and development initiatives, further solidifying the connection between cooperation and innovation.

Moreover, SMEs frequently partake in research consortia, collaborative R&D initiatives wherein they collaborate with research institutions and industry leaders, as described by Hemmelgarn, Glisson and James (2006). These consortia allow SMEs to distribute the costs, mitigate risks, and tap into the expertise necessary for innovation, enabling them to undertake more ambitious projects collectively than they could individually.

Collaboration extends beyond the confines of SME networks, transcending industries and spanning global scales, heralding a new epoch of innovation. These collaborative endeavours synergise the strengths of SMEs with those of larger organisations, serving as potent catalysts for innovation. One manifestation of such collaboration is seen in cross-industry partnerships, as explored by De Jong and Freel (2010), wherein SMEs join forces with diverse partners from other sectors, enriching their innovation potential. For example, a software development SME may strategically collaborate with a healthcare company to pioneer innovative health technology solutions, leveraging each other's domain-specific expertise and market insights.

Additionally, cooperation empowers SMEs by granting them access to invaluable resources and expertise. Collaborative efforts facilitate the distribution of the financial burdens associated with innovation, as expounded by Dushnitsky and Lenox (2005), rendering it feasible for SMEs to undertake more ambitious projects. Moreover, cooperation facilitates access to specialised skills, technologies, and resources held by collaborative partners, thereby augmenting the innovation capabilities of SMEs. Also, as posited by Lorenzen and Mudambi (2013), given the inherent risks associated with innovation, cooperation serves as a potent risk-mitigation strategy for SMEs. By sharing risks with partners, SMEs can experiment and innovate more freely. Failures and setbacks within collaborative endeavours are transformed into valuable learning experiences, fostering a culture of resilience, adaptability, and continuous improvement.

Furthermore, SMEs are increasingly embracing the concept of global innovation networks, a phenomenon underscored by Smith and Romeo (2012). These expansive networks transcend national borders, connecting SMEs with international partners and providing access to a global reservoir of talent, customers, and markets. Within these networks, SMEs can harness diverse knowledge, ideas, and perspectives, thereby fostering a culture of innovation and enhancing their global competitiveness.

Cooperation, as defined by the reviewed research papers, extends beyond mere collaborative efforts and embraces a more holistic perspective. It encompasses various facets, such as strategic orientation, cooperative relationships, and interaction with external entities like academic institutions and industry partners. In addition, the foundational work by Najib and Kiminami (2011) defined cooperation as the collaborative efforts among individuals or entities within an organisation. Their research highlighted the significance of cooperative behaviour in SMEs, showcasing its role in fostering teamwork, knowledge sharing, and collective problem-solving. This collaborative approach was found to enhance innovation, productivity, and overall business performance within SMEs. The measurement model crafted by these authors comprises a series of meticulously designed questions, which were adapted to the research context of this thesis and which will be presented in subchapter 2.2.7. *Operationalisation of innovation determinants measurement model*, that probe into the frequency and depth of cooperation and collaboration undertaken by SMEs. These questions delve into the intricate dynamics of cooperative ventures, partnerships, and engagement with academic institutions.

2.2.3. Technology orientation

In the ever-evolving landscape of business, SMEs have come to realise that technology orientation is not just an option; it's a fundamental necessity for driving innovation. These nimble and dynamic entities understand that embracing technology is key to remaining competitive and achieving sustainable growth (Al-Ansaari, Bederr and Chen, 2015; Salavou, Baltas and Lioukas, 2004). In particular, central to technology orientation within SMEs is the adept use of digital tools and solutions. In today's world, SMEs are not limited by their size; they can leverage technology to access vast reservoirs of data, analyse market trends, and gain profound insights into customer behaviour (Rachinger *et al*., 2018). This data-driven decision-making empowers SMEs to respond swiftly to the ever-changing dynamics of the market, optimise their operations, and pinpoint innovation opportunities with pinpoint accuracy.

Furthermore, technology orientation significantly boosts productivity within SMEs. By automating repetitive tasks and processes through technologies like artificial intelligence and robotic process automation, SMEs can liberate valuable human resources (Brynjolfsson and McAfee, 2014). This liberation allows SMEs to redirect their workforce toward higher-value tasks, such as creative problem-solving and innovation. Cloud computing and Software as a Service solutions empower SMEs to access potent software tools and computing resources without hefty upfront investments (Benlian, Hilkert and Hess, 2015). This democratisation of technology levels the playing field, allowing even resource-constrained SMEs to wield cutting- edge tools for innovation.

Also, e-commerce platforms, for instance, provide SMEs with global reach (Alcácer, Cantwell and Piscitello, 2016). In that regard, technology enables SMEs to transcend geographical boundaries and venture into new markets and industries. SMEs can tap into

international customer bases and diversify their product or service offerings without the need for extensive physical infrastructure. Moreover, Brynjolfsson and McAfee (2014) underlined that, digital platforms and online marketplace facilitate collaboration and partnership-building, enabling SMEs to access global supply chains and tap into specialised talent pools. This collaborative ecosystem empowers SMEs to innovate in ways previously thought impossible.

According to McGrath (2019), technology also helps cultivate an innovation-centric culture within SMEs. The adoption of collaborative tools, project management software, and innovation platforms encourages employees to share ideas, collaborate on projects, and experiment with new solutions. This culture of innovation permeates all aspects of SME operations, from product development to customer engagement. Furthermore, technology orientation equips SMEs with the agility to adapt and pivot in response to changing market dynamics and unexpected disruptions. By leveraging technology, SMEs can rapidly reconfigure their business models, adjust supply chains, and engage with customers through digital channels (Rachinger *et al*., 2018). This adaptability not only ensures business continuity, but also positions SMEs to seize new opportunities as they arise.

Mahemba and Bruijn (2003) offered a profound examination of innovation activities among manufacturing SMEs in Tanzania, with an emphasis on technology adoption. The research unearthed compelling evidence that technology-oriented SMEs displayed a higher inclination toward innovation. Through meticulous analysis of survey data, the study revealed a strong positive correlation between the extent of technology adoption and the frequency of innovative activities. The data showcased that SMEs actively investing in and adopting emerging technologies, such as automation and digitalisation, were more likely to introduce innovative products or processes, thereby gaining a competitive edge in their respective industries.

Salavou, Baltas and Lioukas (2004) defined technology orientation as the strategic focus and approach of an organisation towards adopting and leveraging technology. Their research emphasised the pivotal role of technology orientation in SMEs, showcasing its impact on innovation, efficiency, and competitive advantage. SMEs with a strong technology orientation demonstrated enhanced adaptability, faster product development cycles, and improved market responsiveness, contributing significantly to their overall business performance.

Expanding upon the findings and insights related to the technology orientation, it becomes evident that this dimension also plays a pivotal role in understanding the innovation dynamics within SMEs. Overall, the technology orientation factor recognises the transformative power of technology adoption within SMEs. This concept was inspired by the research conducted by Al-Ansaari, Bederr and Chen (2015), whose measurement scale will be presented in subchapter 2.2.7. *Operationalisation of innovation determinants measurement model*, who in their study highlighted the role of technology adoption and orientation in driving innovation in SMEs. The measurement model's questions

comprehensively assess an SME's technology orientation, reflecting the organisation's commitment to innovation.

2.2.4. Managerial orientation

The capacity of SMEs to innovate is also intricately tied to the managerial orientation embraced by their leadership. Managerial orientation has a multifaceted role and profound influence on SME innovation, it permeates the organisation's culture, drives strategic choices, shapes resource allocation, influences risk tolerance, fosters external collaborations, and underscores adaptability.

Firstly, at the heart of SME innovation lies the leadership's orientation. Leadership, embodied by managers and executives, is the moral compass guiding the entire organisation. It sets the tone for creativity, risk-taking, and adaptability (Teece, 2007). The commitment of leadership to innovation reverberates throughout the organisation, impacting every facet of its operation. Moreover, Chesbrough (2006) claims that innovation thrives in environments that nurture a culture of exploration and experimentation. Managers who prioritise innovation create a workplace where employees are not just encouraged but empowered to question established norms, propose ground-breaking ideas, and embrace calculated risks. This culture of innovation transcends hierarchical boundaries, becoming an intrinsic part of the organisation's identity.

Also, forward-thinking managers craft strategies that explicitly place innovation at the forefront of organisational objectives (Helfat and Peteraf, 2003). The strategic direction chosen by managers plays a pivotal role in SME innovation. Such strategies may encompass investments in R&D, strategic alliances with innovative partners, or the active pursuit of emerging technologies and market trends.

In particular, Gashema and Gao's (2018) exploration of strengthening managerial innovation behaviour within SMEs offered intricate insights into the role of leadership and organisational culture. Their research underpinned the significance of transformational leadership in fostering a culture of innovation. The study claims that managers who exhibited transformational leadership traits, such as vision, inspiration, and intellectual stimulation, were more effective in instilling a culture of innovation throughout the organisation.

Managers are also responsible for the judicious allocation of resources and providing the requisite support to fuel innovation efforts. They recognise that innovation demands dedicated financial backing, the presence of skilled and motivated personnel, and the elimination of bureaucratic impediments (Damanpour, 2010). Decisions related to resource allocation are a testament to the manager's commitment to innovation and their understanding of its long-term value. Furthermore, the willingness of managers to embrace risk profoundly influences SME innovation. Innovative managers appreciate that setbacks and failures are inherent to the innovation process (Tushman and O'Reilly, 2007). They cultivate an environment where failure is not stigmatised, but rather regarded as a

steppingstone to success. This ethos encourages employees to undertake calculated risks and extract valuable lessons from their experiences.

Importantly, according to Dyer and Singh (1998) managers who champion innovation actively seeks external partnerships and collaborations. They understand that innovation often flourishes at the intersection of diverse perspectives. Such managers engage with industry experts, research institutions, customers, and suppliers, fostering alliances that have the potential to yield ground- breaking innovations. Moreover, innovation frequently necessitates changes in processes, products, or business models. Managers who wholeheartedly embrace innovation are adept at managing change within the organisation (Tidd and Bessant, 2020). They comprehend the nuances of navigating resistance within the organisation and are skilled at implementing innovations effectively, ensuring they seamlessly integrate with the organisation's existing operations.

Overall, the reviewed studies demonstrated that SMEs with a well-entrenched innovation culture, marked by a tolerance for risk-taking and experimentation, exhibited heightened levels of managerial innovation behaviour. Specifically, a proactive and adaptive managerial orientation fosters innovation, facilitates effective resource allocation, and nurtures a conducive work environment, ultimately contributing to improved business performance and sustainability within SMEs. The managerial orientation factor underscores the pivotal role of leadership in enhancing innovation. This factor was constructed based on insights from Al-Ansari, Xu and Pervan (2014), whose measurement scale will be presented in subchapter 2.2.7. Operationalisation of innovation *determinants measurement model*, who emphasised the crucial significance of managerial orientation within SMEs.

2.2.5. Organisational IO culture

The ability of SMEs to innovate is not merely a result of their resources or strategies; it's fundamentally tied to the organisational culture they foster. Organisational culture serves as the bedrock upon which SME innovation is constructed. It is the living expression of the values, beliefs, and norms that define the organisation and guide the behaviour of its members (Schein, 1992). A culture that places innovation at its core becomes the driving force for transformation and progress. According to Amabile (1998), innovation thrives in environments that nurture a culture of creativity and experimentation. SMEs with an innovative culture actively cultivate an atmosphere where employees are not only encouraged, but also empowered to think beyond traditional boundaries, question established practices, and generate fresh and unconventional ideas. This creative ethos permeates all facets of the organisation, from product development to customer engagement.

According to Kenny and Reedy (2006) an IO culture may be initially considered as the imperative for generating the highest quantity of innovative concepts within a specified timeframe. However, the authors assert that a more nuanced definition present the innovative culture as a cognitive and behavioural framework that fosters the inception, nurturing, and

embedding of values and attitudes within a company. These values and attitudes, in turn, foster the propensity to embrace, endorse, and facilitate ideas and alterations aimed at enhancing the operational efficacy of the firm, even if such alterations diverge from conventional or traditional norms.

Furthermore, as Kenny and Reedy (2006) underline, the absence of a robust, collective IO culture renders a firm scarcely competitive in terms of innovative advancement. Specifically, an organizational culture grounded in innovation must embody certain core values. These values include client-centricity, unwavering commitment to objectives, a spirit of challenge and initiative, exemplariness in behaviour, teamwork, and a dedication to continuous improvement.

Moreover, the willingness of employees to take risks is profoundly influenced by the prevailing organisational culture (Cameron and Quinn, 2011). In an innovation-focused culture, calculated risk-taking is not only permitted, but celebrated. Employees are emboldened to experiment, learn from failures, and adapt their approaches, as they recognise that the organisation values and encourages the pursuit of innovative solutions. In particular, innovation extends beyond product development and encompasses internal processes and organisational structures (Burgelman, 1983). A culture of innovation empowers and encourages intrapreneurship, where employees are given the autonomy and support to identify opportunities for improvement and drive innovation within their own areas of responsibility. This decentralised approach to innovation ensures that fresh ideas emerge from all corners of the organisation.

Edmondson (2018) underlines that those innovative cultures prioritise and embrace continuous learning and adaptation. It promotes a growth mindset, where employees are not only encouraged but expected to acquire new skills, embrace change, and learn from both successes and setbacks. This culture of learning fuels ongoing innovation and adaptability, ensuring the organisation remains at the cutting edge of its industry. Nevertheless, an innovative culture is not a transient phenomenon, but a sustained commitment (Denison, Haaland and Goelzer, 2004). Leaders within SMEs with innovative cultures actively champion innovation and embed it in the organisation's strategic vision. They allocate resources, set clear expectations, and continually reinforce the importance of innovation in achieving long-term success (Selimović, Pilav-Velić and Krndžija, 2021).

Also, organisations with an innovative culture break down silos and actively encourage cross- functional collaboration. Collaboration is often intrinsic to innovation, as outlined by Nonaka and Takeuchi (2009). They recognise that diverse perspectives and collective knowledge are the breeding grounds for ground-breaking innovations. Such cultures provide platforms and incentives for employees to share insights, experiences, and collaborate effectively.

It becomes apparent that organisational culture wields a profound influence on the innovative behaviour of businesses. Hamdan and Alheet (2020) study unveiled that

organisational culture, particularly in terms of proactiveness, innovativeness, and a willingness to take calculated risks, plays a pivotal role in shaping the innovation landscape within SMEs. Building upon this foundation, Gashema and Gao (2018) reinforced the importance of an innovation-centric culture within SMEs, particularly in the context of managerial innovation behaviour. Their empirical evidence provided strong support for the positive association between an organisational culture that values innovation as a core principle and heightened managerial innovation behaviour. Their research accentuated that a culture that actively promotes and embraces innovation serves as a catalyst for managers to adopt innovative practices and strategies.

Finally, for this research it is important to underline that organisational IO culture will be analysed due to the specificities of the model. Both an innovation-supportive culture and the overall organisational culture operate within a company, each with its distinct emphasis and impact. The broader organisational culture encapsulates the collective values, norms, and behaviours prevalent throughout the organisation, defining how work is done, decisions are made, and relationships are formed. It embodies the company's identity, reflecting its ethos, and influences employee behaviour, encompassing aspects like leadership style, communication patterns, and organisational structure (Al-Ansari, Xu and Pervan, 2014; Büschgens, Bausch and Balkin, 2013). On the other hand, an IS culture is a subset within the overall culture, specifically focused on fostering creativity, experimentation, and idea generation (Sadegh Sharifirad and Ataei, 2012). It encourages risk- taking, openness to new ideas, and tolerance for failure, fostering an environment that supports innovation, often characterised by flexible structures and a mindset that embraces change and unconventional thinking. While the overall culture sets the tone for the company's operations, an IS culture serves as a specialised dimension aiming to cultivate an environment conducive to innovative thinking and practices (Chandler, Keller and Lyon, 2000; Chavda, 2004).

Overall, the measurement model for assessing organisational IO culture's impact on innovation in SMEs draws upon the extensive insights provided by Al-Ansari, Xu and Pervan (2014), whose measurement scale will be presented in subchapter 2.2.7. *Operationalisation of innovation determinants measurement model*. They emphasise how a strong and positive organisational IO culture, characterised by openness, collaboration, and adaptability, influences employee morale, innovation, and overall performance. The measurement model's questions provide a comprehensive evaluation of how organisational IO culture shapes innovation within SMEs.

2.2.6. Market orientation

The ability of SMEs to innovate is also intricately linked to their market orientation. Narver and Slater (1990) underline that market orientation is the compass by which SMEs navigate the complex and ever-changing business landscape. It's about not merely reacting to market dynamics but actively seeking to understand customer needs, competitor actions, and emerging trends. SMEs that prioritise market orientation do not base their strategies on

guesswork; instead, they derive insights from comprehensive market research and analysis. This knowledge then becomes the cornerstone of strategic decision-making, ensuring that the products or services offered are not just relevant but highly competitive.

Conceptually, market orientation refers to an SME's propensity to prioritise the needs and preferences of its customers, actively seek market intelligence, and adapt its strategies, products, and processes accordingly. A market-oriented SME is one that places a premium on customer- centricity and responsiveness to market dynamics (Salavou, Baltas and Lioukas, 2004). Meaning that market orientation involves a deep commitment to understanding and meeting customer needs. SMEs with a strong market orientation prioritise customer satisfaction and actively solicit feedback to refine their offerings.

This customer-centric approach lays the foundation for innovation as it encourages the identification of unmet customer needs and preferences. As another dimension, the authors recognised market intelligence. Where a market-oriented SME continuously monitors market trends, competitors, and emerging opportunities. It collects and analyses data to stay informed about changes in the business environment. This orientation towards market intelligence enables SMEs to make informed decisions and identify opportunities for innovation that align with market demands. Furthermore, as market-oriented SMEs are agile and adaptive, responsiveness to market changes is crucial. They demonstrate a willingness to adjust their strategies, products, and processes in response to shifting market conditions. (Al-Ansaari, Bederr and Chen, 2015; Salavou, Baltas and Lioukas, 2004)

In recent years, an increasingly pivotal facet of exemplary corporate performance has centred on the establishment of a corporate culture that maintains a sharp focus on market dynamics. Despite the prevalence of anecdotal and speculative evidence, it is noteworthy that the nexus between market orientation and corporate performance may potentially be mediated by the organisational dimension of innovativeness. In the past, scholars have diligently endeavoured to explore the nature of the relationship between market orientation and performance, exploring various paradigms such as direct causality (Narver and Slater, 1990; Ruekert, 1992), moderation effects (Diamantopoulos and Hart, 1993; Greenley, 1995), and the underpinning elements contributing to market orientation (Jaworski and Kohli, 1993). Nonetheless, extant research has yet to systematically examine the intricate interplay between innovation and market orientation in shaping organisational prosperity. Slater and Narver (1995), which posits innovation as one of the fundamental "core value-creating capabilities" underpinning the market orientation- performance linkage, represents a paradigm shift in this context.

In particular, at the heart of market orientation is a profound commitment to understanding and fulfilling customer preferences (Kohli and Jaworski, 1990). It's not enough to simply produce goods or services; it's about co-creating value with customers. SMEs that embody this approach do not view innovation as an isolated process; they see it as an ongoing dialogue with their customers. This engagement involves actively involving customers in the innovation journey, soliciting feedback, and continuously iterating to develop products

and services that precisely address their evolving needs. In this way, customer-centricity becomes a driving force for innovation.

Salavou, Baltas and Lioukas (2004) underscore the significance of market orientation as a catalyst for innovation within SMEs. Their research posits that SMEs exhibiting a strong market orientation are more likely to engage in innovative activities. Market orientation based on these findings was conceptualised as an interplay between customer focus, market intelligence, adaptability, strategic alignment, and competitive advantage as key drivers of innovation within SMEs. Consequently, this factor provides a scientifically grounded framework for evaluating how market orientation influences and drives innovative behaviour within the SME context.

Moreover, Slater and Narver (1995) claim that in the world of market-oriented SMEs, there's no room for complacency. They understand that market dynamics are ever evolving, and innovation is not a one-time event, but an ongoing process. SMEs shall actively seek feedback from customers, monitor market trends, and adapt their strategies and offerings accordingly. This commitment to continuous learning ensures that SMEs remain agile and responsive in the face of change, enabling them to not only survive but thrive.

Specifically, by deeply understanding customer needs and preferences, SMEs can develop unique value propositions and innovative solutions that resonate with their target audience. In other words, as emphasised by Narver and Slater (1990), market orientation empowers SMEs to stand out in a crowded marketplace. This differentiation not only positions them favourably in the market but also provides a competitive edge that can be leveraged for sustainable growth. Market-oriented SMEs ensure that every resource, whether financial or human, is meticulously aligned with market needs (Jaworski and Kohli, 1993). Instead of pursuing innovation for innovation's sake, they direct their efforts toward areas that hold the greatest potential to meet customer demands and capture market share. This resource alignment maximises the return on innovation investments and optimises the allocation of resources, making innovation efforts more effective and efficient.

Finally, a distinguishing feature of market-oriented SMEs is their commitment to creating feedback loops with customers (Slater and Narver, 1995). They actively seek and utilise customer feedback to refine their offerings and improve the overall customer experience. This responsiveness not only enhances customer satisfaction but also positions SMEs as agile and adaptive players in the market, capable of swiftly addressing changing customer needs. The market orientation, drawn from the research of Al-Ansaari, Bederr and Chen (2015), whose measurement scale will be presented in subchapter 2.2.7. *Operationalisation of innovation determinants measurement model* incorporates the pivotal role of an SME's strategic orientation towards the market in influencing its innovative behaviour.

2.2.7. Innovation determinants measurement model

As already mentioned, to comprehend the intricate dynamics of innovation within SMEs, it is essential to scrutinise and conceptualise the multifaceted determinants that influence their innovative endeavours. The innovation determinants within SMEs encompass a multitude of variables that influence their ability to create, adopt, and adapt innovations. Based on the analysed body of research, the determinants that influence innovative behaviour are viewed as a multidimensional concept. In accordance with the definition of innovative behaviour and the input from SLR, as well as its goals and characteristics, it was decided to use a measurement model where the first-order factors in Table 3 influence innovative behaviour. Articles that contain in their title a word related to a given aspect were found using primarily the WoS database and other pertinent databases, as shown in Table 3.

Table 3 Search string for operationalisation of innovation behaviour determinants

Variables	**Search string**
Government support	*TITLE: ("government* support" OR "government assistance" OR "government funding") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*
Cooperation	*TITLE: ("cooperation*" OR "collaboration*") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*
Technology orientation	*TITLE: ("technology orientation" OR "technological orientation" OR "tech orientation" OR "R&D orientation" OR "technology") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*
Managerial orientation	*TITLE: ("managerial orientation" OR "leadership") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*
Organisational IO culture	*TITLE: ("innovation*oriented organi*ational culture" OR "innovation*oriented organi*ational climate" OR "innovative organi*ational culture" OR "organi*ational culture" OR "organi*ational climate") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*
Market orientation	*TITLE: ("market orientation" OR "customer orientation") AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*

Source: Author's work.

As this research drew upon relevant literature from various sources, the indicators as determinants of innovative behaviour that measure the innovative behaviour of SMEs, in articles relevant to the subject research, are listed in the table in Appendix A2. Also, several articles that were most frequently cited in the original sources were subsequently included. This study will employ the classifications shown in Table 4, which are based on the overview

of the dimensions from Appendix A2, which may be used to quantify individual determinants of innovation behaviour.

Table 4 Classifications for innovation behaviour determinants

Variables	**Authors of the measurement scale**	**Questions**
Government support	(Thongsri and Chang, 2019)	*The government provides policies and programs that are beneficial to innovation performance.*
		The government provides needed knowledge and other technical support.
		The government provides important market information.
		The government provides external funding and financing/ grants to support innovation performance.
		The government provides information about essential regulations and helps firms to obtain copyright or patent/ intellectual property protection and access to rare resources.
Cooperation	(Najib and Kiminami, 2011)	*… with customers*
		… with suppliers
		… with another firm
		… with government and public sector institutions
		… with universities and research institutions
		… with experts/ business development service providers
Technology orientation	(Al-Ansaari, Bederr and Chen, 2015)	*Our firm's policy is to follow new technology trends*
		Our firm's policy is to adopt/ use new technologies
		Our firm allocates resources for investment in new technologies
		Our firm is often to be first to try out new methods and technologies
		Our firm frequently improves its internal technology and tool usage
Managerial orientation	(Al-Ansari, Xu and Pervan, 2014)	*Our management considers innovation to be our firm's strategic goals and future ambitions*
		Our management favours a strong emphasis on R&D, technological leadership, and innovations
		Our management undertakes/ engages risky projects with the intention of exploring new opportunities
		Our management is involved in new initiatives and innovative programs

		Our management allocates resources to support development of new products or services or processes
Organisational IO culture	(Al-Ansari, Xu and Pervan, 2014)	*Our company supports generating of new ideas*
		Staff within our firm obtains and exchanges new knowledge and skills in fair and collegial ways
		Our firm accurately shares important information such as success and failure and customer feedback with all relevant staff as firm is our internal learning processes
		Our firm has a flexible organisational structure (for example decentralisation, shared decision making, low-moderate use of formal rules…)
		Our firm encourages staff to think freely, generate ideas, follow-up on ideas, learn experiences, and take risks
Market orientation	(Al-Ansaari, Bederr and Chen, 2015).	*Our firm has active communication/ interaction with customers*
		Our firm is oriented towards providing quality services to the customer
		Our firm focuses on better understanding of customers and their needs
		Our firm frequently takes advantage to take over customers from competing firms
		Our firm encourages the exchange of information about customers and market movements among its employees

Source: Author's work.

When it came to choosing the most adequate measuring scale, it was considered which indicators most cover the above-mentioned classification in accordance with the theoretical background and research objectives, and for this purpose sometimes two scales were combined. Questionnaire adaption to suit research context, especially in accordance with the conducted SLR and qualitative analysis results, is common in scientific research. Particularly, within this research mostly adoption - nearly verbatim, and minor adaptations of measurement scales were performed following suggestions of prior well-established studies (Artino *et al*., 2014; Beaton *et al*., 2000; Crucke and Decramer, 2016; Gjersing, Caplehorn and Clausen, 2010; Hair *et al*., 2019; Tsai et al., 2023; Yahaya *et al.*, 2018). Accordingly, the items from Table 4 serve as a foundation for assessing and quantifying the key factors influencing innovative behaviour within SMEs, as identified and influenced by the referenced literature. Given that innovative behaviour is the final outcome of these factors, each of the above-mentioned constructs is expected to have a positive impact on innovative behaviour in SMEs.

2.3. Innovation and business performance

In the dynamic and fiercely competitive milieu of SMEs, innovation assumes an unequivocal role as an indispensable catalyst, underpinning not merely their survival but also their flourishing and ascent. Notably, nestled at the epicentre of the SME ecosystem lies an overarching aspiration for growth, with innovation functioning as the pivotal mechanism propelling this trajectory (Damanpour, 1991). In a corporate landscape marked by relentless technological advancements, evolving consumer preferences, and shifting market dynamics, SMEs that demonstrate alacrity in embracing innovation acquire a substantial competitive advantage. They engender novel and refined products, services, or operational processes that not only cater to nascent customer demands but also broaden their market outreach and revenue streams. Consequently, innovation emerges as the prime impetus behind the perpetuation of progressive growth.

Innovation significantly influences business performance and business success, as highlighted by Schumpeter I and supported by the writings of Smith and Marx. Schumpeter's work, particularly "The Theory of Economic Development", underscores innovation as an entrepreneurial force driving competition and dynamic efficiency within businesses and industries. Conversely, Schumpeter II argues that business performance plays a pivotal role in influencing innovative activities. This perspective underscores the challenges, costs, and uncertainties associated with innovation and questions the appropriation of economic benefits. Indivisibilities and economies of scale and scope have made innovation increasingly expensive, and larger companies with monopolistic power may be more inclined to innovate compared to smaller enterprises facing entry barriers. (Vlados, 2019)

Although there's a two-way relationship between innovation and business success, experts believe these perspectives are not contradictory. Instead, they interact dynamically, potentially applying to specific industries, marketplaces, technological phases, or historical periods. The evolutionary approach aligns with a mutual reinforcement of innovation and business success at the company level. It suggests that innovation often accelerates before business downturns, driven by unfavourable economic conditions, as proposed by Mensch (1975).

The micro-foundations of the Schumpeterian model have been refined through the work of Nelson and Winter (1982), Dosi (1990), and others. In this view, innovation is a firm's key competitive advantage in uncertain, constrained, and path-dependent environments. This leads to diverse innovative behaviours and learning processes, resulting in significant disparities in technical and financial performance among organisations.

Management assumes a pivotal role within this sphere, as underscored by empirical investigations (Han, Kim and Srivastava, 1998; Cainelli, Evangelista and Savona, 2006) underlying the nexus between innovation and business performance. The collective research outcomes consistently reveal a substantive and advantageous association between innovation and performance, one characterised by both directness and utility. Substantiating

this phenomenon are assertions purporting that innovation contributes to a half or more of corporate revenue, underscoring its escalating significance as a survival strategy amidst intensifying competitive pressures and environmental volatility. Previous research affirms the positive impact of innovation on business performance, particularly in the context of manufacturing (Lööf and Heshmati, 2002; Cainelli, Evangelista and Savona, 2006).

Specifically, within the SME sector, innovation stands as a linchpin of competitiveness (Tidd and Bessant, 2020). Amidst markets inundated with analogous products or services, enterprises that wholeheartedly espouse innovation distinguish themselves from their peers. This competitive advantage not only culminates in an expanded market share but frequently engenders augmented profitability and a more robust fiscal foundation. Nevertheless, innovation does not solely serve as a means to attain elevated altitudes; it also acts as a bulwark, fortifying the resilience of SMEs in the face of disruptions (Teece, 2007). SMEs that have interwoven a culture of innovation into their organisational fabric exhibit enhanced readiness to respond to exogenous shocks, be they economic contractions or unforeseen shifts in market dynamics. They possess the nimbleness to pivot expeditiously, adapting their strategies and offerings to harmonise with emergent realities. This resilience not only assures their continued existence but also positions them to thrive amid tumultuous epochs.

Moreover, within the realm of SMEs, innovation transcends the pursuit of transitory gains; it represents a means of securing enduring sustainability. According to Dodgson, Gann and Phillips (2013), enterprises that accord innovation precedence conscientiously prepare for the future. They allocate sustained investments toward research and development, assuring the perpetual relevance of their products and services within the flux of evolving markets. This forward-looking orientation consolidates their standing in the market over the long term, shielding them from obsolescence.

Vorhies and Morgan (2005) suggest that benchmarking marketing capabilities can bolster business performance and foster sustainable growth. In particular, enhanced marketing capabilities empower firms to serve customers, differentiate their offerings, and adeptly respond to market dynamics, thereby fortifying market positioning and augmenting financial outcomes more effectively. By optimising resource allocation and cultivating enduring marketing capabilities, firms can attain sustained competitive advantage and enhance overall business performance.

Additionally, innovation extends beyond the confines of product or service development; it encompasses the optimisation of operational processes and cost management (Chesbrough, 2006). SMEs that wholeheartedly embrace innovation unearth novel approaches to streamline their operations, eliminate inefficacies, and prudently manage expenditures. This, in turn, transmutes into enhanced profitability and superior financial performance, empowering them to confront economic vicissitudes with greater efficacy. Furthermore, Amabile (1998) underlines that it is imperative to underscore that innovation permeates the very bedrock of customer relationships. SMEs that actively engross themselves in customer-centric innovation generate products and services that resonate in precise alignment with the

needs and desires of their clientele. This not only fosters customer fidelity but also stimulates favourable word-of-mouth endorsements and recurrent patronage, further amplifying business performance.

2.3.1. SME business growth

The relationship between innovation and business performance is a critical aspect explored in the literature. While the specifics of this relationship can vary depending on industry, market conditions, and organisational characteristics, Tarutė and Gatautis (2014) conducted research regarding the influence of innovation on business performance. According to their findings, innovation can significantly impact business performance. Particularly, innovations in products, services, processes, or business models can lead to enhanced competitiveness, increased market share, and improved financial results for organisations. Tarutė and Gatautis (2014) underline that innovation not only fosters adaptability in a rapidly changing business environment but also enables companies to meet evolving customer needs and preferences effectively.

Also, innovation is frequently regarded as the cornerstone of SME growth. By continuously augmenting their offerings, whether in terms of products, services, or operational processes, SMEs are empowered to respond adeptly to evolving customer demands and market trends, strategically positioning themselves for expansion (Damanpour, 1991). Innovative SMEs are often at the vanguard of industry transformations, uniquely poised to capitalize on emerging opportunities and adapt to disruptions. They perceive innovation not as a sporadic occurrence, but as an enduring process deeply embedded within their corporate ethos.

A prevalent strategy for SME expansion entails venturing into new markets and diversifying their product or service portfolios. Geographical expansion or targeting distinct customer segments empowers SMEs to reduce dependency on a single market or product (Cavusgil and Knight, 2015). Nonetheless, successful expansion mandates meticulous market research, a profound comprehension of cultural idiosyncrasies, and an ability to adapt to local conditions. A one-size-fits-all approach seldom engenders sustainable growth. Furthermore, the cultivation of strategic partnerships and alliances can significantly expedite SME growth trajectories. According to Mowery, Oxley and Silverman (1996), collaborative endeavours with complementary enterprises or industry frontrunners can provide SMEs access to new customer bases, cutting-edge technologies, expansive distribution networks, and specialised expertise. However, the orchestration of such partnerships demands scrupulous planning and structuring, with well-defined objectives and mutually advantageous outcomes at the forefront.

Nonetheless, while SMEs possess the potential for substantial growth, they also confront a multitude of challenges on their journey towards expansion. Gaining access to capital can prove to be a formidable hurdle, particularly for start-ups and enterprises that lack tangible collateral. Resource constraints, including limitations in human and financial assets, can

impede growth initiatives. The volatility of markets, the labyrinthine nature of regulatory environments, and the ever-evolving competitive landscape add layers of intricacy to the growth trajectory. The recruitment and retention of talent, particularly individuals with specialised skill sets, can represent an ongoing challenge (Baron, Franklin and Hmieleski, 2016).

2.3.2. International performance of SMEs

In business environment which is characterised by high level of competition, SMEs are continuously working on development of strategies that will enable them to reach international markets (Prange and Pinho, 2017). Although, going abroad would yield large number of benefits it would also bring many risks and costs that SMEs should be aware of, and which could potentially have negative impact on their profitability. Innovation capabilities of SMEs, as emphasised by Wang and Ahmed (2004), represents their ability to develop new products and services or even new markets. This is highly important when speaking about industries that are highly dynamic and whose products have short life cycles.

SMEs may have issues with price competition, but their competitive advantage would be in their ability to adapt to international markets and tailor their offer, to recognise new opportunities and in their flexibility. When discussing which type of innovation drives exports, studies proved that product innovation has positive impact on the level of exports in manufacturing firms, while process innovation is also important but only if it is complemented with product innovation (Prange and Pinho, 2017; Sahaym, Trevino and Steensma, 2012).

Available literature reports that different types of innovation especially non-technical ones improve export directly or indirectly by supporting technological innovation (Azar and Ciabuschi, 2017). Prange and Pinho (2017) in their study based on 120 SMEs in Portugal, analysed impact of internal drivers on SMEs international performance. Authors developed a model that assessed influence of organisational innovation and organisational capability drivers on international performance. Results of the study implied that both organisational and personal drivers have positive impact on international performance and authors note that their impact should not be considered separately, but rather in conjunction with the leveraging effect of organisational innovation.

Innovation is not always correlated with improved corporate performance; firm success can result from a range of performance and growth factors (Neely *et al*., 2001). Businesses with creative activities (i.e., more distinctive goods and services) perform better in terms of business growth, according to Hitt, Ireland and Hoskisson (2014).

Neely, Adams and Kennerley (2002) assert that there are additional aspects that influence success in addition to creativity. While the size of the company and the implementation of management strategy orientation are crucial indications for predicting its effectiveness and commercial success, the adoption of innovation may also have an impact on these outcomes.

Furthermore, performance has been evaluated using accounting indicators as profit, cost, and market share (Conant, Mokwa and Varadarajan, 1990; Laitinen, 2002). However, it should be quantified in both financial and non-financial dimensions to enable efficient strategic decision- making. The long-term success of the company is prioritised in non-financial criteria including customer pleasure, internal business process effectiveness, and innovation (Arifeen *et al*., 2014).

2.3.3. Innovation and productivity

Innovative practices among companies that are operating in developed countries are well established. However, when speaking about companies in developing countries adoption of innovative practices is still in its infancy. Bearing in mind that innovation processes in developing countries are often taken as too mainstream, it is highly important to properly assess all the factors that may have influence on productivity.

Still, Battisti and Stoneman (2010) underline that robust empirical evidence of the innovation determinants, especially of various innovation types, is still missing. In recent decades, focus of many studies was to evaluate the impact of generic innovation activities as well as product and process innovation on firm labour productivity or total factor productivity (Chudnovsky, López and Pupato, 2006; Griffith *et al*., 2006; Hall *et al*., 2016; Mairesse and Robin, 2009; Lin *et al*., 2016). When speaking about difference between product and process innovation and their impact on productivity, finding of previous studies differentiated three points of view. First one is that only product innovation has a significant influence of productivity (Mairesse and Robin, 2009) the other one is that process innovation has more benefits for firm productivity than product innovation (Hall *et al*., 2016) and third point of view is that he results of the link between product or process innovation and firm performance are mixed, and it is hard to make a clear division of their impact (Griffith *et al*., 2006).

Mairesse and Robin, (2009) in their study used firm-level community innovation survey to investigate the effect of innovation on labour productivity in France. The authors found that product innovation appears to be the main driver of labour productivity, while the impact of process innovation is either not significant or is close to zero. However, Parisi, Schiantarelli and Sembenelli (2006) used survey data from an Italian investment bank instead of using innovation survey data as a base and their results imply that process innovation has a large impact on productivity. Similar findings in favour of process innovation were presented by Masso and Vahter (2008) and Hall *et al*. (2016). The individual relationship between process/product and firm productivity has been explored in most studies, which makes it difficult to evaluate the complementarity of different innovation modes, in particular product vs. process innovation.

Literature is however scarce with evidence on complementary usage of different innovation strategies. Authors analysed four types of innovation strategies, product only, process only,

mixed and non-innovative one in order to determine their complementary impact on productivity (Hall *et al.*, 2016). Findings of the study suggest that to increase their productivity, it is important for firms to be engaged in both product and process innovation.

2.3.4. Business performance measurement model

In accordance with the definition of business performance, as well as its characteristics, it was decided to use a second-order measurement scale, as shown in Table 5, to measure this variable. Articles that contain in their title a word related to this concept were found using primarily the WoS database and other pertinent databases, as shown in Table 5.

Table 5 Search string for operationalisation of business performance

Variables	Search string
Business performance	*TITLE: (performance" OR success OR growth) AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies)*

Source: Author's work.

In order to develop a comprehensive measurement model for business performance of SMEs, this research drew upon relevant literature from various sources. Accordingly, indicators measuring business performance of SMEs relevant to the subject research are listed in the table in Appendix A3. Particularly, in order to decide regarding the adoption of the measurement model, the aforementioned definition of the variable was analysed in detail. This study will employ the classifications shown in Table 6, adopted from Vorhies and Morgan (2005), which is based on the overview of the dimensions from Appendix A3 and insights from the qualitative analysis. These indicators cover most important aspects of business performance which was recognised in the theoretical framework and will be used to quantify the variable. Based on the definition, previous review of the literature, as well as the review of the constructs from the table, it was concluded that business performance can be viewed as a construct of three dimensions: customer satisfaction, market effectiveness and profitability (Vorhies and Morgan, 2005), each of which is a significant determinant of business performance, in the sense that it helps growth and the company's comparative advantage.

Table 6 Classifications for business performance

Variables	Constructs	Questions
		In comparison to the major firm's competitors…
Business performance	Customer satisfaction	*…your overall customer satisfaction*
		…our customers satisfaction with the quality of our products
		…our customers perception of the money's worth of their purchase
		…the delivery of what your customers want/ meeting customer needs
		…the number of customers that keep doing business with us
	Market effectiveness	*…our market share*
		…our growth in sales revenue/ turnover

		…our growth in sales revenue/ turnover of innovative products or services
		…our acquisition of new customers
		…our sales to existing customers
	Profitability	*…our business profitability*
		…our return on investment
		…our return on sales
		…the reach of financial goals

Source: Author's work.

In particular when it comes to individual constructs and their definition, customer satisfaction refers to the level of contentment or fulfilment experienced by customers after interacting with a product, service, or overall experience provided by a business. It involves meeting or exceeding customer expectations, addressing their needs, and creating a positive perception of the company (Selimović, Pilav-Velić and Krndžija, 2021). Furthermore, market effectiveness measures how well a business performs within its market environment. Or better said, it is assessing the business's ability to understand and meet the needs of its target market, outperform competitors, and effectively position its products or services to achieve success within the industry. Finally, profitability indicates a company's ability to generate earnings in relation to its expenses and investments. It's a measure of financial performance that showcases how efficiently a business is utilising its resources to generate profits (Vorhies and Morgan, 2005).

Accordingly, business performance, represents the overall health and vitality of an enterprise, reflecting its ability to create value for stakeholders. Given that business performance is the final result of commitment to innovative behaviour of SMEs, each of the above-mentioned constructs will have a positive impact on business performance, which is why this thesis proposes a positive influence between innovative behaviour on the one hand and business performance on the other.

2.4. Theoretical framework

Since the primary objectives of the research were to investigate the relationship between the determinants of innovative behaviour and their impact on the innovative behaviour of SMEs, and to empirically analyse the impact of innovative behaviour on the business performance of SMEs, accordingly, this chapter also explains the theoretical foundations on which the selected constructs in the model are based. The research draws on several key theoretical frameworks and concepts from innovation management, SME studies, and business performance, including Resource-Based View, Agency Theory, Institutional Theory, and Open Innovation. Detailed theoretical foundations and explanations are provided in the Appendix A8.

3. EMPIRICAL RESEARCH

This chapter delves into the empirical aspects of the study, encompassing critical components of the research. This chapter seeks to advance the research by comprehensively addressing key facets that underpin the study's methodological rigor and scientific foundation. The components explored herein include the research context, the conceptual model, research hypotheses, methodology, measurement scale, data collection procedure, and the sample.

3.1. Research context

The research context within which this thesis situates the analysis within the broader context of the research area and underscores the relevance and significance of the research questions. This context emerges from a comprehensive review of existing literature and context-related documentation and represents the theoretical underpinning upon which the study is constructed.

The selection of the business context and the emphasis on a small country navigating a particularly challenging transitional economy lends heightened significance to this study for several compelling reasons. This examination of innovative behaviour and business performance primarily concentrates on well-established Western economy companies, rather than small economies undergoing transition. Nonetheless, emerging markets and their distinct circumstances present intriguing opportunities for inquiry, given their notable divergence from Western counterparts in institutional and economic frameworks. Moreover, while Western companies are motivated by the imperative to maintain competitive advantage within familiar market dynamics, businesses in former socialist nations must adapt to unfamiliar free market conditions, posing novel challenges for both management and staff.

Specifically, SMEs in BiH make the backbone of the BiH economy. The political and legal organisation of the country, and the structure of BiH, have defined a specific framework for building and developing institutions to support the development of entrepreneurship. Nevertheless, the passivity and slowness in creating legal and administrative conditions to encourage the development of the SME sector is highly present, despite the importance of this sector. (ABSL, 2021).

There is a lack of proper statistical database in the SME sector. Particularly, the major difficulty in defining and implementing an effective strategy and encouraging development, is the lack of reliable statistics, on the number of SMEs, on basic characteristics and results (activity, number of employees, income, profit), number of newly established and on number of closed SMEs, etc, (PARCO, 2021). Therefore, it is difficult to make a relevant assessment of the effectiveness of any policy to encourage the development of this sector. It is difficult to assess the possible effects of new regulations in this area.

According to the Directive 2013/34/EU and the Law on Accounting and Auditing in FBiH (Law on Accounting and Auditing in FBiH, Official Gazette of the Federation of BiH "No. 15/21), legal entities, in terms of this law, are classified into micro, small, medium and large, depending on the amount of total income, average value of business assets and average number of employees during the business year, determined on the date of drawing up the financial statements in the business year. In RS the classification of SMEs and micro enterprises within small enterprises is the same as in FBiH, and the difference is in the classification with regard to the amount of realised income and in the sum of the balance sheet. In specific, small/ medium enterprises are classified as legal entities that do not exceed the limit values of at least two of the following criteria on the day of preparing the financial statements

- employ less than 50 (small) and 250 (medium) people a year, and
- have an annual turnover of up to BAM 4 million (small) and 40 million (medium) and/ or whose annual balance sheet does not exceed BAM 8 million (small) and 20 million (medium).

The private sector in BiH is poorly developed. Its share of the country's gross domestic product (hereinafter: GDP) is only 65% and it is the lowest in the region (Council of Ministers BiH, 2019). In BiH, SMEs represented around 99% of all enterprises (out of 31,435 actives, with 90% employing less than 10 people) in the non-financial sector in 2015 (UNDP, 2020). Moreover, SMEs in BiH are major contributors to job creation and inclusive economic growth, by participating with over 60% in the overall employment and creating over 60% of the GDP (EU Info Center, 2017). Accordingly, their importance for the economy of BiH as every other country cannot be neglected.

Still, there is no single definition of SMEs in BiH, and the entity laws define and regulate this area in different ways. Moreover, there is no single database on SMEs (central register of companies) in BiH. In particular, one of the main challenges of strategic planning in the sector of SMEs in BiH is the lack of reliable and high-quality statistical database regarding SMEs.

One of the challenges of the entrepreneurship sector is the low level of investment in R&D, which has a significant impact on the competitiveness of the BiH R&D community in the international sphere. The R&D expenditure per inhabitant in 2018 was EUR 10 in BiH, while the EU-27 the average was EUR 662 (Eurostat, 2020). Moreover, the gross expenditure on R&D as a percent of the GDP in 2020 remains the same as in 2017 when it was 0.21% (UNESCO Institute for Statistics, 2020). In 2021, the intended budget for R&D by the business sector in BiH was 7% (Agency for Statistics of BiH, 2022). Moreover, the number of patent applications submitted to the Institute for Intellectual Property of BiH in 2022 was 52 (37 resident and 15 non-resident applications) which is a decrease for 14.8% compared to 2021 (Agency for Statistics of BiH, 2023a).

Furthermore, the overall productivity of SMEs appears to be lower than the EU average. Most of the difference in productivity remains unexplained and the lower level of digitalisation of SMEs may play a crucial role. Average SMEs' productivity, measured as value added per person employed, is EUR 13,950 in BiH which is less than a third of the EU average of EUR 42,700. The lower productivity of BiH SMEs may be partly explained by the sectoral mix. The dominant SMEs employment is within the wholesale and retail trade which contributed most to SMEs value added in the 'non-financial business economy' of BiH. In particular, wholesale and retail trade sector generate a share of 30.9% in total SMEs employment, and with 32.9% in total SMEs value added. Furthermore, the manufacturing sector, as the second most important sector for SMEs in BiH, is generating slightly lower shares of 26.3% in total SMEs value added and 28.6% in total SME employment. However, most of the difference in productivity remains unexplained and the lower level of digitalisation of BiH SMEs may play a crucial role. (SBA Fact Sheet, 2019)

E-commerce makes 10 to 15% of total retail sales in the EU. Yet it influences a much greater share (up to 50%) of the consumer journey, which nowadays includes a mixture of physical and online. Almost every second buyer in retail uses online channels for some part of the purchase. As the E-Commerce report states, Balkan countries take the last positions in the sales charts (Lone, Harboul and Weltevreden, 2021). Moreover, Western Balkan companies are still using the Internet in traditional fashion, mostly for communication and advertising and less so for e- trade. The Balkan barometer report from 2022 underlines that despite widespread internet usage, not much of companies' sales in the region is generated online: 38% of respondents said sales of less than 5% was generated online, which is a striking decline compared to a year ago, likely driven by the easement of the COVID-19 restrictive measures. The usage of e-banking continued to grow over the past year. Innovative dynamism has not seen much of a change as businesses continue to rely on their own strengths in terms of both capacity and financing. (Regional Cooperation Council, 2022)

In accordance with Kemp (2021), BiH had over 2.3 million internet users in 2021 and the internet penetration stood at 95.99% (Regulatory Agency for Communications of BiH, 2021). The most common goods ordered online in 2020, were clothing, footwear or accessories followed by household goods, furniture and utensils (Agency for Statistics of BiH, 2022). Furthermore, in 2021, there were 1.8 million social media users in BiH, which is equivalent to 55.0% of the total population in 2021 (Kemp, 2021).

According to the Agency for statistics in BiH, 76.5% of medium-sized enterprises and 57.8% of small enterprises have a website, while 16.4% of medium-sized enterprises and 6.1% of small enterprises are using cloud computing services. Moreover, the survey showed that 17.2% of enterprises in BiH use interconnected devices or systems that can be monitored or remotely controlled via the Internet. (Agency for Statistics BiH, 2021)

Additionally, when it comes to the institutional framework, the competent institutions for entrepreneurship development in BiH are the Ministry for Foreign Trade and Economic Relations in BiH (hereinafter: MoFTER), the Federal Ministry of Development,

Entrepreneurship and Crafts (hereinafter: MRPO), and the Ministry of Economy and Entrepreneurship of RS (hereinafter: MEE). Moreover, at the lower, cantonal level in FBiH, there are cantonal ministries for economy responsible for the entrepreneurship sector.

As a consequence of the complex administrative structure of BiH, fragmentation on science and innovation policy formulation and implementation among entity-level institutions is also present. Complicated bureaucratic procedures such as company registration and obtaining business licenses creates one of the major issues in BiH business environment which are preventing entrepreneurial activities (Džafić and Omerbašić, 2018). Strategic approach to innovation and financial resources that would facilitate the launch of a new business are highly needed (Džafić, 2015). When speaking about financing, besides being quite limited, it is also decentralised between the two entities. Due to lack of funds, innovation and entrepreneurship (hereinafter: I&E) is depending on the international organisation and donor communities that are providing substantial support through activities that are focused on provision of direct support to enterprises and entrepreneurs (Aridi and Ong Lopez, 2019). In addition, coordination between entities is still weak and inefficient.

The Global Innovation Index (hereinafter: GII) (WIPO, 2023) provides detailed metrics about innovation performance of 132 countries and explores a broad vision of innovation, including business sophistication. According to the GII 2023, BiH ranks as 77th (the 2022 rank was 70) out of 132 countries in terms of innovation performance. Among the analysed categories for BiH, market sophistication has the highest rank of 27, while business sophistication has the lowest rank of 106.

One of the key tools for boosting private sector productivity growth is investment in I&E, whereby existing firms are enabled to introduce new products and processes and new entrepreneurs are highly encouraged to enter the market (Aridi and Ong Lopez, 2019). In 2018, 56% of companies in BiH mentioned introducing new or improved products or services in the last three years (Regional Cooperation Council, 2018). Further, there is a rather high share of companies in BiH that are using technology which is licensed from foreign companies or the firms with internationally recognised quality certificates in BiH (World Bank, 2021). Even though there is quite high level of demand for innovation among firms in BiH, country tends to export low skill or low technology products which can be found in traditional or resource-based industries.

Also, when analysing investments in innovation, country is again a low performer in comparison to neighbouring countries. Namely, BiH has the lowest gross expenditure in R&D intensity among peers at 0.2% of GDP (UNESCO, 2016). Also, business investment in R&D is limited (29% of the total expenditure), compared to 69% in Slovenia and 47% in Croatia (Aridi and Ong Lopez, 2019). Further, BiH are a transition country that has still not adequately organised the development concept of SMEs. In BiH there is an entrepreneurial initiative but without significant government support in the realisation of business ideas of potential entrepreneurs or the implementation of innovative ideas, even though success of

those ideas bring benefits to the whole society and country as well (Džafić and Omerbašić, 2018).

Moreover, literature on innovation in SMEs on territory of BiH is quite limited however there are few studies that can serve as a solid ground for further research in this area. One of them is study on the effects of innovations in the operations of emerging SMEs in BiH and their impact on the growth of market share and increase of the total revenue conducted by Džafić and Omerbašić (2018). In their study authors analysed 200 manufacturing firms in BiH. Authors analysed three categories: process innovation, product innovation and innovative organisational culture. Findings of the empirical analysis showed that innovation has a positive impact on the growth and development of small and medium-sized manufacturing enterprises in BiH. Likewise, investments in innovation proved to have a positive impact on the firm's sales revenue and profitability. Further, authors noted that past experience and practice show that business performance and development of SMEs directly depend on the support provided by the state.

However, it is not always about the government support to innovation, administrative barriers, lack of innovation policies etc. One successful mode for companies to acquire and maintain their competitive advantages is through stimulated innovation and innovative work behaviour (Knezović and Drkić, 2021). In order to facilitate innovation, it is important to invest in human capital and promote an innovative culture within the organisation. Led by this idea, Kenzović and Drkić (2020) in their paper investigated the determinants of innovative work behaviour by examining the moderating role of transformational leadership in the context of SMEs. Sample included 371 employees from BiH SMEs, and authors employed hierarchical regression for empirical part of the research. Findings of the study imply that that if employees are being psychologically empowered, they are more likely to engage in change processes. Furthermore, if the organisation allows for employees to propose new ideas, solutions and make decisions it has a positive impact on their innovative behaviour.

As it may be noticed from the studied literature, although innovation is not the major focus of SMEs in BiH, this issue is central to a vast of research in many countries. Due a lack of systematic monitoring of the innovation system in BiH, there is no evidence about its innovation actors and their routines, patterns and issues. Additionally, the major difficulty in defining and implementing an effective strategy and encouraging entrepreneurial development, is the lack of reliable statistics on the number of SMEs. In the context of SMEs innovation process, there are many determinants of innovation, and their identification is a critical success factor.

3.2. Bibliometric mapping

As innovation is of great importance for strengthening of SMEs, Van Oorschot, Hofman and Halman (2018) explain that it is crucial to evolve a comprehensive understanding of the

research field and its topics. Bibliometric analysis is used, according to Albort-Morant *et al*. (2017), to evaluate key field research and identify the most improvements in the literature. A comprehensive bibliometric mapping is undertaken to navigate the scholarly landscape pertaining to innovation behaviour within SMEs. This bibliometric analysis serves to trace the historical trajectory of the field, discerning noteworthy trends, seminal works, and influential contributors. Through this systematic examination of the literature, an in-depth appreciation of the historical underpinnings of innovation behaviour studies in SMEs is achieved, alongside the identification of the evolving contours of academic interest. In particular, this sub-chapter employs bibliometric mapping to analyse and answer the research question regarding the main research trends in the field of SME innovation behaviour determinants. Moreover, bibliometric analysis was used with the aim to offer comprehensive knowledge of the research studies on SME innovation behaviour and SME performance.

As it was noticed before, previous studies have merely provided a limited understanding of the entire innovation process in enterprise (Lowe, 1995). SMEs usually regard innovation as a process of high risk and with uncertain earnings. Innovation is a contested and frequently misrepresented term due to the fact that various factors, in different sectors, can influence the innovation process (Pachouri and Sharma, 2016; Hossain, 2015). Some consider it as a varying creative action, others solely refer it as a process of idea creation. In a vast number of research, innovation is limited to the development of new products. Furthermore, a small number of studies performed bibliometric mapping of the SME innovation field, which is why contemporary literature lacks an inclusive comprehension of SMEs innovation. Therefore, the main purpose of this analysis is to broaden the understanding of SMEs innovation drivers.

Consequently, the purpose of this bibliometric analysis will be achieved by addressing two main research questions, namely: What are the research themes/ trends within the SMEs innovation field?, and What is the contemporary state of the art of SMEs innovation research?. In addition to the second research questions other sub-questions are defined, as follows: What is the annual publications frequency?; What authors and journals have the most considerable citation impact in the SMEs innovation field?; Which countries lead in research on this?; What are the most cited studies in this field?.

The ultimate goal of this section is to build solid foundations for future empirical research on the role of SME innovation behaviour for SMEs business performance. Accordingly, this analysis will contribute to summarising and mapping the scientific field of innovation in SMEs and identifying the research trends by using bibliographic mapping. Furthermore, as SMEs include different sectors, this analysis integrates the splintered research field. It offers new insights into the dynamic nature of SMEs innovation behaviour while capturing all the aspects which were earlier neglected.

Throughout the bibliometric analysis the academic landscape will be created. The search process and the search string development is explained, after which the search results are

used for the bibliometric analysis. Bibliometric analysis was performed on all studies identified by following the selected search strategy since they all fall into the research field of interest (Vošner *et al*., 2016). On the other hand, primary studies have been singled out to offer answers to the research questions set. The VOS viewer software was used to present different characteristics of the research field, to analyse the bibliometric data, create maps, and to visualise the results.

Particularly, several latest studies have used bibliometric mapping to determine and analyse large amount of information and to identify patterns of research made on a specific topic (Tavares Silva and Teixeira, 2009). According to Odriozola-Fernández, Berbegal-Mirabent and Merigó-Lindahl (2019) bibliometric analysis examines the bibliographic data quantitatively, thus offering an overview of some research field in accordance with adequate indicators. The main indicators which this approach uses to identify top trends, include the publications number, the citations number, most relevant authors, and most influential research institutions and countries (Al-Hanakta *et al*., 2021).

As a first step of the analysis, the search strategy was defined within the WoS database. Moreover, WoS is one of the most used and most reliable databases for bibliometric mapping, due to the fact that it does not display any bias to specific publishers and assures the incorporation of the most relevant journals (Falagas *et al*., 2008; Leydesdorff *et al*., 2013; Rafols, 2016).

In order to identify the eligible articles for this review, the WoS was searched in January 2022, but the data was also updated on the 14th of November 2023 with the aim to present the most recent overview. The search strategy included the term (innov*) which was searched in the title together with the terms for the SMEs: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies) and the terms behaviour OR behaviour which were searched in the topic, abstract and as keywords. ((TITLE: (innov*) AND TOPIC: (behaviour OR behaviour) AND TITLE: ("small and medium enterprise*" OR SME* OR firm OR enterprise* OR company OR companies); Refined by: DOCUMENT TYPES=(ARTICLE); Timespan=All years. Indexes=SCI-EXPANDED, SSCI, A&HCI, ESCI). This search for this string resulted in a total of 1,051 articles with the h-index of 85, an average citation per item of 28.35, and the sum of times cited is 29,791. The trend of publishing and citation is upward all the time.

The number of publications over time or the growth trend are one of the most relevant factors, as of how much a scholar is interested in a specific topic, and as an expansion indicator of the field of research (Ahmed and Huang, 2019; Hernández-Torrano and Ibrayeva, 2020; Udomsap and Hallinger, 2020; Xie, Zhang and Duan, 2020). Figure in Appendix A6 presents the number of published articles on SME innovation behaviour in the period of 1994-2023. It may be noticed that there is an increasing trend of researchers in SME innovation behaviour, especially during the last 13 years. Moreover, it may be concluded that this tendency of increase will also continue in the future.

Table 7 Top 10 most productive authors

Authors	Record Count	% Of 1,051
Liao ZJ	9	0.856
Liu Y	8	0.761
De Massis A	7	0.666
Khan A	5	0.476
Wang T	5	0.476
Wang Y	5	0.476
Zhang J	5	0.476
Zhang Y	5	0.476
Akgun AE	4	0.381
Chen Y	4	0.381

Source: Author's work based on data retrieved from Clarivate Analytics

Table 7 outlines the most productive authors in accordance with the number of published articles on SME innovation behaviour. It may be noticed that Liao ZJ is the most productive author in the field, who has published nine articles on the topics of SME innovation. Meanwhile, on the second and third place, there are Liu Y and De Massis A who published eight and seven studies, respectively.

Table 8 Top 10 journals in accordance with number of published articles

Publication Titles	Record Count	% of 1,051
SUSTAINABILITY	75	7.136
JOURNAL OF CLEANER PRODUCTION	29	2.759
RESEARCH POLICY	29	2.759
FRONTIERS IN PSYCHOLOGY	25	2.379
EUROPEAN JOURNAL OF INNOVATION MANAGEMENT	21	1.998
TECHNOLOGY ANALYSIS STRATEGIC MANAGEMENT	21	1.998
JOURNAL OF BUSINESS RESEARCH	18	1.713
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	18	1.713
SMALL BUSINESS ECONOMICS	15	1.427
BUSINESS STRATEGY AND THE ENVIRONMENT	14	1.332

Source: Author's work based on data retrieved from Clarivate Analytics

It may be noticed in Table 8 that Sustainability is the most frequent source of the analysed field with 75 published articles. Moreover, two also popular journals are Journal of Cleaner Production and Research Policy with 29 articles, each.

Table 9 Top 10 countries in accordance with number of published articles

Countries/Regions	Record Count	% of 1,051
PEOPLES R CHINA	344	32.731
USA	127	12.084
SPAIN	94	8.944
ITALY	85	8.088
ENGLAND	79	7.517
GERMANY	57	5.423

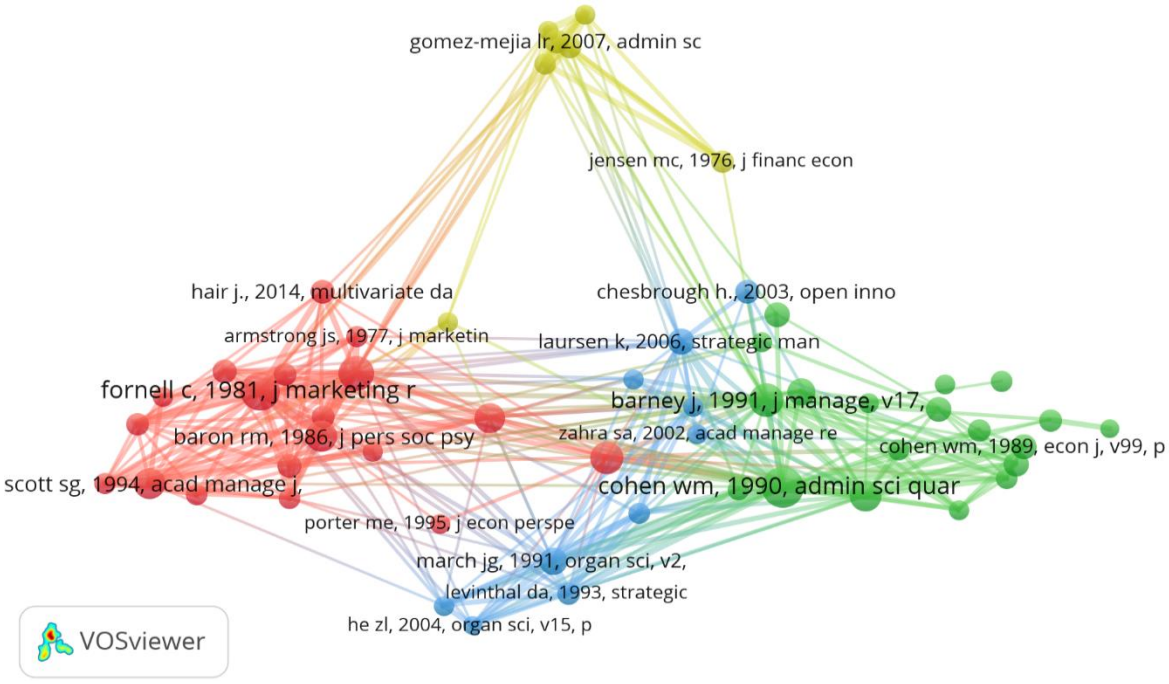
AUSTRALIA	42	3.996
FRANCE	42	3.996
PAKISTAN	35	3.330
NETHERLANDS	32	3.045

Source: Author's work based on data retrieved from Clarivate Analytics

The indicator of countries which contribute most to the field and their social networks represent the basic focus of the study (Peng, Zhu and Wu, 2020; Veloutsou and Mafe, 2020; Zou *et al*., 2019). The 10 leading countries in regard to the number of published articles in the field of SME innovation behaviour are presented in Table 9. The researchers from the People's Republic of China have been most productive in this field, and 344 articles or 32% of all articles on SME innovation behaviour are coming from this country. Furthermore, significant research in this field has been made in USA and Spain, where 12% and 9%, respectively, of all articles were published.

The citation network of studies was described using co-citation analysis. During the analysis, as Albort-Morant *et al*. (2017) explain, key studies have been identified that are often cited with other articles. Figure 1 presents the citation map in which each circle represents an article, and the circle size stands for the number of times that the article was cited (Vošner *et al*., 2016).

Figure 1 Co-citation map



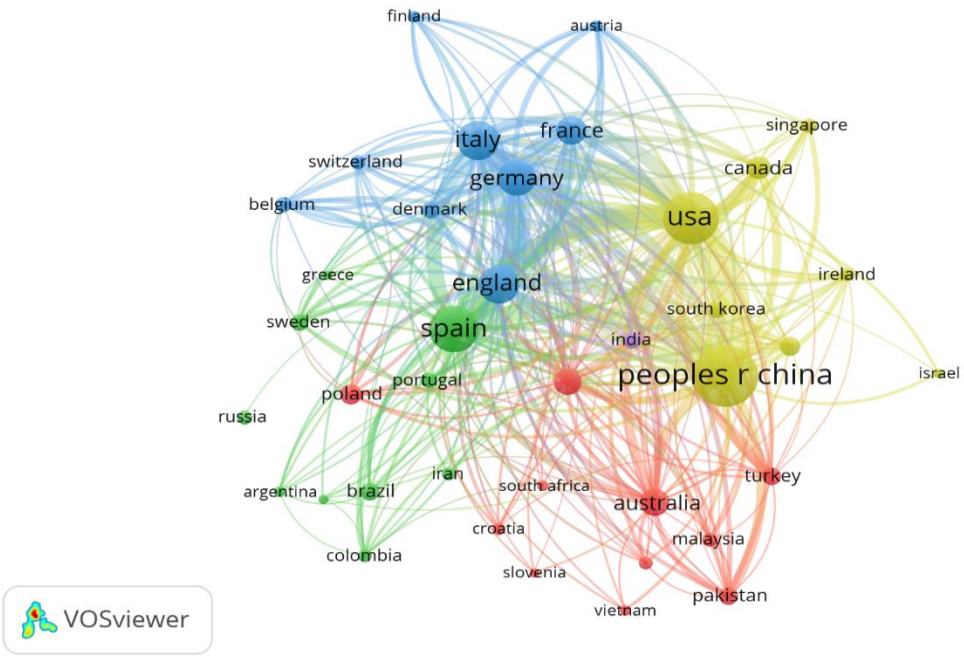
Source: Authors' work.

The colours on Figure 1 map correspond to the four clusters of studies that intermittently cited each other. The first, red cluster, presents studies that mainly deal with methodology, mostly through a quantitative approach to research (Fornell and Larcker, 1981). The second, green cluster, presents studies that deal with sustained comparative advantage (as Barney,

1991) and the innovation (Cohen and Levinthal, 1990). Third, the blue cluster presents the studies that address the open innovation (Chesbrough, 2006; Laursen and Salter, 2006) and the organisational learning (Levinthal and March, 1993). Fourth, the yellow cluster consists of studies dealing with behavioural theory (Gómez-mejía *et al*., 2007) and managerial behaviour (Jensen and Meckling, 1976).

Following Sakata et al., (2013), in order to present the geographical allocation of knowledge, the bibliometric coupling was used. The network of countries on Figure 2 consists of five clusters. The most productive country is People's Republic of China from the yellow cluster. The second most productive country is USA which is also in the yellow cluster. From the green cluster, the most productive country is Spain. The most productive countries from the blue cluster are England, Italy and Germany, from the red cluster, Australia, and India in the purple one.

Figure 2 Bibliometric coupling of countries



Source: Authors' work.

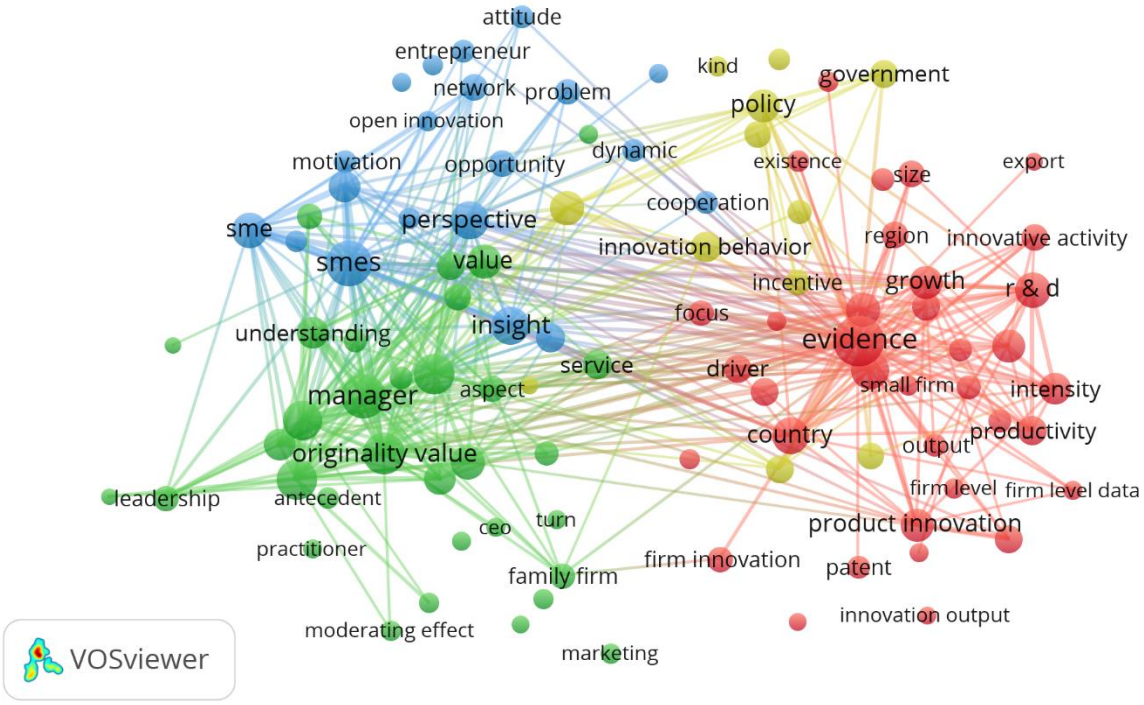
To achieve an even deeper insight in the field of interest, the keywords analysis is of extreme importance as the keywords represent the publications´ context (Al-Hanakta et al., 2021). The keywords indicate the top topics of the field, and their network represents the keywords and topics collaboration.

Figure 3 presents the co-occurrence map, which displays the main keywords in the articles. Those terms that co-occur very often are visualised more closely and are the same colour. The size of the circle displays the relevance and weight of the keyword, whereas the line weight indicates the link strength. The minimum number of co-occurrences of the terms for the co-occurrence map is set to 10. The most common terms are evidence (128), SMEs (105), manager (97), and employee (83).

The identified 101 terms were grouped into 4 clusters. By conducting a comprehensive analysis of the terms belonging to a particular cluster, we made the following conclusions:

- Cluster 1 (red - 36 terms) is based on the terms evidence and innovation activity followed by investment, R&D, product innovation, productivity, which led to naming this cluster “innovation capability (internal aspects)”.
- Cluster 2 (green - 33 terms) revolves around terms manager, organisation, originality value, followed by employee, CEO, leadership, practical implication. Based on the analysis and the logic of relationships between the key concepts, this cluster is labelled as “entrepreneurship”.
- Cluster 3 (blue - 20 terms) revolves around terms SMEs, perspective, insight, entrepreneur followed by motivation, dynamic, opportunity, attitude, network. Based on a detailed analysis of the related concepts and their conceptual connection, this cluster was named as “individual capabilities (internal capabilities)”.
- Finally, cluster 4 (yellow - 12 terms) revolves around terms policy, government, mechanism, followed by competition, incentive, competitiveness, sustainable development. The analysis of the connection between these concepts resulted in naming this cluster “environment (external factors)”.

Figure 3 Co-occurrence map



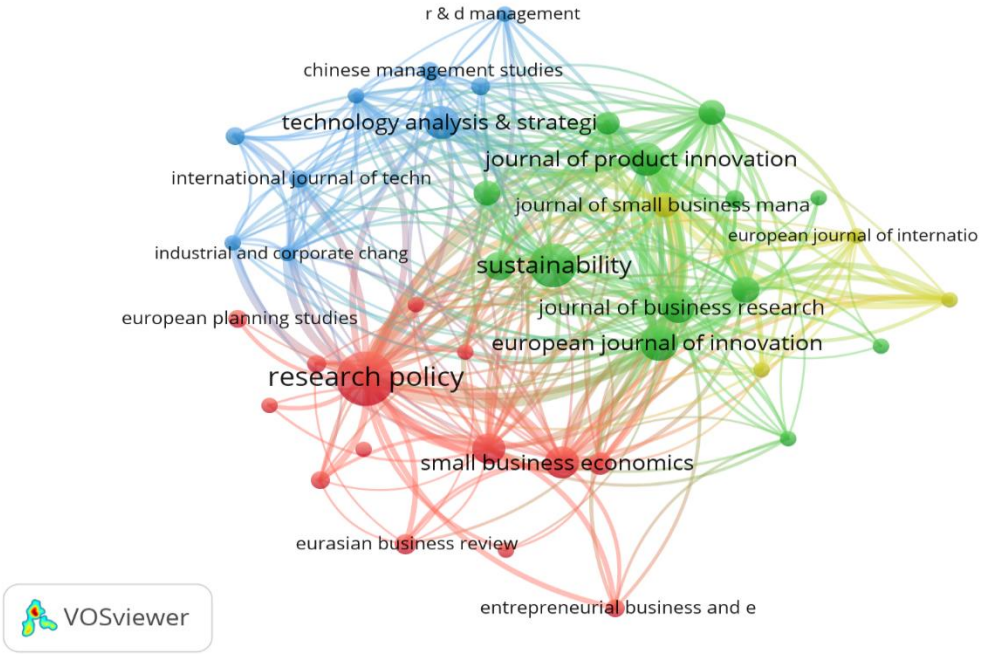
Source: Authors' work.

Interestingly, the results clustered the most common keywords of the identified research field into four main topics, which can be claimed to represent the research landscape of innovation drivers: development of the organisation's innovative capacity, entrepreneurship, individual

capabilities that underpin the innovative capacity, and environment. The four identified topics represent the logical condense of innovation drivers research landscape.

Specifically, the importance of the company's internal dynamic capabilities with the aim of developing innovation capacities has long been recognised in the literature (Brand et al., 2019). Besides, the dynamism of the environment is a significant predictor and moderator of innovation activities. Accordingly, entrepreneurship as a crucial topic for the SMEs sector, has become especially interesting for researchers in the field of innovation (Baron and Tang, 2011).

Figure 4 Bibliometric coupling of sources



Source: Authors' work.

The most cited journals are presented in Figure 4. It may be noticed that the top three journals in the mapped field are the Research Policy, Sustainability and European Journal of Innovation.

3.3. Systematic literature review

Building upon the insights gleaned from bibliometric mapping, the ensuing subsection engages in an exhaustive SLR. Through rigorous scrutiny of prior research endeavours, a synthesis of pertinent knowledge is generated. This segment acts as the bridge between historical trends and contemporary advancements in SME innovation behaviour. By aggregating and synthesising previous research findings, recurring themes, gaps, and areas of convergence or divergence in the literature are identified. These insights not only inform the construction of the conceptual model, but also guide the formulation of research inquiries, hypotheses, and data collection strategies. In particular, the SLR was used in this

article in order to identify and interpr*et al*l the accessible studies which analyse the determinants of innovation behaviour of SMEs and to create a conceptual model. Through this method it is possible to assess various publications and by that offer a comprehensive analysis of the topic.

As it was previously mentioned, a relatively small number of studies examined solely the nature of the SME innovation drivers, which is why contemporary literature lacks an inclusive comprehension of innovation drivers in SMEs. Therefore, the main purpose of this SLR was to broaden the understanding of SMEs innovation drivers and offer a solid input for the main research within the thesis. Consequently, this will be achieved by addressing the following research questions:

- What are the main drivers of SMEs innovation behaviour?
- What is the nature of the main SMEs innovation behaviour drivers?

When it comes to the methodology, the SLR was used in order to identify and interpr*et al*l available studies which answer the research questions set. The search process and the search string development were explained previously. Moreover, the identification of primary studies was done by following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses - PRISMA approach (Moher *et al*., 2009). In order for the studies to be included/ excluded from the review, several criteria had to be met:

- The articles should analyse the field of innovation of SMEs.
- The topic of the articles had to provide details on innovation drivers in order to be included. Additionally, eligible articles had to focus on drivers of innovation in SMEs, not only on drivers of individual innovation.
- Only empirical studies were included, and all systematic reviews were excluded to prevent duplications.
- Only studies written in English were included.
- Only the document types, which were articles and reviews, were included.

In particular, regarding the review method, firstly, the title and abstracts of all 1,051 articles were screened to determine which articles study innovation drivers in SMEs. Through this step, articles that contained search terms in the title or as a topic, but were not related to the research domain, were excluded from the review. In addition, non-English articles and duplicates were excluded. In the second step, the full text of the remaining articles (n = 198) was scanned in order to appraise if they indeed encounter the drivers of innovation behaviour in SMEs. The final stage involved going through the rest of the articles and reading their full text in order to determine if the inclusion criteria were met. The gradual method of selecting the articles, to be included in the final content analysis addressing the research questions, is presented in figure within Appendix A7 .

When it comes to some overall characteristics of the studies reviewed, just as it is the case for the general trend of the research field, the number of studies over the course of several

years has significantly increased. During the period from 1994 to 2015, only one fourth of all the studies regarding the drivers of SME innovation were published. While, in the following years, since 2016, this number rapidly increased, and the largest number of publications, 35% of total studies, were published in last three years, with the tendency for this percentage to continue increasing. Furthermore, it can be noticed that this topic is studied worldwide, but the largest number of studies were conducted in Spain, China and the USA.

Most importantly, in terms of the nature and types of drivers analysed, the reviewed studies have mentioned a large number of internal or organisational drivers of innovation in the SMEs sector. The reviewed drivers were in 93 occasions tied to the internal context, and in 28 occasions to external context.

Table 10 SLR Internal drives

Internal Driver	No. of times mentioned	%
Managerial orientation	26	28
Organisational culture	53	57
Cooperation	14	15
TOTAL	**93**	**100**

Source: Authors' calculations.

The results of the SLR, presented in Table 10, showed that the organisational culture is the most common internal driver of innovation behaviour, which was mentioned on 53 occasions in the reviewed studies. Accordingly, Imran et al. (2022), Lizarelli, de Toledo and Alliprandini (2021), and Gashema and Gao (2018), analysed the significance of fostering an open, collaborative culture that encourages risk-taking and supports leadership endorsement for innovation within SMEs. Similarly, Knezović and Drkić (2021) emphasised the importance of embracing a culture that values learning from failures, while Cao, Le and Nguyen (2022) and Yapa, Senathiraja and Kauranen (2018) highlighted the role of aligning organisational culture with strategic goals and empowering employees to drive innovation. Additionally, Wadho and Chaudhry (2018) emphasised the customer-centric aspect of culture, linking it to innovation efforts within SMEs.

Managerial orientation, which was mentioned on 26 occasions, is the second internal driver of innovation behaviour. Surya et al. (2022) and Knezović and Drkić (2021) both highlighted the influential role of managerial orientation in shaping organisational culture and fostering an environment conducive to innovation within SMEs. Similarly, Cao, Le and Nguyen (2022) emphasised the significance of managerial practices that empower employees, while Wadho and Chaudhry (2018) focused on how managerial orientation, particularly a customer-centric approach, influences culture and drives innovation within these businesses.

The final internal driver that was mentioned 14 times among the reviewed studies, was cooperation. Suh and Kim (2012), Haug et al. (2023), and Bertello et al. (2022) emphasised the importance of a cooperative organisational culture, highlighting how fostering collaboration, open communication, and teamwork significantly drives innovation within SMEs. Similarly, Annamalah et al. (2022) and Srholec (2014) focused on the crucial role of

cooperation within a culture that values diversity, inclusivity, and continuous learning, all contributing factors to stimulate innovative thinking. Additionally, Hameed and Naveed (2019) underscored how a cooperative culture directly influences the innovation process by encouraging the generation and implementation of novel ideas within these businesses.

On the other side, even though not so often analysed as internal factors, the reviewed studies have mentioned several external or contextual drivers of innovation behaviour. It may be noticed in Table 11 that the dominant external drivers which were mentioned in the articles are the government support, market orientation and technology.

Table 11 SLR External drivers

External Driver	No. of times mentioned	%
Government support	12	43
Technology	7	21
Market orientation	10	36
TOTAL	**28**	**100**

Source: Authors' calculations.

Government support was on most occasions mentioned as an important external factor influencing innovation behaviour of SMEs, in particular 12 times during this review. Kweh et al. (2019), Handoko, Smith and Burvill (2014), Doh and Kim (2014), and Liu (2021) collectively explore the interplay between government support or legislation and its influence on shaping an innovation-oriented culture within SMEs, emphasising the pivotal role of policies in incentivising risk-taking, fostering adaptability, and providing resources to nurture creativity and collaboration. In particular, Bertello et al. (2022) further explore this relationship by emphasising the role of government support in creating an ecosystem that encourages open communication and collaboration among SMEs, thereby nurturing a culture where innovative ideas thrive.

Furthermore, market orientation was mentioned on 10 occasions. D'souza et al. (2022), Surya et al. (2022), and Abdul-Halim et al. (2019), collectively emphasise how a culture valuing customer-centricity and aligning strategies with market needs significantly influences innovation by driving customer-driven solutions. In particular, they contribute to this discourse, underlining how a customer-oriented culture directly impacts innovation behaviour within SMEs by enabling a deep understanding of customer demands and preferences, thereby driving the development of innovative solutions.

Finally, the external influence of technology on innovative behaviour was analysed at least in the SMEs context. Yapa, Senathiraja and Kauranen (2018), Kocak, Carsrud and Oflazoglu (2017), and Haug et al. (2023) collectively underscore the pivotal role of technological advancements in embracing innovation, emphasising how a culture that fosters technological experimentation, adaptation, and continuous learning significantly influences innovation behaviour within SMEs by creating an environment conducive to technological change and knowledge-sharing.

3.4. Research questions and hypotheses

The research questions that served as the foundation for the formulation of the hypotheses and the structural model were developed using a qualitative analysis of the body of literature, while also considering the theoretical tenets of the thesis. The research questions are as follows:

- Whether and in what way does government support influence innovative behaviour of SMEs?
- Whether and in what way does cooperation influence innovative behaviour of SMEs?
- Whether and in what way does technology orientation influence innovative behaviour of SMEs?
- Whether and in what way does managerial orientation influence innovative behaviour of SMEs?
- Whether and in what way does organisational IO culture influence innovative behaviour of SMEs?
- Whether and in what way does market orientation influence innovative behaviour of SMEs?
- Whether and in what way does SMEs innovative behaviour influence business performance?

Accordingly, the hypotheses that make up the conceptual model of the thesis were identified based on theoretical and empirical findings of the previous SLR, and as answers to the beforementioned research questions. The research hypotheses are as follows:

H1: Government support influences innovative behaviour of SMEs

H2: Cooperation influences innovative behaviour of SMEs

H3: Technology orientation influences innovative behaviour of SMEs

H4: Managerial orientation influences innovative behaviour of SMEs

H5: Organisational IO culture influences innovative behaviour of SMEs

H6: Market orientation influences innovative behaviour of SMEs

H7: Innovative behaviour of SMEs influences business performance

Moreover, the model will be extended in three cases. Firstly, in case of the extended conceptual model with an estimation of the basic model using aggregate variables, where the impacts of its individual dimensions will be examined rather than using business performance as a second-order measuring scale. Secondly, apart from the basic model, another model that will be tested in this dissertation, is a model extended with control

variables (size and export orientation). Finally, in the form of indirect effect analysis, the extended mediation model is suggested as follows:

H8: Innovative behaviour mediates the relationship between determinants of innovative behaviour and business performance.

H8a: Innovative behaviour mediates the relationship between government support and business performance.

H8b: Innovative behaviour mediates the relationship between cooperation and business performance.

H8c: Innovative behaviour mediates the relationship between technology orientation and business performance.

H8d: Innovative behaviour mediates the relationship between managerial orientation and business performance.

H8e: Innovative behaviour mediates the relationship between organisational IO culture and business performance.

H8f: Innovative behaviour mediates the relationship between market orientation and business performance.

3.5. Conceptual model

The conceptual model employed in this research represents a synthesis of established theories, frameworks, and prior research findings. It outlines the key constructs and their interrelationships, providing a structured foundation for the hypotheses to be tested. This model is not only informed by the existing literature, but also tailored to the unique focus, contextual characteristics, and objectives of the thesis.

By conducting searches across reference and pertinent databases, a compilation of articles, books, and research materials was amassed. This compilation served as the foundation for a SLR and analysis of works, focusing on the relationships and causal links among the researched constructs. The primary takeaway from this review is that constructs such as government support, cooperation, technology orientation, organisational IO culture, managerial orientation, and market orientation exert an indirect influence on business performance. Specifically, these factors impact the innovative behaviour of the company, leading to increased innovation and, ultimately, improved business performance.

Numerous scholarly works have delved into the intricate relationship between government support and the innovative behaviour exhibited by SMEs. Audretsch and Lehmann (2005) posit that government support programs play a pivotal role in nurturing innovation within SMEs. Their research suggests that initiatives such as grants, subsidies, and educational

programs contribute significantly to the development of a conducive environment for innovation. Furthermore, Ayyagari, Beck and Demirguc-Kunt, (2007) have conducted extensive studies that underscore the positive correlation between access to government-sponsored financial resources and the innovation capabilities of SMEs. Their findings suggest that financial support from governmental bodies not only aids in overcoming resource constraints but also acts as a catalyst for fostering a culture of innovation within these enterprises. In a more recent context, studies by Najib, Abdul Rahman and Fahma (2021) provide insights into the diverse ways in which specific types of government support, such as R&D grants, can directly impact the innovation output of SMEs. Their research suggests that targeted financial assistance for R&D activities significantly enhances the innovation performance of SMEs, emphasising the importance of tailored government interventions. Moreover, the work of Carree and Thurik (2010), and Hoque (2018) offers a broader perspective by examining the role of government policies and regulations in influencing the innovative behaviour of SMEs. They argue that a supportive regulatory environment, coupled with financial incentives, creates an ecosystem where SMEs are more likely to engage in innovation activities. Accordingly, the following hypothesis is proposed:

H1: Government support influences innovative behaviour of SMEs

Furthermore, collaborative efforts play a pivotal role in fostering innovation within this business sector. The study by Rothaermel and Deeds (2006) emphasise the significance of inter-firm collaborations and strategic alliances in enhancing the innovative capabilities of SMEs. Their research suggests that cooperative arrangements provide SMEs with access to complementary resources, knowledge, and expertise, fostering a collaborative environment conducive to innovation. Building on this foundation, the work of Hagedoorn and Wang (2012) delve into the dynamic nature of cooperative relationships in innovation processes. Their findings highlight that not only do collaborative networks contribute to the generation of novel ideas, but they also play a crucial role in the diffusion and implementation of innovations within SMEs. Moreover, a more recent study by Tether and Tajar (2008) and Salavou, Baltas and Lioukas (2004) underscore the importance of both internal and external cooperation in driving innovation. Their research suggests that not only do SMEs benefit from collaborations with external partners such as suppliers, customers, and research institutions, but internal cooperation among different departments within the SME is equally instrumental in fostering a culture of innovation. The research by Inkpen and Tsang (2007) adds a global perspective to the discourse by examining the impact of international collaborations on innovation in SMEs. Their findings suggest that cross-border partnerships can provide SMEs with diverse perspectives, technological know-how, and market access, thereby significantly influencing their innovative behaviour. Accordingly, the following hypothesis is suggested:

H2: Cooperation influences innovative behaviour of SMEs

Moreover, a multitude of academic investigations have explored how the orientation towards technology intersects with the innovative tendencies displayed by SMEs. This extensive

body of research underlines the pivotal role that emphasising technology plays in nurturing innovation within the realm of SMEs. One foundational study conducted by Tushman and Nelson (1990) underscores the importance of a technology-oriented approach in enhancing the innovative capabilities of SMEs. Their research suggests that SMEs with a strong technology orientation are better positioned to adapt to technological advancements and leverage cutting-edge solutions, thereby fostering a climate conducive to innovation. Building on this premise, the work of Atuahene-Gima (2005) explores the dynamic nature of technology orientation and its impact on innovation processes within SMEs. The findings suggest that a proactive engagement with technology not only facilitates the identification of new opportunities but also enables SMEs to stay at the forefront of industry trends, driving innovative behaviour. Furthermore, a more recent study by Mahemba and Bruijn (2003) delves into the nuances of how technology orientation influences different dimensions of innovation in SMEs. Their research highlights that a technology-focused approach is linked not only to product innovation but also to process innovation and organisational innovation, indicating a multifaceted impact on the overall innovative behaviour of SMEs. The research by Bharadwaj, Varadarajan and Fahy (1993) adds a strategic perspective to the discourse by emphasising the role of technology orientation in shaping the competitive advantage of SMEs. Their findings suggest that a strategic alignment with technology not only drives innovation but also enhances the overall competitiveness and sustainability of SMEs in the market. Additionally, the work of Teece (2007) further supports this perspective by discussing how dynamic capabilities, including a technology-oriented focus, contribute to sustained competitive advantage in rapidly changing environments. Accordingly, the following hypothesis is suggested:

H3: Technology orientation influences innovative behaviour of SMEs

A substantial body of research has delved into the structured relationship between managerial orientation and the innovative behaviour exhibited by SMEs. Notably, Covin and Slevin (1989) and later Entrialgo (2002) conducted research highlighting the influential role of top management in shaping an organisation's strategic orientation, thereby exerting a profound impact on its innovative pursuits. Their findings emphasise the pivotal connection between managerial decisions and the innovative trajectory of SMEs. Expanding on this foundation, Miller's (1992) work further underscores the significance of managerial preferences and decision-making styles in influencing a firm's approach to innovation. This implies that the attitudes and orientations of SME managers, especially those at the helm of decision-making processes, play a crucial role in shaping the overall innovative behaviour of the organisation. Additionally, Dess and Beard (1984), and Gashema and Gao (2018) delve into the concept of entrepreneurial orientation, encapsulating managerial attitudes toward innovation, risk-taking, and proactiveness. Their research suggests that SMEs with a higher level of entrepreneurial orientation tend to exhibit a more proactive and innovative stance, positioning themselves at the forefront of dynamic and competitive market environments. Furthermore, the research by Hambrick (1989) introduces the upper echelons theory, emphasising that the experiences, values, and personalities of top managers

significantly influence strategic choices and, consequently, the innovative direction of the organisation. This perspective provides valuable insights into how the managerial orientation of SME leaders can shape the overall innovative culture within the firm. Accordingly, the following hypothesis is suggested:

H4: Managerial orientation influences innovative behaviour of SMEs

When it comes to the organisational IO culture, pioneering studies, such as that by Denison, Haaland and Goelzer (2004), assert that organisational IO culture, encompassing shared values, beliefs, and practices within an organisation, significantly influences its ability to foster innovation. The mentioned research highlights the role of a positive and adaptive culture in stimulating creative thinking and innovative initiatives within SMEs. Building upon this foundation, the work of Schein (1992) further emphasises the importance of organisational culture in shaping the innovation landscape of SMEs and encouraging employees to experiment with new ideas, ultimately contributing to the overall innovative behaviour of the organisation. Additionally, the research by Cameron (2008) suggests that organisations fostering a culture that combines flexibility, collaboration, and a focus on long-term goals are more likely to exhibit innovative behaviour. This underscores the idea that specific cultural attributes can significantly impact the innovative capabilities of SMEs. Moreover, the study conducted by Chatman and O'Reilly (2016) explores the concept of "organisational climate," which is closely related to culture, and how it influences innovation. Their findings indicate that a positive and supportive organisational climate enhances employees' willingness to engage in innovative activities, thus contributing to the innovative behaviour of SMEs. In the more recent context, the articles by Al-Ansari, Xu and Pervan (2014); Kenny and Reedy (2006), Sokro (2012), Chandler, Keller and Lyon (2000), and Khazanchi *et al*. (2007) collectively contribute valuable insights into the relationship between an organisational IO culture, motivation, and performance. Sokro's (2012) analysis delves into the intricate dynamics of organisational culture, motivation, and performance. Although the focus is broader, the findings likely underscore the interconnectedness of these factors. An IO culture, as an integral aspect of organisational culture, is expected to be a key contributor to both employee motivation and overall organisational performance. Chandler, Keller and Lyon (2000) exploration provides a focused examination of the determinants and consequences of an organisational IO culture. The article likely clarifies on specific elements within the organisational culture that foster innovation and explores how these contribute to improved performance outcomes. Understanding the determinants and consequences of such a culture is crucial for comprehending the mechanisms through which it influences innovation and, subsequently, organisational performance. Khazanchi, Lewis and Boyer (2007) study takes a nuanced approach by specifically examining the impact of organisational values on process innovation. This likely provides insights into how the core values embedded in an innovation- supportive culture contribute to the innovation process. By linking organisational values to process innovation, the study likely unveils the practical implications of fostering a culture that actively supports and values innovation. Accordingly, the following hypothesis is suggested:

H5: Organisational IO culture influences innovative behaviour of SMEs

In terms of the relationship between market orientation and the innovative behaviour, the research conducted by Slater and Narver (2000), emphasises the pivotal role of market orientation in shaping a firm's approach to understanding and responding to customer needs. Their findings suggest that SMEs with a strong market orientation are better equipped to identify market opportunities and align their innovative efforts with customer demands. Expanding upon this foundational work, Kohli and Jaworski (1990) contribute to the understanding of market orientation by introducing a framework that encompasses three key components: customer orientation, competitor orientation, and inter-functional coordination. Their research highlights that SMEs exhibiting a holistic market orientation, incorporating these components, are more likely to engage in innovative activities driven by a thorough understanding of market dynamics. Additionally, Slater and Narver (1995) provide further insights into the dynamics of market orientation by examining its impact on organisational culture. Their findings suggest that a market-oriented culture, which values customer information and encourages a proactive approach to market understanding, positively influences the innovative behaviour of SMEs. Furthermore, the study by Jaworski and Kohli (1993) explores the relationship between market orientation and innovation from the perspective of information processing. Their research indicates that a market-oriented approach enhances the organisation's ability to collect, disseminate, and respond to market information, thereby facilitating innovative behaviour within SMEs. Moreover, research by Berthon, Hulbert and Pitt (1999) builds on this foundation, highlighting the dynamic nature of market orientation and its impact on SMEs' innovative endeavours. Their findings suggest that a market-oriented approach not only involves customer responsiveness but also encompasses strategic flexibility and an outward-looking mindset, crucial factors influencing the innovative behaviour of SMEs. Expanding the discussion, Zhou, Yim and Tse (2005) contribute valuable insights by examining the link between market orientation and innovation in the context of competitive environments. Their research emphasises that SMEs operating in highly competitive markets benefit significantly from a strong market orientation, as it enhances their ability to identify and capitalize on innovative opportunities. Furthermore, recent studies such as that by Kirca, Jayachandran and Bearden (2005) delve into the global aspects of market orientation. Their research suggests that SMEs with a global market orientation, characterised by an awareness of international market trends and a proactive approach to global competition, are more likely to exhibit innovative behaviour. Considering the evolving landscape of technology and information processing, Li *et al*. (2008) provides insights into the role of market orientation in the digital age. Their findings indicate that a technology-enabled market orientation, leveraging digital tools for customer understanding and market responsiveness, is becoming increasingly crucial for SMEs to stay innovative in the contemporary business environment. Accordingly, the following hypothesis is suggested:

H6: Market orientation influences innovative behaviour of SMEs

A significant body of scholarly research has thoroughly examined and found out that innovative behaviour within SMEs significantly influences their overall business performance. Classic research, such as that by Damanpour (1991), has laid the groundwork by establishing a positive correlation between innovation and organisational performance. Damanpour's work emphasises that SMEs actively engaging in innovative activities are more likely to experience enhanced business performance due to their ability to adapt to changing market conditions and gain a competitive edge. Furthermore, innovation was acknowledged as one of the fundamental presumptions of the company's superior commercial performance and competitive advantage (Hurley and Hult, 1998). Building upon this foundational research, the study conducted by Roper and Love (2002) provides additional insights into the various dimensions of innovation and their impact on SMEs. Their research suggests that not only does product innovation contribute to improved business performance, but process innovation and organisational innovation also play crucial roles in shaping the overall effectiveness and competitiveness of SMEs. Moreover, a more recent examination by Tidd and Bessant (2020) considers the dynamic nature of innovation in the contemporary business landscape. Their findings underscore the importance of fostering a culture of continuous innovation within SMEs, as this positively correlates with sustained business performance. The study highlights that SMEs adapting to a rapidly changing environment through ongoing innovative initiatives are more likely to achieve long-term success. Furthermore, research by Tarutė and Gatautis (2014) emphasises the role of radical innovation in SMEs and its impact on business performance. Their study suggests that SMEs engaging in disruptive and transformative innovations are more likely to experience substantial improvements in business performance, especially in terms of market share and profitability. Considering the evolving landscape of technology and globalisation, the study by Laforet and Tann (2006) explores the impact of innovation on the internationalization of SMEs. Their findings suggest that innovative behaviour is a key driver for SMEs seeking to expand their market reach globally, leading to improved business performance on an international scale. Accordingly, the following hypothesis is suggested:

H7: Innovative behaviour of SMEs influences business performance

Furthermore, as it may be noticed in the literature review, research in the field of business management has extensively investigated the interplay between various factors and their impact on business performance. Scholars have also delved into the mediation role of innovative behaviour, examining how it influences the relationship between several key factors, and among them also cooperation, government support, managerial orientation, market orientation, organisational structure, and technology orientation concerning business performance. Numerous studies have highlighted the significance of innovative behaviour as a mediator within this framework (Byukusenge, Munene and Orobia, 2021; Dedahanov, Rhee and Yoon 2017; Domi, Capelleras and Musabelliu, 2020; Ng, Kee and Ramayah, 2020; Shanker *et al*., 2017; Singh *et al*., 2022; Thongsri and Chang, 2019; Widodo and Mawarto, 2020; Zafar and Mehmood, 2019). The intricate relationships among these factors and their mediation through innovative behaviour underscored the complexity of managing and

optimising business performance in a rapidly evolving landscape. The findings from these studies provided valuable insights for businesses seeking to enhance their competitiveness and adaptability in dynamic markets. Overall, the literature review indicated that there might be a significant indirect effect of several innovative behaviour determinants on business performance, which will be analysed in more detail and in several sub hypotheses. Accordingly, the following main hypothesis is suggested:

> H8. Innovative behaviour mediates the relationship between determinants of innovative behaviour and business performance.

The aforementioned constructs provide a structural model that will be evaluated in this thesis, together with the causal connections suggested in the hypotheses. Particularly, the aforementioned model will assess the following variables:

- Cooperation (COP), *independent variable*
- Technology orientation (TEH), *independent variable*
- Managerial orientation (MNG), *independent variable*
- Organisational IO culture (ORG), *independent variable*
- Market orientation (MKT), *independent variable*
- Innovative behaviour (INNO), *independent and dependent variable*
- Business performance (PERF), *dependent variable.*

Overall, the basic structural model consists of seven hypotheses, as shown in Appendix I. When considering the control variables, the basic model is expanded with two control variables, namely size and export orientation of the company. Moreover, when considering the moderating effects, the basic model is extended with hypothesis 8, and all respective sub-hypotheses for each innovative behaviour determinant.

3.6. Methodology

The methodology section encompasses the overarching approach to research design, data collection, and analysis. This research employs a mixed-methods approach, combining qualitative and quantitative research techniques to offer a comprehensive understanding of the SMEs innovative behaviour.

3.6.1. Qualitative research

As part of the qualitative research, in-depth interviews and content analysis were used, with a focus on extracting rich, contextually embedded insights from participants. To achieve the aim of the qualitative research, the input-throughput-output-based framework for examining the challenges and barriers associated with the innovation initiatives of SMEs was used. The results were saved in code memos (Mayring, 2004). Afterwards, the categories were used to summarise and contrast the aspects that the interviewees mentioned (see Appendix E1). The

Mayring (2004) methodology for qualitative content analysis was employed in this study, incorporating both inductive and deductive approaches to category construction. The investigation commenced by establishing the aggregate dimensions as fundamental categories, derived from the conceptual model, with the primary objective of enhancing construct validity, as advocated by Yin (2009). Utilising MaxQDA software, the data was subjected to inductive analysis, leading to the identification of process activities and their associated organisational requirements within the framework of these categories, as seen in Table 12. Subsequently, these findings were organised into first-order codes. Following the identification of interconnections and relationships among these categories, axial coding was conducted to systematically arrange them into second-order codes that encapsulate the intricacies of the process flows, as proposed by Corley and Gioia (2004).

Table 12 Category system of qualitative content analysis

1st Order Concepts	**2nd Order Concepts**	**Aggregate Dimensions**
– *Employee reluctance or opposition to new ideas and practices.* – *Absence of individuals or groups advocating for innovation within the organisation.* – *Bureaucratic structures that hinder communication and decision-making related to innovation.*	Organisational Culture	Internal barrieres
– *Insufficient funding or budget allocation for innovation projects.* – *A shortage of skilled employees or innovation teams.* – *Outdated or inadequate technology infrastructure.*	Resource Constraints	
– *Lack of specific objectives and key performance indicators for innovation.* – *Incompatibility between innovation goals and the overall business strategy.* – *Weak mechanisms for tracking and evaluating innovation progress.*	Lack of Innovation Strategy	
– *Unequal distribution of relevant information within the organisation.* – *Insufficient market research and customer insights.* – *Lack of awareness of emerging technologies.*	Knowledge Gaps	
– *Insufficient emphasis on fostering creativity and problem-solving skills.* – *Inadequate training programs for employees.*	Skill Deficiencies	
– *Ineffective communication channels hindering idea exchange.* – *Information trapped within departments or teams.* – *Poor knowledge-sharing practices and systems.*	Information Flow	
– *Avoiding innovative endeavors due to potential negative consequences.* – *A culture that punishes failure rather than encouraging experimentation.*	Fear of Failure	

– *Limited strategies for managing and mitigating uncertainty.* – *Lack of diversification in innovation projects to manage risk.*	Uncertainty Management	
– *Saturated markets with limited opportunities for differentiation.* – *Intense competition that discourages risk-taking.* – *Difficulty keeping up with fast-paced technological advancements.*	Market and Competitive Dynamics	External barrieres
– *High regulatory compliance costs and complexity.* – *International trade restrictions affecting innovation efforts.*	Regulatory and Legal Constraints	
– *Challenges in securing external funding or venture capital.* – *Difficulty in establishing strategic partnerships with other organisations.* – *Barriers in accessing external knowledge networks and innovation ecosystems.*	Access to External Resources	

Source: Author's work.

The deductively formulated aggregate dimensions were then aligned with the inductively derived first- and second-order codes. This methodological approach primarily aimed to construct a coherent category system, in alignment with the "Gioia Methodology" (Gioia, Corley and Hamilton, 2013), thus facilitating multiple iterations of the process to attain consistent outcomes, in accordance with the principles outlined by Yin (2009). Visual mapping served as a sense-making technique in this study, enabling the simplification of copious data into manageable units, as recommended by Langley (1999). This method was particularly apt for representing process flows, as it had the capacity to concurrently convey numerous dimensions, their constituent elements, and intricate non-linear interactions.

3.6.2. Quantitative research

Quantitative research methods were employed to quantify relationships and rigorously test hypotheses derived from the conceptual model. The choice of quantitative methods was grounded in its capacity to provide empirical validation and generalisability of findings. Positivism was used as the research philosophy, and a deductive approach to research was chosen.

In the context of this study, the adoption of positivism as the research philosophy is rooted in the assertion that objective, verifiable knowledge can be systematically obtained through empirical observation and measurement (Chia, 2002). This concurs with the epistemological underpinning of the investigation, which underscores the objective and empirical nature of knowledge. To operationalise this philosophical standpoint, a deductive research approach, in accordance with the principles expounded by Popper (2005), was selected. The deductive approach involves a methodical process that commences with the formulation of precise

hypotheses derived from existing theories and concepts, as advocated by Glaser and Strauss (2017). Subsequently, data is gathered and scrutinised to either substantiate or challenge these hypotheses, following a structured framework (Bryman, 2016). In other words, in the deductive research approach, the typical procedure initiates with a comprehensive review of the literature and an examination of existing works pertinent to the research's subject matter and its contextual relevance. It then proceeds to pinpoint the objectives and areas of deficiency within the existing knowledge and literature. In essence, this research framework builds upon pre-existing knowledge and established theories. By amalgamating positivism and deductive reasoning, this study aims to make a meaningful contribution to the body of knowledge within the chosen field and adhere to the tenets of scientific rigor (Gomm *et al*., 2000).

Regarding the data collection process, the decision was made to conduct empirical analysis by using primary data. This primary data was gathered through research conducted among SMEs in BiH, with the utilisation of close-ended questionnaire as the chosen method of data acquisition. This approach allowed to directly engage with businesses in the country and gather valuable information for the study. All statements of the measurement model were measured on a Likert scale ranging from 1 - "Absolutely not describing" to 7 - "Perfectly describing". The questionnaire comprised 15 questions pertaining to the demographic and behavioural aspects of businesses, alongside 57 statements encompassing respective eight measurement models. These measurement models and indicators were developed through a qualitative analysis of the existing literature, drawing on insights from prior empirical research.

The primary aim of the survey was to collect data that could facilitate the quantification and analysis of the drivers of innovative behaviour in SMEs. This endeavour involved a meticulous exploration of the scope and importance of each determinant, a thorough analysis of the underlying constructs that influence these determinants, and the subsequent operationalisation of the measurement models. Also, with the aim of mitigating the common method bias, in some instances, measurement scales from two different authors addressing the same theoretical concept were combined. In essence, the survey was designed not only to identify and quantify the determinants of innovative behaviour but also to delve deeply into the details of each factor. This comprehensive approach ensured that the measurement models were not only robust, but also accurately represent the multifaceted dynamics that influence innovation within SMEs. By scrutinising the scope and significance of each determinant, the survey sought to uncover the various dimensions that contribute to innovative behaviour, enabling a more holistic understanding of this crucial aspect of business operations.

In the context of quantitative analysis, the selection of data type is a pivotal decision in research methodology. It involves a meticulous process of defining the data that will be collected and subsequently determining the most appropriate means of expressing it, whether through quantitative measures, numerical values, or statistical techniques. This decision not only shapes the research approach, but also impacts the depth and breadth of insights that

can be derived, thereby playing a fundamental role in the robustness and validity of the subsequent analysis. As this research encompasses not only qualitative but also quantitative indicators, it is imperative to employ quantitative data analysis methods. This analytical approach will yield quantitative outcomes, which will then be subjected to rigorous scrutiny within the theoretical and literary discourse.

Following an in-depth qualitative analysis of the available literature and having rigorously identified the measurement models for all constructs, the research design of this dissertation adopted specific data analysis methodologies. It was determined that CFA and SEM would be the most appropriate choices for this purpose. The implementation of CFA played a crucial role in evaluating the reliability and validity of the measurement models used in this study. In particular, this process involved assessing how well the measured variables align with the theoretical constructs they were designed to represent, thereby ensuring the quality and trustworthiness of the measurement models. SEM, on the other hand, was employed to test and analyse the structural models established in the research framework. This method facilitated the exploration of intricate relationships, allowing for a more profound understanding of the interplay between variables and the overall model's structural integrity. For a more detailed exposition of the application and nuances of these methodological choices, an extensive discussion is provided in the fourth chapter, where the rationale, methodologies, and procedures are expounded upon to ensure clarity and transparency in the research process.

3.7. Measurement scale

The measurement scale employed in this research was carefully selected to ensure the validity and reliability of data collection. The indicators of the measurement models used in this thesis were taken from earlier validated empirical research, where also certain influence in structuring came from the inputs of conducted interviews. In particular, following Gerbing and Anderson (1988), the psychometric properties of the measurement models were assessed in terms of their content, nomological, discriminative, and convergent validity of the constructs. Accordingly, it is ensured that the measurement models are reliable and valid measures of the constructs they aim to measure.

Particularly, in terms of content and nomological validity, the indicators were extensively rewritten in terms of content, wording, and length to guarantee their applicability for the context and research related setting. While some indicators only required a straightforward translation from English, others needed adjustments to better capture the intended meaning. Moreover, a group of experts with a diverse background, comprising of two CEOs from the private sector and two academics, conducted a thorough review of the questionnaire's content validity before the commencement of the actual research, as documented by Yusoff (2019). This crucial step aimed to ensure that the questionnaire effectively conveys the intended meaning and substance of each variable under investigation. These seasoned professionals not only scrutinised the questionnaire but also offered valuable suggestions for

improvements. Subsequently, they were provided with the online questionnaire via email and were requested to give their feedback and opinions. The input received from these experienced individuals played an important role in refining the questionnaire. Consequently, piloting with SMEs was conducted where adaptation in line with context and research questions based on the inputs from interviews was conducted. Based on their insights, several adjustments were made, including rewording certain sentences to enhance the clarity and precision of the questionnaire's content. This meticulous process of content validation, involving the collaboration of both business leaders and academics, served to strengthen the overall quality of the study's methodology. Finally, in chapter four, CFA will be used to assess the convergent and discriminant validity.

As mentioned in *sub-chapter 3.4*, the measurement models in this thesis are Cooperation (COP); Technology orientation (TEH); Managerial orientation (MNG); Organisational IO culture (ORG); Market orientation (MKT); Innovative behaviour (INNO); and Business performance (PERF). Cooperation is a first-order construct that consists of six items. All items were grouped and adapted from Najib and Kiminami (2011) in line with the research context and the open-innovation concept. Moreover, technology orientation, managerial orientation, organisational IO culture, and market orientation are also a first-order construct that consists of five items. For technology and market orientation all items were adapted from Al-Ansaari, Bederr and Chen (2015), with one item in both constructs was adapted in line with context and research questions based on the inputs from interviews and piloting . For managerial orientation and organisational IO cultureall items were adopted from Al-Ansari, Xu and Pervan (2014). Lastly, for government support all items were adopted from Thongsri and Chang (2019) and one item added in line with the research context and questions.

While combining beforementioned measurement models, conceptual definition of each construct was considered. The consolidating of two measurement models enhances the capacity to decipher the findings for individual authors, and the possibility for the statements to eventually either align or diverge from statements pertaining to other constructs investigated in this study. This respective combining not only facilitates a more detailed understanding of the results but also opens up the possibility for deeper insights into the relationships between different constructs as explored in this research.

Moreover, innovation behaviour is a first-order construct that consists of 12 items. All of items were taken from Pervan, Al-Ansaari and Xu (2015), considering the essence and measurement of the construct, specifically focusing on the nomological validity of the employed statements. Moreover, business performance is a second-order construct that consists of three other constructs, and in total 14 items. Namely, customer satisfaction, market effectiveness and profitability. All items were taken from Vorhies and Morgan (2005) where performance was measured in relation to the main competitors. Furthermore, control variables, such as the company's size (number of employees) and export intensity, were utilised to help the model be adjusted for any unexpected circumstances.

3.8. Data collection

The data collection procedure within this thesis adheres to a systematic and ethical framework. Hence, a detailed descriptions of data collection protocols, including participant recruitment, informed consent procedures, and data recording, are provided in this sub-section. Considerations for ensuring data quality, such as intercoder reliability in qualitative analysis and data validation checks in quantitative surveys, were thoroughly addressed.

3.8.1. Qualitative data gathering

In order to choose suitable interview partners, the procedures of theoretical and purposive sampling were used for the research study (Hulla *et al*., 2021). Theoretical sampling represents an iterative process in which data gathering and data analysis alternate and the sample is not determined in advance (Birks and Mills, 2015). Data gathering and data analysis continues until theoretical saturation is reached and adding more information does not lead to additional insights (Flick, 2013). In this research, a mixture of theoretical and purposive sampling was chosen because some criteria of the case selection were determined in advance. In answering the research questions, semi-structured expert interviews were performed (Flick, 2013). For the data analysis procedure, the structured qualitative content analysis described by Mayring (2004) was used. Therefore, a coding scheme was developed and applied in the qualitative analysis.

An exploratory study was conducted to gain insight into the emerging concept of innovation in the SME context. This exploratory study approach is considered to be an acceptable investigatory method (Tellis, 1997). It helps generate an in-depth understanding based on comprehensive data regarding the research topic (Çakar and Aykol, 2021). As the aim was to understand innovation behaviour and the underlying factors driving innovation at the firm level, a case study methodology was considered appropriate for this research. According to Siau *et al*. (2004), the qualitative research method offers researchers the opportunity to analyse additional facets of the topic and provides greater depth of explanation than the quantitative method.

The interview questions addressed several primary topics related to innovation barriers in the input, throughput and output perspective. The primary data collected through interviews were recorded and transcribed, allowing accurate quotes to be collected and compared data between respondents in the data analysis. Transcripts were read thoroughly to understand how each firm engaged in innovation. After the transcripts were produced, the key points emerging from the interviews were summarised. The summaries facilitated the overall meaning and significance of the data provided and to become more familiar with the principal themes of the interviews. These themes were grouped and structured (Braun and Clarke, 2006).

While ensuring anonymity, the interviews were recorded on tape. This standardisation facilitates the comparison of the interviews (Mayring, 2004). The tapes were transcribed, and a qualitative content analysis was conducted, which methodically fragmented the material into controlled units (Mayring, 2004). A theory-driven category system is at the core of our analysis. Using MaxQDA, the content of the interviews was incrementally reduced to those statements relevant for our research questions.

3.8.2. Quantitative data gathering

The plan for the initiation of the research part of this thesis included several steps and activities. The research initiation involved selecting the research field and conducting an exhaustive literature review within the relevant domain. This process facilitated the identification of research problems, formulation of research questions, and establishment of research objectives. Subsequently, considerations were made regarding data collection methods, leading to the decision that a questionnaire, alongside qualitative analysis, would serve as a pertinent measuring instrument. This choice prompted the selection of measurement scales and contemplation of combining specific measurement models.

The questionnaire was then developed using the SurveyCTO software. Following the creation of the initial questionnaire version, experts from the business and academic sectors were engaged to validate its content and provide feedback, as first part of piloting following the adaptation and survey validation methodology. Subsequent minor modifications were made to certain questions in terms of rephrasing. Consequently, piloting with SMEs was conducted where adaptation in line with context and research questions based on the inputs from interviews was conducted. All suggested improvements were incorporated, resulting in the final questionnaire version, encompassing statements from the second chapter defining the concepts in this study, and demographic data of the companies. Particularly, the structure of the questionnaire was divided in five sections, starting with an introduction of the research, then general information on the company were collected, and finally questions on various perspectives of research were asked. A seven-item Likert scale was employed, with the total number of indicators specified in the Table 13 below.

Table 13 Survey structure

Concept	**Dimension**	**Items**	**Authors**
Demographics and company specific innovative characteristics	-	15	-
Government support	-	5	(Thongsri and Chang, 2019)
Cooperation	-	6	(Najib and Kiminami, 2011)
Technology orientation	-	5	(Al-Ansaari, Bederr and Chen, 2015)

Managerial orientation	-	5	(Al-Ansari, Xu and Pervan, 2014)
Organisational IO culture	-	5	(Al-Ansari, Xu and Pervan, 2014)
Market orientation	-	5	(Al-Ansaari, Bederr and Chen, 2015)
Innovative behaviour	-	12	(Pervan, Al-Ansaari and Xu, 2015)
Business performance	3	14	(Vorhies and Morgan, 2005)

Source: Author's work.

A company database was established, and the questionnaire (see Appendix C3), accompanied by the cover letter in Appendix C1, was distributed via email. The research targeted SMEs in BiH, with high-level managers serving as respondents. The main reason for choosing managers as respondents is that they possess knowledge of their company's innovative activities and performance and are key decision-makers. Respondents were assured of the questionnaire's anonymity, with results utilised solely for scientific research purposes. Data collection occurred from April to September 2023, involving three reminders sent at two-week intervals to non-responsive companies following the initial invitation in April. The respondent response rate, represented as a percentage, was computed by dividing the total count of completed survey questionnaires deemed usable by the total count of survey questionnaires distributed. Out of 2,181 distributed invitations, 348 questionnaires were collected, reflecting a response rate of 15.96%. The total observations used for analysis in this study, after the data testing and verification, are 265, representing 12.15% of the total invitations sent.

3.9. Sample

The composition of the sample is a critical factor influencing the thesis external validity. This section provides a detailed account of the target population, sampling techniques employed, and the characteristics of the actual sample. Additionally, justifications for the chosen sample size and demographic considerations are elaborated upon in this section.

3.9.1. Interview sample

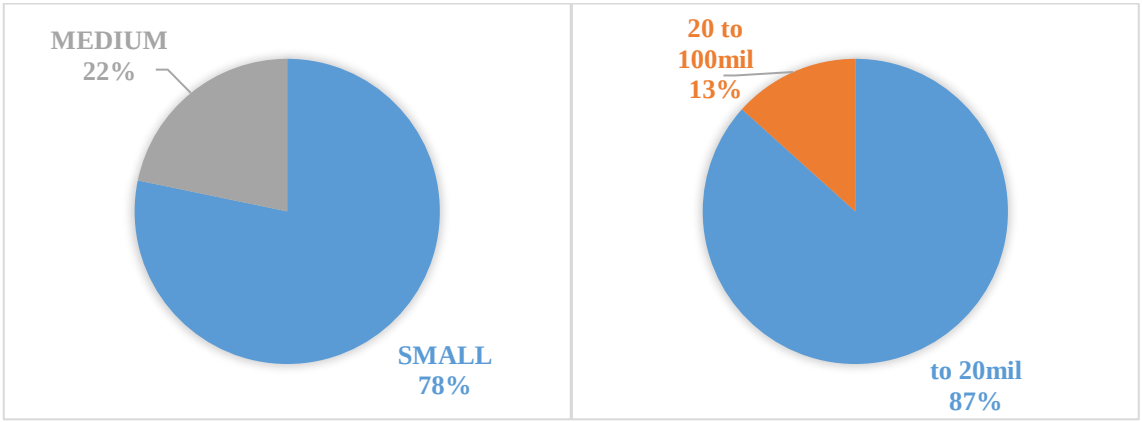
Thirteen cases were selected representing the manufacturing, logistics, knowledge-intensive, creative and IT sector. These choices were based on prior knowledge that the companies would be willing to participate in the study and provide information that would benefit the study’s aims. The data collected included interviews and written sources, such as company documents and reports on innovation. In this way, rich information was gathered with which it was possible to capture the concept of innovation behaviour better and identify the underlying factors that encourage its development. Empirical data were collected primarily through semi-structured interviews with managers within the selected case study firms. A total of 13 interviews were conducted. A convenience sampling technique (Emerson, 2011)

was adopted. Finally, the study respondents were general managers, operations managers, marketing managers, and R&D managers of the SMEs. The interviews were conducted between June and August 2023 using video conferencing software. The interview lasted approximately 45 minutes to one hour.

3.9.2. Survey sample

In designing the survey sample, it is crucial to identify the target population, select an appropriate sampling method, and determine the desired sample size. In that regard, to attain the research objectives and assess the hypotheses, a crucial step involves selecting the research population. Regarding the entities, specifically the companies subject to analysis in this thesis, the focus is on SMEs. The classification follows the EU recommendation 2003/361, the Directive 2013/34/EU and the revised User guide on SME definition from 2020 (European Commission, 2020), which determines SMEs status based on key factors such as staff headcount, turnover, or balance sheet total. As per this guideline, small companies are characterised by having fewer than 50 employees and turnover not exceeding EUR 10 million. Similarly, medium-sized companies fall into the category of those with fewer than 250 employees and turnover below EUR 50 million or a balance sheet total less than EUR 43 million. As it may be noticed in Figure 5, small companies (for the targeted industries) make up most of the SMEs in BiH, in terms of both classifications, by number of employees and turnover (Agency for statistics of BiH, 2023b).

Figure 5 SMEs by size (left) and turnover (right), in population



Source: Author's work based on data retrieved from Agency for statistics BiH, 2022.

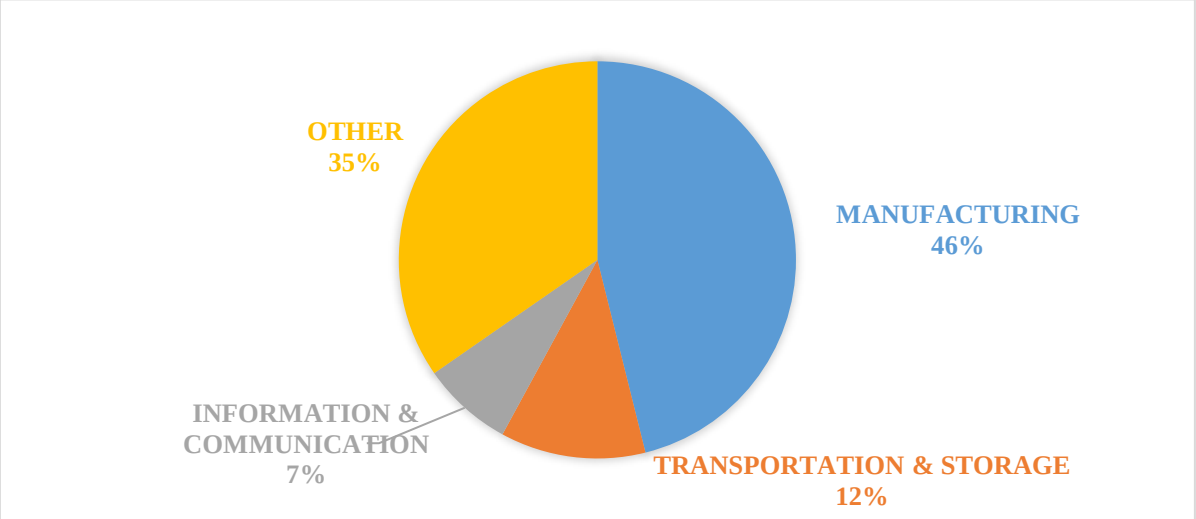
The examined constructs pertain to the innovative behaviour and performance of companies, with particular emphasis on sectors that wield considerable influence on GDP and generate added value. The sector categorisation followed the NACE, Rev. 2.1. statistical classification of business economy by sector of the European Community. Under this classification, the analysis focuses on sectors that contribute significant value-added, including:

- Manufacturing
- Transportation and storage services
- Information and communication services

- Other creative and knowledge-intensive activities
  - Construction
  - Real estate activities
  - Financial and insurance activities
  - Professional, scientific and technical activities
  - Administrative and support service activities

Based on the most recent data provided by the Agency for Statistics for 2022, the identified research population comprises 9,393 active SMEs (based on employee count), with 4,212 of these active SMEs falling within the specified target sectors. It may be noticed in Figure 6, that within the SMEs in BiH, most companies are in manufacturing business, while leas of them are in information and communication services.

Figure 6 SMEs by sector in population



Source: Author's work based on data retrieved from Agency for statistics BiH, 2022.

In this research, the fundamental criterion for the target population is that a company is a SME. The research employs a combination of two methods, namely convenience and stratified sampling. In particular, the survey was sent to high-level managers (CEOs, CTOs, Head of R&D, and similar) of SMEs based on the available e-mail addresses which indicates a convenience sampling approach. These group of respondents are deemed appropriate since they participate in strategic decision-making of the company. While, within the group of SMEs, the focus was on specific industries, which is a form of stratified sampling, where the population is divided into subgroups (strata) based on certain characteristics (in this case, sectors contributing the most to GDP and adding new value). While convenience sampling may introduce biases due to the non-random selection of participants, the stratified aspect helps ensure a representation from different sectors within the SME population. The survey, distributed via email to individuals meeting the established criteria, also involved reaching out to a randomly selected subset of active SMEs in BiH to encourage their employees to participate.

Utilising information acquired from statistical and financial agencies in BiH, as well the FIA, APIF and BD finance directorate, a total of 2,181 SMEs contacts were gathered and subsequently email invitations with a link to the survey were sent. A minimum sample size of 200 respondents was defined, as recommended by Hair et al. (2018) for implementing multivariate analysis techniques. The questionnaire, developed using the SurveyCTO, garnered a total of 348 submitted responses. Following the criteria set by Hair et al. (2018), observations with more than 15% missing data were excluded and several companies whose profile did not completely fit the targeted population, resulting in a relevant sample size of 265 observations for subsequent analysis.

In addition to inquiries concerning innovative behaviour determinants, innovation behaviour, and business performance, as well as questions related to basic firm characteristics and innovation characteristics, were included to provide supplementary information. These basic characteristics encompassed industry type, company size, number of employees, turnover, etc. Further details regarding the surveyed companies are presented in the Table 14 below.

Table 14 Characteristics of surveyed companies

CHARACTERISTICS	N	%
Industry		
Manufacturing	209	79%
Logistics	18	7%
IT	16	6%
Others	22	8%
Number of employees		
10 to 50	171	64%
50 to 250	94	36%
Turnover (BAM)		
Up to 20mil	239	90%
20mil to 100mil	26	10%
Location		
FBiH	170	64%
RS	74	28%
BD	21	8%

Source: Author's calculations.

Notably, small firms have an important role in the survey. As shown in Table 14, approximately 80% of the surveyed entities are engaged in manufacturing, with a diversified distribution across sectors. Specifically, 15% belong to the metal industry, 11% to the food industry, and another 11% operate in the mechanical, automotive, electronic/ electrical industries. This diverse composition ensures a comprehensive exploration of perspectives within the SME landscape, providing valuable insights into the specific nuances of these

sectors. Finally, when comparing the targeted population and the previously given structure of the companies, it may be noticed that sample is representative and reflects on the population structure in terms of the sectors, but also the distribution of companies by number of employees and the turnover.

3.9.3. Sample size adequacy assessment

The size of a sample, much like in any statistical approach, serves as a foundation for estimating sampling error. Importantly, the sample size needed for a specific statistic is secondary to the size needed to generalise from a sample to a population. In nearly all cases, the sample size required for population inference exceeds that for a particular statistic. Larger sample sizes are generally associated with more dependable results, particularly when facing challenges with data or measurements. Specifically, SEM is often perceived to necessitate a larger sample compared to other multivariate approaches. Hair *et al*. (2018) outlined various categories of minimum sample sizes based on model complexity and fundamental characteristics of the measurement model. Moreover, if the data significantly deviates from multivariate normality, if estimation techniques requiring substantial samples are utilised, or if missing data exceeds 15%, it is recommended to augment the sample size. Regarding the assumption of multivariate normality in the data, as deviations increase, the ratio of observations to parameters should rise. A widely accepted guideline to mitigate issues with deviations from normality is to have at least 10 respondents for each parameter estimated in the model. In this context, the sample size is deemed sufficient to minimise the impact of sampling error. Ultimately, as with any statistical inference, the sample size must be adequate to faithfully represent the population of interest.

Concerning the ratio of observations to variables, a typical guideline is to have at least five times as many observations as the number of variables under analysis (Hair *et al*., 2018). An even more preferable sample size would entail a 10:1 ratio or, at a minimum, 20 cases for each variable. However, there is no universally accepted standard for this relationship. Moreover, the prevalent approach to sampling, based on the number of variables, involves determining an appropriate sample size corresponding to the number of variables. Some authors also specify the minimum number of observations in the sample, but once again, there is no universally applicable rule; instead, minimum numbers like 100 or 200 observations are suggested, contingent on the analysis technique to be employed (Hair *et al*., 2018). As the number of variables and anticipated factors rises, researchers propose substantially larger samples, with suggestions going beyond 200 observations. With 265 observations, the research sample fulfils the majority of authors' minimal observational requirement in their sample. Additionally, there are 4.6 observations for every manifest variable in the model, which may be regarded as an appropriate ratio and a suitable sample size for this particular analysis.

4. DATA ANALYSIS

In this chapter, the analysis of the data will be presented along with the results derived from this analysis. The data will undergo multiple steps as outlined by Hair *et al*. (2018) and will utilise various statistical methods. Firstly, there will be an examination of data integrity, including the detection of outliers, an assessment of missing data, and the testing of assumptions related to multivariate statistical analysis techniques. The second stage will involve the evaluation of the measurement models' reliability and their convergent and discriminative validity through CFA. In the third step, the structural model that has been proposed and the hypothesis testing will be performed using the SEM method.

4.1. Interview analysis

This section provides a snapshot of the demographics of the participating SMEs and offers a detailed exploration of the specific barriers they face in their pursuit of innovation based on the input-throughput-output-based framework. Through in-depth interviews, the study uncovers valuable findings concerning the innovation landscape for SMEs.

4.1.1. Demographics

The comprehensive demographics examination in Table 15 encompasses three key aspects: sector affiliation, company size, and export intensity. The data provides valuable insights into the diverse range of businesses involved, their organisational structures, and their global market engagement strategies. This detailed demographic breakdown offers a comprehensive understanding of the interview sample, emphasising the diverse sectors represented, the range of company sizes, and the extent of global market engagement among these businesses.

Table 15 Participant demographics

Demographics	**Characteristics**
Sector affiliation	– Seven manufacturing companies; – One logistic activities (transportation or storage) company; – Five IT or communication services companies.
Company size	– 10% companies had less than 9 employees; – 30% companies had less than 50 employees; – 45% companies had less than 250 employees; – 15% companies had more than 250 employees.
Export intensity	– 5% of companies are not exporting; – 70% of firms have realised export in more than 50% of turnover; – 25% of companies are 99% to completely exporting companies.

Source: Authors own work.

The interview analysis encompassed a diverse array of sectors, presenting a diverse array of economic activities. Among the participating companies, there were seven manufacturing firms, each representing a distinct facet of the production landscape, spanning industries such as automotive, electronics, and consumer goods. These manufacturing companies were pivotal in the creation of tangible products, each with its unique operational nuances.

Additionally, the study included one company deeply entrenched in logistics activities, specialising in the transportation and storage of goods. This entity played a vital role within supply chains, facilitating the efficient movement and distribution of products. Furthermore, five companies were from the dynamic IT or communication services sector, with a portfolio of services that ranged from software development to telecommunications and digital marketing. Their presence underscored the ever-growing significance of technology and communication services in the contemporary business ecosystem.

The size distribution within the interview sample provided a granular understanding of organisational structures and dynamics. Approximately 10% of the companies could be categorised as small enterprises, with lean workforces consisting of fewer than 9 employees. These small businesses often boasted tight-knit teams, emphasising adaptability and agility as central strengths.

Moreover, nearly 30% of the interviewed companies fell within the small to medium-sized category, employing fewer than 50 individuals. This segment of SMEs reflected a vibrant community with moderate organisational complexity, often seen as engines of local economies. Additionally, a substantial portion, constituting 45% of the sample, represented medium-sized enterprises. These firms typically maintained workforces ranging from 50 to 250 employees, allowing for a more extensive infrastructure and positioning them for potential growth and scalability.

Lastly, the remaining 15% of the companies could be classified as large organisations (by the number of employees), commanding workforces of more than 250 individuals. These large corporations were marked by their substantial resources, extensive organisational hierarchies, and potentially significant influence within their respective markets.

The export intensity data pointed at the global market engagement and trade strategies of the interviewed companies. Notably, about 5% of the companies did not actively engage in exporting and primarily concentrated on domestic markets, serving local or regional customer bases. Their business strategies favoured local stability over international expansion.

In stark contrast, a 70% of the firms exhibited a strong export intensity, with exports accounting for more than half of their total turnover. This group showcases a significant commitment to international markets, effectively navigating global complexities to bring their products or services to a broader, global audience. Their success is intertwined with a global outlook and a detailed understanding of international trade dynamics.

The remaining companies stood out as highly export-dependent entities, with exports constituting between 99% and the entirety of their business activities. These companies are deeply integrated into the global marketplace, relying extensively on international trade for sustained growth and profitability. Their operations span borders, and they are acutely attuned to the opportunities and challenges presented by the global business landscape.

4.1.2. Innovation Dynamics in SMEs

With the aim of understanding the innovation dynamics in SMEs, the perception of innovation, triggers of innovative projects, and collaborative SME initiatives were analysed. Particularly, the thematic analysis of interview responses, regarding the definition and importance of innovation, emphasises a shared conceptualisation of innovation among participants, underpinning its pivotal role within their respective organizational frameworks. Innovation emerges as an indispensable cornerstone, integral to the core ethos and operational dynamics of the surveyed enterprises. Central to this understanding is the notion that innovation manifests through the creation of novel products and solutions tailored to meet client exigencies, thus constituting a fundamental driver of sustained business viability. Moreover, SMEs are equally involved in three forms of innovation: production, process and service innovation. It was emphasised that companies constantly work on innovating both of their products and services as well as the organization of work, teams, methodologies, internal processes and similar. Specifically, a hybrid experience is often present when talking about incremental but also radical innovations.

Furthermore, the analysis of the input perspective questions highlights the significant role of employees as drivers of innovation within SMEs, with a particular emphasis on their proactive engagement in proposing and implementing new ideas (see Appendix E2). This underscores the intrinsic importance of employees as catalysts for organisational innovation, especially in the ideation, development, and execution phases of innovative initiatives. Moreover, the findings underscore the deliberate investment made by SMEs in the development and education of their workforce, recognising the pivotal role of employee empowerment in fostering innovation. This aligns with existing research presented in the SLR emphasising the need for a supportive organisational climate conducive to experimentation and idea generation. While internal triggers predominate, there is a lesser mention of technology as a catalyst for innovation. However, there is an acknowledgment of the nuanced interplay between technological enablers and human agency in driving innovation within organisational contexts.

Furthermore, the analysis of responses concerning SME participation in collaborative innovation projects unveils a nuanced landscape contingent upon project-specific parameters. SMEs exhibit engagement in collaborative endeavours with entities spanning both intra- and inter-industry domains, including counterparts within their sector, as well as project bureaus and analogous organisations. This strategic approach to collaboration underscores a discerning alignment of partnerships with project exigencies rather than rigid

industry demarcations, indicative of a deliberate pursuit of synergistic alliances. Moreover, the findings underscore the perceived indispensability of collaboration within SMEs, accentuating its pivotal role in shaping business models and catalysing innovation trajectories. The recognition of collaboration as a linchpin for organisational growth attests to its strategic importance within the innovation ecosystem of SMEs. Notably, the integration of diaspora communities emerges as a salient theme, with SMEs acknowledging their potential as wellsprings of innovation and as strategic allies in collaborative ventures.

In discussions regarding innovation culture, SMEs affirm fostering an environment conducive to idea expression and creativity. They promote open dialogue among employees, providing ample room for discussing solutions and stimulating innovation. Recognizing the pivotal role of employees in the innovation process, SMEs equip them with necessary resources and incentivize innovative contributions primarily through financial rewards (see Appendix E3).

Addressing the need for support, financial assistance emerges as paramount, given the additional investments and inherent risk associated with innovation endeavours. SMEs advocate for financial incentives, investment in innovation labs, and the promotion of innovative ventures to foster development. Alongside financial aid, SMEs advocate for tax benefits and streamlining administrative procedures, which are perceived as cumbersome and time-consuming. Moreover, they highlight the importance of educational initiatives, training programs, and networking opportunities as valuable forms of support (see Appendix E4).

Despite recognizing the need for support, most SMEs indicate limited familiarity with, or participation in, formal support programs. Barriers such as complex application procedures and lack of transparency deter SMEs from engaging with these programs (see Appendix E5). Consequently, many rely on internal financing for innovation initiatives. Simplifying procedures and enhancing transparency could encourage greater SME participation in innovation support programs.

4.1.3. Barriers to SMEs innovation

Data analysis identified several factors that challenge innovation in SMEs. These factors were categorised as external and internal factors. Based on the analysed interviews the external factors for SMEs innovation, as seen in Table 16, are prejudices against scientific research institutions; reluctance towards cooperation; administrative barriers; political instability and brain drain; legislation and funding challenges; lack of specialised talent.

Table 16 Identified external barriers

External Barrier	**Quotations**
Misunderstanding with Scientific	"I have prejudices against scientific research institutions, that they will not understand, that they will invest time in some things that are not important to us at all, that they do not have that aesthetic." (SME5)

Research Institutions	
Reluctance Towards Cooperation	"Although I felt with some of them in contact that they are reluctant towards those of mine ideas and they said that they were not ready for cooperation, they do not want us to act together, but we all somehow keep our information..." (SME5)
Administrative Barriers	"Administrative barriers are also a big problem. E.g., we have recently initiated the development of the Solar Power Plant Construction Project. Elektroprivreda was very unfriendly, which was very disappointing for us. We waited over a month for just one permit, and we also had to submit documentation that is not mentioned or prescribed in any of the regulations." (SME12)
Political Instability and Brain Drain	"Other barriers would be the political situation, unstable situation, disordered system." (SME7)... "Also, considering the current political ability, we have announcements of the departure of a few people who are highly qualified and capable." (SME9) ... "Most people leave because of this political insecurity and the future of their children." (SME4)
Legislation and Funding Challenges	"Legislation is not adapted, access to funds is lacking, there is no culture of innovation." (SME4) ... "Also, a big problem is the new law that reduces the number of legal entities that need to have a mandatory audit, which reduces the number of potential clients." (SME8)
Lack of Specialised Talent	"We mostly need highly specialised engineers with many years of experience, which we cannot find here." (SME2) ... "Because there really is that gap in terms of the labour market and what is required there, and the study programs themselves." (SME4) ... "The lack of adequate staff is certainly a challenge for IT issues." (SME6) ... "Yes, the lack of staff is also a challenge for us, now give me 100 engineers and I will hire them." (SME7) ... "The pace of finding capable people is a little slower." (SME9) ... "Due to the difficulty of finding talent, we have already reached the stage of the impossibility of accepting new clients (when we talk about sales activities) because we want to reduce the possible disruption of our operational model." (SME9) ... "Also, a large number of older employees in companies who are slower to take on new processes or propose innovations slows down their spread." (SME10) ... "We have to admit that it is very difficult to find adequate employees." (SME12)

Source: Authors own work.

For instance, one interviewee candidly expressed scepticism about collaborating with scientific research institutions. They voiced concerns that such institutions might not fully grasp the unique needs and priorities of SMEs. This sentiment underscores a potential divide in understanding and collaboration between SMEs and research institutions. Addressing this challenge could involve initiatives to bridge the communication gap and promote collaboration based on mutual understanding.

Moreover, multiple interviewees shared their experiences with reluctance from potential partners, which could include larger companies or research institutions. These partners exhibited hesitance towards cooperation, with some not ready to engage in joint ventures or collaborative efforts. This reluctance may be rooted in concerns about competition or a

misalignment of priorities. Specifically, these observations highlight the complexities of fostering collaboration and knowledge sharing within the local business ecosystem, emphasising the need for strategies that build trust and demonstrate the mutual benefits of cooperation.

Interviewees provided specific examples of administrative hurdles they face on a daily basis, such as extended delays in obtaining permits and navigating intricate regulatory processes. One interviewee pointed out the frustration of waiting for a permit for over a month and having to provide documentation that was not prescribed by regulations. These instances underscore the significant impact of administrative barriers on innovative projects, calling for reforms in regulatory procedures to support innovation and business growth.

Furthermore, interviewees elaborated on the challenges posed by inadequate legislation and limited access to funding. They stressed the need for regulatory reforms to accommodate innovative business models and technologies. Simultaneously, they called for improved access to funding sources that could support R&D endeavours. Such perspectives emphasise the importance of aligning policies and financial mechanisms with the specific needs of SMEs, ultimately facilitating innovation.

Additionally, interviewees voiced concerns about the enduring political instability in the region, which has led to significant brain drain. They highlighted the departure of highly qualified individuals seeking more stable environments. Accordingly, these insights underscore the profound repercussions of political instability and the urgency of addressing it as it affects not only the labour market but also the innovative capacity of SMEs. Mitigating brain drain and enhancing political stability are essential steps towards fostering innovation.

Also, interviewees shared their concerns about the far-reaching impact of brain drain on the availability of skilled labour. They elaborated on the challenges of retaining talent and the potential loss of critical knowledge and skills within organisations. These perspectives underscore the need for comprehensive strategies aimed at retaining and attracting skilled individuals. Such strategies may encompass competitive compensation packages, supportive work environments, and measures to encourage professionals to return.

The interviewees provided further context on the difficulty of finding specialised talent. This challenge may be exacerbated by a misalignment between the labour market and educational programs. Collaboration between businesses and educational institutions was suggested as a solution, allowing for the tailoring of educational curricula to meet industry demands. Additionally, initiatives like scholarships and internships could help students gain practical experience and become more attractive hires for SMEs.

Furthermore, as organisations usually do not have influence over external forces, but do have power over internal ones, SMEs should concentrate even more on internal issues to foster innovation. The analysis showed that internal innovation challenges within SMEs, as shown

in Table 17, are primarily lack of employee education and engagement; fear of failure and lack of motivation; and difficulty in retaining workers.

Table 17 Identified internal barriers

Internal Barrier	**Quotations**
Lack of Employee Engagement	(SME10) "Employees have enough time and space, but I think we should focus on innovation projects more often."... (SME12) "In general, I think that the bigger problem is that the employees are not sufficiently involved in the processes, it is only important that the daily norm is done."
Lack of Training and Education	(SME10) "We believe that there is a lack of education for all employees when we talk about innovations themselves." ... (SME10) "It is necessary to educate employees and encourage them to freely propose some ideas or changes within the company, and on the very promotion of innovative behaviour."
Prejudices Against Collaboration	(SME5) "I have prejudices against scientific research institutions, that they will not understand."... (SME5) "...they are reluctant towards those of mine ideas, and they said that they were not ready for cooperation..."

Source: Authors own work.

In particular, several interviewees highlighted the absence of innovation-focused education and a lack of employee engagement within SMEs. They noted that employees often prioritise meeting daily production quotas over proposing innovative ideas. This emphasises the need for substantial investments in employee training and the cultivation of an organisational culture that not only encourages, but also rewards innovative thinking. Implementing incentives and recognition systems for innovative contributions could motivate employees to actively participate in innovation processes.

Furthermore, the interviewees offered insights into the fear of failure and a lack of motivation, particularly among young people. They pointed out that creating a culture of innovation necessitates a fundamental shift in mindset and the establishment of a supportive environment where failure is viewed as a valuable learning opportunity. These perspectives emphasise the need for cultural change within organisations, which can be facilitated through incentives, mentorship programs, and platforms for employees to contribute and be recognised for their innovative ideas.

Finally, the challenge of retaining trained workers was discussed in greater detail. Interviewees elaborated on the importance of creating appealing work environments, offering competitive compensation packages, and providing opportunities for professional growth to effectively address this issue. They emphasised the significance of employee well-being, job satisfaction, and career development in talent retention efforts.

4.2. Data testing and verification

Preliminary data analysis is an essential step in any research process, especially prior to using multivariate statistical methods. It involves the use of specific data verification techniques to ensure that certain prerequisites are satisfied before proceeding with the actual analysis,

as recommended by Hair *et al*. (2018). Consequently, prior to examining the reliability and validity of the measurement constructs, as well as evaluating the models and hypotheses, the gathered data will be subject to scrutiny. In line with the guidelines presented by Hair *et al*. (2018), missing data and outliers will be identified, and the data will be tested for the assumptions of multivariate methods. Detailed data testing and verification results are presented in Appendix C4.

4.3. Descriptive statistics

4.3.1. Customer/ client

The survey data outlined the major client categories that these enterprises engage with. As shown on figure in Appendix D1, the most important client segments identified include private households, manufacturers, resellers, and intra-company networks. This data highlights noteworthy distinctions within SMEs' client relationships and the significance of these client groups. Of particular interest is the observation that private households and resellers hold substantial importance as client groups for manufacturers within the SME sector. This observation underscores the varied nature of manufacturers' client bases. The relevance of these client segments is likely a result of the diverse product and service offerings that manufacturers typically provide, catering to both end consumers and intermediary partners in the distribution network.

Additionally, a significant finding from the data pertains to the prevalence of intra-company clients, particularly in sectors such as logistics, IT, and the metal and mechanical/automotive industries. Intra-company clients account for approximately 40% of the client base within these sectors, highlighting their substantial role in shaping business relationships and operational dynamics. This finding underscores the complexity of client interactions within these industries. Furthermore, the data reveals that manufacturers in SMEs exhibit a more diverse range of client types compared to other industry sectors. This diversity reflects the adaptability and versatility of SME manufacturers in serving a wide spectrum of clients, encompassing private households, resellers, and intra-company networks. The diverse client base among SME manufacturers is indicative of their ability to respond to the evolving market demands and competitive dynamics within the SME landscape.

4.3.2. Market

The market analysis conducted within the SME sector provides valuable insights into the competitive landscape and the nature of products offered by these enterprises. The data reveals a series of observations related to the competitive pressure perceived by SMEs, the standardisation of products, and their export activities.

Particularly, a notable finding is that a significant proportion of the surveyed SMEs reported a relatively low level of competitive pressure. Approximately 44% of the respondents

indicated that they faced several or many competitors, while 46% reported having only a few competitors. Remarkably, 10% of SMEs perceived hardly any competitors in their respective industries, with a specific emphasis on the IT sector. This observation highlights the diversity in competitive environments across different SME segments, with IT firms experiencing a comparatively less competitive landscape.

Another key insight is the prevalence of standardised products within the SME sector, as seen in figure in Appendix D2. While the majority of SMEs continue to offer standardised products, a notable exception exists in the IT and metal industry segments, where the production of customized products is a common practice. This distinction underlines the adaptability of SMEs in these sectors, catering to specific client demands with tailor-made solutions.

Furthermore, the data shows that a significant proportion of SMEs, specifically 57%, are actively engaged in exporting their products or services. This export activity is particularly prominent in the metal industry, where approximately 80% of SMEs are involved in international markets, and the IT sector, with 63% of SMEs participating in global trade. Accordingly, the high prevalence of export activities, primarily in the metal and IT sectors, reflects the global orientation of a substantial portion of SMEs, making them active players in international markets.

4.3.3. Competition

The survey data also unveils essential insights into the dynamics of competition within this sector, with a particular focus on the factors that influence competition, emphasising the role of quality, and adaptation to customer needs. One predominant finding is that competition among SMEs places significant emphasis on quality. Approximately two-thirds of all surveyed firms rank quality as either the first or second most important factor in their competitive strategies. This data highlights the paramount importance of quality in gaining and maintaining a competitive advantage in the SME sector, demonstrating an unwavering commitment to excellence within these enterprises.

The market analysis underscores the diverse competitive pressures experienced within this sector. While many SMEs report the presence of multiple competitors, a notable proportion perceives low competitive pressure, especially in the IT segment, as seen on figure in Appendix D3. Surprisingly, adaptation to customer needs is recognised as a competitive advantage for only a quarter of the surveyed firms. This suggests that while quality is widely acknowledged as a crucial factor, the ability to adapt to specific customer requirements is not universally considered a primary competitive advantage in the SME sector. Furthermore, as seen on figure in Appendix D4, upon closer examination of the data, it becomes apparent that 12% of firms identify adapting to customers' needs as their primary competitive factor. This percentage increases to 27% when focusing on smaller firms. This distinction underscores the differences in the competitive strategies of smaller SMEs, where the ability

to cater to the specific demands of customers plays a more substantial role in their competitive positioning.

Overall, the competitive landscape in SMEs, as evidenced by the survey data, is significantly shaped by a focus on quality. The data highlights that a substantial majority of SMEs prioritise quality within their competitive strategies, underscoring its critical importance as a distinguishing factor. While adaptation to customer needs is not uniformly regarded as a competitive advantage, it assumes greater prominence among smaller SMEs.

4.3.4. Innovation fields

The data reveals the main aims of SMEs in terms of innovation, highlighting a clear emphasis on improving quality, followed by the development of new products or services and cost optimisation. Improving quality stands out as the primary focus for SMEs in the realm of innovation. The data, as shown on figure in Appendix D5, indicates that a substantial proportion of SMEs prioritise quality enhancement as their primary objective. This emphasis on quality improvement underscores the commitment of these enterprises to delivering high standards and meeting the evolving demands of their clientele.

The development of new products or services and cost optimisation represents the second major focus area for innovation among SMEs. While quality improvement takes precedence, the SME sector places significant importance on introducing novel offerings and optimising costs to remain competitive. This dual emphasis reflects the multifaceted nature of innovation within SMEs, as they seek to enhance their product or service portfolios while managing operational efficiency.

Moreover, the data, as shown on figure in Appendix D6, highlights a balance between innovative and traditional output among SMEs in manufacturing and logistics. These enterprises engage in both innovative and traditional practices, underscoring their ability to adapt to changing market conditions while also adhering to established methods that have proven effective over time. This balanced approach showcases the flexibility and resilience of SMEs in their pursuit of innovation. Overall, there is a primary commitment to quality improvement, followed by the development of new products or services and cost optimisation. These priorities are emblematic of the adaptability and ambition of SMEs as they seek to excel in the market.

4.3.5. Innovation impulses

Innovation impulses drive product and process innovation within these enterprises. The data reveals that SMEs predominantly draw innovation impulses from internal sources for both product and process innovation, although external sources also play a significant role.

For product innovation, internal sources serve as the primary impulse, with a striking 91% of SMEs generating innovative ideas from within their organisations. This underlines the

capacity of SMEs to foster a culture of innovation and develop new products through their in-house expertise and knowledge. Simultaneously, external sources also exert a substantial influence on product innovation, with 62% of SMEs drawing inspiration from external partners, customers, and stakeholders. This highlights the collaborative nature of innovation in the SME sector, where ideas and impulses from external sources are harnessed to drive product innovation.

A similar pattern emerges in the case of new process innovation, with 92% of SMEs relying on internal sources to generate innovative ideas for process improvement. This underscores the emphasis on operational efficiency and internal capabilities in the SME sector. However, external sources remain significant, with 46% of SMEs actively seeking impulses from external entities for process innovation. Accordingly, the dynamic interplay between internal and external sources underscores the adaptability and openness of SMEs in their quest for process innovation. The data also reveals specific characteristics of SMEs in BiH compared to more general patterns. Notably, as seen in figure in Appendix D7, internal resources other than the head of the company are less frequently utilised as sources of innovation. An exceptional role is played by customers, who serve as the primary external source of innovative ideas for BiH SMEs. In contrast, research institutions, trade fairs, NGOs, and similar platforms are reported as rarely providing ideas for innovation. This distinctive pattern highlights the unique characteristics and challenges faced by SMEs in the BiH.

Finally, there is a strong influence of both internal and external sources on product and process innovation. The specifics observed in BiH SMEs highlight the exceptional role of customers as the main source of innovative ideas and the limited contribution of research institutions and trade fairs in the innovation process.

4.3.6. Cooperation

SMEs engage in cooperative activities, primarily with their customers and suppliers. These relationships form the cornerstone of collaborations within the SME sector, with a strong focus on enhancing value chains and meeting customer needs. However, a distinctive characteristic of SMEs in BiH is their limited interaction with research institutions, as seen on figure in Appendix D8. The data underscores that research institutions are rarely chosen as cooperating partners by BiH SMEs. Likewise, there is a minimal connection between research institutions or universities and BiH SMEs. This pattern suggests a potential gap in knowledge transfer and technology exchange between academic and research entities and the SME sector in BiH.

It is also worth noting that while strong connections with customers and suppliers can yield various benefits, the data hints at a potential downside. Such strong connections might inadvertently lead to unintended dependencies. The reliance on specific customers or suppliers can expose SMEs to risks in case of disruptions or changes in the business environment. Therefore, while collaboration with customers and suppliers is crucial, it is

essential for SMEs to balance these relationships to mitigate potential vulnerabilities. Overall, there is a prominent role of customers and suppliers as cooperative partners, forming the core of collaborative efforts in the SME sector. Notably, the limited involvement of research institutions and universities as cooperating entities highlights a potential area for growth and development in knowledge and technology exchange for BiH SMEs.

4.3.7. Government

The data, presented on figure in Appendix D9, reveals a significant trend with regard to government support for innovation. Specifically, the findings indicate that the current policies, as perceived by SMEs, are predominantly not viewed as supportive of innovation within these firms. This observation highlights a potential misalignment between government initiatives and the needs and expectations of SMEs in the context of fostering innovation. While government support is often considered a critical driver for innovation in many economies, the data suggests that SMEs in this survey may not be reaping the expected benefits from the existing policies and programs.

Accordingly, these findings underscore the importance of further examination and potential revisions in the current policies and strategies to better facilitate innovation within SMEs. Understanding the specific challenges and expectations of these enterprises can lead to more effective and targeted government support initiatives, which, in turn, can play a pivotal role in stimulating innovation, enhancing competitiveness, and driving economic growth within the SME sector.

4.4. Testing reliability and validity of measurement model

The reliability and validity of eight measurement models within the proposed conceptual model, will be assessed through CFA. As described by Suhr (2006), CFA is a statistical method employed to validate the underlying structure of a set of observed variables. It enables researchers to assess hypotheses and connections between observed variables and the latent constructs they represent. CFA involves a careful selection of variables to uncover the underlying mechanisms. This form of analysis is often conducted with SEM, which is also applied in this thesis. The steps for CFA include defining individual measurement constructs, developing measurement models, design of the research process, and evaluating the reliability and validity of the measurement models (Hair *et al*., 2018).

4.4.1. Defining of individual constructs

In this phase, the dimensions and indicators within the measurement models, establishing the theoretical foundation for these constructs, are defined. The measurement models and their respective indicators have been adapted from prior relevant research, where minor adjustments were made during the translation process to ensure they align with the specific context and conceptual definition of each construct. As previously mentioned, once the

appropriate dimensions were selected, a panel of experts was consulted to assess the content validity and identify any potential issues in the measurement instrument. In response to their feedback, minor refinements were made, particularly in rephrasing certain statements, which are discussed in detail in the preceding sub-chapter. The interrelationships between indicators and dimensions, as well as the resulting measurement models, have been explained earlier. Consequently, the content validity of all assertions and constructs is well-supported, with the conceptual definitions aligning seamlessly with the formulation of the indicators. This indicates that the measurement claims effectively capture the essence of the dimensions they aim to measure. Furthermore, nomological validity was rigorously assessed in conjunction with content validity before initiating the research, specifically during the development of the measurement models.

4.4.2. Measurement model development

Concerning the development of the measurement model, it holds paramount significance to ascertain one-dimensionality, as underlined by the influential work of Anderson and Gerbing (1982). This entails ensuring that a set of indicators can be attributed to a solitary underlying construct, essentially capturing the essence of the concept under scrutiny. Respectively, all observable indicators are unidimensional, and this will be verified by examining the factor loadings post-CFA.

In accordance with the well-regarded guideline proposed by Hair *et al*. (2018), it was ensured that each construct encompasses a minimum of three indicators. This practice not only upholds rigor but also allows for the assertion that the measurement models exhibit a greater number of variances and covariances than parameters necessitating estimation, enhancing the robustness of the analyses.

Additionally, within the structural framework of these models, causal relationships have been systematically delineated, discerning whether they assume the formative or reflective measurement models, as expounded by Hair *et al*. (2018). Consequently, the measurement models within this study are unequivocally conceptualised as reflective, signifying that the latent constructs drive the observed or measured variables. Any discrepancies or measurement errors encountered are attributed to the latent constructs' inability to entirely account for the variance within the measured variables, underscoring the fundamental theoretical foundations that underpin the model constructs.

Accordingly, eight measurement constructs were used in the measurement model, one is second-order constructs and seven are first-order constructs. Namely:

1. Government support is a first-order construct that consists of five items. All items were taken from Thongsri and Chang (2019) in line with the adoption based on research questions.
2. Cooperation is a first-order construct that consists of six items. All items were adapted from Najib and Kiminami (2011) in line with the open-innovation concept.

3. Technology orientation is a first-order construct that consists of five items. All items were adapted from Al-Ansaari, Bederr and Chen (2015) in line with context and research questions based on the inputs from interviews and piloting.
4. Managerial orientation is a first-order construct that consists of five items. All items were adopted from Al-Ansari, Xu and Pervan (2014).
5. Organisational IO culture is a first-order construct that consists of five items. All items were adopted from Al-Ansari, Xu and Pervan (2014).
6. Market orientation is a first-order construct that consists of five items. All of items were adapted from Al-Ansaari, Bederr and Chen (2015) in line with context and research questions based on the inputs from interviews and piloting.
7. Innovation behaviour is a first-order construct that consists of 12 items. All of items were taken from Pervan, Al-Ansaari and Xu (2015).
8. Business performance is a second-order construct that consists of three constructs, namely customer satisfaction, market effectiveness and profitability. All items were taken from Vorhies and Morgan (2005) where performance was measured in relation to main competitors.

4.4.3. Research process design

Expanding on the empirical research section related to sampling and sample size determination, it's essential to underscore the meticulous approach adopted in ensuring the robustness of the data collected for analysis. The applied sampling method was convenience sampling, with a combination of stratified sampling. This strategic choice was made to strike a balance between practicality and statistical reliability, resulting in the acquisition of 348 observations. Moreover, the research process design necessitates the examination of the order, which denotes the need that the model's degrees of freedom be larger than zero. Accordingly, the order condition is satisfied because all constructs, as previously said, have a minimum of three indicators. Moreover, the rank condition, which indicates that every parameter will be estimated using a single bound or formula should be analysed, and particularly in this case, it can be anticipated that given the quantity of indicators and the suitable sample size, this condition will be satisfied (Bajgorić *et al*., 2019).

4.4.4. Assessment of reliability and validity

In this chapter, an assessment of the reliability and validity of measurement models will be carried out, in accordance with the prescribed theoretical foundation. Each measurement scale will be tested separately in three main steps. Namely, assessment of the model overall fit, assessment of reliability, and assessment of validity, which will be assessed by using software Lisrel 8.80. Additionally, there will be a fourth step for testing the second-order model in case of business performance.

When assessing the overall fit of the model, it's critical to evaluate the goodness of fit indices (hereinafter: GOF), such as the chi-square test ($\chi 2$), absolute indices, incremental indices, and parsimony indices, are necessary. Absolute indicators assess how well the defined model reflects the observed data. Incremental indicators evaluate the agreement between the observed model and the basic model, assuming no correlation among observed variables. While, parsimony indicators demonstrate the best-fitting model, considering fit relative to model complexity (Bajgorić et al., 2019). Threshold values, as per Hair et al. (2018), for these indicators are provided in table within Appendix I3. During the model fit analysis, special attention will be given to indicators $\chi 2$/df, RMSEA, SRMR and CFI. If these indicators meet the specified limit values while others do not, the discrepancy of the others will be disregarded due to their sensitivity.

Once the model's fit has been assessed and potential model adjustments done, the subsequent step involves evaluating the reliability of the measurement models, which gauges the consistency among various variables of the latent construct. Reliability in this thesis will be evaluated through utilising the Cronbach alpha coefficient, which should be greater than 0.70 (though >0.60 is also deemed acceptable); and by employing composite reliability (hereinafter: CR) which should also surpass 0.70, as outlined by Hair *et al*. (2018).

The third step entails scrutinising the model's validity, assessing how accurately the scale represents the analysed construct. Three widely accepted forms of validity include convergent, discriminant, and nomological (Hair *et al*., 2018). Convergent validity affirms that each measurement construct is interconnected with other constructs within the same measurement model, which can be confirmed through measures like average variance extracted (hereinafter: AVE) and factor loadings. Standardised factor loadings exceeding 0.50 (ideally 0.70) and an AVE surpassing 0.50 indicate satisfactory convergence. Furthermore, discriminant validity ensures that the measurement construct still remains distinct from other constructs, verified by comparing the square root of the AVE (hereinafter SQRT AVE) with correlation values between the construct and others. According to Fornell and Larcker (1981), the square root of AVE must exceed the correlations between the constructs. Moreover, nomological validity determines whether the measurement model accurately reflects the relationships and findings from the theory. This was previously tested alongside content validity. Finally, for the second-order measurement model, subsequent to reliability and validity checks, the factor loadings of the first-order factor on the second-order factor will be outlined, along with the GOF indicators for those models. (Hair *et al*., 2018)

4.4.4.1 Government support

Government support is defined as a first-order construct represented by five indicators, identified by the code GOV. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement

(GOV2: "The government provides needed knowledge and other technical support"). Particular attention, for all constructs, was paid to preserving the integrity of the measurement dimensions and ensuring that, even post- modification, the model adheres to the stipulation of a minimum of three statements.

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=0.327$; RMSEA=0.000; SRMR=0.00021; GFI=0.999; AGFI=0.994; PGFI=0.200; NFI=0.999; NNFI=1.003; CFI=1.000. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 18, present the remaining indicators after the model modification.

Table 18 CFA for Government support

Variable	Code	Indicator	St. loadings	t -value
Government support	GOV1	The government provides policies and programs that are beneficial to innovation performance.	0.951	-
	GOV3	The government provides important market information.	0.944	32.74
	GOV4	The government provides external funding and financing/ grants to support innovation performance.	0.902	27.26
	GOV5	The government provides information about essential regulations and helps firms to obtain copyright or patent/ intellectual property protection and access to rare resources.	0.943	32.59
Chi-Square=0.654; df=2; RMSEA=0.000; SRMR=0.00021; GFI=0.999; AGFI=0.994; PGFI=0.200; NFI=0.999; NNFI=1.003; CFI=1.000				

Source: Author's work.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.955, and the CR indicator equals 0.965, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 18, all indicators exhibit standardised factor loadings exceeding 0.50 (ranging from 0.902 to 0.951). Moreover, the AVE indicator records a value of 0.875, signifying that 86% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Given these findings, it can be affirmed that the GOV construct has satisfactory convergent validity.

4.4.4.2 Cooperation

Cooperation is defined as a first-order construct represented by six indicators, identified by the code COP. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of two statements (COP4: "… with government and public sector institutions" and COP5: "… with universities and research institutions").

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=1.566$; RMSEA=0.0463; SRMR=0.0181; GFI=0.994; AGFI=0.971; PGFI=0.119; NFI=0.993; NNFI=0.992; CFI=0.997. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50, except form COP6, but as other loadings are very high, and this indicator represents an important target group for innovative cooperation to be analysed in accordance with the literature review, it was decided to keep this variable. The results, displayed in Table 19 below, present the remaining indicators after the model modification.

Table 19 CFA for Cooperation

Variable	Code	Indicator	St. loadings	t -value
Cooperation	COP1	… with customers	0.783	-
	COP2	… with suppliers	0.890	13.90
	COP3	… with another firm	0.798	13.23
	COP6	… with experts/ business development service providers	0.324	5.01
Chi-Square=3.131; df=2; RMSEA=0.0463; SRMR=0.0181; GFI=0.994; AGFI=0.971; PGFI=0.119; NFI=0.993; NNFI=0.992; CFI=0.997				

Source: Author's work.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.793, and the CR indicator equals 0.808, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 19, the indicators exhibit standardised factor loadings ranging from 0.324 to 0.890. Moreover, the AVE indicator records a value of 0.537, signifying that 54% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Accordingly, it can be affirmed that the COP construct has satisfactory convergent validity.

4.4.4.3 Technology orientation

Technology orientation is defined as a first-order construct represented by five indicators, identified by the code TEH. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement (TEH4: "Our firm is often to be first to try out new methods and technologies").

Table 20 CFA for Technology orientation

Variable	Code	Indicator	St. loadings	t -value
Technology orientation	TEH1	Our firm's policy is to follow new technology trends	0.956	-
	TEH2	Our firm's policy is to adopt/ use new technologies	0.987	45.20
	TEH3	Our firm allocates resources for investment in new technologies	0.912	29.48
	TEH5	Our firm frequently improves its internal technology and tool usage	0.940	33.80
Chi-Square=0.474; df=2; RMSEA=0.0; SRMR=0.00170; GFI=0.999; AGFI=0.996; PGFI=0.200; NFI=1.000; NNFI=1.004; CFI=1.000				

Source: Author's work.

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=0.237$; RMSEA=0.0; SRMR=0.00170; GFI=0.999; AGFI=0.996; PGFI=0.200; NFI=1.000; NNFI=1.004; CFI=1.000. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 20 below, present the remaining indicators after the model modification.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.963, and the CR indicator equals 0.973, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 20, all indicators exhibit standardised factor loadings exceeding 0.50 (ranging from 0.912 to 0.987). Moreover, the AVE indicator records a value of 0.901, signifying that 90% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Given these findings, it can be affirmed that the TEH construct has satisfactory convergent validity.

4.4.4.4 Managerial orientation

Managerial orientation is defined as a first-order construct represented by five indicators, identified by the code MAN. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement (MAN2: " Our management favours a strong emphasis on R&D, technological leadership, and innovations").

Table 21 CFA for Managerial orientation

Variable	Code	Indicator	St. loadings	t -value
Managerial orientation	MAN1	Our management considers innovation to be firm is our firm's strategic goals and future ambitions	0.886	-
	MAN3	Our management undertakes/ engages risky projects with the intention of exploring new opportunities	0.736	15.05
	MAN4	Our management is involved in new initiatives and innovative programs	0.975	26.71
	MAN5	Our management allocates resources to support development of new products or services or processes	0.923	23.67
Chi-Square=2.119; df=2; RMSEA=0.0150; SRMR=0.0082; GFI=0.996; AGFI=0.980; PGFI=0.199; NFI=0.998; NNFI=0.999; CFI=1.0				

Source: Author's work.

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=1.0595$; RMSEA=0.0150; SRMR=0.0082; GFI=0.996; AGFI=0.980; PGFI=0.199; NFI=0.998; NNFI=0.999; CFI=1.0. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 21 below, present the remaining indicators after the model modification.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.931, and the CR indicator equals 0.934, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 21, all indicators exhibit standardised factor loadings exceeding 0.50 (ranging from 0.736 to 0.975). Moreover, the AVE indicator records a value of 0.782, signifying that 78% of the variance in the indicators can be accounted for by the latent

construct (Hair et al., 2018). Given these findings, it can be affirmed that the MAN construct has satisfactory convergent validity.

4.4.4.5 Organisational IO culture

Organisational IO culture is defined as a first-order construct represented by five indicators, identified by the code ORG. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement (ORG2: "Staff within our firm obtains and exchanges new knowledge and skills in fair and collegial ways").

Table 22 CFA for organisational IO culture

Variable	Code	Indicator	St. loadings	t -value
Organisational IO culture	ORG1	Our company supports generating of new ideas	0.831	-
	ORG3	Our firm accurately shares important information such as success and failure and customer feedback with all relevant staff as firm is our internal learning processes	0.933	20.50
	ORG4	Our firm has a flexible organisational structure (for example decentralisation, shared decision making, low-moderate use of formal rules…)	0.956	21.46
	ORG5	Our firm encourages staff to think freely, generate ideas, follow-up on ideas, learn experiences, and take risks	0.944	20.98
Chi-Square=6.804; df=2; RMSEA=0.0954; SRMR=0.0093; GFI=0.987; AGFI=0.936; PGFI=0.197; NFI=0.988; NNFI=0.988; CFI=0.996				

Source: Author's work.

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=3.402$; RMSEA=0.0954; SRMR=0.0093; GFI=0.987; AGFI=0.936; PGFI=0.197; NFI=0.988; NNFI=0.988; CFI=0.996. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 22 below, present the remaining indicators after the model modification.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.945, and the CR indicator equals 0.955, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as

illustrated in Table 22, all indicators exhibit standardised factor loadings exceeding 0.50 (ranging from 0.831 to 0.956). Moreover, the AVE indicator records a value of 0.842, signifying that 84% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Given these findings, it can be affirmed that the ORG construct has satisfactory convergent validity.

4.4.4.6 Market orientation

Market orientation is defined as a first-order construct represented by five indicators, identified by the code MKT. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement (MKT5: "Our firm encourages the exchange of information about customers and market movements among its employees").

Table 23 CFA for Market orientation

Variable	Code	Indicator	St. loadings	t -value
Market orientation	MKT1	Our firm has active communication/ interaction with customers	0.908	
	MKT2	Our firm is oriented towards providing quality services to the customer	0.974	30.90
	MKT3	Our firm focuses on better understanding of customers and their needs	0.980	31.47
	MKT4	Our firm frequently takes advantage to take over customers from competing firms	0.681	13.74
Chi-Square=7.571; df=2; RMSEA=0.103; SRMR=0.0156; GFI=0.986; AGFI=0.929; PGFI=0.197; NFI=0.992; NNFI=0.983; CFI=0.994				

Source: Author's work.

Following the modification, a subsequent CFA was performed using the remaining four indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=3.786$; RMSEA=0.103; SRMR=0.0156; GFI=0.986; AGFI=0.929; PGFI=0.197; NFI=0.992; NNFI=0.983; CFI=0.994. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 23 below, present the remaining indicators after the model modification.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.922, and the CR indicator equals 0.940, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 23, all indicators exhibit standardised factor loadings exceeding 0.50

(ranging from 0.681 to 0.980). Moreover, the AVE indicator records a value of 0.799, signifying that 80% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Given these findings, it can be affirmed that the MKT construct has satisfactory convergent validity.

4.4.4.7 Innovative behaviour

Innovative behaviour is defined as a first-order construct represented by twelve indicators, identified by the code INNO. The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of four statements (INNO3: "Our firm is a pioneer to market with new products or services", INNO8: "Our firm is regularly looking for new marketing methods", INNO10: "Our firm spends resources on R&D for new products", and INNO12: "Our firm spends resources on R&D for new processes").

Table 24 CFA for Innovative behaviour

Variable	Code	Indicator	St. loadings	t -value
Innovative behaviour	INNO1	Our firm frequently tries out new ideas	0.833	-
	INNO2	Our firm frequently introduces new products, or services, or processes, or organisation/ management systems	0.850	17.45
	INNO4	Our management seeks out new ways to do things	0.771	14.99
	INNO5	Our firm is creative in its methods of operation	0.919	20.01
	INNO6	Our firm uses up-to date technologies	0.846	17.31
	INNO7	Our firm develops new market segments	0.907	19.53
	INNO9	Our firm is regularly looking for new ways of establishing relationships with customers	0.849	17.43
	INNO11	Our firm spends resources on R&D for new services	0.871	18.20
Chi-Square=64.797; df=20; RMSEA=0.0921; SRMR=0.0220; GFI=0.942; AGFI=0.896; PGFI=0.523; NFI=0.983; NNFI=0.984; CFI=0.988				

Source: Author's work.

Following the modification, a subsequent CFA was performed using the remaining eight indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended

limit values: $\chi 2/df=3.2329$; RMSEA=0.0921; SRMR=0.0220; GFI=0.942; AGFI=0.896; PGFI=0.523; NFI=0.983; NNFI=0.984; CFI=0.988. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 24 below, present the remaining indicators after the model modification.

When evaluating the construct's reliability, the Cronbach's alpha for the construct is 0.954, and the CR indicator equals 0.957, surpassing the recommended threshold of 0.70. This substantiates the construct's reliability. Additionally, in terms of convergent validity, as illustrated in Table 24, all indicators exhibit standardised factor loadings exceeding 0.50 (ranging from 0.771 to 0.919). Moreover, the AVE indicator records a value of 0.731, signifying that 73% of the variance in the indicators can be accounted for by the latent construct (Hair et al., 2018). Given these findings, it can be affirmed that the INNO construct has satisfactory convergent validity.

4.4.4.8 Business performance

Business performance is defined as a second-order construct represented by fourteen first-order indicators. When it comes to first-order factors, the following were proposed in previous research: Customer satisfaction (identified by the code - CS), Market effectiveness (identified by the code - ME), and Profitability (identified by the code - PR).The mentioned factors will be measured through the reflective indicators mentioned earlier. Santos and Brito (2012) suggestions were followed for statistical testing of second-order constructs.

The model underwent a CFA analysis, revealing an unsatisfactory fit. Consequently, an examination of standardised residuals and modification indices was conducted, leading to a modification involving the removal of one statement of construct customer satisfaction (CS1 "…your overall customer satisfaction"); two statements of construct market effectiveness (ME2: "…our growth in sales revenue/ turnover", and ME4: "…our acquisition of new customers"); and one statement of construct profitability (PR1: "…our business profitability").

Following the modification, a subsequent CFA was performed using the remaining ten indicators, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=2.8577$; RMSEA=0.0839; SRMR=0.0142; GFI=0.935; AGFI=0.889; PGFI=0.544; NFI=0.983; NNFI=0.983; CFI=0.988. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50. The results, displayed in Table 25 below, present the remaining indicators after the model modification.

Table 25 CFA for Business performance

Variable	Code	Indicator	St. loadings	t -value
		In comparison to the major firm's competitors…		

Business performance	CS2	…our customers satisfaction with the quality of our products	0.894	-
	CS3	…our customers perception of the money's worth of their purchase	0.919	23.95
	CS4	…the delivery of what your customers want/ meeting customer needs	0.901	22.74
	CS5	…the number of customers that keep doing business with us	0.957	26.75
	ME1	…our market share	0.883	-
	ME3	…our growth in sales revenue/ turnover of innovative products or services	0.901	21.95
	ME5	…our sales to existing customers	0.909	22.39
	PR2	…our return on investment	0.960	-
	PR3	…our return on sales	0.969	40.48
	PR4	…the reach of financial goals	0.952	36.58
Chi-Square=91.446; df=32; RMSEA=0.0839; SRMR=0.0142; GFI=0.935; AGFI=0.889; PGFI=0.544; NFI=0.983; NNFI=0.983; CFI=0.988				

Source: Author's work.

When evaluating the construct's reliability, the Cronbach's alpha for all three constructs is surpassing the recommended threshold of 0.70 (from 0.918 to 0.970), as well as the values of CR (ranging from 0.926 to 0.973), as seen in Table 26. This substantiates the reliability of the constructs. Additionally, in terms of convergent validity, as illustrated in Table 25, all indicators exhibit standardised factor loadings of all indicators are exceeding 0.50 (ranging from 0.883 to 0.969). Moreover, the AVE indicator for all constructs records a value greater than 0.50 (from 0.806 to 0.922), signifying that at least 80% of the variance in the indicators can be accounted for by the latent constructs (Hair *et al*., 2018). Given these findings, it can be affirmed that these constructs have satisfactory convergent validity.

Table 26 Validity of PERF

Variable	**CR**	**AVE**	CS	ME	PR
CS	0.955	0.843	**0.918**		
ME	0.926	0.806	0.895	**0.898**	
PR	0.973	0.922	0.743	0.902	**0.960**

Source: Author's calculations.

Moreover, regarding discriminant validity, Table 26 showcases the SQRT AVE values diagonally (right side) and presents the correlations between the constructs below. To confirm discriminant validity, the SQRT AVE value must exceed the correlations between the construct and other factors. The findings indicate that the examined constructs indeed possess discriminant validity. Additionally, these constructs exhibit substantial mutual correlations ranging from 0.743 to 0.902, hinting at the possibility of a second-order construct that reflects these factors.

Furthermore, since business performance is described as a second-order construct that is represented by three first-order constructs, further verification of the construct is necessary. The measuring characteristics of the first-order components were looked at before, when the validity of the second-order construct was assessed. The findings indicated that all of the first-order constructs had valid and reliable multi-indicator scales.

Table 27 CFA for second-order measurement model PERF

Path	St. loadings	t -value
PERF – CS	0.867	-
PERF – ME	0.915	22.77
PERF – PR	0.842	19.21

Source: Author's work.

Upon deeper examination, it was established that all factors of first-order loading onto the respective second-order factor are significant, and surpass 0.50, as illustrated in table 27. This substantiates the model's convergent validity. The GOF indices also show corresponding values. Furthermore, the correlations among the first-order factors remain under the recommended threshold of 0.90, indicating distinctiveness between these constructs. Given the high intercorrelation among these first-order factors, it can be said that they collectively represent business performance.

4.4.4.9 CFA Overview

Table 28 summarises the results of the CFA. As explained in detail previously, the model fit, reliability and validity of the measurement models were confirmed for all models.

Table 28 CFA overview

	Items	Absolute indicators			Incremental indicators		CR	AVE	SQRT AVE
		χ^2/df	RMSEA	SRMR	NFI	CFI			
COP	4	1.566	0.046	0.018	0.993	0.997	0.808	0.537	0.773

MAN	4	1.595	0.015	0.008	0.998	1.000	0.934	0.782	0.884
ORG	4	3.402	0.095	0.009	0.994	0.996	0.955	0.842	0.917
TEH	4	0.237	0.000	0.002	1.000	1.000	0.973	0.901	0.949
MKT	4	3.786	0.103	0.016	0.992	0.994	0.940	0.799	0.894
GOV	4	0.327	0.000	0.002	0.999	1.000	0.965	0.875	0.935
INNO	8	3.233	0.092	0.022	0.983	0.988	0.957	0.731	0.855
PERF									
CS	4	2.8577	0.0839	0.0142	0.983	0.988	0.955	0.843	0.918
ME	3						0.926	0.806	0.898
PR	3						0.973	0.922	0.960

Source: Author's calculations.

When it comes to discriminative validity in Table 29, it can be concluded that all constructs meet the condition of discriminative validity. Accordingly, the observed measurement models can be further analysed in terms of structural analysis, as there are no significant deviations from the reference values of the relevant indicators.

Table 29 Discriminant validity testing

	GOV	**COP**	**TEH**	**MAN**	**ORG**	**MKT**	**INNO**	**CS**	**ME**	**PR**
GOV	**0.773**									
COP	0.153	**0.884**								
TEH	0.186	0.472	**0.917**							
MAN	0.068	0.464	0.808	**0.949**						
ORG	0.220	0.594	0.627	0.783	**0.894**					
MKT	0.267	0.752	0.665	0.672	0.770	**0.935**				
INNO	0.130	0.617	0.749	0.849	0.779	0.808	**0.855**			
CS	0.156	0.631	0.514	0.635	0.682	0.652	0.742	**0.918**		
ME	0.189	0.547	0.513	0.662	0.659	0.542	0.664	0.895	**0.898**	
PR	0.250	0.531	0.486	0.569	0.572	0.452	0.601	0.743	0.902	**0.960**

Source: Author's calculations.

4.5. Hypothesis testing

As previously outlined, SEM was employed to evaluate the proposed structural model in this thesis. This multivariate method combines factor analysis and multiple regression, enabling the simultaneous examination of connections between observable variables and latent constructs, as well as among multiple latent constructs. In fact, its key feature lies in its ability to assess multiple interconnected relationships at once. (Hair *et al*., 2018)

According to Hair *et al*. (2018), SEM comprises six fundamental steps. The first four steps align the steps of CFA, aimed at determining the reliability and validity of the measurement constructs, which ultimately constitute the structural model analysed in the final step (Bajgorić *et al*., 2019).

4.5.1. Structural model characteristics

Numerous factors impact a company's innovation and business, making it impractical to encompass and test all constructs from prior research in a single model. However, concerning innovative behaviour and the foundational theories, particularly considering the conducted SLR, it can be inferred that the proposed model addresses a substantial portion of the factors influencing companies' innovative behaviour.

The structural research model, which was developed based on the findings and recommendations of earlier research and studies, was defined in the previous chapter of this thesis and will be tested in this chapter. It is composed of the following hypotheses:

H1: Government support influences innovative behaviour of SMEs

H2: Cooperation influences innovative behaviour of SMEs

H3: Technology orientation influences innovative behaviour of SMEs

H4: Managerial orientation influences innovative behaviour of SMEs

H5: Organisational IO culture influences innovative behaviour of SMEs

H6: Market orientation influences innovative behaviour of SMEs

H7: Innovative behaviour of SMEs influences business performance

The testing of the eighth hypothesis, by also involving the moderating effect of innovative behaviour, will follow the analysis of the fundamental model. Additionally, an extension to the basic model will be undertaken, incorporating control variables to assess their influence. The outlined hypotheses, defining the basic conceptual model, are visualised in the diagram provided in Appendix K. In terms of the structural model characteristics, the model is comprised of seven first-order constructs with 43 indicators and one second-order construct

consisting of three constructs and 14 indicators. Drawing from 265 observations, the model's covariance matrix, as already mentioned, illustrates its recursive nature, denoting the absence of two-way connections among latent constructs.

4.5.2. Overall conceptual model testing

In this part of the analysis, which is at the same time the last step of the process, model fit, and hypothesis testing are performed. The evaluation of the overall model fit is performed in the same way as explained in the section 4.4.4., i.e., *Assessment of reliability and validity.* CFA of the basic model was performed, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=3.299$; RMSEA=0.0933; SRMR=0.072; NFI=0.945; CFI=0.959.

Due to the intricacy of the model, second-order scales were combined in a manner that allowed the factors' mean value to be determined, and they were then utilised as indicators of second-order factors. In other words, second-order constructs were converted into first-order constructs in order to reduce the number of variables in the model and produce composites from first-order constructs. This technique, known as "parcelling," uses item bundles in SEM and has gained popularity recently. Some writers even suggest using it. In a SEM analysis, parcelling entails substituting the parcel scores for the item scores by adding together or averaging the item scores from two or more items (Bandalos, 2002).

Moreover, CFA of the aggregated model without structural relationships was performed, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=3.342$; RMSEA=0.0942; SRMR=0.0722; NFI=0.956; NNFI=0.965; CFI=0.969. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50, except COP6 for which the explanation was previously given (Appendix I4). Moreover, discriminant validity testing showed the same results as by individual CFA.

In addition, an analysis was conducted on the structural relationship model to verify that no notable modifications were made in relation to the CFA model. The basic structural model is nothing more than a synthesis of structural connections represented by hypotheses and CFA of the used components. The standardised factor loadings showed no noteworthy alterations, remaining consistent with the outcomes from the CFA model, and affirming the stability of the measurement indicators. Given the absence of alterations in the factor loadings, it is reasonable to assert that the conclusions drawn from the CFA results remain applicable to the comprehensive structural model, especially those pertaining to reliability and validity.

4.5.3. Hypothesis testing

Once the model's fit was confirmed, an examination of the hypotheses' depicted relationships was conducted. Table 30 showcases standardised evaluation parameters illustrating the change of the dependent variable concerning the change of standard deviation of the independent variable. As well as of the unstandardised parameter, as the magnitude which reflects the result of changing the dependent variable for a single change in the independent variable while holding all other independent variables constant. Additionally, it includes the t-values, indicating whether a certain parameter is significantly different from zero in the population, and the R^2 values, signifying the proportion of variance in the dependent variable explained by the independent variable. The graphical representation of the structural model testing results is outlined in Appendix K. Based on the data outlined in Table 30, it can be deduced that the data substantiates seven causal relationships posited by the aforementioned hypotheses, demonstrating a significant positive correlation between the constructs.

Table 30 Hypotheses testing results

	Dependent variable	**Independent variable**	**Non-standardised rating parameter**	**Standardised rating parameter**	**t – value**	**Hypotheses testing**
H1	INNO	← GOV	-0.0362	-0.026	-0.727	Not significant
H2	INNO	← COP	0.230	0.085	1.397+*	Significant
H3	INNO	← TEH	0.0285	0.041	0.595	Not significant
H4	INNO	← MAN	1.053	0.511	5.405***	Significant
H5	INNO	← ORG	0.0113	0.009	0.124	Not significant
H6	INNO	← MKT	0.736	0.349	4.332***	Significant
H7	PERF	← INNO	0.415	0.939	18.174***	Significant
R^2 (INNO) = 77.9%						
R^2 (PERF) = 84.1%						

***p<0.01; **p<0.05; *p<0.1

+*p – one-tailed

Source: Author's work

The results show that cooperation (β=0.085; t=1.397; p<0.1), managerial orientation (β=0.511; t=5.405; p<0.01) and market orientation (β=0.349; t=4.332; p<0.01) positively and significantly influence innovative behaviour. On the other side, organisational IO culture (β=0.009; t=0.124), technology orientation (β=0.041; t=0.595), and government support (β=-0.026; t=-0.727) do not significantly influence innovative behaviour. The R^2 value, as expected for these constructs, is relatively high and indicates that the model successfully explains about 77.9% of the variance of innovative behaviour. Namely, if a SME cooperates with suppliers, other firms and consultants it may develop new market segments and become creative in its methods of operation. Moreover, if its management is involved in new initiatives and allocates resources to R&D, it will introduce new products/ services/ processes, and seek out new ways to do things. Finally, if the SME focuses on better understanding of customers and their needs and is oriented towards providing quality

services to the client, its communication with the customers will be enhanced and new relationships will be established.

Furthermore, as already stated, the results show that H3, H4 and H6 are not confirmed. However, it is important to note that the data indicate a positive causal relationship between the constructs in the case of organisational IO culture and technology orientation, but this relationship is not statistically significant. This implies that while the findings did not meet the conventional standards for significance, there could still be practical implications. Moreover, it indicates that these factors could indeed contribute to fostering innovative behaviour of SMEs, albeit the effect might be subtle or influenced by other variables not accounted for in the study.

Also, although it is not statistically significant, an intriguing observation emerged indicating a negative causal relationship between the constructs in the case of government support. This discrepancy might stem from various plausible factors. For instance, unaccounted-for variables or interactions, such as market conditions or industry dynamics, might be influencing this relationship. Moreover, the possibility of reverse causality, wherein innovative SMEs might attract less government support, confounding the observed relationship may also be considered. Nevertheless, the probably most important factor would be the research context. Namely, in the context of an emerging economy, the relationship between government support and innovative behaviour in SMEs might manifest differently due to unique economic, social, and regulatory conditions (Pimenova and Van Der Vorst, 2004). The absence of statistical significance coupled with the indication of a negative causal relationship within the research could be interpreted through this lens. As seen previously in this dissertation, in emerging economies, factors such as inconsistent policies, bureaucratic hurdles, or inadequate infrastructural support could potentially hinder the positive impact of government support on fostering innovation in SMEs (Radaš and Božić, 2009; Vajjhala and Strang, 2018). Emerging economies often face challenges related to access to capital, technology, and skilled labour, which could overshadow the potential benefits of government initiatives aimed at stimulating innovation. Furthermore, as mentioned by Silajdžić and Mehić (2021), cultural perceptions and risk-averse behaviours prevalent in emerging markets might influence how SMEs interact with and perceive government support programs, affecting the observed relationship. Therefore, while the data might not exhibit statistical significance, the indication of a negative causal link could signify the presence of systemic barriers or complexities within the emerging economy context that impede the anticipated positive effects of government support on SME innovation.

Regardless of the fact that the stated results are not completely in accordance with the findings and results of earlier research when it comes to these variables, it is very possible that there are certain determinants that mediate between these factors and innovative behaviour, and which are not part of this research. In that regard Thongsri and Chang (2019) found out that political ties mediate the relationship between government support and innovative behaviour, and also that innovative behaviour is actually a mediator between government support and firm performance. Moreover, several studies found out that

Organisational IO culture is a mediator to other factors and innovative behaviour (Arabeche et al., 2022), or even between innovative behaviour and performance as seen at Kenny and Reedy (2006), Kraśnicka, Głód and Wronka- Pośpiech (2018) and Nimfa et al. (2021), for some as Iranmanesh et al. (2021) also a moderator, or that even there are some factors as organisational learning, capabilities or leadership style that mediate this relationship (Bhatti, Rehman and Rumman, 2020; Rehman, Bhatti and Chaudhry, 2019). The absence of a robust, collective IO culture renders a firm scarcely competitive in terms of innovative advancement. In particular, organisational IO culture is only one aspect of the overall organisational culture of a firm. Inclusion of other aspects may have a different influence on innovative behaviour. Finally, researcher also found that there are some mediators between technology orientation and innovative behaviour Henao-García and Montoya (2021), as for example learning orientation which was underlined by Salavou (2005), but also that technology may moderate the relationship of innovative behaviour and performance (Mansour and Al-Najjar, 2018; Tariq, Badir and Chonglerttham, 2019; Tayal et al., 2018; Wu et al., 2017).

Furthermore, the results show that innovative behaviour (β=0.939; t=18.174; p<0.01) positively and significantly influences business performance. Overall, the proposed conceptual model explains 84.1% of the variance of the SMEs business performance. In particularly, these results mean that if an SME frequently tries out new ideas, develops new market segments, and is regularly looking for new ways of establishing relationships with customers, this will result in a greater customer satisfaction, market effectiveness and profitability. In terms of hypothesis testing, the outcomes are nearly identical to those obtained using the model without composite variations.

Finally, the model confirms that COP, MAN and MKT have an indirect influence on the company's business performance, through innovative behaviour. In other words, there is a positive significant relationship between COP and INNO, MAN and INNO, MKT and INNO and between INNO and PERF. On the other hand, an additional test was performed to see if there is some indirect significance of the factors which were not proved significant, over the other determinants. Accordingly, organisational IO culture, as noticed also prior through the literature review, also affects innovative behaviour but through COP (β=0.530; t=6.148; p<0.01), MAN (β=0.475; t=8.579; p<0.01) and MKT (β=0.585; t=9.081; p<0.01), as proved by prior studies (e.g., Arabeche et al., 2022; Kenny and Reedy, 2006; Kraśnicka, Głód and Wronka- Pośpiech, 2018; Nimfa et al., 2021). Moreover, technology orientation also affects innovative behaviour, but through COP (β=0.131; t=1.696; p<0.1), MAN (β=0.534; t=10.080; p<0.01) and MKT (β=0.282; t=5.038; p<0.01), as suggested by Salavou (2005) or Mansour and Al-Najjar (2018). Specifically, a firm that has a flexible organisational structure and is open to accepting new ideas, and a firm that follows new technology trends and invests in technology, will improve the cooperation of the firm, managerial openness to new ideas and be more oriented to customer needs, which will in turn bring to enhanced innovative behaviour of the firm.

4.5.4. Extended model testing

The model was extended in three cases. Firstly, in case of the extended conceptual model with an estimation of the basic model using aggregate variables, where the impacts of its individual dimensions were examined rather than using business performance as a second-order measuring scale. Secondly, apart from the basic model, another model that was tested is a model extended with control variables. Finally, in the form of indirect effect analysis.

4.5.4.1 Business performance individual dimensions

CFA of the extended model where second-order constructs (CS, ME and PR) of business performance were analysed as first-order constructs was performed, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators. All indicators conform to recommended limit values: $\chi 2/df=2.589$; RMSEA=0.0776; SRMR=0.0651; NFI=0.972; CFI=0.975. Additionally, each indicator loads onto respective factor with a loading exceeding 0.50.

Once the model's fit was confirmed, an examination of the hypotheses' depicted relationships was conducted, in particular the influence was analysed on each single of the previous second-order factors. The graphical representation of the structural model testing results is outlined in Appendix K. Based on the data outlined in Table 31, it can be deduced that the data substantiates nine causal relationships posited by the aforementioned hypotheses, demonstrating a significant positive correlation between the constructs.

Table 31 PERF individual hypotheses testing results

	Dependent variable	**Independent variable**	**Non-standardised rating parameter**	**Standardised rating parameter**	**t – value**	**Hypotheses testing**
H1	INNO	← GOV	0.00374	-0.003	-0.0790	Not significant
H2	INNO	← COP	0.357	0.134	2.260**	Significant
H3	INNO	← THE	0.0177	0.026	0.388	Not significant
H4	INNO	← MAN	1.071	0.521	5.645***	Significant
H5	INNO	← ORG	0.0879	0.075	1.011	Not significant
H6	INNO	← MKT	0.588	0.284	3.668***	Significant
H7a	CS	← INNO	0.503	0.768	12.230***	Significant
H7b	ME	← INNO	0.473	0.677	11.171***	Significant
H7c	PR	← INNO	0.304	0.657	10.665***	Significant
R^2 (INNO) = 83.9%						
R^2 (CS) = 58.9%						
R^2 (ME) = 45.8%						
R^2 (PR) = 43.1%						

***p<0.01; **p<0.05; *p<0.1

Source: Author's work

Overall, the results of this extended model show approximately the same results as the original models in terms of the hypotheses, which are confirmed or not. Nevertheless, the overall fit and significance of individual parameters of this model is better than in the original. Specifically, the t-values of cooperation (β=0.134; t=2.260; p<0.05) and organisational IO culture (β=0.0879; t=1.011) are much higher. Also, the R^2 value, is higher and indicates that the model successfully explains about 83.9% of the variance of innovative behaviour. Ultimately, when it comes to some reasons for the beforementioned differences, this model extension likely enhanced the model's clarity by reducing measurement error and complexity. It also improved the fit of the model, resulting in more precise relationships between variables and consequently, more significant estimates. Simplifying the model structure potentially mitigated issues like multicollinearity, making the relationships clearer and easier to interpret, ultimately leading to better significance of certain variables compared to the original model.

4.5.4.2 Control variables

Considering the constant characteristics that can have a significant impact on the company's business performance, two control variables were added to the model. These are the size of the company measured by the number of employees, as well as the export intensity of the company. Accordingly, the model includes independent factors such as firm size and export, whereas the dependent variables include innovative behaviour and business performance.

CFA of the model with control variables was performed, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators, as shown in Table 32.

Table 32 CFA of the model with control variables

Model fit indicators	**Basic model**	**Model with control variables**
$\chi 2$/df	3.342	3.227
Absolute indicators		
GFI	0.722	0.721
RMSEA	0.0942	0.0918
RMR	0.361	0.343
SRMR	0.0722	0.0698
Incremental indicators		
NFI	0.956	0.953
NNFI	0.965	0.962
CFI	0.969	0.967
Parsimonial indicators		
AGFI	0.671	0.665
PGFI	0.855	0.601

Source: Author's own work.

As shown in Table 33, the results show that the size of the company does not have a significant impact on business performance (β=0.015; t=0.840), but it does on the innovative

behaviour of the company (β=0.071; t=1.956; p<0.1). In other words, the results suggest that the larger the company is (in terms of the employees), the more innovatively it behaves. Specifically, larger SMEs, with their expanded human capital and potentially greater financial resources, might have the capacity to dedicate more personnel and funds toward innovation efforts. Furthermore, the export intensity of the company has no significant influence either on business performance (β=-0.018; t=-1.052), nor on the innovative behaviour of companies (β=-0.040; t=-1.136).

Table 33 Hypotheses testing results with control variables

	Dependent variable	Independent variable	Non-standardised rating parameter	Standardised rating parameter	t – value	Hypotheses testing
H1	INNO	← GOV	-0.0319	-0.023	-0.645	Not significant
H2	INNO	← COP	0.174	0.064	1.044	Not significant
H3	INNO	← TEH	0.0182	0.026	0.381	Not significant
H4	INNO	← MAN	1.077	0.524	5.476***	Significant
H5	INNO	← ORG	0.0390	0.032	0.422	Not significant
H6	INNO	← MKT	0.721	0.343	4.307***	Significant
H7	PERF	← INNO	0.415	0.937	18.201***	Significant
C_{1a}	INNO	← EMP	0.381	0.071	1.956*	Significant
C_{1b}	PERF	← EMP	0.0317	0.015	0.840	Not significant
C_{2a}	INNO	← EXP	-0.0858	-0.040	-1.136	Not significant
C_{2b}	PERF	← EXP	-0.0156	-0.018	-1.052	Not significant

***p<0.01; **p<0.05; *p<0.1

Source: Author's work

When it comes to export, it is interesting that in both cases a negative tendency of the influence of exports was shown, although insignificant. A strong export intensity does not necessarily lead to an improved business performance as it was already proved by several studies (Behyan, Mohamad and Omar, 2015; Girma, Greenaway and Kneller, 2001; Karedza and Govender, 2017; Kim and Hemmert, 2016). Moreover, recent research has uncovered conflicting results regarding the link between a company's exporting activity and its innovation performance. According to Xie and Li (2017) in instances of very high export orientation or intensity, specialised exporters often concentrate on foreign markets where their strengths in product innovation might not be competitive, leading to a reduced focus on developing new products or innovations. Often, in emerging economies, companies with lower export levels often prioritise innovation for several reasons. Resource constraints may lead them to allocate resources to domestic market consolidation and innovation rather than extensive exporting. Unique local market demands drive these companies to innovate products or services tailored to these specific needs. Moreover, government support or policies encouraging innovation for economic growth, coupled with infrastructural or technological gaps, further motivate these companies to innovate for local competitiveness, resulting in a scenario where lower-export companies display notable innovation behaviour (Xie and Li, 2017). In light of the findings that size, and export do not have substantial

impact on business performance, nor innovative behaviour in terms of export, the control variables will not be analysed in the indirect effect model.

4.5.4.3 Indirect effects

Following the examination of the foundational conceptual model, the presentation of results, and the incorporation of control variables into the model, the subsequent step involves probing indirect effects. In accordance with this model, hypothesis eight (H8a - H8f) is introduced, positing that innovative behaviour serves as moderator, influencing the connection between individual factors determining innovative behaviour and a company's business performance. This investigation was conducted using an aggregated model, aiming to comprehend the complex relationships among these variables within a holistic framework.

In adhering to robust research practices, it is important to assess whether a specific variable exerts a direct influence on the dependent variable before examining its moderating effect. Essentially, this entails confirming and validating the direct impact of individual innovative behaviour factors on business performance. CFA of the model was performed, demonstrating that the measurement model exhibits notably strong fit in terms of absolute, parsimonious, and incremental indicators, as shown in Table 34.

Table 34 CFA of the model with direct effect of determinants

Model fit indicators	Basic model	Model with direct effect
$\chi 2$/df	3.342	3.227
Absolute indicators		
GFI	0.722	0.722
RMSEA	0.0942	0.0942
RMR	0.361	0.361
SRMR	0.0722	0.0722
Incremental indicators		
NFI	0.956	0.956
NNFI	0.965	0.965
CFI	0.969	0.969
Parsimonial indicators		
AGFI	0.671	0.671
PGFI	0.855	0.610

Source: Author's work.

As the next step, it will be tested whether innovative behaviour moderates the relationship between determinants of innovative behaviour and business performance. Path analysis was used to explore the indirect effects of innovative behaviour on this relationship. As it may be noticed in Table 35, research hypotheses were supported with the path coefficients statistically significant at the 1% level. In particular, the relationship between government support; cooperation; technology orientation; managerial orientation; organisational IO culture; market orientation; and business performance is moderated by innovative behaviour. In other words, innovative behaviour affects how strongly these other factors impact

business performance. Essentially, SMEs that exhibit higher levels of innovative behaviour may experience greater benefits from government support, cooperation, technology orientation, managerial strategies, organizational culture, and market approach in terms of improved business performance.

Table 35 Path analysis for total and indirect effects

	Paths	β	SE	t	p
H8a	GOV → INNO → PERF	0.1393	0.500	2.7864	0.0057
H8b	COP → INNO → PERF	0.5363	0.0462	11.6175	0.0000
H8c	TEH → INNO → PERF	0.4432	0.0382	11.6001	0.0000
H8d	MAN → INNO → PERF	0.4508	0.0362	12.4549	0.0000
H8e	ORG → INNO → PERF	0.5494	0.0388	14.1426	0.0000
H8f	MKT → INNO → PERF	0.4945	0.0415	11.9025	0.0000

Source: Authors' work.

The direct relationship between the dependent and independent variables proved to be insignificant. Meaning that the impact of these factors on performance is not straightforward and can be influenced by the level of innovative behaviour within the organisation. Particularly, results of total, direct and indirect testing can offer conclusion regarding H8a-H8f, namely, the results suggest the full mediation of innovative behaviour between the determinants and business performance. The full mediation effect exists when there is an indirect statistically significant effect, but not a direct effect (Pardo and Román, 2013).

Moreover, the mediation analysis was conducted using the PROCESS procedure (Hayes, 2012) in SPSS 22 to validate the indirect impact of the independent variables on the dependent variable through the mediator, innovative behaviour. The mean scores of composite latent variables were computed and utilised to generate bias-corrected 95% bootstrap confidence intervals (hereinafter: CIs) for the indirect effects. When the interval for an indirect effect does not encompass zero, it indicates a significant difference from zero with 95% confidence. Mediation models were individually estimated for each hypothesis, employing bootstrapping with 5,000 resamples to calculate bias-corrected and accelerated confidence intervals for the indirect effect (Hayes, 2013).

Table 36 Parameter estimates for Mediation effects

Paths	Mediation index	BootSE	BootLLCI	BootULCI
COP → INNO → PERF	0.3376	0.0454	0.2474	0.4268
MAN → INNO → PERF	0.4353	0.0752	0.2903	0.5869
ORG → INNO → PERF	0.3184	0.0630	0.1904	0.4379
TEH → INNO → PERF	0.4301	0.0581	0.3152	0.5451
MKT → INNO → PERF	0.4147	0.0619	0.2917	0.5326
GOV → INNO → PERF	0.0900	0.0346	0.0188	0.1553

Source: Authors' work.

The findings from the PROCESS analysis offer supplementary support for the mediation analysis of innovative behaviour in linking determinants of innovative behaviour to business performance. Moreover, through this procedure all the hypotheses, H8a - H8f, were confirmed. In general, as it is shown in Table 36, the CI range does not contain a zero and the findings uphold the proposed mediation model, indicating that all independent variables exert a noteworthy indirect influence on business performance through their impact on innovative behaviour. When these factors are viewed as antecedents, they collectively yield a positive net effect on performance through their impact on innovative behaviour. In essence, fostering innovative behaviour within a firm serves as a catalyst—enhancing the levels of innovative behaviour stimulated by determinants, consequently leading to an uptick in business performance.

Additionally, as throughout the literature review, the organisational IO culture and technology variable were many times underlined as factors that enhance the relationship of other determinants and innovative behaviour, an indirect effect analysis was performed. The results showed that ORG is a mediator to all other factors, namely cooperation (β=0.3876; CI= (0.3156, 0.4593)), managerial orientation (β=0.3025; CI= (0.2270, 0.3772)), technology orientation (β=0.3621; CI= (0.2881, 0.4379)), market orientation (β=0.3795; CI= (0.2882, 0.4635)), government support (β=0.1534; CI= (0.0718, 0.2339)), and their relationship to innovative behaviour. Moreover, technology orientation mediates the relationship between managerial orientation (β=0.2587; CI= (0.1658, 0.3478)), cooperation (β=0.3323; CI= (0.2640, 0.4000)), market orientation (β=0.3237; CI= (0.2525, 0.3984)), and innovative behaviour.

5. RESULTS DISCUSSION

The goal of this chapter is the interpretation of the results stemming from exhaustive conceptual model testing, meticulous analysis of interview findings, and hypothesis testing. By delving into these multifaceted aspects, this section will synthesise the data, draw meaningful connections, and derive comprehensive conclusions pivotal to advancing the understanding and implications within the studied field.

5.1. Results discussion according to conceptual model

This sub-chapter critically examines the multifaceted exploration of SMEs dynamics within a conceptual model, analysing findings derived from bibliometric analysis, SLR, and the assessment of the conceptual model. The discussion is structured into three interconnected subsections. Firstly, the bibliometric analysis unveils historical trends, predominant themes, and influential contributors within the realm of SMEs innovation behaviour research. Subsequently, the SLR consolidates existing theories, methodologies, and research gaps, contributing to a nuanced comprehension of SME performance. Lastly, the evaluation of the conceptual model integrates insights from both analyses, validating interrelationships

between constructs, offering a comprehensive understanding of SMEs dynamics and their operational performance.

5.1.1. Bibliometric analysis results

As a result of bibliometric analysis, it was noticed that the number of studies on SME innovation behaviour has been increasing during the last ten years. This increase is especially evident in the last seven years compared to the years before. The analysis showed that the number of published articles in this field was approximately 20 per year ten years ago. In the following years this number suddenly started to increase and came to approximately 50 published articles in the period 2015-2018. An even more important rise happened in the last three years, especially in 2021 (data for mid-2021) where the number of research papers was already close to 120. The increase in interest during this period of 2019-2021 may also, among other things, be explained by the outbreak of the COVID-19 pandemic during which especially the importance of innovation, R&D, and information technologies was recognised. This enormous growth by over 700% in the last eight years underlines the importance of the topic and the need for even further analysis of the field.

The co-citation analysis of cited references resulted in four main clusters. The most cited document is a paper that argues the importance of strong learning orientation in order for contemporary organisations to effect firm innovativeness and gain competitive advantage (Calantone, Cavusgil and Zhao, 2002). The following is a study focusing on introducing constructs of climate for initiative on the firm level (Baer and Frese, 2003). This is followed by papers which deal with the role of R&D cooperation for the innovation process (Becker and Dietz, 2004) and the role of individual entrepreneurs in facilitating innovation occurrence (Baron and Tang, 2011).

Moreover, through the analysis also most productive authors, journals and countries were identified. The journal which published most articles in this field is Sustainability. Furthermore, through bibliometric coupling it was noticed that the top three journals in the mapped field are the Research Policy, Sustainability and European Journal of Innovation. These journals occur as the main outlets in SME innovation research. Particularly, the information on the most popular journal may certainly be useful for further research and the identification of reliable sources on SME innovation.

Furthermore, the leading scholars in this field are coming from the People's Republic of China, the USA and Spain. The analysis showed that this research field is very popular in developed countries, while it is less researched in developing countries. Further bibliographic coupling of countries indicated that the most productive and cooperating countries are People's Republic of China, USA, Spain, Germany, England, Italy, France, and Australia. This additionally underlines the importance for more research in developing countries, especially the Western Balkans, and the need for wider collaboration between regional researchers.

Moreover, recent studies have recommended that more countries should collaborate in their research on SME innovation in order to share resulting benefits and costs (Al-Hanakta *et al*., 2021). Accordingly, the results of the analysis showed much cooperation among the different clusters, but also USA and People's Republic of China as collaborating in one cluster, collaboration of England, Germany, Italy, and France in the second cluster, Spain, Brazil and Sweden collaborating in another cluster, while Australia, Malesia and Pakistan also collaborate in other cluster.

Four clusters were identified by the co-occurrence analysis of the keywords. Moreover, through the analysis four prevalent research topics were identified. The first concerns the internal aspect and innovation capabilities of SMEs (cluster 1); the second relates to entrepreneurship and managerial orientation (cluster 2); the third presents the internal capabilities and organisational orientation of SMEs (cluster 3), and finally the fourth concerns the external environment factors of SME innovation (cluster 4). In the first cluster, the most dominating topics are "evidence" and "innovation activity". The dominant topics of the second cluster are "manager" and "organisation". In the third cluster revolves around "SMEs", "perspective" and "insight", while the dominating topics of the last cluster are "policy" and "government". The analysis revealed some similar clusters and showed that innovation and SMEs are associated topics, which need further research.

5.1.2. Systematic literature review results

This thesis employed SLR to identify the drivers of innovation in SMEs. The aim was to assimilate the existing fragmented knowledge of the applicable studies and to embellish the understanding of drivers so that the awareness of the same can be enhanced. Hence, a comprehensive content analysis of the 87 studies on factors driving innovation in the SMEs sector was conducted. Accordingly, this analysis presented a detailed review of SMEs innovation drivers. The results of the content analysis of the primary studies identified the most mentioned internal and external drivers of innovative behaviour.

Furthermore, Cao, Le and Nguyen (2022) highlight the empowerment of employees through autonomy, a factor that sparks innovative thinking and problem-solving. Yapa, Senathiraja and Kauranen (2018) stresses the importance of aligning this culture with strategic innovation goals, ensuring that the organisational ethos directly supports and reinforces innovative practices. Finally, Wadho and Chaudhry (2018) bring the focus to the customer-centric aspect, underlining how understanding customer needs is pivotal for aligning products or services with market demands, thus driving innovation. Together, these insights, derived from various authors and their respective studies, form a comprehensive view of how various facets of organisational culture contribute synergistically to foster innovation within SMEs, from leadership values to empowerment, resilience, strategic alignment, and customer focus.

Moreover, the discourse on innovation within SMEs is enriched by a comprehensive examination of managerial orientation and cooperation as crucial components. Surya *et al*. (2022) highlight the pivotal role of managerial orientation, emphasising how managers' attitudes, beliefs, and strategic outlook significantly mould the culture within SMEs. Knezović and Drkić (2021) further explore managerial orientation, linking it directly to fostering an innovation-driven culture by stressing the impact of managerial attitudes toward risk-taking and experimentation. In parallel, Cao, Le and Nguyen (2022) emphasise the importance of managerial practices that empower employees, creating an environment conducive to innovation.

In tandem with managerial orientation, the significance of cooperation within innovative SMEs is evident. Suh and Kim (2012) and Haug *et al*. (2023) highlight how a collaborative culture promotes knowledge-sharing and teamwork, fostering an environment ripe for innovation. Bertello *et al*. (2022) reinforce this by stressing the role of a cooperative culture in nurturing diverse ideas through open communication and collaboration. Annamalah *et al*. (2022) delve into the vital role of cooperation within a culture embracing diversity and inclusivity, as essential elements for stimulating innovative thinking. Srholec (2014) contribute by underscoring the link between cooperation and a culture valuing continuous learning, as a critical factor in driving innovation. Hameed and Naveed (2019) further emphasise how a cooperative culture directly impacts the innovation process, particularly in generating and implementing novel ideas.

In exploring external factors influencing innovative behaviour in SMEs, research has linked government support and legislation to the cultivation of conducive environments. Kweh *et al*. (2019) emphasise how government policies incentivise risk-taking, fostering a landscape where innovative ideas thrive. Bertello *et al*. (2022) further highlight how such support encourages collaboration among SMEs, nurturing an environment where innovation thrives. Handoko, Smith and Burvill (2014) and Doh and Kim (2014) delve into how government initiatives impact the establishment of innovation-oriented cultures, aiding SMEs in aligning with innovation goals. Liu (2021) emphasise government policies' role in stimulating creativity and adaptation within these businesses.

The relationship between a market-oriented culture and innovation is another focal point. D'souza *et al*. (2022) stress how such cultures leverage customer insights to drive innovative solutions. Surya *et al*. (2022) highlight how cultural values and managerial beliefs significantly shape customer-centric practices, fostering an environment conducive to innovation. Abdul- Halim *et al*. (2019) delve into the interplay between market orientation and organisational culture, aligning products or services with market needs to fuel innovation. Moreover, they underscore how customer-oriented cultures directly impact innovation by understanding and meeting customer demands.

Finally, aligning organisational IO culture with technological advancements emerges also as crucial. Yapa, Senathiraja and Kauranen (2018) highlights how a culture embracing technological change fosters innovation. Kocak, Carsrud and Oflazoglu (2017) stress the

impact of technology-driven cultures on innovation outcomes, advocating for a culture that encourages technological experimentation. Finally, Haug *et al*. (2023) underscores how a technology- oriented culture facilitates knowledge-sharing and collaboration, essential for innovation within SMEs.

This comprehensive exploration of innovation drivers in SMEs reveals the intricate interplay between internal and external influences, and innovation behaviour. It underlines the imperative for cultivating a holistic, innovation-driven culture within SMEs—an environment that embraces risk-taking, fosters collaboration, empowers employees, and aligns with market demands and technological advancements. This synthesis of factors forms a foundation for fostering innovation, offering valuable insights for shaping policies and strategies aimed at propelling SMEs toward sustained innovative success.

5.1.3. Conceptual model analysis results

This research provides new information to prior studies by identifying the factors that drive companies' innovative behaviour and how innovative behaviour impact business performance. The study offers an empirically supported model that is grounded in theory. The findings derived from the conceptual model analysis, which integrated established theories and prior research, unravel essential insights into the intricate dynamics shaping innovative behaviour within SMEs. These revelations, stemming from comprehensive literature reviews and meticulous analyses, carry significant academic importance, offering a detailed understanding of factors influencing innovation in the SME sector and their implications.

The examination of government support's impact on innovative behaviour within SMEs yielded insightful conclusions following the research of several authors (e.g., Audretsch and Lehmann, 2005; Ayyagari, Beck and Demirguc-Kunt, 2007; Carree and Thurik, 2010; Hoque, 2018; Najib, Abdul Rahman and Fahma, 2021). Notably, studies highlighted a positive correlation between governmental initiatives, such as grants, subsidies, and educational programs, and the innovation capabilities of SMEs. Moreover, tailored interventions were found to foster a conducive environment for innovation, emphasising the critical role of financial assistance and supportive regulatory frameworks in nurturing innovation within these enterprises.

In terms of the influence of collaborative efforts, the findings (e.g., Hagedoorn and Wang, 2012; Inkpen and Tsang, 2007; Rothaermel and Deeds, 2006; Salavou, Baltas and Lioukas, 2004; Tether and Tajar, 2008) established a vital link between cooperation and an organisation's innovative culture within SMEs. Particularly, the research underscored the significance of strategic alliances and cooperative networks, emphasising their role in providing access to diverse resources, knowledge, and expertise, which in turn stimulated the generation, diffusion, and implementation of innovative ideas within SMEs. This

highlighted the interconnectedness between cooperative endeavours and the cultivation of an environment conducive to innovation.

Moreover, the examination of technology orientation's impact on innovative behaviour within SMEs emphasised the strategic importance of a proactive engagement with technology. The findings, in line with those of some other authors (e.g., Atuahene-Gima, 2005; Mahemba and Bruijn, 2003; Teece, 2007) emphasised how a technology-oriented approach not only facilitated the identification of new opportunities, but also drove various facets of innovation, including product, process, and organisational innovation. This highlighted the strategic significance of aligning with technological advancements to maintain competitive advantage and drive innovation.

In parallel, the research emphasised the critical role of managerial orientation, particularly the influence of top management, in shaping an organisation's innovative culture. Specifically, the findings, supported by prior research also (e.g., Entrialgo, 2002; Gashema and Gao, 2018) underscored how managerial attitudes towards risk-taking, innovation, and strategic decision- making significantly shaped an organisation's approach to innovation. This accentuated the pivotal role of leadership in fostering an innovative environment within SMEs.

As for organisational IO culture, the research underscored the pivotal role of an IO culture, also confirmed by other studies (e.g., Al-Ansari, Xu and Pervan, 2014; Cameron, 2008; Chatman and O'Reilly, 2016; Denison, Haaland and Goelzer, 2004; Kenny and Reedy, 2006; Khazanchi, Lewis and Boyer, 2007; Sokro, 2012) in stimulating creative thinking and experimentation within SMEs. It highlighted that a culture fostering an environment where employees are motivated to engage in innovative activities significantly impacts the organisation's innovative behaviour, showcasing the interconnectedness between culture and innovation.

Moving forward, the examination of market orientation's influence on SMEs' innovative behaviour underscored the significance of understanding market dynamics. It highlighted the importance of aligning innovative efforts with customer demands and effectively processing market information to drive innovation within SMEs. This emphasises the strategic implications of market-focused strategies in fostering innovative behaviour, which was also supported by prior studies (e.g., Kirca, Jayachandran and Bearden, 2005; Li *et al*., 2008; Slater and Narver, 2000; Zhou, Yim and Tse, 2005).

Lastly, the findings consistently established the pivotal role of innovative behaviour in driving SMEs' overall business performance. The various dimensions of innovation, such as product, process, and organisational innovation, were found to positively influence business performance, market expansion, and sustained competitiveness within the SME sector, forming a cohesive link between innovation and business success (e.g., Laforet and Tann, 2006, Roper and Love, 2002; Tarutė and Gatautis, 2014; Tidd and Bessant, 2020).

These findings offered a comprehensive framework for further research and empirical testing of hypotheses, in accordance with theoretical assumptions. They provide actionable insights for policymakers, practitioners, and scholars seeking to foster innovation and drive business performance within the SME landscape, emphasising the interconnectedness and significance of various factors influencing innovative behaviour within these enterprises. In particular, one of the notable contributions of the proposed model lies in its comprehensive scope, presenting an integrated framework that enables the examination of the interdependent relationship among identified determinants of innovative behaviour. Additionally, it allows for the simultaneous exploration of how these determinants collectively influence a company's innovation and performance.

5.2. Interview findings

When it comes to the qualitative research findings and in terms of the input-throughput-output framework, it is important to underline several specific barriers. From the perspective of innovation throughput, the research pinpointed two critical obstacles: a notable deficiency in employees actively participating in the innovation cycle and a noticeable absence of motivation to engage in innovative initiatives. In terms of innovation output, the prevailing business model among companies in BiH typically does not emphasise innovation as a central skill set. Instead, SMEs in this region primarily prioritise cultivating distinct client relationships as their primary strategy for solidifying their market foothold, placing less emphasis on innovation as a primary driver for success. This focus underscores a preference for relationship-building over heavy reliance on innovative approaches in securing and maintaining market positions within these enterprises. Extending this idea suggests that while innovation remains essential, SMEs in BiH currently lean more towards personalised client interactions as their strategic cornerstone.

The analysis of interview data unveils a collective comprehension of innovation among participants, highlighting its fundamental significance within the operational paradigms of the surveyed SMEs. Notably, participants elucidate that innovation encompasses a multifaceted endeavour, encompassing both incremental improvements and radical transformations. Moreover, SMEs are depicted as actively engaged in innovation across multiple fronts, encompassing not only product development but also process refinement and service enhancement. This holistic approach extends beyond mere product innovation to encompass organizational structures, team dynamics, and procedural methodologies, reflecting an overall understanding of innovation as a multifaceted phenomenon.

The findings regarding the drivers of innovative projects within SMEs reveal a notable emphasis on internal triggers, primarily attributed to the proactive involvement of employees in proposing novel ideas and problem-solving approaches. Employees emerge as pivotal agents in the ideation, development, and implementation phases of innovation initiatives, thereby underscoring their intrinsic role as catalysts for organisational innovation. Moreover, the results highlight a concerted effort of SMEs to invest in the development and education

of their workforce, recognising the pivotal role of employee empowerment in driving innovation. Such investments not only contribute to enhancing the creative capacity of employees but also serve to cultivate a culture of continuous learning and adaptation, essential for sustained innovation in dynamic business environments.

Moreover, within the SMEs of BiH, the examination of interview responses reveals several intrinsic impediments to innovation and growth. A pivotal challenge resides in the inadequacies pertaining to employee education and engagement. It was consistently articulated that employees predominantly prioritise meeting daily production targets over the proposition of innovative ideas. This resonates with established research asserting the paramount importance of a proficient and driven workforce for catalysing innovation within SMEs as underlined by Cui, Lim and Song (2022). This predicament warrants a proactive approach involving investments in employee development and the cultivation of an organisational ethos that values continuous learning and innovation. The emphasis on employee education, engagement, and motivation resonates as a universal challenge across emerging economies, where skill development and fostering a culture of innovation are paramount. Policymakers and industry leaders in these economies can benefit from investing in educational reforms that bridge the gap between academic curriculum and industry demands.

Another internal impediment surfaces in the form of a pervasive fear of failure and a pronounced lack of motivation among employees, particularly manifested among the younger workforces. This palpable trepidation of failure can detrimentally impede the origination and execution of inventive concepts within SMEs as also underlined by Dweck (2006). It is imperative to foster an environment where employees are emboldened to undertake calculated risks, cognizant of the constructive dimensions of failure as a conduit for learning. Moreover, the fear of failure and lack of motivation among employees highlighted in this context mirror prevalent challenges in fostering entrepreneurial mindsets within emerging economies. Encouraging risk-taking, nurturing a growth mindset, and providing supportive ecosystems for experimentation become imperative to cultivate a culture of innovation across SMEs in these regions.

A recurring challenge internal to SMEs in BiH is the precarious task of retaining trained personnel. Evident high turnover rates can substantially obstruct the accumulation of firm-specific knowledge and expertise. This issue aligns with the corpus of research suggesting that elevated employee turnover negatively impacts innovation as proved by Yu *et al*. (2014). Addressing this challenge necessitates a concerted focus on crafting appealing work ecosystems, offering competitive remuneration packages, and proffering avenues for professional advancement.

In the external domain, SMEs in BiH grapple with plenty of challenges stemming from the broader business milieu. Foremost among these is the manifestation of inherent biases against scientific research institutions, as also pointed out by Kafouros and Forsans (2012). The biases against collaboration with scientific institutions and the reluctance of potential

partners to engage in collaborative ventures mirror the broader scepticism and competitive barriers prevalent in emerging economies' business landscapes. Interviewees alluded to a degree of scepticism concerning collaboration with such institutions, often stemming from concerns regarding a disconnect in comprehending the idiosyncratic needs and priorities of SMEs. This accentuates a critical impediment to collaboration and underscores the need for initiatives aimed at nurturing mutual understanding and trust.

An additional external barrier materialises in the form of a palpable reluctance of prospective partners, potentially inclusive of larger enterprises or research institutions, to engage in collaborative endeavours. This hesitancy may be attributed to multifarious factors, encompassing competitive considerations and divergence in strategic priorities. Fostering a collaborative ecosystem and nurturing an ethos of open innovation are instrumental in mitigating these barriers which was also showed by Chesbrough (2006). Collaborative efforts bring forth shared resources and expertise, concretely demonstrating the mutual advantages of such engagements.

Furthermore, administrative impediments, typified by protracted delays in securing permits and navigating intricate regulatory landscapes, surface as conspicuous external challenges. The administrative complexities and regulatory hurdles identified in the BiH context, and also underlined by Džafić and Omerbašić (2018); echo challenges faced by SMEs in many emerging economies. These hurdles are manifestly obstructive to innovation initiatives and hold the potential to stymie business growth. The streamlining of regulatory processes and the amelioration of bureaucratic complexities have been demonstrated to wield a constructive influence on innovation, which also García-León (2016) supported. A significant role is envisaged for governments in facilitating an enabling regulatory environment conducive to innovation. Simplifying regulatory frameworks, reducing bureaucratic obstacles, and creating a conducive business environment can catalyse innovation and growth within these regions.

Moreover, the spectre of political instability and its corollary, the phenomenon of brain drain, stands as a formidable external challenge confronting SMEs in the region. The brain drains phenomenon and legislative gaps restricting funding for R&D are not unique to BiH but are pervasive in various emerging economies. Brain drain is characterised by the exodus of highly qualified individuals in pursuit of more stable environments. Research underscores the indispensability of political stability as a linchpin in fostering innovation (ABSL, 2021; Pisani-Ferry *et al*., 2010). Tackling the brain drain conundrum necessitates multifaceted policy measures aimed at engendering an alluring environment for skilled individuals to either remain or contemplate a return. Simultaneously, streamlining legislative processes and providing accessible funding mechanisms are crucial for nurturing innovation ecosystems across these economies.

Finally, legislative lacunae and restricted access to funding emerged as external challenges undermining the capacity of SMEs to invest in R&D. These factors restrict the innovation potential of SMEs, as also underlined by Pilav-Velić and Marjanović (2016). The imperative

for policy reforms, in tandem with the provisioning of accessible funding mechanisms, as proved by Hall *et al*. (2016), emerges as a critical axis in nurturing innovation. Both governmental institutions and financial intermediaries play pivotal roles in navigating these challenges, laying the groundwork for sustainable innovation and growth within emerging economies like BiH. Addressing these challenges through tailored policy interventions, fostering collaborative ecosystems, nurturing skilled talent, and creating supportive regulatory frameworks are pivotal steps toward propelling innovation and sustained growth within emerging economies worldwide.

5.3. Hypotheses testing results

In this sub-chapter, the results of hypothesis testing are presented with a focus on three main aspects: the role of analysed innovation drivers, the influence of control variables, and the impact of analysed moderating effects. The discussion unfolds by scrutinising the significance and effects of innovation drivers, delineating their contributions to shaping innovative behaviour and, consequently, business performance. Simultaneously, the examination extends to the influence of control variables, revealing their role in mitigating potential confounding factors and providing an understanding of the observed relationships. Furthermore, the analysis explores the moderating effects, unravelling their implications for the intricate interplay between various variables.

5.3.1. Role of determinants in the basic model

The hypotheses formulated in this model draw upon existing theories and prior research. The analyses conducted in this thesis support four hypothesis, whereas the significance of the remaining hypotheses was not established, as depicted in Table 37.

Table 37 Conclusions of hypotheses testing

Hypothesis	Analysis conclusion
H1: Government support influences innovative behaviour of SMEs	Not significant
H2: Cooperation influences innovative behaviour of SMEs	Significant
H3: Technology orientation influences innovative behaviour of SMEs	Not significant
H4: Managerial orientation influences innovative behaviour of SMEs	Significant
H5: Organisational IO culture influences innovative behaviour of SMEs	Not significant
H6: Market orientation influences innovative behaviour of SMEs	Significant
H7: Innovative behaviour of SMEs influences business performance	Significant

Source: Author's work

The study findings underscore the pivotal role of several determinants in shaping innovative behaviour within SMEs. Specifically, the significance of cooperation, managerial orientation, and market orientation emerged as influential factors in fostering innovative behaviour. Particularly, this aligns with existing literature where collaborative engagements with suppliers, firms, and consultants were found to incite novel approaches and market

expansion within SMEs (Radaš and Božić, 2009; Vajjhala and Strang, 2018), echoing the observed positive and statistically significant relationship between cooperation and innovation. The observed significance of cooperation implies that SMEs benefit significantly from collaborative endeavours with external entities such as suppliers, firms, and consultants. This collaboration fosters an environment conducive to innovation by encouraging knowledge sharing, exchange of ideas, and access to diverse perspectives. It allows SMEs to tap into external expertise, potentially leading to the development of new products, services, or processes. Concretely, in line with the findings of prior studies (e.g., Hagedoorn and Wang, 2012; Inkpen and Tsang, 2007; Rothaermel and Deeds, 2006; Salavou, Baltas and Lioukas, 2004; Tether and Tajar, 2008), this suggests that SMEs should actively seek and nurture partnerships to drive innovation, leveraging external resources and insights.

Furthermore, the results as shown by other authors, as Entrialgo (2002) and Gashema and Gao (2018), indicate a high correlation between managerial orientation to innovative behaviour. Accordingly, the active involvement of management in instigating new initiatives and allocating resources towards R&D activities emphasises the significance of managerial orientation in propelling innovation within these enterprises. The importance of managerial orientation signifies the pivotal role that leadership plays in fostering innovation. When management prioritises and actively engages in R&D activities, promotes a culture of experimentation, and allocates resources towards innovation, it sets a tone for the entire organisation. This implies that SMEs should empower and encourage managerial involvement in innovation-related initiatives, fostering a culture that values and supports innovative thinking and risk-taking.

Similarly, the emphasis on understanding customer needs and delivering high-quality services, as outlined by the significance of market orientation, resonates with the belief that customer- centric strategies act as catalysts for innovative behaviour. The importance of market orientation highlights the criticality of understanding customer needs and preferences. SMEs that align their strategies closely with customer demands are better positioned to identify untapped market opportunities and develop innovative solutions that directly address these needs. Accordingly, SMEs should invest in market research, customer feedback mechanisms, and adaptability to tailor their offerings in response to evolving market dynamics, which was also proved by prior research (e.g., Kirca, Jayachandran and Bearden, 2005; Li et al., 2008; Slater and Narver, 2000; Zhou, Yim and Tse, 2005).

However, the non-significant impact of certain factors such as technology orientation, government support, and organisational IO culture also poses intriguing insights. While these factors might not exhibit direct statistically significant impacts on innovative behaviour, they could still hold contextual relevance.

For instance, although technology orientation did not show statistical significance, the absence of this direct relationship does not undermine the importance of technological advancements for SMEs' long-term competitiveness. It implies that while technology may

not directly trigger innovation in this context, its strategic integration could still be crucial for future relevance and adaptation. Also, the fact that these results refer to SMEs should not be neglected, as highlighted by Pilav-Velić and Marjanović (2016), larger companies possess extensive technology portfolios and a broader scope of technological expertise conducive to commercialisation. Consequently, they not only possess the capacity to acquire fresh knowledge, but also boast a substantial reservoir of existing knowledge for outward innovation endeavours. Moreover, the authors emphasise that, given the prevailing struggle for survival among most companies, coupled with inadequate internal resources to invest in new technology, they predominantly depend on external sources of knowledge and technology, procured at no cost, through collaborative R&D ventures with external partners. Consequently, rather than allocating funds for new technology and other resources, these companies prioritise the cultivation of valuable relationships and collaboration to facilitate the transfer of essential know-how required for innovation.

The non-significant results for government support actually point to the complexities and challenges within the context of an emerging economy. Pilav-Velić and Marjanović (2016) also confirmed that due to the economic context of a small emerging economy, an adequate assistance by government and innovation intermediaries, especially considering innovation funding, does not exist. Overall, while government initiatives might not directly drive innovation in SMEs, improving the consistency and effectiveness of such programs or addressing bureaucratic hurdles could potentially enhance their impact.

The noteworthy observation of a non-significant yet negative relationship between government support and innovative behaviour warrants deeper exploration. The distinctive context of an emerging economy like BiH plays a pivotal role here. Factors such as inconsistent policies, bureaucratic hurdles, and inadequate infrastructural support might impede the expected positive impact of government initiatives on fostering innovation within SMEs. These systemic barriers unique to emerging economies may obscure the anticipated relationship between government support and innovative behaviour, aligning with insights from Silajdžić and Mehić (2021) about hindered effects of government initiatives in transitional contexts.

The lack of significant influence of an organizational IO culture on the innovative behaviour could also be attributed to various factors intrinsic to the business environment and the organizational context within these economies. One plausible explanation lies in the complex interplay between cultural values, resource constraints, and market dynamics that shape the behaviour of SMEs operating in such contexts. Despite fostering an IO culture within their organisations, SMEs in emerging economies often encounter challenges that hinder their ability to translate this culture into tangible innovative actions, which also Džafić and Omerbašić (2018) confirmed. Moreover, limited access to financial capital, skilled human resources, and advanced technologies constrains the ability of SMEs to invest in R&D activities, thereby restricting their capacity for innovation. In the absence of adequate resources, SMEs may struggle to initiate and sustain innovative projects, regardless of the prevailing organisational culture that encourages innovation, as claimed by Pilav-Velić and

Marjanović (2016). Furthermore, the high regulatory compliance costs and the risk of encountering legal uncertainties deter SMEs from engaging in experimentation and innovation, despite the existence of an IO culture within the organisation. Finally, cultural factors also play a pivotal role in shaping the innovative behaviour of SMEs in emerging economies. In such environments, SMEs may prioritise stability and conformity over creativity and risk-taking, thereby undermining the influence of an IO culture on their behaviour. Nevertheless, particularly due to the beforementioned reasons, prior studies (e.g., Arabeche et al., 2022; Kenny and Reedy, 2006; Kraśnicka, Głód and Wronka-Pośpiech, 2018; Nimfa et al., 2021) discovered that organisational IO culture is often a mediator to innovative behaviour and its determinants, or that organisational IO culture affects innovative behaviour through some other variables. These findings were also confirmed by this study as shown in the previous chapter.

Moreover, these findings may hold practical implications or interactions with unaccounted variables. For instance, the subtlety or the influence of unmeasured variables on the relationship between these determinants should be considered, as highlighted in studies by Pimenova and Van Der Vorst (2004) and Silajdžić and Mehić (2021), who underscored the complexities and challenges within emerging economies.

Additionally, the findings related to mediators between determinants and innovative behaviour, as highlighted by Arabeche et al. (2022); Bhatti, Rehman and Rumman (2020); and Rehman, Bhatti and Chaudhry (2019), Thongsri and Chang (2019) accentuate the intricate relationships within transitional settings. They underscore the role of political ties, organisational culture, learning capabilities, and leadership styles as influential mediators, further clarifying the complex interplay between determinants and innovative behaviour in such contexts.

Ultimately, the robust and positive association between innovative behaviour and business performance underscores the strategic significance of nurturing innovation within SMEs. The results confirm and support prior studies on the relationship of innovative behaviour and business performance (e.g., Laforet and Tann, 2006, Roper and Love, 2002; Tarutė and Gatautis, 2014; Tidd and Bessant, 2020). This indicates that a proactive approach toward exploring new ideas, market segments, and customer relationships significantly impacts customer satisfaction, market effectiveness, and profitability, highlighting the indispensable role of innovation in driving business success.

Overall, the findings align with the broader landscape of research in transition economies. They underscore the multifaceted nature of these economies, where factors beyond conventional expectations can significantly influence the innovative behaviour of SMEs. The significance of certain factors to innovative behaviour implies concrete actions for SMEs. It emphasises the importance of collaboration, proactive leadership involvement, and customer-centric strategies in fostering an environment conducive to innovation. However, the non-significant hypotheses also require a more detailed understanding, guiding SMEs to reconsider the contextual relevance and potential indirect impacts of these factors in their

innovation strategies. Further exploration into these relationships could yield deeper insights into fostering innovation and driving business performance in such economies.

5.3.2. Role of analysed control variables

The exploration into the influence of control variables, yielded some insights into their interplay with innovative behaviour and business performance within the context of emerging economies. Regarding the size of the company, the findings reveal a significant impact on the innovative behaviour of SMEs, while demonstrating no statistically significant effect on business performance. In the literature, there is an established attitude that companies of different sizes can have different innovative behaviour that could affect business performance. The results suggest that larger SMEs, benefiting from amplified human capital and potentially augmented financial resources, tend to exhibit a higher inclination toward innovative behaviour. This aligns with the rationale that larger organisations possess the capability to allocate more personnel and financial investments toward fostering innovation within their operations.

However, despite the observed influence on innovative behaviour, the absence of a significant impact on overall business performance underscores a complex relationship between company size and holistic business success. Other studies also found that increased company size does not necessarily lead to increased performance (Adams and Buckle, 2003; Serrasqueiro and Maçãs Nunes, 2008). Specifically, while larger SMEs may display proclivity for innovation, it might not directly translate into immediate enhancements in overall business performance. This complexity highlights the unique dynamics at play within differing organisational sizes, particularly within the challenging landscape of emerging economies.

In contrast, the research does not identify a significant influence of export intensity on either business performance or innovative behaviour among SMEs. A strong export intensity does not necessarily lead to an improved business performance as it was already proved by several studies (Behyan, Mohamad and Omar, 2015; Girma, Greenaway and Kneller, 2001; Karedza and Govender, 2017; Kim and Hemmert, 2016). Despite the lack of statistical significance, the noted negative tendency regarding the influence of exports offers intriguing insights. Particularly, export intensity may adversely affect the performance of SMEs by diverting resources from critical areas, exposing firms to heightened risks, and creating dependencies on limited markets. Additionally, the complexities of international trade regulations, market access barriers, and competitive pressures further exacerbate challenges for SMEs in sustaining profitability and competitiveness in global markets.

These findings resonate with the research, such as that of Xie and Li (2017), suggesting conflicting outcomes regarding the association between a firm's export activities and its innovation and performance. Xie and Li (2017) propose that high export intensity might divert specialised exporters' focus away from product innovation, potentially diminishing

emphasis on developing new products or innovations in fiercely competitive foreign markets. Conversely, lower-export companies might prioritise innovation due to resource constraints, distinct local market demands, and governmental support policies aimed at bolstering local competitiveness.

These outcomes imply a structured relationship between export intensity and innovation behaviour within SMEs, highlighting the intricate interplay between international market engagements and innovative strategies, particularly in the context of emerging economies. While high-export companies might grapple with innovation amidst competitive global markets, low-export firms might leverage local market needs and governmental support to accentuate innovation for domestic competitiveness. Given the findings indicating that the size of the company and export intensity do not exert significant influence on business performance, and innovative behaviour concerning exports, these control variables were not further examined in the indirect effect model.

5.3.3. Role of analysed indirect effects

The examination of the mediation effect of innovative behaviour holds considerable importance, confirming prior research results, as it underlines the intricate relationships between factors like *cooperation* (Imamoğlu *et al*., 2019; Prange and Pinho, 2017; Singh *et al*., 2022), *government support* (Jin and Lee, 2020; Rita, Widi and Budi, 2021), *technology orientation* (Al-Ansari, Altalib and Sardoh, 2013; Obeidat, 2016; Yousaf *et al*., 2020), *organisational IO culture* (Kraśnicka, Głód and Wronka-Pośpiech, 2018; Obeidat, 2016; Prange and Pinho, 2017; Subramaniam and Moslehi, 2013; Zafar and Mehmood, 2019), *managerial orientation* (Aryee *et al*., 2012; Byukusenge, Munene and Orobia, 2021; Helm, Mauroner and Dowling, 2010; Prange and Pinho, 2017; Savitri, Dp and Syahza, 2021; Subramaniam and Moslehi, 2013; Zafar and Mehmood, 2019) and *market orientation* (Bamfo and Kraa, 2019; Carmen and María José, 2008; Cheng and Krumwiede; 2011; Liu, 2013; Mahmoud *et al*., 2016; Zehir, Köle and Yıldız, 2015) and business performance through the influence of innovation. These analysis results may provide firms with actionable insights, especially in terms of prioritising initiatives to foster innovation and thereby enhancing overall performance. Understanding this mediation effect also assists in allocating resources prudently, optimising investments in innovative strategies.

The outcomes indicating the complete mediation effect of innovative behaviour between the analysed determinants and business performance bear profound implications, notably within the sphere of emerging economies. These findings underscore the criticality of nurturing innovation as a key for augmenting business performance within a distinctive economic context. The affirmative cumulative effect noted through innovative behaviour underscores its pivotal role. This aligns with established perspectives, highlighting that fostering innovation serves as a mechanism for firms in these contexts to surmount inherent challenges. Innovative behaviour functions as a catalyst, enabling firms to effectively leverage their determinants, thereby leading to an amelioration in business performance.

Furthermore, the substantiation of innovative behaviour as a mediator between the analysed determinants and firm performance supports also abundant prior empirical research (e.g., Byukusenge, Munene and Orobia, 2021; Dedahanov, Rhee and Yoon, 2017; Domi, Capelleras and Musabelliu, 2020; Ng, Kee and Ramayah, 2020; Shanker *et al*., 2017; Singh *et al*., 2022; Thongsri and Chang, 2019; Widodo and Mawarto, 2020; Zafar and Mehmood, 2019). Former studies, spanning both emerging and developed economies, have underscored the pivotal role played by innovative behaviour as a mediator influencing firm performance. This finding further accentuates the universal significance of innovative behaviour in facilitating business success across diverse economic landscapes. The intricate relationships among these factors and their mediation through innovative behaviour underscore the complexity of managing and optimising business performance in a rapidly evolving landscape. The findings from these studies provide valuable insights for businesses seeking to enhance their competitiveness and adaptability in dynamic markets. Consequently, these results underscore the strategic imperative of fostering a culture of innovation within firms, particularly in demanding economic environments typified by emerging economies, as an avenue to augment overall business performance.

6. IMPLICATIONS, CONCLUSION, RECOMMENDATION

This chapter will include the thesis's conclusion, as well as the theoretical and practical contributions. It will also highlight the research's limitations and make recommendations for further research. The significance of this research is primarily reflected in its original contribution to both practice and theory, as well as future investigations. Particularly, the choice of the research context and focus on BiH, a small emerging economy, makes this thesis distinct and noteworthy. This unique comprehensive research on the determinants of innovative behaviour in a small emerging post-war economy, provides valuable insights into innovative practices and challenges that extend beyond well-researched Western economies.

6.1. Theoretical implications

The main contributions of the bibliometric analysis are in mapping the research field of innovation behaviour and creating the research landscape. This analysis provided a critical overview of studies on SME innovation. Furthermore, the aim was to assimilate the existing fragmented knowledge of the applicable studies and to embellish the understanding of innovation behaviour even more so that the awareness of the same can be enhanced. In order to achieve the above-mentioned objective and enhance the knowledge regarding this topic, several research questions were established. Particularly, the conducted bibliometric analysis served as a comprehensive mapping tool, presenting a detailed overview of the research field regarding SME innovation behaviour through an extensive analysis of published articles. This mapping encompassed various perspectives, emphasising on crucial trends such as publication numbers, citations, influential authors, research institutions, and countries, providing a comprehensive understanding of the field's development. The

observed, rapid and substantial, scientific growth in research from 1994 to 2023, as highlighted in the bibliometric analysis, indicated an increasing interest and attention devoted to studying SME innovation behaviour over time. This growth trend underscored the escalating significance of this research domain within the academic landscape during that period.

Moreover, the analysis revealed that the SME and innovation literature is characterised by considerable fragmentation, exposing notable deficiencies in both subject and methodology which was also prior underlined particularly by Dabić *et al*. (2020). As such, this research significantly enhances the existing body of literature by broadening the prevailing dominant theoretical frameworks. It posits the existence of a diverse range of determinants influencing SMEs innovation behaviour within national contexts. Additionally, this diversity aids in elucidating firm-level performance.

Furthermore, the clustering of articles into four thematic clusters through bibliometric analysis not only organised the existing literature but also suggested potential directions for future research. These clusters—innovation capability, entrepreneurship, individual capabilities, and environment—provided a structured framework to comprehend the various facets of SME innovation behaviour. Moreover, the identification of the most significant sources through co-citation analysis of authors and references offered foundational knowledge for future studies in this field, establishing a solid background upon which further research could build. Additionally, the analysis of bibliometric coupling among countries discerned the varying levels of research activity, highlighting which nations were more actively contributing to SMEs innovation research and those that may have required more attention or collaboration. Finally, the observation that co-cited keywords predominantly revolved around technology, R&D, and management, confirming the close nexus of innovation and management as underlined by Al-Hanakta *et al*. (2021), but still suggesting that other dimensions of SMEs innovation behaviour are under-researched. This insight emphasised the need for further exploration into these less-investigated aspects/ subject gap to achieve a more comprehensive understanding of innovation behaviour within SMEs.

Moreover, after conducting an extensive SLR, this thesis meticulously examined the theoretical aspects and components of innovative behaviour. The thesis, rooted in an integrative research framework, represents a pioneering endeavour to explore the impact of innovative behaviour on SMEs performance by integrating diverse determinants systematically outlined in existing empirical literature. It further diligently scrutinised the practical application of these concepts in empirical research, specifically referencing the acquired results from previous empirical studies.

There is a shortage of studies that comprehensively consider the factors of innovative behaviour in SMEs. Consequently, this SLR reconciled the various approaches through which these determinants have been examined. Previous research has insufficiently acknowledged the differing access to resources, capabilities, and networks experienced by emerging SMEs, often operating within a varied range of governmental policies. The SLR

identifies significant advancements in understanding the innovative behaviour of SMEs. There is mounting evidence indicating that certain routines and practices adopted by SMEs can profoundly influence their innovativeness. Nevertheless, the SLR also highlights that the majority of the SME literature, especially in emerging economies remains highly fragmented and scantily explored (Dabić *et al*., 2020; Al-Hanakta *et al*., 2021; Jeza and Lekhanya, 2022; Kassa and Getnet Mirete, 2022; Makuwe and Lekhanya, 2021).

The adaptation and/or adaptation and refinement of survey questions from established studies, coupled with contextual adjustments based on interview insights, represents a significant original contribution to this research as it was confirmed by prior research (Artino *et al*., 2014; Beaton *et al*., 2000; Hair *et al*., 2019). This approach enriches the theoretical framework by aligning measurement scales more closely with the nuances of SME innovation culture. It highlights the dynamic interplay between established theory and empirical context, enhancing the methodological robustness of the study.

Moreover, the theoretical foundation has profound implications in the context of emerging economies, as it offers a foundation that can be particularly instrumental in guiding strategic initiatives to foster innovation in the SME sector. This thesis contributes significantly to the literature by presenting empirical evidence of validating the integrated structural model. Considering the multidisciplinary nature of innovation itself, this research signifies a convergence of various fields such as management, information technology, and strategic planning aspects. While earlier studies (e.g., Hoque, 2018; Najib and Kiminami, 2011; Najib, Abdul Rahman and Fahma, 2021; Salavou, Baltas and Lioukas, 2004; Su, Chen and Wang, 2019) focused on individual aspects of this measurement model, this integrative model stands distinct as it combines these varied concepts into a unified exploration of innovative behaviour within the SME sector.

Particularly, the findings make a noteworthy contribution to academic discourse by uncovering and addressing a spectrum of abovementioned research gaps, which undoubtedly could engender an entire research cycle, enriching extant knowledge and understanding of innovation dynamics in diverse economic environment. The exploration of innovative behaviour within SMEs in emerging economies initiates numerous previously unexplored questions that will undoubtedly lead to novel qualitative and quantitative research and insights equally applicable in both emerging and developed economies. Finally, by using the SEM technique, this thesis contributed to a more comprehensive understanding the sources of innovative behaviour and how it in turn affects business performance. This implied the integration of various independent drivers of innovative behaviour, the aspects of innovative behaviour itself, and business performance of SMEs while examining the theoretical and empirical literature.

6.2. Practical implications

The findings and insights from this research hold considerable promise for shaping future managerial strategies within SMEs. Understanding the implications of the study's outcomes could significantly influence managerial decision-making in several ways. Particularly, the managerial implications derived from the research hold significant relevance for SMEs in emerging economies, offering actionable insights to shape strategic decision-making and foster innovation.

This thesis delves into the intricate nexus between innovation and the business growth performance of SMEs, aiming to dissect the determinants of innovative behaviour. One of the pivotal managerial implications of the thesis lies in the overview of critical research themes and trends within the realm of SMEs' innovation drivers. By identifying these, a roadmap for managerial focus is provided, allowing businesses to prioritise their efforts in fostering innovation. Moreover, the exploration of the challenges faced by SMEs in developing innovation brought forth a pragmatic understanding of elements hindering this crucial facet of business performance. This understanding may guide managerial decisions towards targeted solutions, aiding in overcoming barriers to innovation.

Specifically, exploring barriers to innovation within SMEs significantly contributes to the comprehension of the challenges confronting these enterprises, a fundamental aspect for fostering sustainable economic growth. Pragmatically, such insights empower companies to surmount institutional deficiencies and market uncertainties, thereby facilitating the identification of potential solutions and best practices. These solutions hold promise for broader applicability, extending beyond emerging economies, as developed economies also cope with heightened risks and uncertainties stemming from frequent crises and shocks. Consequently, emerging economies emerge as fertile grounds for the genesis of innovative approaches aimed at addressing challenges and barriers to innovation within SMEs.

The analysis of relationship between government support, cooperation, technology orientation, managerial orientation, organisational IO culture, market orientation, and innovative behaviour of SMEs serves as a guidepost for strategic decision-making. Managers in emerging economies can leverage these insights to understand the multifaceted elements impacting innovation within their SMEs, facilitating specific interventions and adjustments. Understanding these determinants could lead to tailored approaches in fostering innovation and ultimately business performance, acknowledging the contextual elements that influence innovation practices within diverse economic landscapes.

In particular, acknowledging the pivotal role of collaboration suggests that SME managers in emerging economies should actively cultivate strategic partnerships and networks. Building alliances with external entities like suppliers, firms, and consultants can be instrumental in fostering an innovative culture within SMEs. This emphasises the importance of fostering an environment that encourages knowledge exchange and external

engagement, aligning with the findings on the significance of cooperation in stimulating innovative thinking.

Furthermore, the observed significance of managerial involvement in initiating new projects and directing resources toward R&D activities underscores the strategic imperative for leaders in emerging economy SMEs. Managers should not merely advocate for innovation but actively engage in guiding and promoting innovative initiatives. This proactive engagement of leadership aligns with the identified significance of managerial orientation in driving innovation.

Moreover, the emphasis on market orientation implies that SMEs in emerging economies must be attentive to evolving market dynamics and customer preferences. Adapting strategies to align with market demands through comprehensive market research and customer-centric approaches becomes imperative for fostering innovation and sustaining competitiveness within these contexts.

Despite certain factors like technology orientation and government support not exhibiting direct statistical significance, their latent implications hold managerial relevance. Managers in emerging economies should strategise on leveraging available technologies, despite their indirect impact on innovation, to maintain competitiveness and future adaptability. Additionally, navigating the challenges highlighted in government support by engaging actively with policy advocacy or seeking avenues to overcome bureaucratic hurdles becomes crucial in fostering an environment conducive to innovation within SMEs.

Particularly, this thesis underlines the pivotal role of technological orientation in shaping innovation behaviour within specific sectors. By examining the interplay between technological capabilities, R&D investments, and digitalisation efforts across analysed sectors, insights were given into how SMEs leverage their technological orientation to enhance performance. These insights have practical implications for sector-specific strategies aimed at fostering innovation and enhancing competitiveness. Specifically, SMEs operating in sectors with high technological intensity may benefit from prioritising investments in advanced technologies and fostering a culture of continuous technological innovation. Conversely, SMEs in sectors with lower technological intensity may focus on leveraging existing technological assets and enhancing operational efficiencies to drive innovation. By tailoring strategies to sector-specific challenges and opportunities, SMEs can maximise their innovation potential and adapt to evolving market dynamics.

Furthermore, the research contributes to advancing understanding of sector-specific nuances in innovation behaviour and outcomes within SMEs. By integrating sector-specific insights into the broader discourse on innovation, the existing knowledge base is enriched and valuable implications for practitioners and policymakers seeking to foster innovation-led growth across diverse sectors are provided.

The research provides managers with a comprehensive guide outlining important factors that need to be considered during the formulation and execution of innovative strategies, as well as the improvement of existing ones. Particularly, managers can enhance their innovative behaviour and business performances through investments in novel products and innovative practices, by better understanding the customers and their needs, and by developing skills in building valuable relationships with various collaborative partners.

Importantly, emerging economies serve as fertile grounds for the exploration of innovation routines and innovative practices. The selection of this business context and the emphasis on a small country navigating a particularly challenging transitional economy lend heightened significance. Enterprises operating within these contexts often necessitate agility and innovation to thrive, thereby affording research opportunities to delve into previously uncharted strategies and methodologies. Furthermore, investigating innovative behaviour within emerging economies facilitates the discernment of factors that impact a firm's capacity to concurrently pursue novel opportunities while leveraging existing capabilities amidst highly dynamic conditions. In a broader scholarly context, emerging economies confront distinctive challenges, including institutional voids, infrastructure deficiencies, and market uncertainties.

On the other side, by aligning the findings with the country's specific economic and institutional landscape, policymakers can extract actionable insights to devise targeted strategies aimed at nurturing innovation-led growth within SMEs. Highlighting sector-specific considerations in policy discussions can aid in crafting nuanced approaches that tackle the diverse needs and challenges encountered by SMEs. Specifically, policy interventions could be tailored to incentivise technological adoption and R&D investments, particularly within sectors identified as possessing significant innovation potential. Moreover, exploring measures to foster collaboration between SMEs and research institutions could stimulate knowledge exchange and innovation diffusion, and contribute to evidence-based policy making. Additionally, addressing bureaucratic obstacles and fostering an enabling regulatory framework are pivotal in facilitating innovation and entrepreneurial endeavours within the nation. By integrating customised policy measures, a country can capitalise on its distinct strengths and surmount existing barriers to fully unleash the innovative capacity of its SME sector.

Consequently, scrutinising how SMEs navigate and surmount these challenges yields particularly valuable insights with practical implications that extend beyond emerging economies and may be germane to developed economies as well. Notably, recent crises and external shocks increasingly compel developed economies to respond adeptly, placing heightened demands on SMEs within those contexts. Therefore, the determinants influencing SMEs' innovative behaviour in emerging economies are gaining prominence and relevance for firms operating in developed economies. This underscores the notion that the lessons gleaned from emerging economies hold significant value and pertinence for their counterparts in developed economies.

Finally, these implications necessitate a strategic approach that encourages collaboration, proactive managerial involvement, market responsiveness, technology integration, and proactive engagement with the challenges posed by the posed by the unique economic landscape of emerging economies. Incorporating these strategies can significantly enhance the innovative capacity of SMEs within emerging economies, contributing to their sustainable growth, innovation routines and competitiveness. Overall, this research can be particularly relevant for emerging economies striving to enhance the competitiveness of their SMEs in the global market.

6.3. Limitations and recommendations

Along with outlining the results of this thesis, it is important to consider certain limitations to this research. These refer to the overall research process from the bibliometric analysis, SLR, model development, data collection, to results testing.

Firstly, in terms of the bibliometric analysis, the methodology of bibliometric review has certain limitations in the sense that it cannot completely replace extensive reading and content analyses, which is why an additional approach of SLR was used. Furthermore, a limitation that is common for this form of review is one of the searched terms. A lot of attention was given to defining a proper search string. Still, for a fact, SME innovation may have also been researched under some other terms as change management, business model innovation, entrepreneurship, R&D, technological and IT implementation, and similar. Even though these terms may be a good recommendation for some future research, including each of them in this review would have significantly increased the number of articles to be analysed. With the aim of providing high-quality results the WoS database was used, which limited the research in terms of quantity. Although this database is fairly comprehensive, there is a possibility that some influential articles could have been omitted. In this regard, some additional databases, as Scopus, EBSCO, and similar can also be searched, and some professionals from the field can also be asked for a recommendation on the given topic. Finally, as a general recommendation in terms of the bibliometric analysis, it would be beneficial that some future analysis and research dedicate more attention to various aspects of SME innovation behaviour and the multiple effects they have on performance and economy overall. Furthermore, it should be noted that most studies in the review used quantitative analysis. This is why it would be beneficial to perform more qualitative analysis in the future in order to acquire some more profound insight in the work practices and organisation of SMEs.

In terms of the SLR, one significant challenge was the publication bias, wherein the review might have been skewed due to the selective publication of studies, potentially excluding non-significant or negative results. Moreover, the review's quality heavily relies on the included studies; if these studies harbour methodological flaws or biases, it could undermine the SLR reliability. To address this the inclusion criteria was strictly defined, and the review methods was transparently reported. Still, despite meticulous search strategies, limitations

in databases, language barriers, or specific search terms might have resulted in the omission of pertinent studies, introducing selection bias. Accordingly broader search terms were used to reduce the likelihood of missing relevant studies. Additionally, the temporal gap between completing the review and new studies being published may also compromise the SLR currency. In that regard an update of the database was done to capture new literature.

Regarding the analysis, the primary constraint involves the subjective measurement of SMEs' innovative behaviour, potentially posing a challenge in accurately gauging a company's actual innovativeness. To address this, it is recommended to also consider the input from other employees, not only high-level managers, or to incorporate various company reports, leading to a more intricate research design. Moreover, when operationalising measurement models, careful consideration was given to the content validity of each claim, ensuring a clear distinction between different concepts. However, particularly in discussions on innovation processes, overlapping concepts in the literature are common due to their interrelated nature. To address this, content validity was meticulously controlled in various ways within this research. Additionally, using qualitative performance indicators to assess business performance may present challenges in accurately measuring SME performance. Nonetheless, some researchers, i.e., Arifeen *et al*. (2014), advocate that this nature of indicators is even more adequate and precise in evaluating a company's success.

In terms of data collection, the key limitation was in sampling. While convenience and stratified sampling, incorporating elements of random sampling, were employed, ensuring the sample's representativeness was pivotal. Companies were selected from a database of financial and statistical agencies in BiH, as other more comprehensive databases are harder to access and contain numerous registered, but inactive companies.

Moreover, the absence of a completely normal distribution stands as another limitation. Although the SEM method, known for reliability, was utilised for analysis, acknowledging this deviation is essential during interpretation. Additionally, for global applicability, validation of the model on samples from various economies beyond BiH, especially of those in transition, is necessary to generalise the results. Similar considerations should also be applied to the context of different industry sectors, which were not the focus of this analysis.

Despite these limitations, the model and acquired data hold significant value. Future attention in both business practices and scientific research should be directed towards this subject. Furthermore, recommendations for future research include exploring other factors influencing innovative behaviour and SMEs' business performance in more depth.

6.4. Conclusion

Innovation is a multifaceted and indispensable aspect of SMEs' survival and growth. SMEs exhibit innovation across various dimensions, driven by factors such as entrepreneurial orientation and collaboration. Although resource constraints and market uncertainties pose

challenges, government support and well-designed policies can mitigate these barriers, fostering a conducive environment for innovation in SMEs. SMEs are considered as a valuable element of economic development in any country and thus, SME innovation behaviour has a critical role in this phenomenon. Innovation behaviour, as an important factor of organisational competitiveness and business performance, should be of great interest for SMEs all around the world.

Innovation serves as a driving force behind their competitiveness, growth, and resilience. SMEs that embrace innovation across various dimensions, including product development, internal processes, marketing strategies, and organisational structures, are better positioned to thrive in today's dynamic and challenging business environment. Innovative SMEs not only survive in competitive markets but also thrive and become leaders in their respective industries. Government support, industry partnerships, and a culture of continuous improvement all play a role in fostering innovation within SMEs, ensuring their long-term sustainability and contribution to economic development.

Nevertheless, the challenges faced by emerging economy companies in their innovational pursuit are multifaceted. Resource constraints, external environmental factors, and internal organisational capabilities all play pivotal roles in influencing innovation outcomes. Addressing these challenges requires a strategic approach, including securing funding and talent, adapting to market dynamics, navigating regulations, and fostering an innovation-focused culture within SMEs. Understanding and mitigating these challenges can empower SMEs to harness their innovation potential, ensuring their competitiveness and relevance in an ever-evolving business landscape.

Among the key barriers from the perspective of permeability, the following can be distinguished: lack of employee education, insufficient involvement of employees in the process and motivation to innovate, and insufficient focus of the company on innovation. The lack of focused education, low level of motivation and involvement in the same process were identified as key challenges of the permeable perspective. Moreover, most SMEs have confirmed brain drain as one of the biggest problems they are currently struggling with. BiH is facing the problem of an increasing number of young, educated and capable people leaving the country. This trend emphasises even more the problem of finding qualified staff, but also the impossibility of keeping them within the company. Brain drain is among the key challenges that SMEs in BiH are currently facing. This challenge has a direct impact on the limitation of business development, capacity expansion and innovative ideas.

Moreover, the research approach applied in this study involved a deductive approach, specifically testing established theories. The theoretical framework for this research model encompassed innovation theory and the theory of the firm. The research philosophy underpinning this study was positivism. By drawing from prior research and relevant literature on the subject, a conceptual model was formulated. To conduct this research, the initial phase involved acquiring secondary data through bibliometric mapping and an extensive SLR focusing on innovation in SMEs within the country, region, and globally.

Subsequently, the research was executed using a mixed-method approach, necessitating both qualitative and quantitative analyses to delve into the SMEs' innovation concept. A comprehensive comprehension of SMEs and individual attitudes toward innovation necessitated the amalgamation of these perspectives.

The comprehensive analysis through a SLR drew a fundamental inference: the determinants shaping innovative behaviour manifest in a dichotomy of internal and external factors. Internal determinants encompass elements such as organisational culture, leadership orientation, and collaborative practices. Conversely, external influences encompass government support, technology orientation, and market focus. These findings significantly inform the framework proposed in the conceptual model, positing that these determinants intricately impact the augmentation of a company's innovative behaviour. This, in turn, is anticipated to culminate in heightened innovation outputs and, consequently, enhanced business performance.

Furthermore, the analysis of interview responses from SMEs in BiH highlighted a multifaceted landscape characterised by a constellation of internal and external barriers to innovation and business growth. These findings underscore the complexity of the challenges faced by SMEs and emphasise the need for collaborative efforts involving government entities, educational institutions, industry consortiums, and SMEs themselves. Fostering a culture of innovation, investing in human capital, and creating an enabling ecosystem for SMEs are essential steps toward driving economic expansion and innovation in the emerging economy context of BiH.

Regarding the measurement models, all indicators used to measure constructs were sourced from previously validated empirical studies. The evaluation of psychometric properties adhered to established standards, specifically focusing on assessing content validity and construct validity. A subset of indicators required translation from English, and in certain instances, rephrasing was necessary to capture the core meaning of the statements. To ensure content validity and relevance, piloting with a panel of experts drawn from both the private sector and the academic sphere in BiH and SMEs conducted thorough assessments.

All constructs, with the exception of business performance, were characterised as first-order reflective models, while business performance was designated as a second-order reflective construct. Through employing a 7-level Likert scale questionnaire, the data collection was conducted using the online SurveyCTO software. The study encompassed SMEs within BiH, targeting respondents holding top managerial positions with a comprehensive understanding of their company's innovative behaviour and performance. From a total of 2,181 invitations disseminated, 348 completed questionnaires were obtained, yielding a response rate of 15.96%. After the exclusion of observations containing more than 15% missing data, 265 responses were utilised for analysis, accounting for 12.15% of the total distributed surveys. Furthermore, the reliability, convergent validity, and discriminant validity of the measurement models underwent scrutiny and validation through CFA. Following this, SEM testing was done for a fundamental model comprising of seven hypotheses. Additionally,

extended models were examined, encompassing a more intricate scrutiny of the business performance construct, incorporating control variables, and incorporating a moderating variable for a comprehensive analysis.

The research findings validate four out of the seven main hypotheses posited in this study, signifying a significant step in understanding the dynamics influencing innovative behaviour and business performance within SMEs. Notably, certain determinants highlighted in this dissertation, such as collaboration, managerial orientation, and market orientation, emerged as pivotal factors fostering innovative behaviour within companies in BiH. This discovery emphasises the crucial role these elements play in driving business performance improvements in innovative SMEs. Moreover, while the scale of a company or its level of export activity does not serve as definitive indicators explaining the variance in business performance or innovative behaviour linked to export intensity, the research highlights the salience of company size in influencing the propensity for innovative behaviour.

These findings collectively underline the intricate interplay between determinants of innovative behaviour and their subsequent impact on achieving successful business performance. They suggest that the relationship between factors driving innovative behaviour and business success is moderated by the level of innovative behaviour itself. This implies that fostering innovative behaviour within SMEs is not merely about understanding individual determinants, but also comprehending how they collectively interact to influence overall business performance.

Furthermore, this research makes significant contributions to knowledge in the field of SME innovation behaviour through both qualitative and quantitative analyses. The synthesis of theoretical aspects and empirical findings enriches understanding of innovative behaviour in SMEs, particularly in emerging economies. Moreover, the adaptation of survey questions and contextual adjustments enrich the study's methodological robustness.

Moreover, this research underscores the paramount importance of recognising sector-specific characteristics, particularly through the lens of technological orientation, in understanding innovation behaviour and outcomes within SMEs. Different sectors exhibit varying degrees of technological adoption and innovation strategies, influenced by their unique contexts and demands. Particularly, while certain sectors may demonstrate a strong inclination towards embracing cutting-edge technologies and digitalisation to drive innovation, others may adopt more conservative approaches due to sector-specific constraints.

In essence, these results stress the need for a holistic approach in leveraging determinants to cultivate a culture of innovation, which, in turn, could significantly enhance business performance in the SME sector. Particularly, the findings of this dissertation hold considerable significance within the academic sphere by presenting a synthesised and comprehensive conceptual model. This model integrates diverse determinants that have been studied in isolation concerning their influence on both a company's innovative behaviour

and its resultant business performance. By offering an encompassing framework, this research provides a means to grasp the multifaceted sources of innovation. Moreover, this comprehensive model, not only consolidates previously disparate insights, but also offers a detailed understanding of how these determinants interact and contribute to innovation in specific economic landscapes undergoing transition.

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APPENDICES

Appendix A: Operaonalisation of variables

Appendix A1: Operationalisation of Innovative Behaviour

Literature review for Innovative behaviour

Authors name and year	Aim of the paper	Constructs	Findings
Peeters, C., & Van Pottelsberghe de la Potterie, B. (2007).	This paper investigates whether firms' innovation strategies affect their patenting behaviour, as measured by both the probability of having a patent portfolio and the number of active patents held. Three main dimensions of an innovation strategy are taken into account: the relative importance of basic research, applied research and development work in total R&D activities, the product or process orientation of innovation efforts, and the extent to which firms enter into collaborative R&D with other institutions	The data set used in this study comes from an original survey on firms' innovation competencies and performance undertaken in Belgium in 2001. The questionnaire was sent to the CEO's of 1,301 large firms. Control variables include the firm size, age, domestic or foreign nature of ownership, degree of internationalization, and indicators of sector concentration and technological opportunity. Innovation strategy variables and barriers perception variables.	There is a positive relationship between the patent portfolio of firms and an outward-oriented innovation strategy characterised by R&D partnerships with external organisations — scientific institutions and competitors in particular; Process-oriented innovators patent less than product-oriented innovators; Stronger focus on basic and applied research is associated with a more active patenting behaviour; firms that perceive high barriers to innovation have smaller patent portfolios; the perceived limitations of the patent system do not significantly influence the patenting behaviour.
Paily, G. (2018).	This paper tries to contribute to the emerging stream of research on innovation in developing economies looking at the impact of different firm level strategies on innovation outcomes and the impact of these innovations on firm performance. These strategies include technology creation, technology adoption and absorptive capacity building	Final total samples include 6986 firms from these sectors which is located all across India. Variables: age of the firm, Size of the firms measured by log of sales, Dummy of: Technology creation through in-house R&D effort, Technology acquisition through technology licensing, Complementary strategy in which technology creation is supplemented with buying Embodied technology transfer measured through percentage of imported inputs. Percentage of workforce who have attained tertiary education. Experience of the manager, in number of years Dummy of whether the firm is located in an export processing zone and Dummy of whether the firm having an overdraft facility.	The option of only relying on technology adoption is found to be not effective for process innovations. Author find that product innovations and particularly the combination of product and process innovation significantly improve firm performance. Both innovation and growth performance are supported by availability of finance and managerial skills.

Brunswicker, S., & Vanhaverbeke, W. (2015).	In this paper author explore how small and medium-sized enterprises (SMEs) engage in external knowledge sourcing, a form of inbound open innovation.	A sample of 1,411 firms was used to develop an empirical typology of external knowledge sourcing strategies in SMEs. The sample consists of fairly small, young firms, which reflects the dominance of such companies in Europe. Authors used three kinds of measures. The first kind captured a firm's external knowledge sourcing, the second addressed innovation performance, and the third covered internal organisational	Authors draw upon on sample of 1,411 SMEs and empirically conceptualise a typology of strategic types of external knowledge sourcing, namely minimal, supply-chain, technology-oriented, application-oriented, and full scope sourcing. Each strategy reflects the nature of external interactions and is linked to a distinct mixture of four internal practices for managing innovation. Both full-scope and application-oriented sourcing offer performance benefits and are associated with a stronger focus on managing innovation. However, they differ in their managerial focus on strategic and operational aspects.
Van Hemert, P., Nijkamp, P., & Masurel, E. (2013).	This study claims that policy makers may not be sufficiently aware of the importance of maintaining an appropriate balance between exploration and exploitation networks for small and medium-sized enterprises (SMEs). This study explores the innovation strategy of innovative Dutch SMEs by means of their sources of innovation, innovation capabilities, innovation performance, and commercialisation sources.	Study is based on the sample of 243 Dutch SMEs. CFA resulted in following constructs and items: *Sources of innovation (SI)* (University contact, International network); *Innovation capabilities (IC)* (New products or services New production or service processes); *Innovation performance (IP)*(Sales performance, Location); *Commercialisation process (CP)* (Competitors, National network)	On the basis of the open innovation model, increasingly, SMEs are being stimulated to develop their exploration skills for exploring (technology) opportunity. This was also the aim of the Dutch innovation voucher programme. This development towards policy support of university-industry interaction of SMEs is supported by studies that show that, in the early stages of innovation, firms do indeed benefit from external networks with universities. Policy makers, but also researchers, do not seem to be sufficiently aware of the importance of maintaining an appropriate balance between exploration and exploitation networks for SMEs. There- fore, a subsidy programme like the Dutch 'innovation vouchers' may be regarded with scepticism by SMEs, because it highlights that an exploration network as the 'manna from heaven' for successful innovation, while SMEs are generally all too aware that an exploitation network is equally important—something that does not always seem sufficiently recognised.
Contreras, F., Juarez, F., Cuero Acosta, Y. A., Dornberger, U., Soria-Barreto, K., Corrales-Estrada, M., ... & Yshikawa Salusse, M. A. (2020).	The aim of this study is to examine how transformational and transactional leaders, boost the employees' innovative work behaviour, directly or through work engagement, organisational climate for innovation and absorptive capacity in Latin American firms.	Multifactor Leadership Questionnaire (MLQ): Transformational and transactional leadership were measured using 28 items of the version of the MLQ (B.M. Bass & Avolio, 1995) translated and validated by Vega and Zavala (2004). Absorptive Capacity Scale: Flatten *et al*.	According to the results, leadership by itself is insufficient to promote employees innovative work behaviour. Transformational and transactional leader- ship exert effect on this behaviour only through absorptive capacity and work engagement respectively. As a conclusion, leadership practices are needed to encourage innovative work behaviour within the Latin American organisational context, however some individual (engagement) and

		(2011) elaborated on this absorptive capacity scale, which was designed to evaluate the innovation processes of companies. Climate for Innovation: Scott and Bruce (1994) developed this scale based on Siegel and Kaemmerer (1978) work. Utrecht Work Engagement Scale (UWES): Schaufeli, Martínez *et al*. (2002) elaborated on this scale, which comprises nine items to assess three engagement dimensions: i.e., vigour, dedication and absorption. Hypothesis 1 (H1): Innovative work behaviour can be predicted by the direct effect of transformational and transactional leadership. Hypothesis 3 (H3): Innovative work behaviour can be predicted by the direct effect of organisational climate for innovation (OCI), employee work engagement (EWE), and absorptive capacity (ACAP).	organisational (absorptive capacity) conditions are also needed to ensure this effect.
Pervan, S., Al-Ansaari, Y., & Xu, J. (2015).	To examine and analyze the influence of environmental factors on the adoption and implementation of open innovation within Small and Medium Enterprises (SMEs) located in Dubai, United Arab Emirates	H1. Environmental factors significantly affect the implementation of open innovation in Dubai SMEs. H2. Specific environmental determinants have varying impacts on different aspects of open innovation.	Supported by empirical evidence, the study confirmed that environmental factors (economic, social, technological, and regulatory aspects) indeed have a substantial impact on the adoption and execution of open innovation strategies in SMEs within the Dubai context. The research highlighted the influence of distinct environmental determinants on various dimensions of open innovation practices within Dubai's SMEs. For instance, economic factors might heavily influence collaboration practices, while regulatory factors could impact the use of external knowledge sources.
Fatoki, O. (2021).	To explore the relationship between innovative behaviour, firm competitive advantage, and the moderating effect of environmental dynamism.	1. Innovative behaviour positively influences firm competitive advantage. 2. Environmental dynamism moderates the relationship between innovative behaviour and	The study's empirical analysis supported the hypotheses, indicating that innovative behaviour indeed has a positive influence on firm competitive advantage. Additionally, the research highlighted the moderating effect of environmental dynamism, showcasing that the impact of innovative

		firm competitive advantage.	behaviour on competitive advantage varies based on the level of environmental dynamism. The findings underscored the significant role of innovative behaviour in driving firm competitive advantage, further emphasising the influence of environmental factors on this relationship.
Kruft, T., Gamber, M., & Kock, A. (2018).	To examine the relationship between corporate incubator support, innovation climate, and their impact on the innovative behaviour of the hosting firm, exploring whether they act as substitutes or complements.	The study aims to explore two main hypotheses: 1. Corporate incubator support and innovation climate act as substitutes for fostering innovative behaviour. 2. Corporate incubator support and innovation climate act as complements for fostering innovative behaviour.	The research findings indicated that corporate incubator support and innovation climate actually act as complements rather than substitutes in fostering innovative behaviour within the hosting firm. They work together synergistically, demonstrating that when both aspects are present and effectively utilised, they contribute significantly to fostering innovative behaviour within the firm. This suggested that instead of being mutually exclusive, these factors work in tandem, reinforcing each other's impact on fostering innovation within the hosting firm.
Suarez, D. (2014).	To investigate the persistence of innovation in unstable environments, focusing on the continuity and change in a firm's innovative behaviour under unstable conditions.	The study does not explicitly outline specific hypotheses but aims to explore the continuity and change in the firm's innovative behaviour in unstable environments.	The research revealed insights into the dynamics of innovation in unstable environments, emphasising both continuity and change in a firm's innovative behaviour. It highlighted that while firms might adapt and change their innovation strategies in response to unstable conditions, they also display a degree of persistence in their innovative behaviour. The findings point on the nature of innovation within firms operating in unstable environments, showcasing both adaptive changes and underlying continuity in their innovative approaches.
Sundbo, J., Orfila-Sintes, F., & Sørensen, F. (2007).	To conduct a comparative study of the innovative behaviour of tourism firms in Denmark and Spain, exploring and comparing the innovation strategies and behaviours in the tourism sector of the two countries.	The study aims to compare the innovative behaviours of tourism firms in Denmark and Spain without explicitly outlining specific hypotheses.	The research findings highlighted significant differences in the innovative behaviours and strategies of tourism firms between Denmark and Spain. The study underscored variations in innovation practices, suggesting differences in the approaches to innovation adoption, implementation, and strategies between the two countries' tourism sectors. The findings contributed to a deeper understanding of the innovation dynamics within the tourism industry and underlined the country-specific factors influencing innovation behaviours in this sector.
Del Carpio Gallegos, J. F., Miralles, F., & Soria Gómez, E. J. (2020).	To analyze and assess the innovative behaviour of medium-low and low-technology firms within an emerging economy, examining the factors	The study aims to analyze the factors influencing innovative behaviour in medium-low and low-technology firms in an emerging economy without explicitly	The research provided insights into the innovative behaviour of medium-low and low-technology firms in an emerging economy. It explored the factors influencing innovation in these firms and highlighted how these firms exhibit unique characteristics in their

	influencing innovation in these types of firms.	outlining specific hypotheses.	innovation strategies and behaviours. The findings contributed to understanding the dynamics of innovation within these specific types of firms operating in an emerging economy context.
Dzieńdziora, J., Smolarek, M., Żebrak, D., & Gross-Gołacka, E. (2022).	To explore the organisational factors influencing commitment to innovation and innovative behaviour in SMEs operating in the Renewable Energy Sources (RES) industry.	Hypothesis 1: Organisational culture significantly influences commitment to innovation in SMEs in the RES industry. Hypothesis 2: Leadership style impacts innovative behaviour in SMEs in the RES industry. Hypothesis 3: Resource allocation affects both commitment to innovation and innovative behaviour in SMEs in the RES industry.	The findings might reveal that organisational culture significantly affects commitment to innovation within SMEs operating in the RES industry. Additionally, the study might suggest that leadership style plays a vital role in influencing innovative behaviour, highlighting specific styles that foster or hinder innovation. Moreover, resource allocation within these SMEs could impact both commitment to innovation and the actual innovative behaviour exhibited by the firms. The research might provide insights into the key organisational factors affecting innovation commitment and behaviour within SMEs in the Renewable Energy Sources sector, as published in Energies journal.
Thomas, A., Scandurra, G., & Carfora, A. (2023).	To investigate and profile green innovative behaviour within Italian technology-based SMEs, aiming to identify key factors and characteristics.	Hypothesis 1: Italian technology-based SMEs with a higher focus on environmental sustainability will exhibit greater levels of green innovative behaviour.	The findings might reveal a positive correlation between the degree of emphasis on environmental sustainability and the extent of green innovative behaviour within Italian technology-based SMEs. This could suggest that SMEs prioritising environmental concerns tend to demonstrate higher levels of innovative behaviour specifically focused on eco-friendly practices. The study could provide insights into the factors driving green innovation within Italian technology-based SMEs, contributing to the Journal of Engineering and Technology Management.

Appendix A2: Operationalisation of innovation determinants

Literature review for Innovation determinants

Authors name and year	**Aim of the paper**	**Constructs**	**Findings**
Henttonen, K., & Lehtimäki, H. (2017.	This study examines how technology-intensive small- and medium-sized enterprises (SMEs) engage in open innovation.	A multiple case study of 13 technology-intensive SMEs in forestry sector was conducted. Identified strategies: in-house, outsourcing, licensing, partnership and collaboration, knowledge sale (patent and technology sale) and	The study results imply that SMEs benefit from opening up their innovation process in the commercialisation phase. The firms in this study employed a blend of strategies that capitalized on their internal strengths. They collaborated actively with external firms and outsourced from specialists. This way they were able to compensate for their internal weaknesses and gain competitive advantage.

		divestment of company units.	
Brunswicker, S., & Vanhaverbeke, W. (2015).	In this paper author explore how small and medium-sized enterprises (SMEs) engage in external knowledge sourcing, a form of inbound open innovation.	A sample of 1,411 firms was used to develop an empirical typology of external knowledge sourcing strategies in SMEs. The sample consists of fairly small, young firms, which reflects the dominance of such companies in Europe. Authors used three kinds of measures. The first kind captured a firm's external knowledge sourcing, the second addressed innovation performance, and the third covered internal organisational	Authors draw upon on sample of 1,411 SMEs and empirically conceptualise a typology of strategic types of external knowledge sourcing, namely minimal, supply-chain, technology-oriented, application-oriented, and full scope sourcing. Each strategy reflects the nature of external interactions and is linked to a distinct mixture of four internal practices for managing innovation. Both full-scope and application-oriented sourcing offer performance benefits and are associated with a stronger focus on managing innovation. However, they differ in their managerial focus on strategic and operational aspects.
Hamdan, Y., & Alheet, A. F. (2020).	The impact of organisational culture on innovation, proactive, and risk-taking behaviour of SMEs in UK was assessed.	The use of descriptive correlational design is justified as the research intends to seek out whether there is dependency between proposed situational aspects (Shah and Al-Bargi, 2013; Appuhami and Bhuyan, 2015). In the current study, descriptive correlational design was undertaken due to the fact that independent variable (organisational culture) is responsible for influencing the dependent variables (proactiveness, innovativeness, and risk-taking behaviour of SMEs). H2: Group culture has a significant influence on the innovativeness of SMEs H3: Group culture is significantly related to the risk-taking behaviour of SMEs Developmental culture is significantly linked with the innovativeness of SMEs H6: Developmental culture has a positive association with risk-	The analysis revealed that organisational cultures like group, rational, and developmental culture impact the proactiveness, innovativeness, as well as risk-taking behaviour of SMEs. Also, a significant correlation was observed between group, developmental, and rational culture on innovativeness of SMEs. Thus, it is inferred that organisational culture tends to have influence on SMEs' proactiveness, innovativeness, and risk-taking behaviours

		taking behaviour of SMEs H8: Rational culture positively influences on the innovativeness of SMEs H9: Rational culture has significantly association with the risk-taking behaviour of SMEs	
Gashema, B., & Gao, Y. (2018).	Managerial innovation as an internal change agent plays a central role in coping with the speed of today's fast-paced customer demand and highly competitive market, yet previous studies paid less attention to the potential measures of strengthening managerial innovation behaviour within organisations. Drawing from transformational leadership theory, the current study aims to clarify this issue by examining the role of CEO transformational leadership (TFL), innovation culture (IC) and cross- functional integration (CFI) in advancing managerial innovation behaviour in SMEs.	The study underlined this issue by examining the role of CEO transformational leadership (TFL), innovation culture (IC) and cross- functional integration (CFI) in advancing managerial innovation behaviour in SMEs. H1: CEO transformational leadership influence managerial innovation behaviour H2: CEO transformational leadership influence organisational innovation culture H3: Organisational innovation culture positively influences managerial innovation behaviour	The overall findings revealed that the relationship proposed in the model were significantly supported. However, our new mechanism implying innovation culture and cross-functional integration in the relationship between CEO transformational leadership and managerial innovation behaviour, provide a substantial contribution
Uddin, M. A., Priyankara, H. R., & Mahmood, M. (2019).	The purpose of this paper is to investigate the influence of an employee's personal creative identity on their innovation behaviour in knowledge-intensive information technology (IT) service provider firms. It further investigates the mediating role of an employee's creative process engagement (CPE) and the moderating effects of the organisational creative climate on creative identity-innovative behaviour (IB) relationships.	Authors developed a measurement model that consisted of IB, a CPI, a creative climate and CPE. H1. Employees' CPI have a significant relationship with the IB in organisational contexts of the knowledge-intensive IT service firms. H2. Employees' CPE mediates the CPI–IB relationship in organisational contexts of knowledge-intensive IT firms. H3. A creative climate moderates the CPI and CPE relationship. A CPI has a stronger positive effect on CPE in a highly creative climate than in a low creative climate. H4. A creative climate moderates the relationship between a CPI and IB. Highly	The results revealed the significant influence of an employee's creative personal identity (CPI) on their IB. The mediation analysis revealed that CPE mediates the association between a CPI and IB. The study also found a significant moderating effect of a creative organisational climate between a CPI and CPE

		creative climate has a stronger effect on CPI and IB than does a low creative climate.	
Cheng, L., & Lei, Z. (2015).	To examine the potential impact of the expansion of Chinese state-owned enterprises (SOEs) on the innovative behaviour of private enterprises in China.	Hypothesis 1: Increased expansion of Chinese state-owned enterprises negatively affects the innovative behaviour of private enterprises in the country.	The findings might suggest a negative relationship between the expansion of Chinese state-owned enterprises and the innovative behaviour of private enterprises. This could imply that as SOEs expand, there might be a dampening effect on the innovative behaviour exhibited by private enterprises, possibly due to increased competition, resource allocation, or market dynamics. The study could contribute insights into the interplay between SOE expansion and innovative behaviour within the context of the Asia-Pacific Journal of Accounting & Economics.
Sahrom, N. S., Tan, C. L., & Yahya, S. (2016).	This study seeks to examine the relationship between regulation, incentives and government policy to R&D (research and development) engineers' innovative behaviour in Malaysia biotechnology SMEs.	The predictor variables consist of institutional factors that include regulation, incentives and government policy. H1a: Regulation will be positively innovative behaviour. H1b: Incentives will be positively associated with individual innovative behaviour H1c: Government policy will be positively associated with individual innovative behaviour.	The result unfolds that government policy is positively and significantly associated with innovative behaviour. Nevertheless, regulation was found significant to innovative behaviour but demonstrates negative magnitude. On the other hand, incentives was insignificant to innovative behaviour. This in turn suggests that government policy is critical to foster innovative behaviour whereby the regulation enforcement that indicates disequilibrium possess by higher compliance cost be a disincentive for the R&D engineers to act innovatively
Najib, M., Abdul Rahman, A. A., & Fahma, F. (2021).	To investigate the interplay between government support, innovation, and the survival of small and medium-sized restaurants during crises.	1. Government support positively influences the survival of small and medium-sized restaurants during crises. 2. Innovation plays a significant role in enhancing the survival prospects of small and medium-sized restaurants facing crises.	The study conducted empirical analysis demonstrating a positive correlation between government support and the survival of small and medium-sized restaurants during crises. Additionally, it highlighted the pivotal role of innovation in significantly contributing to the resilience and survival chances of these establishments in times of crisis. This was observed through various innovative strategies employed by restaurants to adapt and sustain during challenging periods.
Mahemba, C. M., & Bruijn, E. J. D. (2003).	To explore and analyze the innovation activities undertaken by small and medium-sized manufacturing enterprises (SMEs) in Tanzania.	1. SMEs in Tanzania engage in innovation activities to improve their competitive edge. 2. The availability of resources influences the level of innovation within SMEs in Tanzania. 3. Collaboration positively impacts the innovation	The research findings indicated active participation by SMEs in Tanzania in various innovation activities aimed at enhancing their competitive advantage. Additionally, the study highlighted the crucial role of resource availability in influencing the extent and nature of innovation within these enterprises. Collaboration emerged as a significant factor contributing to the innovation efforts of SMEs in Tanzania, showcasing the importance of

		efforts of SMEs in Tanzania.	partnerships and alliances in fostering innovation.
Najib, M., & Kiminami, A. (2011).	To investigate the relationship between innovation, cooperation, and the business performance of small food processing clusters in Indonesia.	1. Innovation positively impacts the business performance of small food processing clusters in Indonesia. 2. Cooperation among cluster members enhances the business performance of small food processing clusters.	The study provided empirical evidence supporting the hypotheses: it revealed a positive correlation between innovation and the business performance of small food processing clusters in Indonesia. Additionally, cooperation among cluster members was found to significantly contribute to the enhanced business performance of these clusters. The findings underscored the importance of both innovation and cooperation in driving the success and competitiveness of small food processing clusters in the Indonesian context.
Salavou, H., Baltas, G., & Lioukas, S. (2004).	To explore and analyze the role of strategic orientation and competitive structure in influencing organisational innovation within Small and Medium Enterprises (SMEs).	1. Strategic orientation significantly influences the extent of organisational innovation in SMEs. 2. Competitive structure impacts the level of organisational innovation in SMEs.	The study's findings supported the hypotheses by revealing that strategic orientation plays a significant role in determining the extent of organisational innovation within SMEs. Additionally, the competitive structure was identified as a factor influencing the level of organisational innovation in SMEs. The research highlighted the importance of strategic focus and adaptability, along with the competitive environment, in shaping the innovation practices of SMEs.
Alheet, A., Adwan, A., Areiqat, A., Zamil, A., & Saleh, M. (2021).	To examine the influence of different leadership styles on employees' innovative work behaviour within organisations.	1. Transformational leadership positively influences employees' innovative work behaviour. 2. Transactional leadership has a moderate effect on employees' innovative work behaviour. 3. Laissez-faire leadership negatively impacts employees' innovative work behaviour.	The study's empirical analysis supported the hypotheses, revealing that transformational leadership significantly enhances employees' innovative work behaviour. Transactional leadership exhibited a moderate positive influence, while laissez-faire leadership had a negative impact on employees' innovative work behaviour. The findings underscored the pivotal role of leadership styles in shaping the innovation culture and behaviours within organisations.
Hoque, A. S. M. M. (2018).	To explore the impact of entrepreneurial orientation on the performance of Small and Medium Enterprises (SMEs) in Bangladesh while considering the mediating role of organisational culture.	1. Entrepreneurial orientation positively affects SME performance. 2. Organisational culture mediates the relationship between entrepreneurial orientation and SME performance.	The empirical analysis supported the hypotheses, demonstrating that entrepreneurial orientation significantly influences the performance of SMEs in Bangladesh. Additionally, organisational culture was found to act as a mediator in the relationship between entrepreneurial orientation and SME performance. The findings highlighted the significance of fostering an entrepreneurial orientation and cultivating a supportive organisational culture for enhancing SME performance in the Bangladeshi context.
Kenny, B., & Reedy, E. (2006).	To investigate the influence of various organisational culture factors on the levels of innovation within Small	The study does not explicitly outline specific hypotheses, but it aims to explore how organisational culture elements impact	The research revealed empirical evidence showcasing the significant impact of various organisational culture factors on innovation levels within SMEs. It highlighted elements such as leadership style, collaboration, risk-

	and Medium Enterprises (SMEs).	innovation levels in SMEs.	taking propensity, and support for creativity as influential in fostering an innovative culture within SMEs. The findings emphasised the importance of a conducive organisational culture in driving innovation initiatives within SMEs.
Su, Z., Chen, J., and Wang, D. (2019).	To explore the relationship between organisational structure, managerial innovation, and the mediating role of cross-functional integration.	1. Organisational structure significantly influences managerial innovation. 2. Cross-functional integration mediates the relationship between organisational structure and managerial innovation.	The study's findings supported the hypotheses, demonstrating that organisational structure indeed has a significant impact on managerial innovation. Additionally, the research highlighted the mediating effect of cross-functional integration, indicating that it plays a crucial role in connecting organisational structure and managerial innovation. The findings emphasised the importance of both organisational structure and cross-functional integration in fostering and facilitating managerial innovation within organisations.
Shi, X., & Wu, Y. (2017).	To investigate and analyze the impact of internal and external factors on the innovative behaviour of Chinese manufacturing firms.	The study aims to explore several hypotheses regarding the influence of internal and external factors on innovative behaviour in Chinese manufacturing firms.	The empirical findings revealed significant influences of both internal and external factors on the innovative behaviour of Chinese manufacturing firms. Internal factors, such as R&D investment, firm size, and human capital, were found to positively impact innovative behaviour. Additionally, external factors like market competition, technological spillover effects, and government support also demonstrated positive effects on fostering innovative behaviour within these firms. The research highlighted the multifaceted nature of influences shaping innovative behaviour in Chinese manufacturing firms, emphasising the importance of both internal capabilities and external environmental factors.
Friedman, Y., & Carmeli, A. (2018).	To explore the impact of decision comprehensiveness on innovative behaviours in small entrepreneurial firms, particularly emphasising the role of connectivity in influencing this relationship.	The study hypothesises: 1. Decision comprehensiveness positively influences innovative behaviours in small entrepreneurial firms. 2. Connectivity moderates the relationship between decision comprehensiveness and innovative behaviours.	The empirical analysis supported the hypotheses, revealing that decision comprehensiveness indeed has a positive impact on innovative behaviours in small entrepreneurial firms. Additionally, the research highlighted the moderating effect of connectivity, indicating that when connectivity levels are high, the positive influence of decision comprehensiveness on innovative behaviours is strengthened. The findings underscored the importance of both decision-making processes and the level of connectivity in fostering innovative behaviours within small entrepreneurial firms.
O'Leary, D., Doran, J., & Power, B. (2022).	To explore and analyze the relationship between the intensity of competition and firm innovative behaviour, investigating how competition levels	The study aims to examine the impact of the intensity of competition on firm innovative behaviour without explicitly	The research findings pointed on the relationship between competition intensity and firm innovative behaviour. It demonstrated that the intensity of competition indeed influences how firms engage in innovative behaviour.

O'Leary, D., Doran, J., & Power, B. (2022).	influence firms' approaches to innovation.	outlining specific hypotheses.	The study highlighted that higher competition levels tend to prompt firms to enhance their innovative efforts, possibly driven by the need to differentiate and remain competitive. The findings contributed to understanding how competition dynamics shape firms' approaches to innovation within the context of Economics and Business Letters.
Galende, J., & de la Fuente, J. M. (2003).	To explore and analyze the internal factors that determine a firm's innovative behaviour, focusing on identifying and understanding the key elements within the firm influencing its innovation efforts.	The study aims to investigate various internal factors influencing a firm's innovative behaviour without explicitly outlining specific hypotheses.	The research findings highlighted several internal factors within firms that significantly influence their innovative behaviour. It identified factors such as the firm's R&D investment, human resource policies, organisational structure, and strategic orientation as crucial elements shaping a firm's approach to innovation. The study underscored the importance of internal factors in driving and fostering a culture of innovation within firms, highlighting the multifaceted nature of these factors and their impact on innovative behaviour as discussed in the Research Policy journal.
Uddin, M. A., Priyankara, H. R., & Mahmood, M. (2019).	To investigate the relationship between having a creative identity and the encouragement of innovative behaviour specifically within knowledge-intensive IT service firms.	The study aims to examine whether having a creative identity encourages innovative behaviour within knowledge-intensive IT service firms without explicitly stating specific hypotheses.	The research findings demonstrated a positive relationship between having a creative identity and encouraging innovative behaviour within knowledge-intensive IT service firms. It highlighted that a creative identity among employees or within the organisational culture contributes significantly to fostering and encouraging innovative behaviour. The study emphasised the importance of cultivating a creative identity as a driver for fostering innovative behaviours within knowledge-intensive IT service firms, showcasing its positive impact on innovation within these firms as presented in the European Journal of Innovation Management.
He, Y., & Zhao, C. (2018).	To investigate and analyze the influence of media reports on the innovative behaviours of photovoltaic enterprises in China, exploring how media coverage impacts these firms' approaches to innovation.	The study aims to explore the impact of media reports on the innovative behaviours of photovoltaic enterprises in China without explicitly outlining specific hypotheses.	The research findings suggested that media reports indeed have an impact on the innovative behaviours of photovoltaic enterprises in China. It highlighted that media coverage plays a role in influencing firms' innovation approaches, potentially affecting their innovative strategies and behaviours. The study emphasised the significance of media reports as a factor that influences the innovation dynamics within photovoltaic enterprises, showcasing their role in shaping innovative behaviours within this sector, as presented in the Light Engineering journal.
Yusof, R., Imm, N. S., Ann, H. J.,	To explore and assess the influence of SME employees' intentions on their innovative behaviour,	The study aims to investigate the influence of SME employees' intentions on innovative	The research findings indicated a significant relationship between SME employees' intentions and their innovative behaviour. It highlighted that

& Rahman, A. A. (2018).	examining how their intentions impact the likelihood of engaging in innovative behaviours within SMEs.	behaviour without explicitly stating specific hypotheses.	employees' intentions play a crucial role in shaping and influencing their engagement in innovative behaviours within SMEs. The study emphasised the importance of understanding and fostering employees' intentions as a factor in encouraging and promoting innovative behaviours within small and medium-sized enterprises, as presented in the Pertanika Journal of Social Sciences & Humanities.
Moreno, A. R., García-Morales, V. J., & Llorens Montes, F. J. (2013).	To investigate the determinants influencing proactive innovative behaviour in new services, specifically comparing service firms to manufacturing firms.	The study aims to identify and compare determinants impacting proactive innovative behaviour in new services between service and manufacturing firms without outlining specific hypotheses.	The research findings revealed differences in the determinants affecting proactive innovative behaviour between service and manufacturing firms. It highlighted distinct factors that significantly influence proactive innovation in new services compared to manufacturing firms. The study showcased that while some determinants might have common importance, the weight and impact of certain factors differ between service and manufacturing sectors. This research contributed to understanding the determinants shaping proactive innovation in new services and manufacturing firms, as discussed in The Service Industries Journal.
Dwiputri, R. M., Suyono, E., & Laksana, R. D. (2023).	To examine the relationships between financial literacy, risk aversion, financial performance, and innovative behaviour in Indonesian SMEs.	Hypothesis 1: Financial literacy positively correlates with innovative behaviour. Hypothesis 2: Risk aversion negatively correlates with innovative behaviour. Hypothesis 3: Financial performance mediates the relationship between financial literacy and innovative behaviour.	The findings highlighted significant relationships between financial literacy, risk aversion, financial performance, and innovative behaviour in Indonesian SMEs. Results supported the positive association between financial literacy and innovative behaviour, the negative correlation between risk aversion and innovative behaviour, and the mediating role of financial performance in this relationship.
Phukrongpet, P., Daovisan, H., & Satsanasupint, P. (2022).	To investigate and comprehend the determinants influencing innovative behaviour within sustainable community-based enterprises through qualitative case studies.	The study might not outline specific hypotheses but aims to uncover factors driving innovative behaviour in sustainable community-based enterprises through qualitative insights.	The research findings might highlight various determinants driving innovative behaviour in sustainable community-based enterprises. Insights may reveal factors such as community engagement, social impact, environmental sustainability, leadership qualities, or unique business models as significant drivers of innovation within these enterprises. The study may provide insights into the dynamics and motivations behind innovative behaviours in sustainable community-based enterprises, contributing qualitative evidence to the International Journal of Innovation Science.
Wu, M., Luo, T., & Tian, Y. (2022).	To examine the impact of open innovation through mergers and acquisitions (M&A) on the innovative	Hypothesis 1: Enterprises engaging in open innovation through M&A will exhibit higher levels of innovative behaviour compared to	The findings might reveal a positive association between engaging in open innovation through mergers and acquisitions and the innovative behaviour of Chinese listed enterprises. This evidence might suggest that

	behaviour of Chinese listed enterprises.	enterprises not involved in such strategies.	enterprises utilising M&A for open innovation purposes tend to display higher levels of innovative behaviour, possibly due to enhanced access to external resources, technology, and knowledge resulting from such strategies. The study could contribute valuable insights to Frontiers in Psychology regarding the effects of open innovation strategies on enterprise innovation within the Chinese context.
Soltanzadeh, J., Elyasi, M., Ghaderifar, E., Rezaei Soufi, H., & Khoshsirat, M. (2020).	To assess the impact of R&D subsidies on the innovative behaviour of Iranian firms, redefining and examining behavioural additionality in this context.	Hypothesis 1: R&D subsidies positively influence the innovative behaviour of Iranian firms. Hypothesis 2: Behavioural additionality in the context of R&D subsidies significantly contributes to innovative behaviour in Iranian firms.	The findings might reveal a positive relationship between R&D subsidies and the innovative behaviour of Iranian firms, indicating that these subsidies have a stimulating effect on fostering innovation within these organisations. Moreover, the study could suggest that behavioural additionality—defined as additional impacts beyond financial support—significantly contributes to the innovative behaviour of Iranian firms benefiting from R&D subsidies. The research might provide insights into the effectiveness of R&D subsidies and the concept of behavioural additionality concerning innovative behaviour within the Iranian context, as reported in the Journal of Science and Technology Policy Management.
Imran, M., Ismail, F., Arshad, I., Zeb, F., and Zahid, H. (2022).	To investigate the mediating role of innovation between organisational culture and organisational performance in Pakistan's banking sector.	1. Organisational culture positively influences innovation. 2. Innovation significantly impacts organisational performance. 3. Organisational culture indirectly affects organisational performance through innovation mediation.	The study confirms a significant indirect effect of organisational culture on organisational performance through the mediation of innovation in Pakistan's banking sector. It establishes a strong relationship between organisational culture, innovation, and overall performance.
Lizarelli, F. L., de Toledo, J. C., and Alliprandini, D. H. (2021).	To examine the relationship between continuous improvement and innovation performance in Brazilian manufacturing companies.	1. Continuous improvement positively affects innovation performance.	The research provides evidence supporting the positive impact of continuous improvement practices on enhancing innovation performance within Brazilian manufacturing firms. It underscores the relevance of ongoing improvement initiatives in fostering innovation.
Knezović, E., and Drkić, A. (2021).	To explore the role of transformational leadership in fostering innovative work behaviour in SMEs.	1. Transformational leadership positively influences innovative work behaviour in SMEs.	The study highlights the pivotal role of transformational leadership in encouraging innovative work behaviour among employees in SMEs. It emphasises the significance of leadership styles in promoting a culture of innovation within smaller enterprises.
Kocak, A., Carsrud, A., and Oflazoglu, S. (2017).	To investigate the impact of market, entrepreneurial, and technology orientations on innovation and firm performance.	1. Market orientation positively influences innovation. 2. Entrepreneurial orientation positively influences innovation. 3.	The research substantiates the positive influence of market, entrepreneurial, and technology orientations on innovation and subsequent firm performance. It emphasises the importance of multiple orientations for

		Technology orientation positively influences innovation.	fostering innovation within firms, ultimately leading to enhanced performance.
Cao, T. T., Le, P. B., and Nguyen, N. T. M. (2022).	To explore the impacts of high-involvement HRM practices on organisational innovation capability, mediated by tacit and explicit knowledge sharing.	1. High-involvement HRM practices positively influence tacit and explicit knowledge sharing. 2. Tacit and explicit knowledge sharing mediate the relationship between high-involvement HRM practices and organisational innovation capability.	The study confirms that high-involvement HRM practices significantly enhance tacit and explicit knowledge sharing, consequently contributing to improved organisational innovation capabilities. It establishes a clear link between HRM practices, knowledge sharing, and innovation capabilities.
Yapa, S. R., Senathiraja, R., and Kauranen, I. (2018).	To improve innovation performance through convergence in open innovation in Sri Lankan software firms.	Convergence in open innovation positively influences innovation performance in Sri Lankan software firms.	The research demonstrates that embracing open innovation and fostering convergence significantly enhances innovation performance within Sri Lankan software firms. It emphasises the importance of collaborative approaches in driving innovation outcomes.
Wadho, W., and Chaudhry, A. (2018).	To study the relationship between innovation and firm performance in Pakistani textile and apparel manufacturers.	Innovation positively impacts firm performance in Pakistani textile and apparel manufacturers.	The study establishes a positive correlation between innovation and firm performance in Pakistani textile and apparel manufacturing sectors. It emphasises the pivotal role of innovation in enhancing overall business performance.
Surya, R. A. S., Afifah, U., Khoiriyah, M., and Oktari, V. (2022).	To assess the impact of entrepreneurship orientation, innovation, market orientation, and total quality management on SME performance.	Entrepreneurship orientation positively influences SME performance. Innovation positively influences SME performance. Market orientation positively influences SME performance. Total quality management positively influences SME performance.	The research highlights the significant positive impact of entrepreneurship orientation, innovation, market orientation, and total quality management on SME performance. It underscores the multi-dimensional aspects contributing to SME success.
Suh, Y., and Kim, M. S. (2012).	To analyze the effects of SME collaboration on R&D in the service sector within open innovation.	SME collaboration positively influences R&D activities in the service sector within open innovation.	The study indicates that collaborative efforts among SMEs positively influence R&D activities within the service sector, particularly in an open innovation setting. It emphasises the importance of collaboration for innovation in SMEs.
Haug, A., Adsbøll Wickstrøm, K., Stentoft, J., and Philipsen, K. (2023).	To examine the impact of information technology on product innovation in SMEs, considering technological orientation.	Information technology positively impacts product innovation in SMEs, especially with a strong technological orientation.	The research demonstrates that information technology significantly contributes to product innovation in SMEs, especially when coupled with a strong technological orientation. It

			highlights the synergy between IT and technological focus for innovation.
Bertello, A., Ferraris, A., De Bernardi, P., and Bertoldi, B. (2022).	To analyze challenges to open innovation in traditional SMEs through university-industry-government collaboration.	Challenges exist for open innovation in traditional SMEs involved in university-industry-government collaboration.	The study highlights the challenges faced by traditional SMEs in engaging with open innovation models through collaborative projects involving universities, industries, and governments. It identifies barriers hindering effective collaboration.
Annamalah, S., Aravindan, K. L., Raman, M., and Paraman, P. (2022).	To investigate SME engagement with open innovation and the commitments and challenges in collaborative innovation.	SMEs face commitments and challenges in engaging with open innovation for collaborative projects.	The research delves into SMEs' experiences in open innovation, outlining their commitments and challenges in engaging in collaborative innovation endeavors. It clarifies the intricacies of SME involvement in open innovation initiatives.
Srholec, M. (2014).	To explore cooperation and innovative performance of firms in the Czech Republic, Norway, and the UK.	Cooperation positively influences the innovative performance of firms in the Czech Republic, Norway, and the UK.	The study showcases how cooperation positively impacts the innovative performance of firms across different countries, specifically in the Czech Republic, Norway, and the UK. It underscores the universality of cooperation's positive influence on innovation.
Hameed, W. U., and Naveed, F. (2019).	To study coopetition-based open-innovation and its impact on innovation performance, considering trust and dependency in Malaysian high-tech SMEs.	Coopetition-based open innovation positively impacts innovation performance in Malaysian high-tech SMEs, influenced by trust and dependency.	The research underlines the positive impact of coopetition-based open innovation on innovation performance within Malaysian high-tech SMEs, influenced significantly by trust and dependency dynamics. It emphasises the complex interplay between cooperation and competition for innovation.
Kweh, Q. L., Ting, I. W. K., Hanh, L. T. M., and Zhang, C. (2019).	To examine the relationship between intellectual capital, governmental presence, and firm performance in Malaysian publicly listed companies.	Intellectual capital and governmental presence positively influence firm performance in Malaysian publicly listed companies.	The study highlights the significant influence of intellectual capital and governmental presence on firm performance within Malaysian publicly listed companies. It emphasises the multifaceted nature of factors impacting firm performance.
Handoko, F., Smith, A., and Burvill, C. (2014).	To analyze the roles of government, universities, and businesses in advancing technology for SMEs' innovativeness.	Government, universities, and businesses play significant roles in advancing technology for SMEs' innovativeness.	The research underscores the crucial roles played by government, universities, and businesses in collectively advancing technology to enhance innovativeness within SMEs. It emphasises the collaborative efforts required for fostering SME innovation.
Doh, S., and Kim, B. (2014).	To investigate government support for SME innovations in regional industries, focusing on a government financial support program in South Korea.	Government financial support positively impacts SME innovations in South Korea's regional industries.	The study emphasises the positive impact of government financial support programs on fostering SME innovations within regional industries in South Korea. It underscores the importance of government initiatives in driving innovation within SMEs.
Liu, Z. (2021).	To study the impact of government policy on macro dynamic innovation in the UK's and China's animation sectors.	Government policy significantly impacts macro dynamic innovation in the UK's	The research reveals the significant influence of government policy on macro dynamic innovation within the animation sectors of the UK and China. It emphasises the role of policy frameworks in shaping innovation

		and China's animation sectors.	dynamics within specific industry segments.
D'souza, C., Nanere, M., Marimuthu, M., Arwani, M., and Nguyen, N. (2022).	To explore the relationship between market orientation, performance, and the mediating role of innovation in Indonesian SMEs.	Market orientation positively influences performance, mediated by innovation, in Indonesian SMEs.	The study highlights the positive relationship between market orientation and performance, mediated by innovation, within Indonesian SMEs. It underscores the pivotal role of market orientation in influencing performance through innovation.
Abdul-Halim, H., Ahmad, N. H., Geare, A., and Thurasamy, R. (2019).	To investigate innovation culture in SMEs, emphasising organisational culture, organisational learning, and market orientation.	Organisational culture, organisational learning, and market orientation significantly influence innovation culture in SMEs.	The research emphasises the substantial influence of organisational culture, organisational learning, and market orientation in shaping innovation culture within SMEs. It highlights the multifaceted aspects contributing to fostering an environment conducive to innovation within smaller enterprises.

Appendix A3: Operationalisation of business performance

Literature review for Business performance

Authors name and year	**Aim of the paper**	**Constructs**	**Findings**
Paily, G. (2018).	This paper tries to contribute to the emerging stream of research on innovation in developing economies looking at the impact of different firm level strategies on innovation outcomes and the impact of these innovations on firm performance. These strategies include technology creation, technology adoption and absorptive capacity building.	Final total samples include 6986 firms from these sectors which is located all across India. Variables: age of the firm, Size of the firms measured by log of sales, Dummy of: Technology creation through in-house R&D effort, Technology acquisition through technology licensing,	The option of only relying on technology adoption is found to be not effective for process innovations. Author find that product innovations and particularly the combination of product and process innovation significantly improve firm performance. Both innovation and growth performance are supported by availability of finance and managerial skills.
Crema, M., Verbano, C., & Venturini, K. (2014).	The purpose of this paper is to analyse the linkages between company's strategy, open innovation and innovation performance, focusing on small and medium enterprises (SMEs).	A survey has been conducted in the Italian manufacturing context and a database of 107 responses was obtained.	The obtained model confirmed most of the relations hypothesised, giving useful indications on how to define competitive strategy and coherent level of open innovation to pursue improved firm performance. Results highlight that firms, which pursue an innovative strategy are those who invest more on technical skills and core competencies. Companies who choose a strategy of diversification are likely to use, exclusively, managerial practices of open innovation, while firms focused on a strategy of efficiency are inclined toward open innovation practices and, to a lesser extent, to the development of core competencies.

Van Hemert, P., Nijkamp, P., & Masurel, E. (2013).	This study claims that policy makers may not be sufficiently aware of the importance of maintaining an appropriate balance between exploration and exploitation networks for small and medium-sized enterprises (SMEs). This study explores the innovation strategy of innovative Dutch SMEs by means of their sources of innovation, innovation capabilities, innovation performance, and commercialisation sources.	Study is based on the sample of 243 Dutch SMEs. CFA resulted in following constructs and items: *Sources of innovation (SI)* (University contact, International network); *Innovation capabilities (IC)* (New products or services New production or service processes); *Innovation performance (IP)*(Sales performance, Location); *Commercialisation process (CP)* (Competitors, National network)	On the basis of the open innovation model, increasingly, SMEs are being stimulated to develop their exploration skills for exploring (technology) opportunity. This was also the aim of the Dutch innovation voucher programme. This development towards policy support of university-industry interaction of SMEs is supported by studies that show that, in the early stages of innovation, firms do indeed benefit from external networks with universities. Policy makers, but also researchers, do not seem to be sufficiently aware of the importance of maintaining an appropriate balance between exploration and exploitation networks for SMEs. There- fore, a subsidy programme like the Dutch 'innovation vouchers' may be regarded with scepticism by SMEs, because it highlights that an exploration network as the 'manna from heaven' for successful innovation, while SMEs are generally all too aware that an exploitation network is equally important—something that does not always seem sufficiently recognised.
Tarutė, A., & Gatautis, R. (2014).	To examine and assess the influence of Information and Communication Technology (ICT) on various dimensions of Small and Medium Enterprises (SMEs) performance.	1. ICT adoption positively impacts the efficiency of SMEs. 2. ICT utilisation enhances the productivity of SMEs. 3. ICT contributes to innovation within SMEs. 4. ICT adoption improves SMEs' competitiveness.	The study provided comprehensive empirical evidence supporting the hypotheses: it demonstrated that ICT adoption significantly improves the efficiency and productivity of SMEs. Furthermore, the research highlighted that ICT utilisation fosters innovation within SMEs and enhances their overall competitiveness. The findings underscored the multi-dimensional positive impact of Information and Communication Technology (ICT) on various aspects of SME performance, emphasising its role in improving efficiency, productivity, fostering innovation, and enhancing competitiveness.
Vorhies, D. W., & Morgan, N. A. (2005)	Examining business performance benefits from benchmarking marketing capabilities	Market-based organizational learning, benchmarking, marketing capabilities, sustainable competitive advantage Construct items: Product development, Pricing, Channel management, Marketing communications, Selling, Market information management, Marketing planning, Marketing implementation, Market effectiveness, Profitability, Customer	The study empirically investigates the potential business performance benefits of benchmarking the marketing capabilities of top-performing firms. The findings indicate that benchmarking is a valuable learning mechanism for identifying, building, and enhancing marketing capabilities that contribute to sustainable competitive advantage. Specifically, the study highlights the importance of market sensing, customer linking, and channel bonding as critical marketing capabilities for achieving sustainable competitive advantage in dynamic markets. The results emphasize the significance of continuous benchmarking to adapt and succeed in evolving market environments.

		satisfaction, Capability interdependence.	
López-Sintas, J., & Martínez-Ros, E. (1999).	To examine the relationship between the innovative behaviour of Spanish enterprises and its potential impact on salaries within these enterprises.	Hypothesis 1: There is a positive correlation between the innovative behaviour of Spanish enterprises and salaries within those enterprises.	The findings might indicate a positive association between the level of innovative behaviour exhibited by Spanish enterprises and the salaries of employees within those enterprises. This could suggest that enterprises emphasising innovation tend to offer higher salaries, possibly due to factors such as increased productivity, competitiveness, or demand for specialised skills. The research might provide insights into the interplay between innovative behaviour and salary levels in Spanish enterprises, contributing to Small Business Economics journal.
Omri, W. (2015).	To investigate the relationship between innovative behaviour and venture performance of SMEs, considering the moderating effect of environmental dynamism.	Hypothesis 1: There is a positive association between innovative behaviour and venture performance in SMEs. Hypothesis 2: Environmental dynamism moderates the relationship between innovative behaviour and venture performance.	The findings might suggest a positive link between innovative behaviour and venture performance in SMEs. Moreover, the study could reveal that the impact of innovative behaviour on venture performance might vary based on the level of environmental dynamism. This moderation effect could imply that in dynamic environments, innovative behaviour has a more pronounced or different impact on venture performance compared to stable environments. The research might contribute insights into the interplay between innovative behaviour, environmental dynamism, and SME performance within the context of the European Journal of Innovation Management.

Appendix A4: SLR input

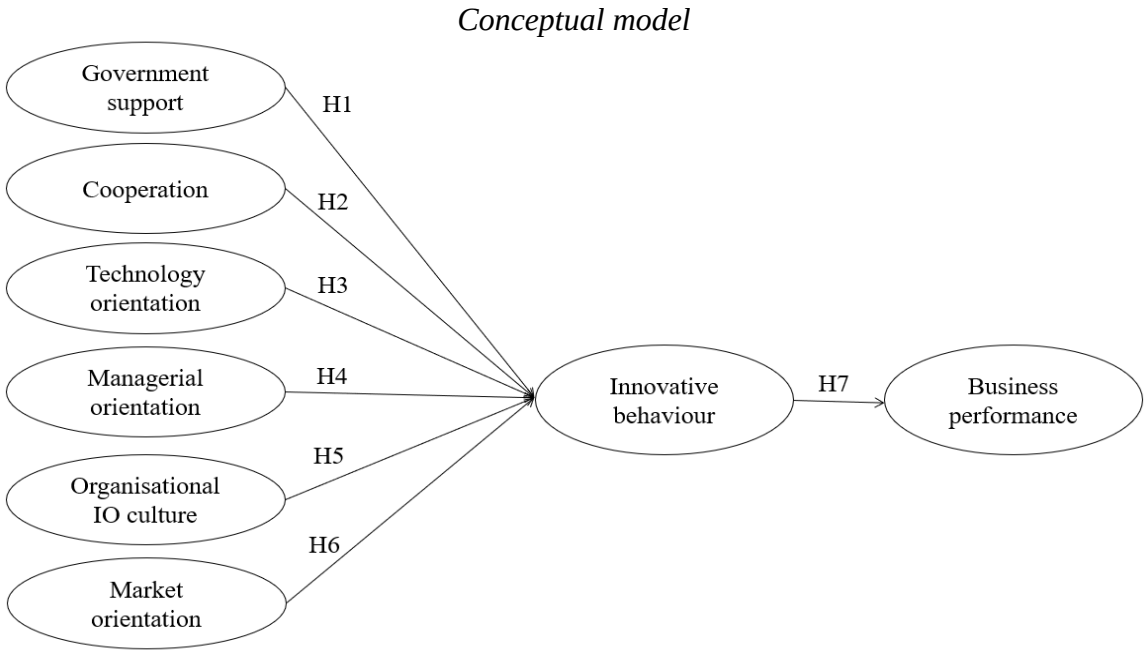
Systematic literature review input

Factor	**Research of innovation factors**
Government support	(Forfas 2004; Hadjimanolis 1999; Nelson and Soete 1988; Radaš and Božić 2009; Kweh *et al*., 2019; Yin *et al*., 2020; Zhang *et al*., 2020)
Cooperation	(Aragon-Sanchez and Sanchez-Marin 2005; Batonda and Perry 2003; Baum, Calabrese and Silverman 2000; Cooke and Morgan 1993; Wadho and Chaudhry, 2018; Freel 2003; Hadjimanolis 1999; Helmy *et al*., 2019; Hoffmann and Schlosser 2001; Kang and Park 2012; Karlsson and Olsson 1998; O'Dwyer, Gilmore and Carson 2011; Ortega-Egea *et al*., 2014; Soda 2011; Starr and MacMillan 1990; Stuart 2000; Cao, Le and Nguyen, 2022; Zeng, Xie and Tam 2010)
Technology orientation	García-León 2016; Cooper 1994; Laforet and Tann 2006; Cumming 1998; Gatignon and Xuereb 1997; Prahalad and Hamel, 2009; Henard

	and Szymanski 2001; Gatignon and Xuereb 1997; Nemet 2009; Simon 1996; Zhou, Yim and Tse, 2005)
Managerial orientation	(Aragon-Sanchez and Sanchez-Marin 2005; Baldridge and Burnham 1975; Blumentritt and Danis, 2006; Cannon 1985; Christensen 2003; Cromer, Dibrell and Craig 2011; Surya *et al.*, 2022; Lizarelli, de Toledo and Alliprandini, 2021; Wadho and Chaudhry, 2018; Gashema and Gao, 2018; Mahemba and De Bruijn 2003; Knezović and Drkić, 2021; O'Regan and Ghobadian 2005; Stoffers, Van der Heijden and Jacobs, 2020; Thomas, Listschert and Ramaswamy 1991; Cao, Le and Nguyen, 2022; Webster 1988)
Organisational innovation-oriented (hereinafter: IO) culture	(Lizarelli *et al*., 2021; Davenport and Bibby 1999; Domi *et al*., 2020; Wadho and Chaudhry, 2018; Forsman 2011; Freel 2003; Galende and Manuel, 2003; Gashema and Gao, 2018; Ghobadian and Gallear 1997; Jimenez-Jimenez, Valle and Hernandez-Espallardo 2008; Hamdan and Alheet, 2020; Helmy *et al*., 2019; Laguna *et al*., 2020; Martins and Terblanche 2003; Peebles 2003; Stoffers *et al*., 2020; Teece 2010; Tushman and O'Reily, 1997; Uddin *et al*., 2019; Van de Ven 1986; McKee 2003; Xu *et al*. 2007)
Market orientation	(Adams and Hall 1993; Baker and Sinkula 2007; Cui, Lim and Song, 2022; Surya *et al*., 2022; Day and Wensley 1988; Dibrell, Craig and Hansen 2011; Domi, Capelleras and Musabelliu, 2020; Gray *et al*. 1998; Han, Kim and Srivastava 1998; Henard and Szymanski 2001; Hult, Hurley and Knight, 2004; Iyer, LaPlaca and Sharma 2006; Jaworski and Kohli 1993; Keskin 2006; Lee and Tsai 2005; Lin 1998; Morris and Lewis 1995; Slater 1997; Tajeddini, Trueman and Larsen 2006; Varadarajan and Jayachandran 1999; Verhees and Meulenberg 2004)

Source: Authors own work.

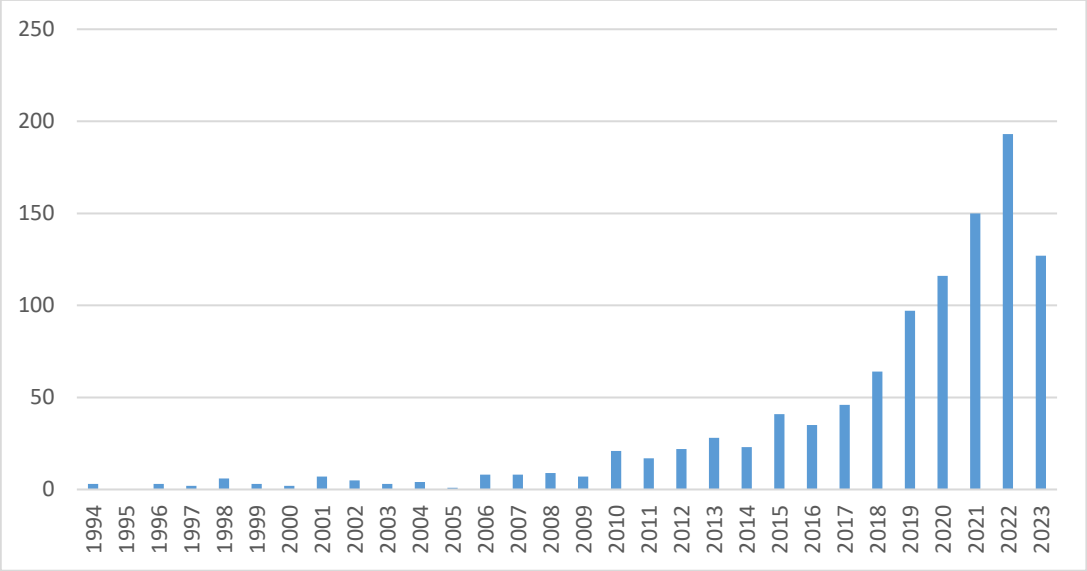
Appendix A5: Basic conceptual model



Source: Authors own work.

Appendix A6: Number of published articles

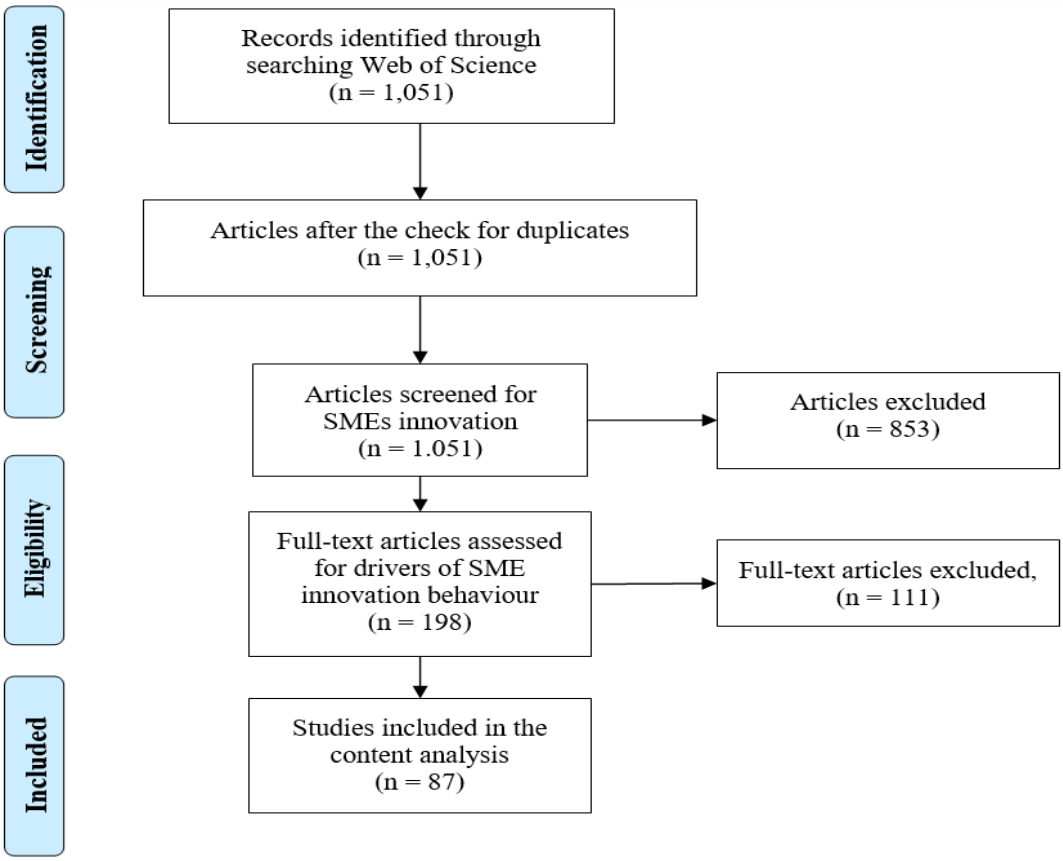
Number of published articles in period 1994-2023



Source: Author's work based on data retrieved from Clarivate Analytics

Appendix A7: Process of primary studies selection

Process of primary studies selection



Source: Authors' work.

Appendix A8: Detailed t*heoretical framework*

As the theoretical basis of this thesis lies at the intersection of innovation management, SMEs, and business performance, this multidisciplinary approach draws on several key theoretical frameworks and concepts. Moreover, by examining the interplay between internal factors (Resource-Based View (hereinafter: RBV) and Agency Theory) and external forces (Institutional Theory and Open Innovation), this thesis provides a holistic understanding of how SMEs' innovative behaviour is shaped and how it, in turn, influences their business performance.

The relationship between innovation behaviour and business performance is grounded in economic and strategic management theories. In particular, the research builds upon established economic theories such as Theory of Creative Destruction and the Innovation Diffusion Theory (Nooteboom, 1994). Schumpeter's theory of creative destruction highlights the role of entrepreneurship and disruptive innovation in economic development to explain how innovation can lead to competitive advantages and economic growth. This is particularly relevant for SMEs aiming to create competitive advantages through innovation. Whereas, the Roger's Innovation Diffusion Theory, on the other hand, helps explain how innovations spread and are adopted within SMEs, affecting their innovative behaviour. Rogers introduced the concept of innovation diffusion, which highlights how innovations spread within organisations and across markets. The theory helps explain how SMEs adopt and adapt innovative practices and technologies based on factors like relative advantage, compatibility, and observability (Nooteboom, 1994).

This thesis primarily combines two current research topics, namely innovation theory and the theory of the firm, by developing a full conceptual model. The firm theory has long been a source of contention for economists. It moves from straightforward topics to multidisciplinary ones. It discusses the existence of the firm, its organisational structure, and behavioural activity (i.e., scale, scope, or type), as well as how the firm interacts with the market and variations in commercial success. (Grant 1991; Ryung, Chung and Tibben, 2006; Teece, 2010; Terziovski, 2010)

Furthermore, strategic management theories, including the RBV and the Dynamic Capabilities Framework, underlined how innovation influences a firm's long-term performance. In particular, the RBV represents a well-established area of research in the field of strategic analysis. Its origins can be traced back to the work of Edith Penrose in 1959, where she provided valuable insights into how companies acquire, use, and expand their resources to gain a competitive edge (Barney, 1991; Barney and Clark, 2007). The RBV is a highly influential perspective in the realm of strategic management, offering a framework for understanding and predicting the core elements of a company's performance and competitive advantage. The RBV serves as a fundamental theoretical lens for understanding how SMEs leverage their unique resources and capabilities to foster innovation. Barney (1991) emphasised the role of valuable, rare, and non-substitutable resources in achieving competitive advantage. For SMEs, these resources could include technological expertise,

human capital, and networks. In this context, innovative capabilities and the ability to leverage and manage them are considered critical resources that can lead to sustained competitive advantage. This theory provides insights into the internal factors that drive innovation within SMEs (Barney, 1991).

Specifically, RBV effectively expounds upon how firms attain competitive advantages and, importantly, how these advantages can be sustained. For instance, Rumelt (1984) underscores that differences in profitability within an industry often surpass those between industries, emphasising the significance of resources over industry-specific effects. From an internal organisational perspective, RBV envisions firms as bundles of resources. Resources alone do not automatically translate into above-average business performance; certain characteristics and attributes are essential for this outcome. After decades of research, it is theorized that firms endowed with Valuable, Rare, Inimitable, Non-substitutable (hereinafter: VRIN) resources can achieve sustainable competitive advantages by implementing unique value-creating strategies that are challenging for competing firms to replicate (Barney, 1986; Dierickx and Cool, 1989; Grant, 1991; Madhani, 2010; Talaja, 2012).

Notably, there is a close correlation between resources that are valuable and rare and their contribution to competitive advantage, which, in turn, exerts a discernible influence on overall firm performance. Specifically, Terziovski (2010) leverages the lens of RBV analysis to analyse the similarity in innovation strategies between SMEs and their larger counterparts. As such, the strategic imperative of resource accumulation with VRIN characteristics to augment competitive advantage has crystallised as a cornerstone within the realm of both academic discourse and managerial strategic contemplation.

In contrast, scholars operating within the paradigm of the Dynamic Capability View (DCV) extend the RBV framework by examining the dynamic nature of markets and their effects on firms (Helfat and Peteraf, 2003). The pioneering work of Teece, Pisano and Shuen (1997) introduces the conceptual domain of DCV, with a primary emphasis on the pivotal role played by a firm's capabilities in the processes of resource acquisition, integration, and reconfiguration, which are essential for adaptation to profoundly volatile business environments. In contexts marked by rapid and tumultuous alterations, it becomes evident that the DCV framework excels in explicating the determinants of firm competitiveness, a point substantiated by a body of research (Clulow, Gerstman and Barry, 2003; Deeds, Decarolis and Coombs, 2000; Eisenhardt and Martin, 2000; Makadok, 2001; Teece, Pisano and Shuen, 1997; Zahra, Sapienza and Davidsson, 2006; Zollo and Winter, 2002; Zott, 2003). Research into DCV delves deeply into the attributes, origins, processes, influences, and contributions of dynamic capabilities (Barreto, 2010; Helfat and Peteraf, 2003; Loasby, 2002; Sharmelly and Ray, 2021; Prange and Verdier, 2011; Teece, 2007; Wang and Ahmed, 2007; Zahra, Sapienza and Davidsson, 2006; Zhou and Li, 2010; Zollo and Winter, 2002; Zott, 2003), with a consensus prevailing among scholars, that dynamic capabilities indeed play a pivotal role in amplifying competitive advantage. Furthermore, dynamic capabilities are regarded as a catalyst for the transformation of resources into augmented firm

performance, as aptly illustrated by Wu and Vahlne (2020), who demonstrates that dynamic capabilities serve as intermediaries in the relationship between entrepreneurial resources and firm performance.

With the proposal of absorptive capability by Cohen and Levinthal (1990), combinative capabilities by Kogut and Zander (1992), and capabilities by Amit and Schoemaker (1993), Teece, Pisano and Shuen (1997) introduce the concept of dynamic capabilities to explain why certain organisations outperform others in dynamic markets. Dynamic capabilities are also recognised for their contribution to long-term firm performance (Wang and Ahmed, 2007). Teece, Pisano and Shuen (1997) suggest that firms should develop the ability to build, integrate, and reconfigure both internal and external resources to adapt to the volatile business environment. Deeds, Decarolis and Coombs (2000) argue that high-tech firms should nurture their dynamic capabilities to innovate and create novel products in response to a rapidly changing industry landscape and global competition. Additionally, Eisenhardt and Martin (2000) view dynamic capabilities as the process of integrating, reallocating, acquiring, and divesting resources in response to changes in the market. D'Aveni, Dagnino and Smith (2010) emphasise the importance of dynamic adjustment capability for short-term competitive advantages in managing a hyper-competitive environment where resources are challenging to acquire.

This investigation, following the approach of Teece, Pisano and Shuen (1997), defines firm dynamic capabilities as the capacity of a firm to integrate, learn, and reconfigure internal and external resources. Internal resources refer to those assets owned by the firm, while external resources can be obtained through cooperative alliances and acquisitions. Moreover, a firm must be capable of restructuring or transforming its existing resources to remain competitive and adapt to changing markets (Amit and Schoemaker, 1993).

As Barney (1986) suggests, VRIN resources are pivotal components of firm competitiveness, and recent studies underscore their significance through the mediating effect of dynamic capabilities. Wu and Vahlne (2020) illustrate that dynamic capabilities can act as mediators between resources and firm performance. Consequently, dynamic capabilities are viewed as transformative elements that convert resources into improved performance. Owing to the distinctive attributes of VRIN resources, dynamic capabilities are effective in extracting competitive advantages from them to enhance firm performance. For instance, a company can advance its performance by creating innovative technologies and learning through cooperative alliances. Similarly, through the integration of proprietary know-how, a firm can gain a higher return on developing new and competitive products. Wu and Vahlne (2020) suggest that firms reconfigure resources and acquire knowledge by managing alliances to improve firm performance. Also, absorptive capability through alliances enhances firm performance. In sum, dynamic capabilities effectively mediate VRIN resources to enhance performance.

Conversely, non-VRIN resources, such as real estate and financial capital of a firm, have a limited impact on firm performance compared to VRIN resources. Consequently, non-VRIN

resources are not typically considered as target resources within the RBV framework. When considering the combined influence of RBV and DCV, firm performance is a result of not only the direct effects of resources but also the indirect effects mediated by dynamic capabilities. The limited influence of non-VRIN resources on firm performance may be attributed to two main factors: the inherent ineffectiveness of the resources themselves and the limited effectiveness of dynamic capabilities in mediating non-VRIN resources. In other words, for non-VRIN resources, the performance enhancement through dynamic capability may be relatively weak due to their inability to create competitive advantages. (Barney, 1986)

Furthermore, another theory helps clarify on how SMEs can absorb and apply external knowledge to foster innovation. Building on Cohen and Levinthal's (1990) concept of absorptive capacity, this framework underscores the importance of SMEs' ability to acquire, assimilate, transform, and exploit external knowledge. Also, Institutional Theory, as proposed by DiMaggio and Powell, helps explain how external forces and institutional pressures shape the behaviour of SMEs regarding innovation (Powell and Colyvas, 2008). SMEs are embedded in various institutional environments, including regulatory frameworks, industry norms, and societal expectations, all of which influence their innovative behaviour. This theory highlights the role of external factors in shaping innovation strategies and decisions. Moreover, Agency Theory, as developed by Jensen and Meckling (1976), offers valuable insights into the principal-agent relationships within SMEs and how they affect innovation. It addresses issues of agency conflicts and how the alignment of interests between owners, managers, and employees can impact a firm's willingness and ability to engage in innovation activities. Agency Theory is particularly relevant in understanding the dynamics of innovation in owner-managed SMEs.

Finally, in terms of external factors, Open Innovation and Network Theory, popularised by Chesbrough (2006) and Powell, Staw and Cummings (1990), emphasise the importance of external collaborations and networks in driving innovation. SMEs often lack the internal resources to innovate independently, making external networks and open innovation strategies crucial for their innovative behaviour. This theory explores how SMEs can leverage external relationships to enhance innovation. By adopting this multi-theoretical approach, the subsequent sections of this thesis will delve into empirical research and data analysis to validate and, among other things, elaborate on the theoretical foundations outlined above.

Appendix B: Interview guidelines

The guidelines and questions in local language which were used during the interviews are presented in this appendix. The structure of the interview was divided in seven sections, starting with an introduction of the research, then general information on the company and interviewee were collected, and finally questions on various perspectives of research were asked.

Section A - Introducion

- Predstavljanje istraživača
- Objasniti ciljeve istraživanja
- Istaknuti povjerljivost i sigurnost informacija

Section B – General company information

1) Ime i prezime, funkcija i područje rada u kompaniji (odjel, sektor, radno mjesto, itd.)?
2) Koliko dugo radite u kompaniji?
3) Šta je glavna djelatnost kompanije? Industrija? Sektor?
4) Koliko kompanija ima zaposlenika?

Section C - Input perspective

5) Šta za Vas predstavlja inovacija? – Kako biste definisali inovacije?) Da li je Vaša kompanija inovirala nešto u zadnjih pet godine? Novi proizvod, ili pak poboljšanje proizvoda (neka izmjena npr. pakovanje, izgled proizvoda, materijal, itd.)/usluge /procesi (npr. prodaja, oglašavanje, process proizvodnje – nova oprema, online prodaja, itd.? Stepen inovativnosti (npr. inkrementalna vs radikalna inovacija)?

6) Šta ili ko predstavlja pokretač/okidač (izvor) Vaših inovativnih projekata? (Jesu li ti okidači interni ili eksterni npr. klijenti, kupci, dobavljači, saradnici, zaposlenici, itd? Koje vrste kontakata ili izvora smatrate najrelevantnijim i najvažnijim za inovacije u Vašoj kompaniji? (npr. klijenti, kupci, dobavljači, saradnici, konkurencija, istraživačke institucije, događaji kao što su sajmovi i sl.)?

7) Da li Vaša kompanija učestvuje u kolaborativnim inovacijskim projektima? (Ako učestvuje, s kim sarađujete? Kompanija (iz istog sektora) ili kompanija (iz drugog sektora) ili s naučnoistraživačkim institucijama? Da li sarađujete sa ekspertima iz dijaspore ili dijasporom općenito? (npr. zajednički inovativni projekti; razvoj novih proizvoda, usluga, nova tržišta; zajednička ulaganja; …) Možete li ocjeniti značaj ove saradnje za Vaš biznis uključujući različite aspkete kao što su inovacijski procesi, inovacije poslovnih modela, digitalna trasnformacija, …?

Section D - Throughput perspective

8) Kako organisirate Vaše inovativne projekte? Molim Vas opišite process inoviranja u Vašoj kompaniji? Možete li definirati pojedine faze u tom procesu? Koje su Vaše rutine pri inoviranju? Da li i kako uključujete zaposlenike u proces inoviranja? Da li koristite neke IM alate i tehnike?

9) Kako promovirate i podstičete inovativno okruženje u kompaniji? Organziujete li treninge za zaposlene? Nagrađujete li zaposlene za njihove ideje (i kako)? Ohrabrujete li kolaboraciju/saradnju i kako? Da li inovacija predstavlja Vašu ključnu vrijednost – promovirate li je kao ključnu vrijednost? Dajete li zaposlenicima dovoljno vremena, prostora ili drugih resursa za inoviranje?

Section E - Output perspektiva

10) Da li i kako štite Vaše inovacije? (Patenti? Poslovna tajna? Specijalni odnosi s klijentima/kupcima i dobavljačima?)
11) Kako štitite Vašu konkurentsku poziciju?

Section F – Innovation support programs

12) Da li ste ikada učestvovali u nekom programu podrške inovacijama od strane javnih institucija? (Ako jeste, koji su to program bili / kakva su Vaša iskustva? Ako niste, zašto niste?) Koju vrstu podrške (podsticaja) biste voljeli dobiti? (npr. koje mjere podrške-finansijske podsticaje; poreske olakšice, smanjenje taksi; edukativnu podršku, mentorsku podršku, administrativnu – kraće i jednostavnije procedure, itd. …)

Section G – Challenges and trends

13) Mala i srednja preduzeća često imaju ograničene resurse i sopsobnosti (pogotovo kada je riječ o specifičnim znanjima i vještinama) u odnosu na velike kompanije. Da li to isto vrijedi i za Vašu kompaniju? Ako da, kako?
14) Pored toga, koji su to glavne barijere koje sprečavaju i negativno se održavaju na inovativnost Vaše kompanije?
    - Nedostatak osposobljenih zaposlenika (uključujući brain drain i emigracije iz BIH)? Da li se trenutno i koliko taj nedostatak negativno održava ili će se odraziti u budućnosti na Vašu kompaniju i njenu inovativnost? Ako da, kako (npr. kojim kontramjerama) se suprostavljate ovim izazovima?

Appendix C: Survey distribution

Appendix C1: Invitation letter for research participation

Poštovani,

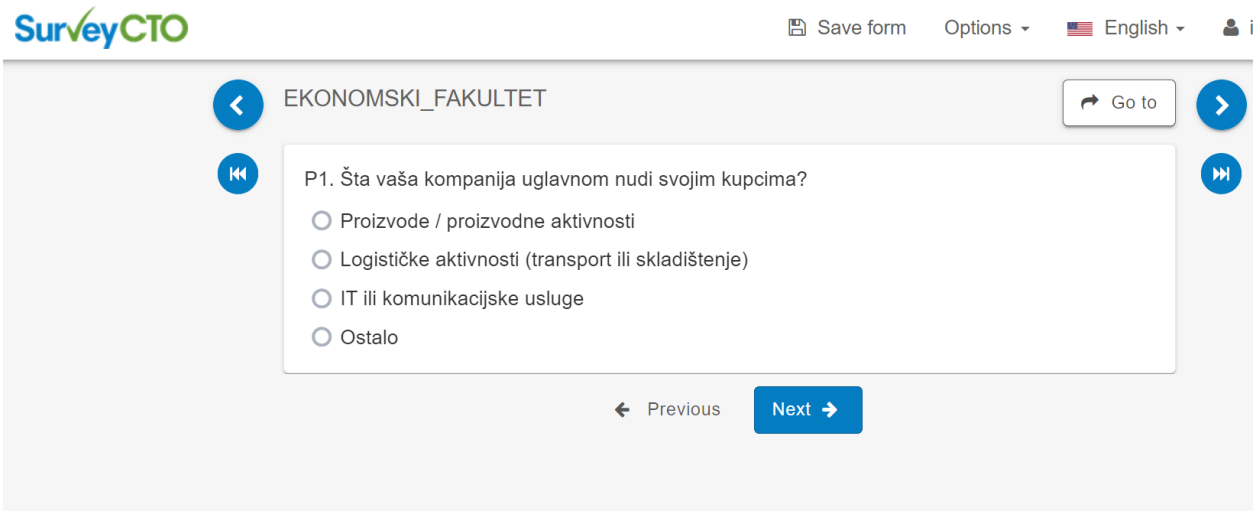
za potrebu izrade doktorske disertacije na Ekonomskmg fakultetu u Sarajevu, sprovodi se istrazivanje na temu determinant inovativnog ponašanja u malim i srednjim preduzećima u BiH. S tim u vezi, Vaše mišljenje je od velikog značaja za ovo istraživanje, te Vas ljubazno pozivam da izdvojite 10 do 15 minuta Vašeg i odgovorite na sve pitanja iz ovog upitnika. Upitnik je u potpunosti anoniman, te mu možete pristupiti putem ovog linka: https://customconcept.surveycto.com/collect/ef2S?caseid=.

U znak zahvalnosti, nakon sprovedenog istrazivanja dostavit ću Vam rezultate istraživanja sa preporukama za kompanije u pogledu faktura koji mogu unaprijedti njhovo inovativno ponašanje i poslovne performanse.

Unaprijed Vam se zahvaljujem, te ukoliko Vam budu potrebne dodatne informacije, budite slobodni da me kontaktirate na *lamijab@mail.com*.

Srdačan pozdrav,
Lamija Krndžija

Appendix C2: Example of online survey design



Appendix C3: Survey questions

Istraživanje o malim i srednjim preduzećima u Bosni i Herzegovini

Molimo Vas da date odgovor na sva pitanja u nastavku i da se u odgovaranju referirate na Vašu firmu.

Karakteristike Vaše kompanije

U narednim pitanjima Vas molimo da ukratko opišete svoju kompaniju

1: Šta vaša kompanija uglavnom nudi svojim kupcima?

- ☐ Proizvode / proizvodne aktivnosti ➡ 1a
- ☐ Logističke aktivnosti (transport ili skladištenje) ➡ 1b
- ☐ IT ili komunikacijske usluge ➡ 1c
- ☐ Ostalo: _____ ➡ 2

1a: *Filtrirano - ako je odabrano "proizvodnja"]*

☐ **Kojem sektoru pripada vaša kompanija?**

⇨ *Molimo naznačite kojem sektoru pripada vaš glavni proizvod.*

- ☐ Mašinstvo
- ☐ Metalna industrija
- ☐ Farmaceutska/hemijska industrija
- ☐ Elektronika / Elektroindustrija
- ☐ Prehrambena industrija
- ☐ Automobilska industrija
- ☐ Ostali industrijski sektor

1b: *[Filtrirano - ako je odabrano "logistika"]*

☐ **Koju vrstu logističkih usluga vaša kompanija nudi svojim klijentima?**

⇨ *Molimo vas da odgovorite u odnosu na glavnu uslugu koju vaša kompanije pruža klijentima.*

- ☐ Uglavnom usluge skladištenja
- ☐ Uglavnom transportne usluge

1c: *[Filtrirano - ako je odabrano "IT ili komunikacijske usluge"]*

☐ **Koju vrstu IT usluga vaša kompanija nudi svojim klijentima?**

⇨ *Molimo vas da označite osnovnu aktivnost*

- ☐ Kreiranje finalnog softvera ili aplikacije
- ☐ Ponuda informacionih usluga kao što su web portali, skladištenje podataka, itd.
- ☐ Ostale IT usluge

2: Kome vaša kompanija uglavnom prodaje svoje proizvode/usluge?

⇨ *Molimo označite najvažnije*

Drugim kompanijama (van industrije kojoj vaša kompanija pripada)

- ☐ Ostale industrijske/proizvodne kompanije ➡ 2a
- ☐ Uslužne kompanije/freelanceri/samozaposleni
- ☐ Građevinarstvo/energetika
- ☐ Preprodavači/distributeri
- ☐ Privatni potrošači/domaćinstva
- ☐ Javna tijela/Uprave/NVO

Unutar industrije

- ☐ Ponude unutar firme
- ☐ Drugi klijenti: _____

2a: *[Filtrirano - ako je proizvodna kompanija]*

U kojoj ulozi vaša kompanija nudi svoje proizvode/usluge kupcima?

⇨Molimo vas da odgovorite u odnosu na glavni proizvod koji vaša kompanije nudi klijentima.

- ☐ proizvođači gotovih proizvoda
- ☐ dobavljač (sistemi, dijelovi)
- ☐ ugovorni proizvođač

3: Da li vaša kompanija uglavnom nudi standardizirane proizvode/usluge ili uglavnom nudi proizvode/usluge koji su prilagođeni i orijentisani na narudžbu?

- ☐ Uglavnom standardizovani proizvodi/usluge
- ☐ Uglavnom prilagođeni/naručeni proizvodi/usluge

4: **Općenito, koliko su za diferenciranje vase kompanije od konkurenata važni sljedeći konkurentski faktori?**

⇨*Molimo dodijelite brojeve od 1 do 6, počevši od najvažnijeg konkurentskog faktora kojeg ćete označiti sa brojem 1.*

- ☐ Cijena usluge/proizvoda
- ☐ Kvalitet usluge/proizvoda
- ☐ Inovativnost usluge/proizvoda
- ☐ Prilagođavanje potrebama kupaca
- ☐ Poštivanje rokova isporuke/pouzdanost
- ☐ Pristup kupcu/poznavanje tržišta
- ☐ *Pitanje se ne odnosi na našu kompaniju.*

5: Koji je najbolji način da opišete konkurenciju na tržištu vašeg glavnog proizvoda/usluge?

- ☐ jedva da ima konkurenata
- ☐ nekoliko konkurenata
- ☐ nekoliko/mnogo konkurenata
- ☐ *Ovo pitanje se ne odnosi na našu kompaniju.*

6. **Da li vaša kompanija sarađuje sa drugim zainteresovanim stranama?**

⇨ *Molimo navedite u kojoj mjeri vaša firma sarađuje sa drugim zainteresovanim stranama.*

Saradnja...	***Vrlo mala***	***Mala***	***Umjerena***	***Nikakva***	***Solidna***	***Velika***	***Veoma velika***
.. sa kupcima	☐	☐	☐	☐	☐	☐	☐
.. sa dobavljačima	☐	☐	☐	☐	☐	☐	☐
.. sa drugom firmom	☐	☐	☐	☐	☐	☐	☐
.. sa vladom i institucijama javnog sektora	☐	☐	☐	☐	☐	☐	☐
.. sa univerzitetima i istraživačkim institucijama	☐	☐	☐	☐	☐	☐	☐
.. sa stručnjacima/pružaocima usluga za razvoj poslovanja	☐	☐	☐	☐	☐	☐	☐

Inovacijske karakteristike firme

Sljedeća pitanja se odnose na ključne izazove sa kojima se vaša kompanija suočava u smislu inovativnog ponašanja.

7: Molimo navedite koliko dobro sljedeće izjave opisuju vašu firmu?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	*Ne opisuju*	*Dijelom ne opisuju*	*Nisam siguran/na*	*Dijelom opisuju*	*Opisuju*	*Apsolutno opisuju*
Naša firma često isprobava nove ideje	☐	☐	☐	☐	☐	☐	☐
Naša firma često uvodi nove proizvode, usluge, procese ili sisteme organisacije/upravljanja	☐	☐	☐	☐	☐	☐	☐
Naša firma je pionir na tržištu sa novim proizvodima ili uslugama	☐	☐	☐	☐	☐	☐	☐
Naš menadžment traži nove načine za obavljanje poslova	☐	☐	☐	☐	☐	☐	☐
Naša firma je kreativna u svojim metodama rada	☐	☐	☐	☐	☐	☐	☐
Naša firma koristi najsavremenije tehnologije	☐	☐	☐	☐	☐	☐	☐
Naša firma razvija nove tržišne segmente	☐	☐	☐	☐	☐	☐	☐
Naša firma redovno traži nove marketinške metode	☐	☐	☐	☐	☐	☐	☐
Naša firma redovno traži nove načine uspostavljanja odnosa sa kupcima	☐	☐	☐	☐	☐	☐	☐
Naša firma ulaže u istraživanje i razvoj novih proizvoda	☐	☐	☐	☐	☐	☐	☐
Naša firma ulaže u istraživanje i razvoj novih usluga	☐	☐	☐	☐	☐	☐	☐
Naša firma ulaže u istraživanje i razvoj novih procesa	☐	☐	☐	☐	☐	☐	☐

8: Koliko su trenutno važna sljedeća područja inovacija za vašu kompaniju?

⇨ *Molimo dodijelite brojeve od 1 do 6, počevši od najvažnijeg konkurentskog faktora* kojeg ćete označiti sa brojem 1.

Razvoj novih	**Razvoj novih**	**Razvoj novih kanala distribucije**	**Smanjenje troškova/optimisacija**	**Poboljšanje kvaliteta proizvoda,**	**Digitalizacija proizvoda,**

proizvoda i/ili usluga	**poslovnih područja**		**troškova proizvoda, usluga, ponuda**	**usluga, ponuda**	**usluga, ponuda**
☐	☐	☐	☐	☐	☐

9: Odakle dolaze glavni impulsi/ideje za inovacije u ponudi proizvoda/usluga ili internim procesima?

⇨ *Molimo označite najviše tri kvadratića po koloni/ vertikalno.*

	Izvor	**Ideje za nove proizvde/ usluge**	**Ideje za nove procese**
Unutrašnji	R&D / inženjersko osoblje	☐	☐
	Proizvodno/servisno osoblje	☐	☐
	Osoblje za odnose s kupcima	☐	☐
	Izvršni direktor / šef kompanije	☐	☐
Vanjski	Dobavljač	☐	☐
	Kupac/ implikacije ugovora	☐	☐
	Konkurencija	☐	☐
	Istraživačke institucije/univerzitet	☐	☐
	Konferencije, sajmovi	☐	☐
	Vanjske NVO/ administracije	☐	☐

10: Molimo vas da naznačite koliko dobro sljedeće izjave opisuju vašu firmu u pogledu „Orijentacije menadžmenta ka inovacijama"?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	***Ne opisuju***	***Dijelom ne opisuju***	***Nisam siguran/na***	***Dijelom opisuju***	***Opisuju***	***Apsolutno opisuju***
Naš menadžment smatra da je inovacija dio naših strateških ciljeva i budućih ambicija naše firme	☐	☐	☐	☐	☐	☐	☐
Naš menadžment favorizuje snažan naglasak na istraživanju i razvoju, tehnološkom liderstvu i inovacijama	☐	☐	☐	☐	☐	☐	☐
Naš menadžment poduzima/uključuje rizične projekte s namjerom da istražuje nove mogućnosti	☐	☐	☐	☐	☐	☐	☐
Naš menadžment je uključen u nove inicijative i inovativne programe	☐	☐	☐	☐	☐	☐	☐
Naš menadžment izdvaja resurse za podršku razvoju novih proizvoda ili usluga ili procesa	☐	☐	☐	☐	☐	☐	☐

11: Molimo navedite koliko dobro sljedeće izjave opisuju vašu firmu u vezi sa „Organizacionom kulturom"?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	*Ne opisuju*	*Dijelom ne opisuju*	*Nisam siguran/na*	*Dijelom opisuju*	*Opisuju*	*Apsolutno opisuju*
Naša kompanija je otvorena za prihvaćanje novih ideja	☐	☐	☐	☐	☐	☐	☐
Osoblje u našoj firmi stiče i razmjenjuje nova znanja i vještine na fer i kolegijalan način	☐	☐	☐	☐	☐	☐	☐
Naša firma precizno dijeli važne informacije kao što su uspjeh i neuspjeh i povratne informacije kupaca sa svim relevantnim osobljem kao dio naših internih procesa učenja	☐	☐	☐	☐	☐	☐	☐
Naša firma ima fleksibilnu organizacionu strukturu (na primjer decentralizacija, zajedničko donošenje odluka, niska formalizacija...)	☐	☐	☐	☐	☐	☐	☐
Naša firma ohrabruje zaposlene da slobodno razmišljaju, stvaraju ideje, prate ideje, stiču iskustva i preuzimaju rizike	☐	☐	☐	☐	☐	☐	☐

12: Molimo navedite koliko dobro sljedeće izjave opisuju Vašu firmu u vezi sa „tehnološkom orijentacijom“?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	*Ne opisuju*	*Dijelom ne opisuju*	*Nisam siguran/na*	*Dijelom opisuju*	*Opisuju*	*Apsolutno opisuju*
Politika naše firme je da prati nove tehnološke trendove	☐	☐	☐	☐	☐	☐	☐
Politika naše firme je usvajanje/koristi nove tehnologije	☐	☐	☐	☐	☐	☐	☐
Naša firma izdvaja sredstva za ulaganje u nove tehnologije	☐	☐	☐	☐	☐	☐	☐
Naša firma je često prva koja će isprobati nove metode i tehnologije	☐	☐	☐	☐	☐	☐	☐
Naša firma često unapređuje svoju internu tehnologiju i upotrebu alata	☐	☐	☐	☐	☐	☐	☐

13: Molimo navedite koliko dobro sljedeće izjave opisuju vašu firmu u vezi sa „Odnosom prema kupcima”?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	***Ne opisuju***	***Dijelom ne opisuju***	***Nisam siguran/na***	***Dijelom opisuju***	***Opisuju***	***Apsolutno opisuju***
Naša firma ima aktivnu komunikaciju/interakciju sa kupcima	☐	☐	☐	☐	☐	☐	☐
Naša firma je orijentisana na pružanje kvalitetnih usluga klijentima	☐	☐	☐	☐	☐	☐	☐
Naša firma se fokusira na bolje razumijevanje kupaca i njihovih potreba	☐	☐	☐	☐	☐	☐	☐
Naša firma često koristi prednost da preuzme kupce od konkurentskih firmi	☐	☐	☐	☐	☐	☐	☐
Naša firma podstiče razmjenu informacija o kupcima i tržišnim kretanjima među svojim zaposlenima	☐	☐	☐	☐	☐	☐	☐

14: Molimo navedite koliko dobro sljedeće izjave opisuju vašu firmu u smislu „vladine podrške?

⇨ *Molimo označite jedan kvadratić za svaki red.*

	Apsolutno ne opisuju	***Ne opisuju***	***Dijelom ne opisuju***	***Nisam siguran/na***	***Dijelom opisuju***	***Opisuju***	***Apsolutno opisuju***
Vlada osigurava politike i programe koji su korisni za inovativne performanse.	☐	☐	☐	☐	☐	☐	☐
Vlada pruža potrebno znanje i drugu tehničku podršku.	☐	☐	☐	☐	☐	☐	☐
Vlada pruža važne informacije o tržištu.	☐	☐	☐	☐	☐	☐	☐
Vlada obezbjeđuje finansiranje/grantove za podršku inovativnim performasama.	☐	☐	☐	☐	☐	☐	☐
Vlada pruža informacije o osnovnim propisima i pomaže firmama da dobiju zaštitu autorskih prava ili patenta/intelektualne svojine i pristup rijetkim resursima.	☐	☐	☐	☐	☐	☐	☐

Performanse kompanije

Sljedeća pitanja će nam pružiti dodatne informacije o vašoj kompaniji.

15: Koliko je zaposlenika imala vaša kompanija 2021. godine?

- ☐ 0-9 zaposlenih
- ☐ 10-49 zaposlenih
- ☐ 50-249 zaposlenih
- ☐ Više od 250 zaposlenih

16: Koliki je bio promet Vaše kompanije u BiH u 2021. godini?

- ☐ do 4 mil KM
- ☐ 4 mil do 20 mil KM
- ☐ 20 mil do 100 mil KM
- ☐ preko 100 mil KM

17: Da li se vaša kompanija bavi izvozom usluga ili proizvoda?

- ☐ Da ➡ 18a
- ☐ Ne

17a: *[Filtrirano - ako je odabrano "da na pitanje 18"]*
Ukoliko vam je poznato, navedite okvirni postotak ostvarenog izvoza u 2021. godini?

- ☐ 1% - 5%
- ☐ 6% - 20%
- ☐ 21% - 50%
- ☐ 51% - 90%
- ☐ Preko 91%

Performanse

Sljedeća pitanja će nam pružiti više informacija o poziciji i učinku Vaše kompanije u odnosu na njene ključne konkurente

18: Molimo navedite kako je vaša firma poslovala u odnosu na vaše glavne konkurente tokom prošle godine u smislu zadovoljstva kupaca?

⇨ *Molimo označite jedan kvadratić za svaki red.*

U poređenju sa glavnim firminim konkurentima:	***Mnogo gore***	***Gore***	***Dijelom gore***	***Isto***	***Dijelom bolje***	***Bolje***	***Mnogo bolje***
Sveukupno zadovoljstvo naših kupaca je...	☐	☐	☐	☐	☐	☐	☐
Zadovoljstvo naših kupaca kvalitetom naših proizvoda je...	☐	☐	☐	☐	☐	☐	☐
Percepcija naših kupaca o novčanoj vrijednosti njihove kupovine je ...	☐	☐	☐	☐	☐	☐	☐
Isporuka onoga što vaši kupci žele/zadovoljavanje potreba kupaca je ...	☐	☐	☐	☐	☐	☐	☐
Broj kupaca koji nastavljaju poslovati sa nama je ...	☐	☐	☐	☐	☐	☐	☐

19: **Molimo navedite kako je vaša firma poslovala u odnosu na vaše glavne konkurente tokom prošle godine u smislu tržišne efektivnosti?**

⇨ *Molimo označite jedan kvadratić za svaki red.*

U poređenju sa glavnim firminim konkurentima:	***Mnogo gore***	***Gore***	***Dijelom gore***	***Isto***	***Dijelom bolje***	***Bolje***	***Mnogo bolje***
Naš udio na tržištu je...	☐	☐	☐	☐	☐	☐	☐
Naš rast prihoda od prodaje/prometa je ...	☐	☐	☐	☐	☐	☐	☐
Naš rast prihoda od prodaje/promet inovativnih proizvoda ili usluga je ...	☐	☐	☐	☐	☐	☐	☐
Naša akvizicija novih kupaca je...	☐	☐	☐	☐	☐	☐	☐
Naša prodaja postojećim kupcima je...	☐	☐	☐	☐	☐	☐	☐

20: **Molimo navedite kako je vaša firma poslovala u odnosu na vaše glavne konkurente tokom prošle godine u smislu trenutne profitabilnosti?**

⇨ *Molimo označite jedan kvadratić za svaki red.*

U poređenju sa glavnim firminim konkurentima:	***Mnogo gore***	***Gore***	***Dijelom gore***	***Isto***	***Dijelom bolje***	***Bolje***	***Mnogo bolje***
Profitabilnost našeg poslovanja je...	☐	☐	☐	☐	☐	☐	☐
Naš povrat na ulaganje (ROI) je...	☐	☐	☐	☐	☐	☐	☐
Naš povrat od prodaje (ROS) je...	☐	☐	☐	☐	☐	☐	☐
Doseg naših finansijskih ciljeva je...	☐	☐	☐	☐	☐	☐	☐

Zaključne informacije

21: **Molimo vas da navedete svoju poziciju u kompaniji kako bismo bolje razumjeli kontekst vaših odgovora.**

- ☐ CEO
- ☐ Menadžer kompanije
- ☐ Rukovodilac odjela za istraživanje i razvoja
- ☐ Drugo: .....

22: **Molimo navedite da li se vaša kompanija nalazi u:**

- ☐ FBiH
- ☐ RS
- ☐ BD

Hvala vam na pruženim informacijama o vašoj kompaniji. Zaista cijenimo vaš doprinos. Ako imate bilo kakvih komentara ili pitanja, kontaktirajte: lamijab@mail.com ili isti dodajte u dole predviđeni prostor.

Finalni komentari

Appendix C4: Data testing and verification

Missing value analysis

The Missing Value Analysis (hereinafter: MVA) was developed to identify instances where data values are absent within a sample. It involves a four-stage process to assess the presence and patterns of missing data. Initially, the first step aims to classify the type of missing data and gauge its extent. Subsequently, the second step, as suggested by Hair *et al*. (2018), suggests that missing data under 10% for each individual observation can be disregarded unless it's specifically missing for a particular sample. Following this, the third step involves investigating the randomness of missing data, distinguishing between data missing completely at random, data missing at random, and data missing not at random, which indicates a discernible pattern in the data's absence. In the first case, missing values have no association with other measurement variables or with the values of the same variable. In the second case, missing values of the variable are linked to one or more measurement variables in the model but not to the values of the same variable. The third possibility is that the data are missing not at random, signifying that the values of the missing variables are related to the values themselves, even after accounting for other variables, as outlined by Enders (2022), and Hair *et al*. (2018). Finally, the last step involves selecting an appropriate data imputation method, which is determined by the results obtained in the previous step, specifically, the randomness of missing data.

Hence, in this study's initial stage, it was determined that the missing data could not be ignored, as they resulted from respondents not providing answers. An examination of the missing data was conducted, and observations with over 15% missing responses were eliminated. Consequently, out of the initial 348 observations, 265 were retained for further analysis.

To assess the randomness of the missing data, the first step involved conducting the Little MCAR test. This test indicated a significant difference between the observed sample of missing data and a random sample (Little's MCAR test: Little's MCAR test: chi-Square = 3813.481, df = 2925, Sig. = .000). Thus, it was established that the missing data were not missing completely at random, as shown in Annex F. Then, the data were examined for missing at random, implying that the missing data might be associated with a specific variable, but are not related to the potential values of the missing responses. The analysis concluded that the data were indeed missing at random, indicating randomness in the missing data.

In the context of selecting the most suitable method for imputing missing data, the decision was influenced by the findings from the previous phase of the analysis, which indicated that the missing data followed a pattern known as missing at random. This means that the missing values may be related to specific variables but are not influenced by the potential values of the missing responses; instead, they exhibit a degree of randomness in their occurrence. Given this information, the choice was made to utilise the Maximum Likelihood Estimation

technique for data imputation, a method recommended by Hair *et al*. (2018). This technique is a statistical approach that seeks to find the parameter values that maximise the likelihood of the observed data, assuming a certain statistical model. In the case of imputing missing data, the technique is used to estimate the values of missing data points in a way that is consistent with the observed data patterns and the underlying statistical model. In addition, the Expectation-Maximisation (hereinafter: EM) approach, as also suggested by Hair *et al*. (2018), was employed for imputing the missing data. The EM method involves two distinct phases:

- The E phase (Expectation): In this phase, the algorithm estimates the missing data values based on the available information and the statistical model. It computes the expected values of the missing data points given the observed data and the current parameter estimates.
- The M phase (Maximisation): In this phase, the algorithm updates the model's parameters (such as mean values, standard deviations, and correlations) based on the imputed missing data. This iterative process continues until convergence is achieved, resulting in parameter estimates that best fit the observed data.

The EM approach is particularly valuable when dealing with missing data because it iteratively refines the estimates of both missing data and model parameters. This ensures that the imputed values are consistent with the overall data structure and statistical relationships, making it a robust method for handling missing data in statistical analysis (Bajgorić *et al*., 2019).

Outliers

Outliers are defined as data points exhibiting a combination of characteristics that markedly differ from other observations within the sample. This phase involves scrutinising and identifying data with exceptionally high or low values. To conduct an analysis of outliers, a multivariate approach was employed, which involves examining each variable's multidimensional position concerning some common reference points, as recommended by Hair *et al*. (2018). Specifically, the Mahalanobis D^2 method was utilised, which assesses the distance of each observation in the multidimensional space in relation to the centre represented by the mean values of all observations. This calculation is carried out irrespective of the number of variables, allowing for the computation of the D^2 value for each observation. To identify outliers, the D^2 value is divided by the degrees of freedom (D^2/df), employing a significance level of 0.005 or 0.001. In the present study, a threshold of 3.50 was applied, as per the recommendation by Hair *et al*. (2018). Ultimately, the multivariate analysis, as detailed in Annex G, did not reveal the presence of any outliers. Consequently, it was determined that all observations could be retained for further analysis.

Multivariate assumptions testing

As per Hair *et al*. (2018), when employing multivariate techniques, it is essential to satisfy specific statistical assumptions. These assumptions are necessary because of the intricate interplay of numerous variables and the complexity of the analyses and their outcomes. Multivariate analyses entail a two-step data testing process: initially for each individual variable and subsequently for a multivariate model, with the requirement that all variables in the analysis meet the same set of assumptions. The assumptions that need to be met are normality, homoscedasticity, linearity and multicollinearity of the data (Hair *et al*., 2018).

The initial assumption in multivariate analysis pertains to the normality of the data. While strict adherence to the normal distribution is not always mandatory, it is a crucial consideration. Achieving normality is believed to lead to better results (Hair *et al*., 2018). The shape of each distribution can be characterised by two key parameters: skewness (symmetry) and kurtosis (roundness). Thus, the normality assumption was tested using these measures. In an approximately normal distribution, the skewness value should approach 0, and the kurtosis value should approximate 3. The results showed that 52 indicators exhibited positive kurtosis, indicating a leptokurtic distribution, which implies an elongated data distribution, while nine variables displayed negative kurtosis, signifying a platykurtic or flattened data distribution. Notably, 49 had negative skewness measures, suggesting a rightward shift in the data distribution while 12 indicators had positive skewness indicating a leftward shift. These findings are presented in Appendix H. Based on these results and their implications; it is noticed that the data does not conform entirely to a normal distribution. This non-compliance can significantly impact results, particularly in cases with small samples ($n < 50$). However, the impact diminishes when dealing with samples of 200 or more observations (Hair *et al*., 2018; Tabachnik and Fidell, 2013). Moreover, the Maximum Likelihood estimation method employed is notably robust in the context of deviations from normality in multivariate techniques, such as factor analysis and SEM (Fuller and Hemmerle, 1966). Given that the SEM method, which is highly credible, is applied, and the sample consists of 265 observations, this may be overlooked, and the analysis may proceed.

Furthermore, one of the assumptions under consideration is homoscedasticity, which suggests that the variance of the dependent variables remains consistent across all observed variables (Hair *et al*., 2018). If the variances are not uniform, it indicates the presence of heteroscedasticity, while uniform variances signify homoscedasticity in the data. In that regard the assumption of homoscedasticity was assessed using the Breusch-Pagan test, with the null hypothesis indicating the presence of homoscedasticity. To do this, a regression analysis using aggregated variables was conducted, where the cooperation was the dependent, and all other independent variables. The test yielded a result of p-value of 0.665, indicating that the null hypothesis may not be rejected (see Appendix I1). As a result, the findings affirm the presence of homoscedasticity in the data.

Linearity, within the context of statistical analysis, denotes the presence of a linear relationship between variables. In essence, this means that as one variable changes, it does so in a consistent and proportional manner with respect to another variable (Shrestha, 2020).

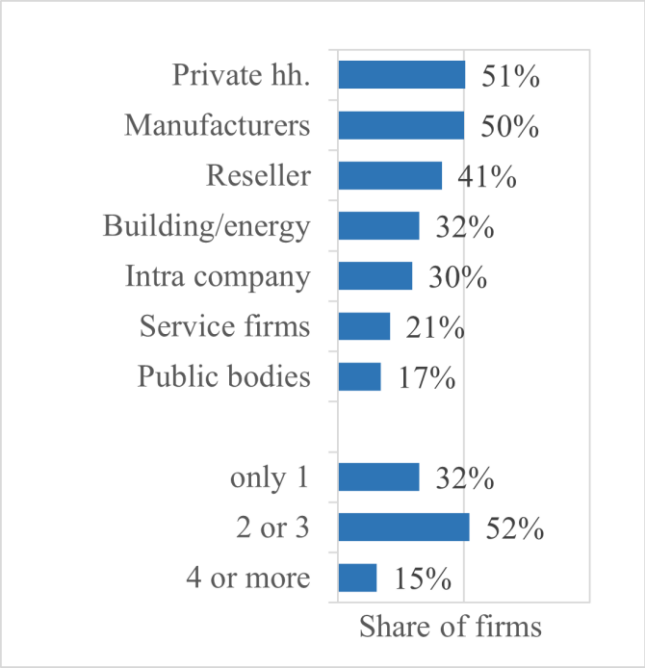
In consideration of the structural equation method's supplementary assumption regarding the presence of a linear relationship between the variables, an assessment of the residuals and data points on a scatter plot was conducted. It was observed that all the data exhibited a linear distribution pattern, thereby confirming the fulfilment of the linearity assumption for the data.

On the other hand, multicollinearity is a distinct concept that arises when there is a significant degree of correlation between two or more independent variables in a statistical model. In multicollinear situations, these variables tend to move together or exhibit a high degree of interdependence, which can pose challenges for accurate model interpretation (Shrestha, 2020). This may happen when respondents perceive different latent variables gauge a similar underlying concept, which is why the measurement instrument was carefully designed as previously explained.

Collinearity was assessed by calculating the Variance Inflation Factor (hereinafter: VIF) for all predictor latent variables, as recommended by Hair *et al*. (2018). The resulting VIF values were then compared to a predetermined maximum threshold. For the purposes of this thesis, the VIF threshold of 10, proposed by Hair *et al*. (2018) was utilised. When the VIF equals or exceeds a specified threshold, it implies the presence of collinearity between variables. As VIF is used to analyse collinearity and multicollinearity between independent variables, this analysis was performed for variables COP, MAN, GOV, MKT, TEH, ORG, and INNO. The VIF table is provided in Appendix I2, and it demonstrates the absence of any significant issue of multicollinearity within the dataset.

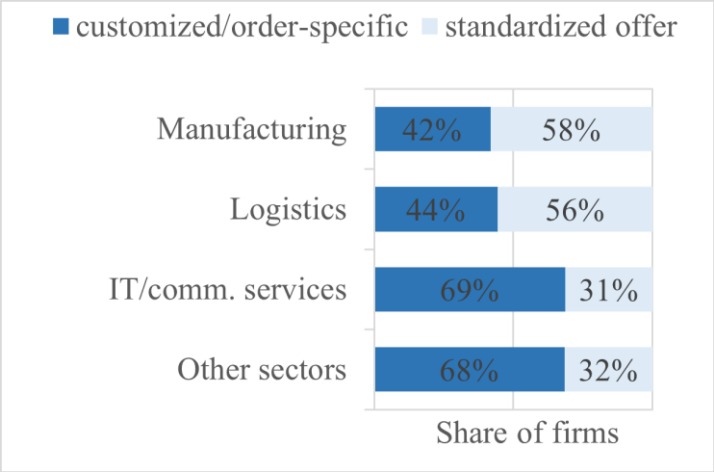
Appendix D: Survey descriptive statistics

Appendix D1: Major clients



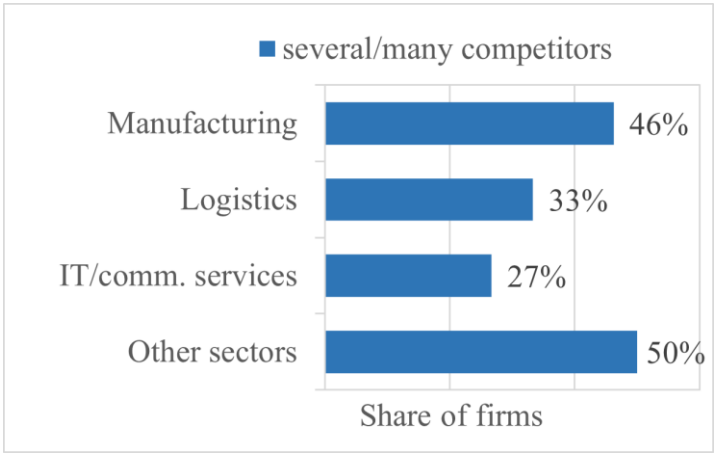
Source: Authors own work.

Appendix D2: Product standardisation



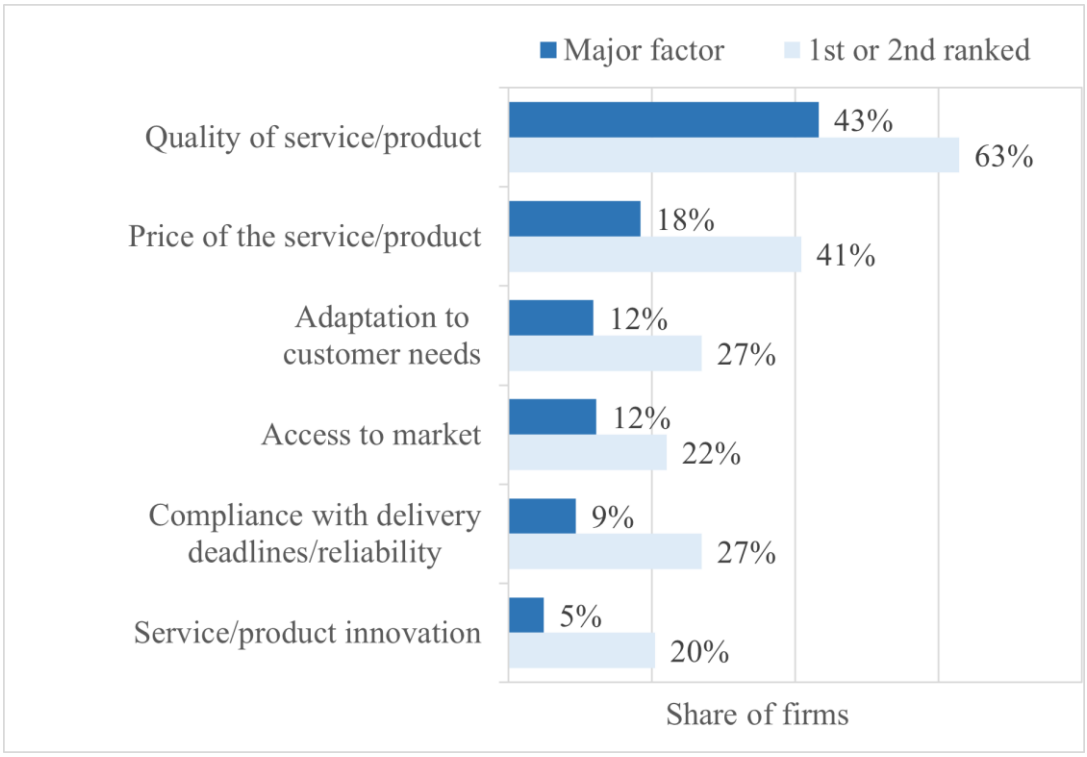
Source: Authors own work.

Appendix D3: Competitors structure



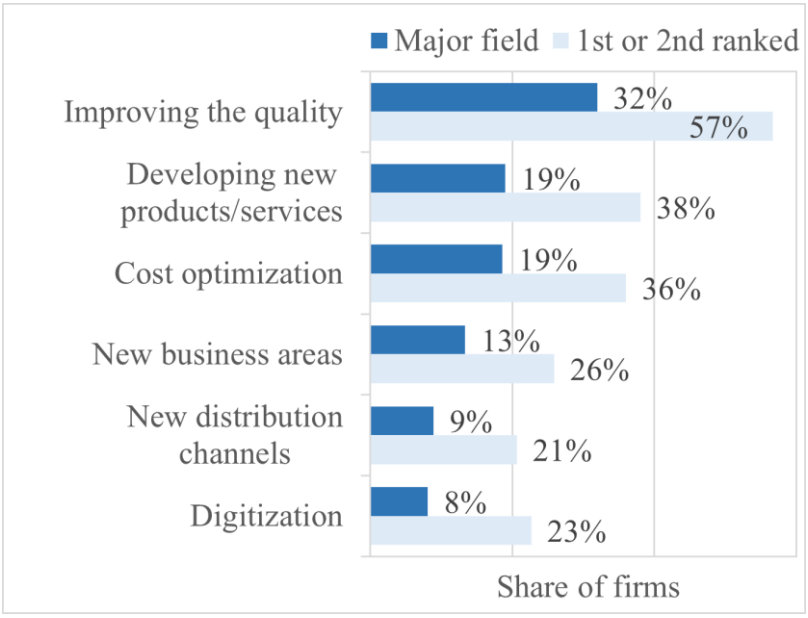
Source: Authors own work.

Appendix D4: Competetive factors



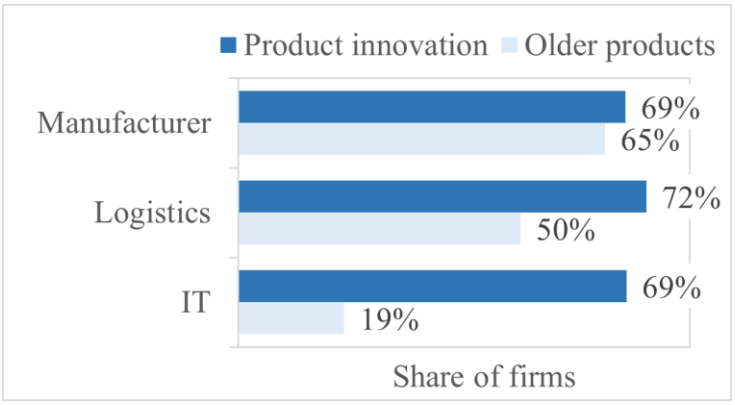
Source: Authors own work.

Appendix D5: Innovation fields



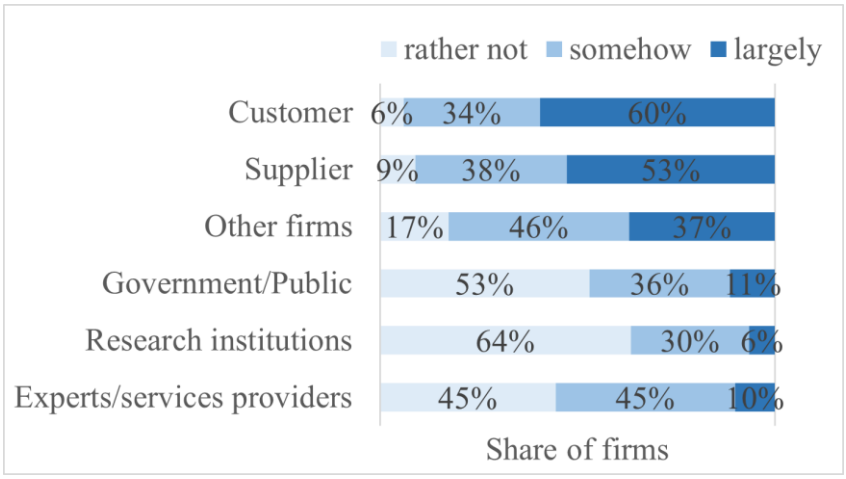
Source: Authors own work.

Appendix D6: Product innovation by sector



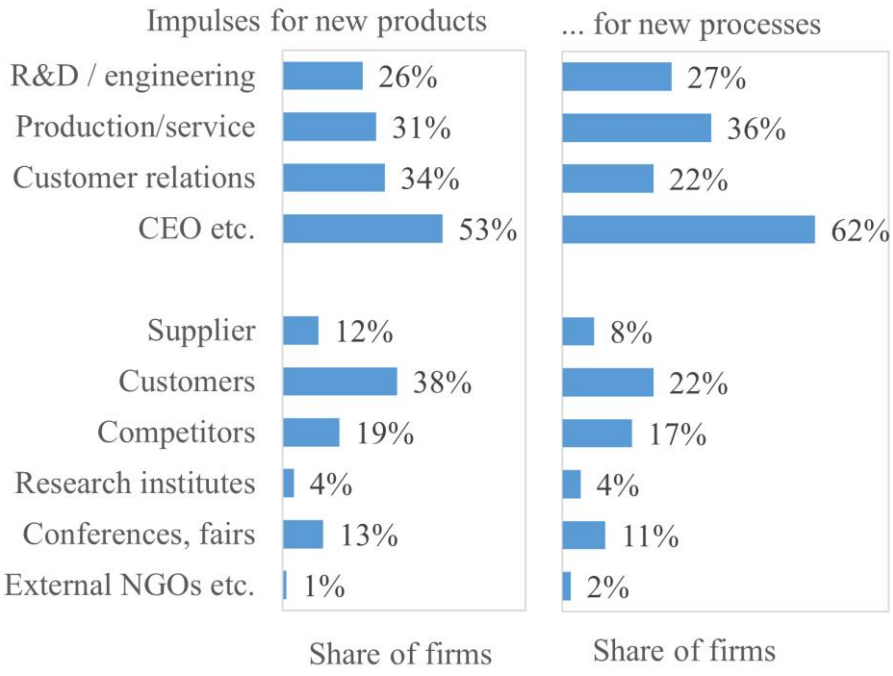
Source: Authors own work.

Appendix D7: Innovation impulses



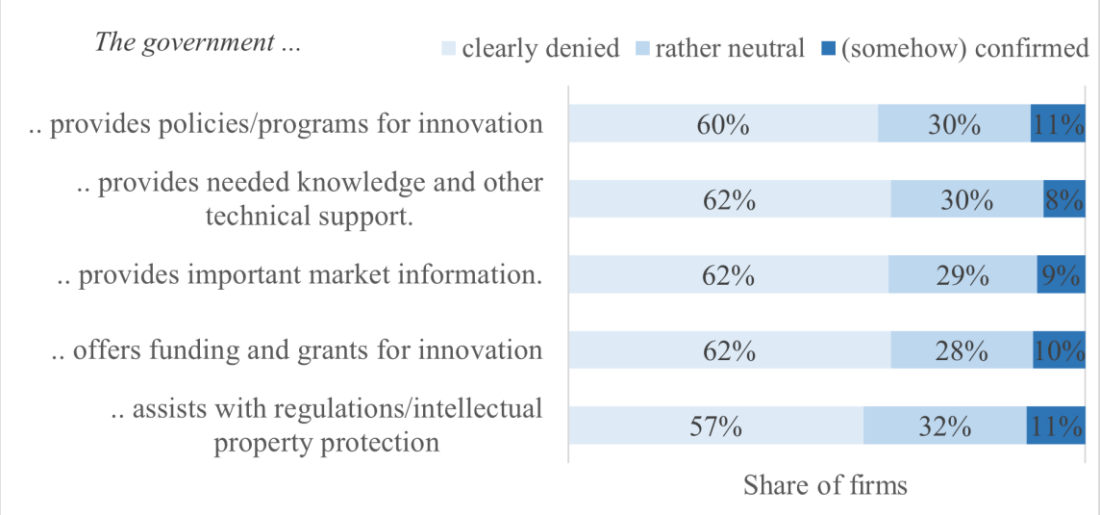
Source: Authors own work.

Appendix D8: Cooperation



Source: Authors own work.

Appendix D9: Government role

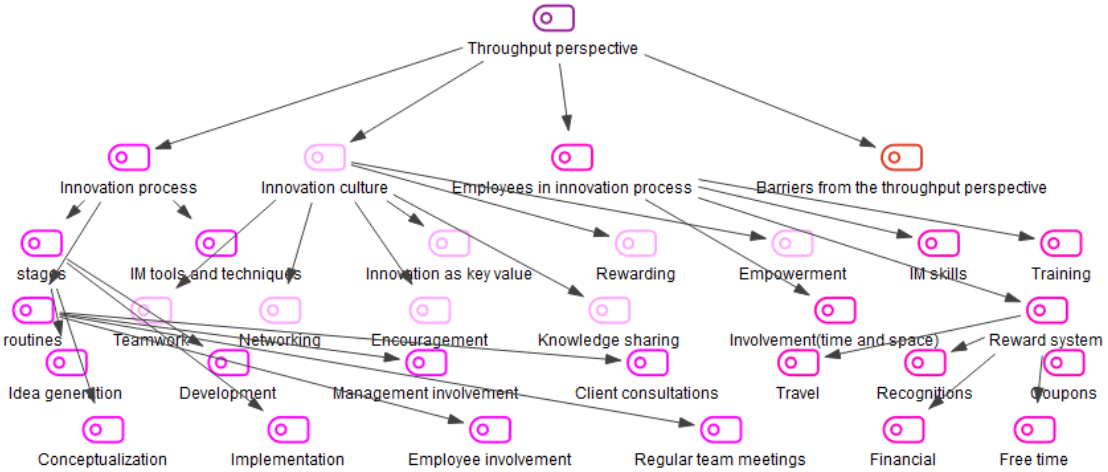


Source: Authors own work.

Appendix E: Software output of qualitative analysis

Appendix E1: Throughput perspective coding

Throughput software coding



Source: MAXQDA software.

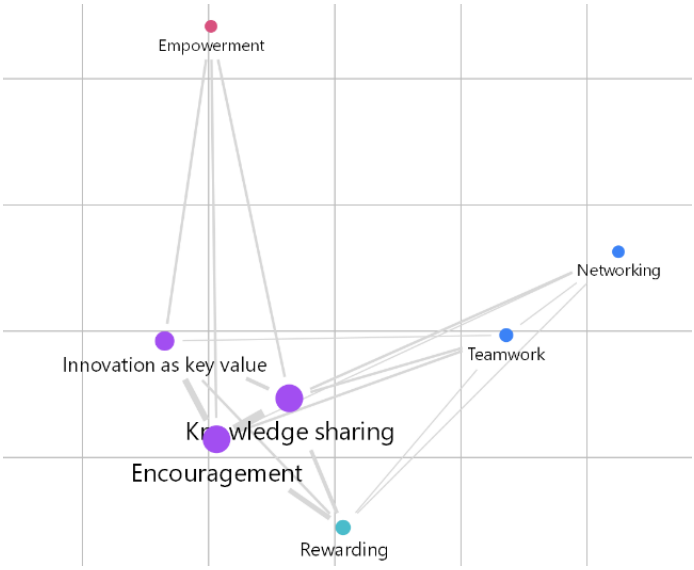
Appendix E2: Input perspective triggers

Input innovation triggers

Source: MAXQDA software.

Appendix E3: Organisational culture perspectives

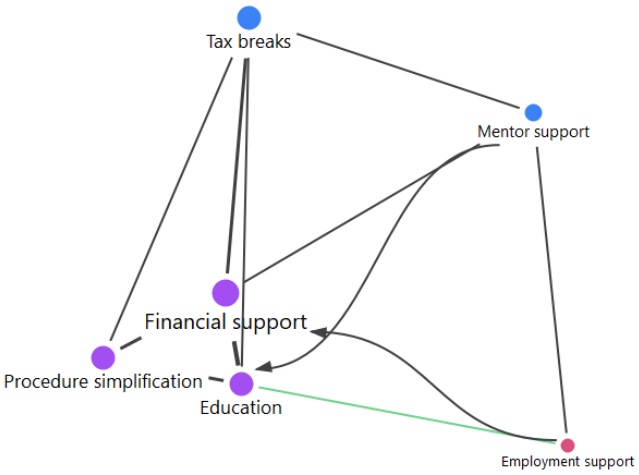
IO Organisational culture



Source: MAXQDA software.

Appendix E4: Future needs

Future support requirements



Source: MAXQDA software.

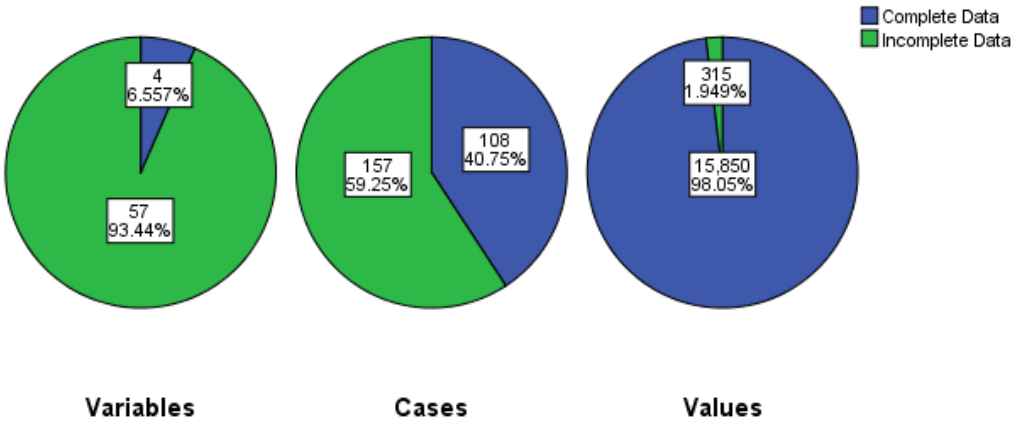
Appendix E5: Throughput perspective challenges

Throughput challenges

Source: MAXQDA software.

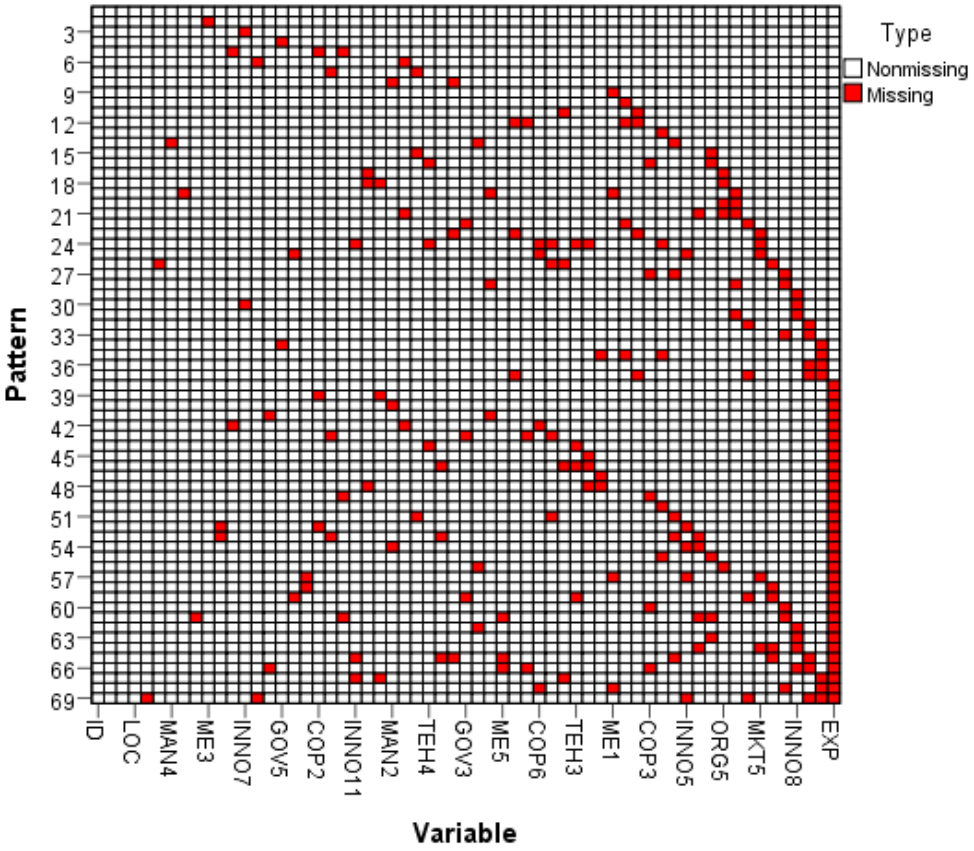
Appendix F: Missing value analysis

Overall summary of missing data



Source: SPPS output.

Missing value patterns



Source: SPPS output.

Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes[a]	
				Count	Percent	Low	High
ID	265	132.9962	76.63726	0	.0	0	0
COP1	263	5.40	1.595	2	.8	14	0

COP2	262	5.14	1.690	3	1.1	8	0
COP3	260	4.67	1.710	5	1.9	0	0
COP4	260	3.17	1.839	5	1.9	0	0
COP5	262	2.82	1.704	3	1.1	0	0
COP6	261	3.38	1.773	4	1.5	0	0
INNO1	263	5.00	1.742	2	.8	0	0
INNO2	265	5.01	1.712	0	.0	7	0
INNO3	260	4.34	2.061	5	1.9	0	0
INNO4	262	5.04	1.727	3	1.1	12	0
INNO5	260	5.11	1.615	5	1.9	0	0
INNO6	264	4.94	1.674	1	.4	4	0
INNO7	263	4.87	1.858	2	.8	0	0
INNO8	258	4.69	1.885	7	2.6	0	0
INNO9	259	5.03	1.811	6	2.3	0	0
INNO10	261	4.63	1.976	4	1.5	0	0
INNO11	262	4.66	1.908	3	1.1	0	0
INNO12	262	4.69	1.875	3	1.1	0	0
MAN1	262	5.11	1.799	3	1.1	0	0
MAN2	262	4.94	1.782	3	1.1	0	0
MAN3	264	4.54	1.874	1	.4	0	0
MAN4	264	4.98	1.787	1	.4	0	0
MAN5	260	5.02	1.775	5	1.9	0	0
ORG1	262	5.78	1.464	3	1.1	8	0
ORG2	260	5.63	1.538	5	1.9	8	0
ORG3	262	5.39	1.633	3	1.1	0	0
ORG4	258	5.39	1.636	7	2.6	0	0
ORG5	260	5.58	1.566	5	1.9	8	0
TEH1	260	5.28	1.638	5	1.9	19	0
TEH2	261	5.24	1.647	4	1.5	0	0
TEH3	261	5.07	1.769	4	1.5	0	0
TEH4	262	4.65	1.798	3	1.1	0	0
TEH5	258	5.13	1.656	7	2.6	0	0
MKT1	260	5.74	1.567	5	1.9	13	0
MKT2	263	5.87	1.514	2	.8	11	0
MKT3	262	5.76	1.555	3	1.1	13	0
MKT4	261	4.94	1.845	4	1.5	0	0
MKT5	260	5.28	1.707	5	1.9	0	0
GOV1	262	2.39	1.544	3	1.1	0	0
GOV2	263	2.30	1.517	2	.8	0	12
GOV3	262	2.37	1.543	3	1.1	0	13
GOV4	262	2.35	1.578	3	1.1	0	0
GOV5	263	2.50	1.653	2	.8	0	0
EMP	265	2.33	.539	0	.0	0	0
EXP	144	3.24	1.419	121	45.7	0	0
CS1	261	5.41	1.352	4	1.5	1	0
CS2	263	5.45	1.397	2	.8	0	0
CS3	264	5.03	1.494	1	.4	2	0
CS4	264	5.31	1.439	1	.4	0	0
CS5	260	5.28	1.406	5	1.9	0	0
ME1	261	4.99	1.326	4	1.5	1	0
ME2	263	5.05	1.357	2	.8	1	0
ME3	264	4.84	1.380	1	.4	3	0
ME4	262	4.94	1.327	3	1.1	3	0
ME5	262	4.98	1.360	3	1.1	4	0
PR1	261	5.00	1.383	4	1.5	5	0
PR2	262	4.84	1.389	3	1.1	5	0
PR3	261	4.80	1.398	4	1.5	6	0
PR4	262	4.83	1.388	3	1.1	7	0
LOC	265	1.44	.637	0	.0	0	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

Source: SPPS output.

Appendix G: Identification of multivariate outliers (Mahalanobis d^2)

Multivariate outliers

ID	Mahalanobis	Mahalanobis/df
43.00	170.62895	3.05
140.00	147.88638	2.64
249.00	143.88741	2.57
116.00	135.51903	2.42
106.00	135.16650	2.41
143.00	134.70631	2.41
258.00	130.94134	2.34
152.00	129.47459	2.31
134.00	123.54666	2.21
202.00	117.45427	2.10
265.00	118.12232	2.11
246.00	114.18576	2.04
79.00	116.62241	2.08
15.00	113.74191	2.03
8.00	111.10217	1.98
221.00	110.00137	1.96
195.00	109.17992	1.95
5.00	105.38135	1.88
207.00	100.58519	1.80
28.00	100.05725	1.79
154.00	100.07243	1.79
2.00	100.15726	1.79
173.00	100.60913	1.80
206.00	97.58714	1.74

184.00	99.09482	1.77
55.00	100.39257	1.79
34.00	96.67146	1.73
23.00	94.86779	1.69
91.00	95.64346	1.71
259.00	98.98520	1.77
159.00	93.73228	1.67
33.00	91.65128	1.64
131.00	92.83164	1.66
111.00	93.15666	1.66
170.00	92.62349	1.65
100.00	93.11996	1.66
110.00	92.16879	1.65
22.00	92.51437	1.65
175.00	89.08836	1.59
227.00	87.40641	1.56
222.00	87.97477	1.57
224.00	91.49138	1.63
192.00	86.14743	1.54
4.00	84.50790	1.51
120.00	87.36821	1.56
150.00	87.61079	1.56
53.00	86.83381	1.55
113.00	86.26558	1.54
58.00	84.44837	1.51
59.00	84.47568	1.51
40.00	83.37155	1.49

9.00	80.64472	1.44
251.00	86.20676	1.54
127.00	88.08976	1.57
81.00	81.71208	1.46
205.00	81.84594	1.46
181.00	83.28599	1.49
161.00	81.21777	1.45
98.00	80.87251	1.44
264.00	83.22403	1.49
19.00	79.97295	1.43
228.00	78.27342	1.40
245.00	79.03227	1.41
125.00	78.95752	1.41
151.00	77.84824	1.39
39.00	79.52039	1.42
208.00	77.23737	1.38
114.00	93.60912	1.67
115.00	77.54705	1.38
90.00	76.04089	1.36
203.00	75.03799	1.34
118.00	78.17881	1.40
198.00	74.26114	1.33
209.00	74.72382	1.33
257.00	74.42214	1.33
107.00	87.62188	1.56
20.00	69.72608	1.25
50.00	72.01557	1.29

37.00	73.80569	1.32
146.00	70.25320	1.25
225.00	67.77782	1.21
38.00	69.95588	1.25
75.00	68.91798	1.23
261.00	70.59344	1.26
85.00	69.11455	1.23
136.00	79.80487	1.43
42.00	72.40714	1.29
124.00	68.70589	1.23
186.00	68.43340	1.22
56.00	66.38396	1.19
141.00	68.41190	1.22
12.00	67.34471	1.20
129.00	69.78683	1.25
178.00	66.17341	1.18
201.00	64.58626	1.15
10.00	63.67083	1.14
32.00	64.78882	1.16
251.00	68.45699	1.22
130.00	64.09115	1.14
210.00	66.91818	1.19
121.00	63.81134	1.14
69.00	64.62938	1.15
185.00	61.70376	1.10
144.00	62.68337	1.12
36.00	62.95316	1.12

204.00	60.55566	1.08
83.00	60.59092	1.08
137.00	61.38069	1.10
158.00	61.88099	1.11
45.00	62.87716	1.12
6.00	57.57977	1.03
78.00	60.74295	1.08
105.00	59.97603	1.07
138.00	58.37249	1.04
126.00	59.39644	1.06
27.00	54.48639	.97
31.00	55.99031	1.00
13.00	53.23956	.95
61.00	55.38018	.99
63.00	55.17625	.99
164.00	56.02467	1.00
21.00	54.00460	.96
35.00	53.99854	.96
250.00	51.19284	.91
189.00	58.77498	1.05
229.00	52.55429	.94
262.00	56.25370	1.00
188.00	52.36140	.94
132.00	53.08015	.95
102.00	52.08967	.93
182.00	53.47735	.95
122.00	51.37194	.92

89.00	51.30255	.92
248.00	49.13741	.88
247.00	45.57157	.81
117.00	49.13088	.88
168.00	48.92148	.87
142.00	48.60745	.87
93.00	49.34392	.88
255.00	49.30520	.88
41.00	46.71165	.83
46.00	47.68089	.85
64.00	47.79833	.85
155.00	48.48564	.87
162.00	45.46255	.81
256.00	44.53599	.80
197.00	45.67647	.82
26.00	39.92034	.71
167.00	47.37299	.85
163.00	44.01162	.79
176.00	54.77991	.98
153.00	44.84187	.80
183.00	42.44828	.76
7.00	38.88552	.69
80.00	41.90198	.75
73.00	40.24221	.72
86.00	40.64691	.73
16.00	39.78271	.71
119.00	39.17060	.70

82.00	38.45533	.69
104.00	38.94542	.70
71.00	40.52496	.72
30.00	38.36616	.69
254.00	38.92400	.70
84.00	38.50671	.69
236.00	36.25099	.65
190.00	38.58019	.69
135.00	38.71727	.69
226.00	34.82074	.62
92.00	37.98720	.68
212.00	37.58848	.67
213.00	36.78846	.66
49.00	35.18220	.63
72.00	33.80691	.60
96.00	35.91347	.64
65.00	34.30722	.61
109.00	35.38172	.63
217.00	33.49596	.60
29.00	35.22564	.63
220.00	33.67932	.60
160.00	34.45406	.62
99.00	34.78611	.62
171.00	32.33814	.58
51.00	32.16017	.57
77.00	33.49910	.60
18.00	30.20481	.54

157.00	33.15795	.59
74.00	32.43364	.58
66.00	32.06180	.57
1.00	31.80157	.57
133.00	32.52286	.58
194.00	32.19973	.57
147.00	31.03346	.55
179.00	30.99885	.55
165.00	31.44965	.56
215.00	30.03991	.54
237.00	27.85311	.50
52.00	29.42297	.53
11.00	29.88979	.53
218.00	33.20346	.59
44.00	28.67915	.51
191.00	30.61529	.55
234.00	29.32117	.52
14.00	27.76945	.50
70.00	29.75204	.53
174.00	31.48531	.56
219.00	28.29111	.51
187.00	28.68779	.51
223.00	26.94976	.48
169.00	27.72699	.50
193.00	27.24990	.49
67.00	27.75451	.50
260.00	26.58205	.47

24.00	27.49510	.49
177.00	26.86078	.48
145.00	28.75279	.51
128.00	30.91582	.55
211.00	25.50754	.46
68.00	25.14119	.45
87.00	25.41055	.45
148.00	25.91012	.46
57.00	23.35624	.42
139.00	24.21559	.43
233.00	24.24312	.43
112.00	23.64898	.42
101.00	23.43899	.42
60.00	21.32024	.38
108.00	23.11993	.41
253.00	18.73843	.33
17.00	17.72060	.32
94.00	21.44260	.38
244.00	21.69850	.39
123.00	21.30174	.38
54.00	21.13413	.38
172.00	22.13214	.40
97.00	20.69618	.37
3.00	19.12298	.34
62.00	20.43338	.36
263.00	20.89658	.37
47.00	18.79956	.34

180.00	19.12784	.34
166.00	17.85835	.32
103.00	19.63699	.35
240.00	17.50898	.31
200.00	18.78828	.34
149.00	18.88614	.34
25.00	14.74085	.26
230.00	14.59979	.26
48.00	12.88139	.23
196.00	15.14026	.27
216.00	13.94533	.25
232.00	12.67539	.23
243.00	11.54544	.21
242.00	11.54544	.21
241.00	11.54544	.21
239.00	11.54544	.21
238.00	10.53020	.19
76.00	11.60254	.21
214.00	11.01393	.20
199.00	13.24534	.24
156.00	10.38039	.19
88.00	9.02156	.16
231.00	7.81175	.14
95.00	7.40937	.13
235.00	6.89773	.12

Source: SPPS output.

Appendix H: Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
COP1	265	1	7	5.39	1.599	-.923	.150	-.223	.298
COP2	265	1	7	5.14	1.682	-.777	.150	-.445	.298
COP3	265	1	7	4.66	1.702	-.560	.150	-.688	.298
COP4	265	1	7	3.18	1.839	.462	.150	-.946	.298
COP5	265	1	7	2.81	1.722	.632	.150	-.694	.298
COP6	265	1	7	3.38	1.769	.250	.150	-1.016	.298
INNO1	265	1	7	5.02	1.732	-.599	.150	-.595	.298
INNO2	265	1	7	5.01	1.712	-.591	.150	-.668	.298
INNO3	265	1	7	4.30	2.072	-.211	.150	-1.254	.298
INNO4	265	1	7	5.04	1.723	-.699	.150	-.461	.298
INNO5	265	1	7	5.09	1.648	-.597	.150	-.562	.298
INNO6	265	1	7	4.97	1.672	-.486	.150	-.759	.298
INNO7	265	1	7	4.86	1.852	-.503	.150	-.935	.298
INNO8	265	1	7	4.67	1.898	-.433	.150	-.987	.298
INNO9	265	1	7	5.00	1.824	-.751	.150	-.469	.298
INNO10	265	1	7	4.63	1.969	-.446	.150	-1.103	.298
INNO11	265	1	7	4.64	1.918	-.444	.150	-1.034	.298
INNO12	265	1	7	4.69	1.866	-.534	.150	-.841	.298
MAN1	265	1	7	5.11	1.791	-.710	.150	-.608	.298
MAN2	265	1	7	4.92	1.778	-.480	.150	-.849	.298
MAN3	265	1	7	4.53	1.873	-.274	.150	-1.035	.298
MAN4	265	1	7	4.98	1.784	-.611	.150	-.690	.298
MAN5	265	1	7	4.97	1.802	-.556	.150	-.811	.298
ORG1	265	1	7	5.76	1.487	-1.138	.150	.392	.298
ORG2	265	1	7	5.64	1.519	-.998	.150	-.057	.298
ORG3	265	1	7	5.39	1.625	-.801	.150	-.387	.298
ORG4	265	1	7	5.41	1.624	-.760	.150	-.539	.298
ORG5	265	1	7	5.59	1.574	-.855	.150	-.418	.298
TEH1	265	1	7	5.28	1.672	-.823	.150	-.262	.298
TEH2	265	1	7	5.25	1.644	-.657	.150	-.608	.298
TEH3	265	1	7	5.08	1.765	-.603	.150	-.787	.298
TEH4	265	1	7	4.65	1.810	-.279	.150	-.959	.298
TEH5	265	1	7	5.09	1.675	-.550	.150	-.754	.298
MKT1	265	1	7	5.74	1.570	-1.262	.150	.647	.298
MKT2	265	2	7	5.88	1.510	-1.269	.150	.398	.298
MKT3	265	1	7	5.77	1.550	-1.221	.150	.418	.298
MKT4	265	1	7	4.95	1.842	-.597	.150	-.769	.298
MKT5	265	1	7	5.28	1.701	-.775	.150	-.462	.298
GOV1	265	1	7	2.42	1.563	.925	.150	.023	.298
GOV2	265	1	7	2.29	1.514	1.075	.150	.437	.298
GOV3	265	1	7	2.37	1.540	1.000	.150	.202	.298
GOV4	265	1	7	2.36	1.578	.938	.150	-.096	.298
GOV5	265	1	7	2.51	1.649	.893	.150	-.036	.298
CS1	265	1	7	5.38	1.399	-.720	.150	-.048	.298
CS2	265	1	7	5.43	1.410	-.754	.150	-.097	.298
CS3	265	1	7	5.03	1.491	-.363	.150	-.686	.298
CS4	265	1	7	5.33	1.434	-.599	.150	-.365	.298
CS5	265	2	7	5.28	1.402	-.442	.150	-.754	.298
ME1	265	1	7	4.99	1.330	-.369	.150	-.359	.298
ME2	265	1	7	5.06	1.354	-.454	.150	-.335	.298
ME3	265	1	7	4.85	1.373	-.238	.150	-.340	.298
ME4	265	1	7	4.92	1.349	-.449	.150	-.079	.298
ME5	265	1	7	5.00	1.361	-.347	.150	-.196	.298
PR1	265	1	7	5.00	1.383	-.651	.150	.289	.298
PR2	265	1	7	4.82	1.396	-.471	.150	-.103	.298
PR3	265	1	7	4.78	1.413	-.507	.150	-.069	.298
PR4	265	1	7	4.84	1.390	-.594	.150	.227	.298
Valid N (listwise)	265								

Source: SPPS output.

Appendix I: Multivariate analysis assumptions testing

Appendix I1: Breusch-pagan test

Breusch-pagan test

Model		Sum of Squares	df	Mean Sqare	F	Sig.
1.	Regression	0.375	1	0.375	.411	0.522[b]
	Residual	239.992	263	0.913		
	Total	240.367	264			

a. Dependent Variable: sqres
b. Predictors: (Constant), Unstandardised Predicted Values

B = ½* 0.375 = 0.1875
P value = 0.665006

Moreover, a homoskedasticity macro in SPSS, through the Breusch-pagan and Koenker test, was used to additionally confirm the results.

Appendix I2: Variance Inflation Factor Table (VIF)

Variance Inflation Factor

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	COP2	.312	3.205
	COP3	.335	2.987
	COP4	.337	2.969
	COP5	.275	3.637
	COP6	.328	3.049
	INNO1	.202	4.951
	INNO2	.183	5.462
	INNO3	.292	3.426
	INNO4	.230	4.349
	INNO5	.166	6.014
	INNO6	.171	5.845
	INNO7	.155	6.439
	INNO8	.176	5.696
	INNO9	.174	5.760
	INNO10	.161	6.212
	INNO11	.106	9.440
	INNO12	.108	9.302
	MAN1	.130	7.693
	MAN2	.134	7.487
	MAN3	.317	3.150
	MAN4	.124	8.091
	MAN5	.139	7.219
	ORG1	.140	7.145
	ORG2	.107	9.389
	ORG3	.143	6.987
	ORG4	.144	6.966

	ORG5	.144	6.948
	TEH1	.090	11.104
	TEH2	.075	13.275
	TEH3	.129	7.731
	TEH4	.178	5.619
	TEH5	.101	9.867
	MKT1	.120	8.311
	MKT2	.070	14.346
	MKT3	.073	13.792
	MKT4	.302	3.317
	MKT5	.165	6.068
	GOV1	.098	10.190
	GOV2	.093	10.809
	GOV3	.117	8.524
	GOV4	.156	6.397
	GOV5	.171	5.843
	CS1	.101	9.867
	CS2	.099	10.092
	CS3	.191	5.226
	CS4	.141	7.109
	CS5	.136	7.375
	ME1	.120	8.348
	ME2	.087	11.544
	ME3	.130	7.690
	ME4	.114	8.766
	ME5	.184	5.434
	PR1	.125	7.985
	PR2	.061	16.400
	PR3	.076	13.134
	PR4	.084	11.925

a. Dependent Variable: COP1

Source: SPSS output.

Appendix I3: Model fit indicators

Model fit indicators

Model fit indicators	**Values**
$\chi 2$/df	<5
Absolute indicators	
GFI	>= 0.90
RMSEA	<0.05 good fit; <0.08 reasonable fit; <0.1 mediocre fit
RMR	From -4 to 4
SRMR	<0.08
Incremental indicators	
NFI	>0.95
NNFI	>0.95
CFI	>0.90
Parsimonial indicators	
AGFI	=>0.90
PGFI	=>0.90

Source: Author's work.

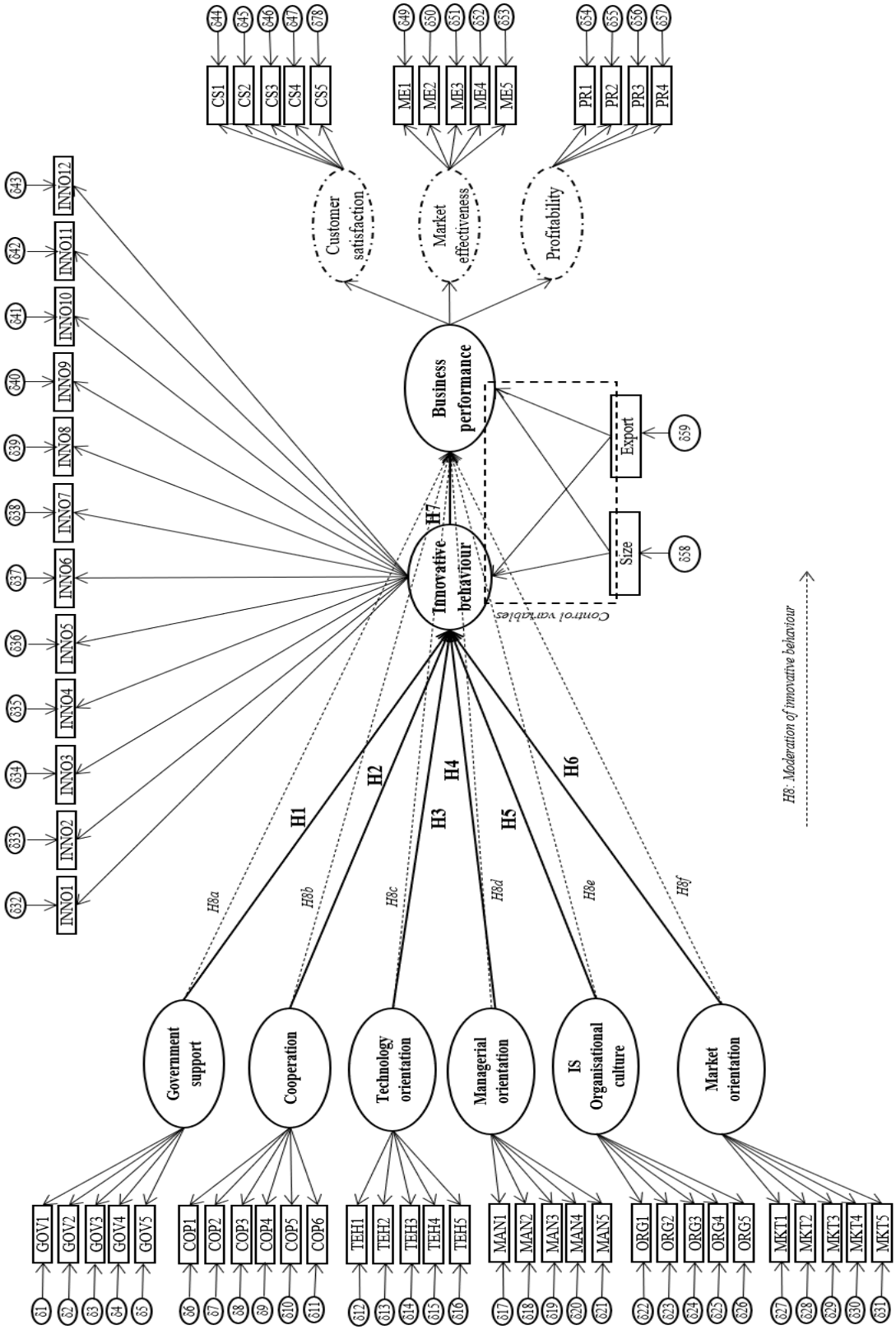
Appendix I4:Overall conceptual model testing

Standardised loadings

Variable	Standardised loading
COP1	.801
COP2	.802
COP3	.740
COP6	.337
INNO1	.799
INNO2	.818
INNO4	.753
INNO5	.856
INNO6	.803
INNO7	.852
INNO9	.810
INNO11	.846
MAN1	.849
MAN3	.701
MAN4	.914
MAN5	.893
ORG1	.803
ORG3	.897
ORG4	.894
ORG5	.903
TEH1	.917
TEH2	.934
TEH3	.871
TEH5	.898
MKT1	.865
MKT2	.940
MKT3	.922
MKT4	.656
GOV1	.907
GOV3	.898
GOV4	.859
GOV5	.902
CS	.870
ME	.914
PR	.838

Source: Author's work.

Appendix J: Conceptual model



Appendix K: Structural model testing