Coopetitive service innovation: the role of geographical proximity, innovation focus and customer cooperation

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Abstract

Purpose – Previous research on the impact of coopetition on innovation performance has provided contradictory results. Thus, this study aims to fill the gap by gathering data to explain the impact of coopetition on service innovation, considering the partners' geographical proximity, innovation focus of the firm and cooperation with customers.

Design/methodology/approach – A logistic regression model is applied, and four hypotheses are tested using data from the Eurostat Community Innovation Survey 2018. The cross-sectional data set consists of 13,723 firms innovating services in selected European Union countries.

Findings – The findings verify the importance of coopetition for service innovation. However, the coopetitive partners' nationality does not have a significant impact. Furthermore, the integration of customer cooperation with coopetition enhances service innovation. Hence, competing partners seem not to avoid cooperation in output functions near the customers. To coopete in innovation is risky, but the findings reveal that partners develop novel services through coopetition, intended to produce a higher return to compensate for the risks.

Originality/value – Presumably, this is one of the first large-scale studies examining the impact of coopetition on service innovation in a European context. This study indicates that coopetition amplifies service innovation, thus reducing the divergent views on the impact of coopetition on innovation performance. It responds to the request for more research on the context of coopetitive innovation by explaining how the firms' geographical proximity, innovation focus and cooperation with customers impact their service innovation performance.

Keywords Coopetition, Coopetition strategy, Innovation, Service innovation, EU, CIS

Paper type Research paper

1. Introduction

During the last decade, there has been growing attention to service innovation (Mahavarpour *et al.*, 2023), as it contributes to the growth of firms and differentiation (Helkkula *et al.*, 2018) [1]. According to Santamaría *et al.* (2012), innovation of services is not the same as innovation of products due to the services' specific, intangible characteristics. Product innovation is about new product development and physical innovations *for* the customers, whereas service innovation is about value cocreation with the customers to solve their problems (see also Wang and Chen, 2022). Service innovation integrates the customers with the firm, the firm's service delivery system and internal and external processes in the service concept. This fact may influence, for example, how partners work together in service innovation and which conditions affect the innovation activities.

Service innovation requires formal and informal cooperation between multiple partners (Mahavarpour *et al.*, 2023). In an era of networking and open innovation, firms have access to a broader range of external resources, capabilities and knowledge, which are indispensable in, for example, service innovation activities (e.g. Agarwal and Selen, 2009; Heikkinen and Still, 2008; Mustak, 2014: Rusanen *et al.*, 2014). Furthermore, cooperative service innovation enables complex problem-solving, improves customer orientation and creativity, shortens lead time and reduces risks and costs (Syson and Perks, 2004). To cooperate with competitors or, in other words, to coopete is proved relevant in this process (Ritala *et al.*, 2008).

Gnyawali and Charleton (2018, p. 2513) defined coopetition as "... simultaneous competition and cooperation among firms with value creation intent". The definition implies that there is an inherent, constant struggle between the contradictory logics of cooperating and competing, causing cognitive and emotional

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strain or tension between the partners (Bengtsson *et al.*, 2016). Creating value through innovation is a primary motive for firms to engage in coopetition (Bicen *et al.*, 2021; Chen *et al.*, 2021; Park *et al.*, 2014). Access to both similar and complementing resources, capabilities and knowledge is eligible when competing partners innovate (Bonel and Rocco, 2007; Chin *et al.*, 2008; Galvagno and Garaffo, 2010; Luo *et al.*, 2007). Besides access to external resources, the competitive dimension of coopetition places demands on the partners to be proactive and to develop their business (Chiambaretto *et al.*, 2020).

An imbalance between value creation (cooperation) and value capture (competition) may create tension between the partners (Fernandez *et al.*, 2014; Lundgren-Henriksson and Tidström, 2021; Munten *et al.*, 2021). The risks for conflicts, loss of intellectual property and dilution of competitive advantages are prominent in coopetition (Crick, 2020; Gnyawali *et al.*, 2016; Virtanen and Kock, 2021). However, according to Peng *et al.* (2012), coopetition enables the firms to rise to a higher level of performance at a quicker pace than would otherwise be achievable. Moreover, Wang and Gao (2021) argued that information gathered from competitors helps firms to discover opportunities in the markets and update their resources, capabilities and knowledge, which in the end strengthens their competitive positions.

Based on results from previous studies, some authors conclude that the relationship between coopetition and innovation performance is unclear (e.g. Bagherzadeh *et al.*, 2022; Della Corte, 2018; Fernandes *et al.*, 2019; Navío-Marco *et al.*, 2019; Pekovic *et al.*, 2020). Studies have verified that coopetition impacts innovation performance positively (Fernandes *et al.*, 2019; Gnyawali *et al.*, 2006). The reason is that the competitive pressure forces the partners to develop their business. Pekovic *et al.'s* (2020) results indicate that coopetition is favorable for innovation but to a lesser extent than cooperating with nonrivals. Furthermore, Bagherzadeh *et al.* (2022) discovered that small firms with financial constraints derive the greatest advantage from coopetitive innovation. On the other hand, authors have also concluded that the competition between the partners may impede innovation outcomes (Bengtsson *et al.*, 2010; Gnyawali *et al.*, 2016). Della Corte (2018) asserted that coopetition intensity seems to impact the coopetition – innovation relationship. Moreover, the mixed evidence may be due, in part, to the context, or in other words the market conditions and circumstances in which coopetition takes place. Ritala (2012), for example, discovered that market uncertainty, competition and compatibility between the firms impacted the strength of the coopetition – innovation relationship. The mixed evidence may also be due to the theoretical lens applied, as different lenses may produce different results (Bagherzadeh *et al.*, 2022). To sum up, coopetitive innovation embraces both pains and gains (Bouncken and Kraus, 2013; Chiambaretto *et al.*, 2020). Notably, none of the studies mentioned thus far have specifically discussed service innovation.

Consequently, although coopetition is more prevalent in the service sector compared to the manufacturing sector, coopetition as a strategy to amplify service innovation has been less researched (Mention, 2011). Coopetition as a viable strategy for service innovation has been examined in a few cases, such as in the context of the finance sector (Broløs, 2009), services for mobile TV (Ritala *et al.*, 2009), the grocery business (Kotzab and Teller, 2003) and travel agencies (Wang and Chen, 2022). Moreover, Yami and Nemeh (2014) have focused on innovation of both products and services in the wireless telecommunication sector.

More research is needed on the implications and background of coopetition for innovation (Xie *et al.*, 2023), especially taking into account the diverse types of innovation activities (Yadav *et al.*, 2022), such as service innovation (Wang and Chen, 2022). The previous, contradictory results on the coopetition–innovation relationship provide yet another cause to pursue further studies. Thus, the aim of the study presented in this paper is to address the gap in the knowledge by empirically investigating coopetition as a service innovation strategy. The following main research question guides this investigation:

RQ1. Should firms engage in coopetition to amplify service innovation?

The reason why prior studies have produced mixed evidence is that innovation performance may depend on the conditions of the coopetition, which are relatively underresearched (Bagherzadeh *et al.*, 2022; Crick and Crick, 2021; Xie *et al.*, 2023). According to Granata *et al.* (2018), such questions as which conditions allow coopetition to be successful, how tension can be managed and how firms can organize coopetition to find the right balance of the cooperative and competitive dimensions remain open. This raises the following question: When is coopetition effective for service innovation and when is it not? Accordingly:

RQ2. Do the geographical proximity of coopeting partners and the innovation focus of the firm enhance service innovation in coopetition?

RQ3. Do the focal firms' cooperation with customers enhance service innovation in coopetition?

This study investigates whether coopetition positively impacts service innovation, and which focal conditions of coopetition enhance service innovation in firms in the European Union (EU). A quantitative analysis of the 2018 data set from Eurostat Community Innovation Survey (CIS) is conducted. The CIS addresses innovation activities of firms in a European context, for example, distinct types of innovation activities (e.g. service innovation) pursued through coopetitive partnerships. This study is large-scale and international, answering Yadav *et al.'s* (2022) call for larger samples to increase the validity and generalizability of coopetition research.

There are different types of proximity in coopetition (Albert-Cromarias and Dos Santos, 2020; Klimas, 2020). However, we have chosen to focus on geographical proximity as it may facilitate interactive learning needed in innovation, by strengthening other dimensions of proximity (Boschma, 2005). Geographical proximity enhances trust between the partners, especially in situations where the partners have no or little previous experience of working together. Trust is essential in relations filled with tensions, due to simultaneous competition and cooperation.

This study enriches the literature in three ways. First, it extends the literature on service innovation by integrating coopetition into the context of service innovation, proving it to be a viable strategy. It extends the view on value cocreation by also incorporating competitors in the concept. Second, it adds to the literature on coopetition by empirically evidencing the impact of coopetition as an alternative service innovation

strategy. Although coopetition arguably entails a risk in innovation activities, and previous studies have produced mixed evidence on the impact of coopetition, findings from the current study indicate that coopetition amplifies service innovation, thus reducing the divergent views on the positive or negative impact of coopetitive innovation. Third, it examines the context favorable for coopeting to amplify service innovation. Furthermore, it responds to the request for more research on the conditions necessary for coopetitive innovation and explains how the partners' proximity, the innovation focus of the firm and their cooperation with customers impact their service innovation performance.

The article continues in Section 2 with a review of the theoretical framework and the hypotheses, directing attention to the focal conditions under which coopetition occurs. Sections 3 and 4 present the methodology and the results of the study. In Section 5, the results are discussed, and on a broader level, the theoretical and practical implications are presented. The last section, Section 6, addresses the limitations and provides directions for further research.

2. Theoretical background and hypotheses

2.1 Coopetition

The concurrence of competition and cooperation creates tension between the partners. Each actor plays the dual role of cooperative partner and competitor, working together on some activities and competing in other areas. Gnyawali and Charleton (2018) also pointed out the intentional, strategic rationale for coopetition: coopetition is pursued to realize clearly defined benefits, motivating the partners to take part in a risky endeavor despite the potential for failure. The aspect of coopetition in focus in this article is the partners' intent to innovate services.

Coopetition may in the future be the most significant business logic for many industrial sectors (Baumard, 2009). Competitors need the same types of resources, and have similar interests in the markets, creating a natural rationale for coopetition (Virtanen and Kock, 2022). However, cooperation and competition operate on different and contradictory logics (Bengtsson *et al.*, 2016; Raza-Ullah *et al.*, 2014; Riquelme-Medina *et al.*, 2022). Cooperation involves the pursuit of collective and reciprocal interests and benefits, whereas competition entails an opportunistic pursuit of one's own interests and benefits. However, the amalgamation of cooperation and competition is argued to increase a firm's innovation capacity due to the dualism of coopetition forcing the partners to put in an effort (Bouncken *et al.*, 2020a) and due to the complementary resources, capabilities and knowledge they possess (Bacon *et al.*, 2020; Bouncken and Kraus, 2013).

The partners' shared view of their customers, markets and other competitors creates an eligible condition for high value capture or benefiting from the value created in coopetition (Bouncken *et al.*, 2020a). Some level of cooperation between the partners is necessary to drive innovation, but if the competitive activities become too intensive, they may hamper innovation (Park *et al.*, 2014). Bouncken *et al.* (2020b, p. 651) explained:

> In coopetition, firms could be tempted to intensify their value capture at the expense of their partner. These tensions in the value capture may encourage firms to invest less effort and resources in the innovation value process.

Studies have explored under which conditions coopetition is favorable for innovation performance. Coopetition has been identified to facilitate product innovation (Estrada *et al.*, 2016; Navío-Marco *et al.*, 2019; Wu, 2014), particularly under the following conditions:

- value creation and capture are equally distributed (Bouncken *et al.*, 2020b);
- the cooperative and competitive dimensions of coopetition are in balance (Novais Santos, 2021; Park *et al.*, 2014);
- the relationship is governed by mutual trust and commitment (Bicen *et al.*, 2021); and
- external knowledge is integrated into the innovation activities (Chen *et al.*, 2021).

Also, market uncertainty, network externalities and competitive intensity explain how coopetition may facilitate innovation (Ritala, 2012). Furthermore, Bagherzadeh *et al.* (2022) concluded that the coopetition–innovation performance relation depends on the partners' firm size and financial capability. These studies have all focused on product innovation, but the results can be presumed to also be relevant to service innovation.

Proximity is also a condition that may impact the result of coopetition. The concept is multidimensional (Klimas, 2020). It includes geographical, cognitive, organizational, social, institutional and communicational proximity. The fundamental concept of proximity functions dually as a catalyst for coopetition and, conversely, is reciprocally reinforced by coopetition (Albert-Cromarias and Dos Santos, 2020). Firms are more inclined to form interorganizational relationships with partners that are similar and close in some or many aspects of their business activities. Proximity directly triggers and stimulates mutual learning, which indirectly increases the partners' competitiveness and innovativeness.

It is commonly acknowledged that the impact of proximity on innovation can be described as an inverted U-curve (Klimas, 2020). Too much similarity between the partners results in an unfulfilled potential for learning and creativity, as their knowledge bases and approaches are overly homogeneous. Due to the homogeneous knowledge base, the possibility for unintended spillover increases. Too little similarity impedes, for example, coordination, communication and building of trust. It may also be difficult to find a common ground for innovation if the knowledge bases are too heterogenous. Hence, the level of proximity should be optimal. Nevertheless, the conceptually developed inverted U-curve effect of proximity on innovation can be questioned, because some empirical studies have not verified it (Klimas, 2020).

2.2 Coopetitive service innovation performance

Bouncken and Kraus (2013) considered coopetition to be a double-edged sword, due to its advantages and disadvantages. It can positively impact service innovation because it enables access to critical, external resources, capabilities and knowledge. At the same time, the risk of unintended knowledge leakage and conflicts may hamper innovation performance. Mention (2011) discovered that information from competitors seems to negatively influence innovation (see also Nieto and Santamaría, 2007). The results indicate that competitors may

use the information to pursue imitation strategies, instead of far-reaching innovations.

However, appropriate social, organizational and legal governance mechanisms can solve the problem with knowledge sharing and, thus, enhance coopetitive service development (Estrada *et al.*, 2016; Ritala *et al.*, 2009). Another way to avoid risks in coopetition is to separate cooperation from competition (Virtanen and Kock, 2022). Coopetitors can together develop new services "far away from the customers" (e.g. information shared on a general market level in input activities) and compete "near the customers" (e.g. information not shared on a customer level in output functions) (Kotzab and Teller, 2003; Ritala *et al.*, 2009).

Broløs (2009) confirmed that coopetition is advantageous, especially for the input of new ideas in the first stages of the service innovation process. The competitors' common understanding of basic market conditions and a broader common knowledge base is advantageous for generating new insights. However, they are not identical, ensuring some diversity. We consider that the diverse and complementary resources, capabilities and knowledge of the partners create value in service innovation, thereby providing a compelling incentive for coopetition. It also enables the partners to achieve a critical mass in, for example, research and development (R&D) activities (Le Roy *et al.*, 2016). Moreover, coopetition facilitates the knowledge acquisition (Zhang *et al.*, 2010), knowledge sharing (Seepana *et al.*, 2020) and learning (Bouncken and Kraus, 2013) needed to amplify service innovation (Mustak, 2014). More specifically, coopetition promotes the exchange of both codified and tacit knowledge, allowing for a novel recombination of the two (Carvalho Santos *et al.*, 2021; Estrada *et al.*, 2016). For these reasons, research has acknowledged that coopetition, moderated by coopetition recognition (Wang and Chen, 2022), is advantageous for service innovation (Marcovic *et al.*, 2020). Thus, we hypothesize that:

H1. Coopetition is positively related to service innovation.

2.3 Geographical proximity amplifies service innovation

National-level coopetition defines geographical proximity (see also Crick and Crick, 2019) including coopetition between partners located within the same country. The mainstream literature on innovation clusters and networks considers that geographical proximity facilitates learning (Letaifa and Rabeau, 2013) and, thus, innovation indirectly (Klimas, 2020). At the same time, too close of a distance may lead to a lock-in situation that can impede creativity (Boschma, 2005; Love *et al.*, 2010). As such, geographical proximity may enhance management and coordination of cooperation in innovation activities, but it may also hinder interactive learning and creativity, due to the partners' homogenous knowledge and resources.

Crick and Crick (2021) found in their study that coopetition occurs more frequently between international rather than domestic partners, suggesting that the partners may give precedence to competition rather than cooperation in the domestic market (Navío-Marco *et al.*, 2019). In the study, the overlap between the domestic partners' target markets and products was high, creating direct rivalry between them. This may explain the reasons why they chose international partners. On the other hand, Zhang *et al.* (2010) discovered no apparent differences between international and domestic partners related to knowledge creation and innovation performance. An explanation is that firms may pay different amounts of attention to knowledge acquired from alliance partners in different countries, creating an appearance of no overall differences between international and domestic partners. The focus of these studies has been on products.

A characteristic of services is heterogeneity. We argue that services are mostly adapted to meet the specific needs and preferences of customers nationally. Customizing services for domestic markets reduces the necessity of seeking international partners for service innovation. Vence and Trigo (2010) reported that cooperation and networking in service innovation in general seem to be nationally bound. Geographical proximity allows easy access to the partners' tangible and intangible resources (Crick and Crick, 2019; Letcher *et al.*, 2022), for example, their national-bounded knowledge. Geographical proximity also stimulates transfer of tacit knowledge (Klimas, 2020). We assume that this could explain why geographically close partners in coopetition can enhance service innovation performance. Another plausible explanation is that partners from the same geographical area are likely to share similar cultures, structures and administrative processes (Albert-Cromarias *et al.*, 2022; Dorn *et al.*, 2016). Shared beliefs, values and practices facilitate decision-making and communication in general, and lower the risk of the partners behaving opportunistically (Steinicke *et al.*, 2012), as well as enhance building of trust and knowledge transfer in innovation activities (Bacon *et al.*, 2020). Consequently, the partners' similarities enhance innovation. Hence, we craft our second hypothesis accordingly:

H2. In coopetition, geographical proximity to the partner is positively related to service innovation.

2.4 Innovation focus of the firm amplifies service innovation

Studies on the influence of coopetition on a firm's innovation focus have produced mixed evidence. Nieto and Santamaría (2007) uncovered in their study a negative relation between coopetition and novel innovations, whereas Chen *et al.* (2021) argued that coopetition impacts radical innovation positively when the partners can fully integrate each other's knowledge. Coopetition can trigger radical innovation, but it can be harmful when the innovation is extremely novel (Bouncken and Kraus, 2013). Le Roy *et al.* (2016) concluded that the number and choice of coopetition partners impact how novel the innovations are (see also Vence and Trigo, 2010). Additionally, Bouncken *et al.* (2018) discovered that the influence of coopetition on how novel the innovations are, is related to the phase of the innovation process. The above mentioned studies have focused on product innovation; research that has investigated the influence of coopetition on service innovation focus is scarce.

In a service innovation setting, a firm's innovation focus refers to whether the innovation is incremental or novel

(radical), or in other words, whether the developed services reflect improvements to existing services or are new (see also den Hertog *et al.*, 2010; Gallouj and Weinstein, 1997). We consider that the resources, capabilities and knowledge needed for developing existing services can be found or developed internally, for example, by gathering market-based information. On the other hand, innovation of new services may demand access to external resources, capabilities and knowledge. Indeed, in projects involving lower levels of innovation, knowledge sharing is not required; however, in highly innovative projects, sharing new valuable knowledge is relevant (Le Roy *et al.*, 2021).

Cooperating with competitors in innovation is risky due to the tension stemming from the underlying contradictory logic, distrust and opportunism (Gernsheimer *et al.*, 2021) and the risk of unintended knowledge transfer (Estrada *et al.*, 2016; Gast *et al.*, 2019). Due to the risks involved, the potential return on cooperating with competitors must be high to make the effort worthwhile (Virtanen and Kock, 2022). The prospect of return may be measured in, for example, how novel the innovations are. Through cooperation, the higher-order capabilities and knowledge needed for novel service innovation emerge (Agarwal and Selen, 2009). Moreover, resources that are difficult to transfer demand high-intensity cooperation (Rusanen *et al.*, 2014). Competitors may be key partners in this process, which is focused on developing novel services to compensate for the risks. Thus, we propose our third, hypothesis:

H3. In coopetition, innovation focus on novel services is positively related to service innovation.

2.5 Coinnovation with customers amplifies service innovation

Working together with, for example, customers, suppliers, competitors and other organizations, is relevant in service innovation (Mustak, 2014). These diverse actors' input and ideas may differ, but service innovators can take advantage of this and combine the different knowledge sets to amplify innovation (Marcovic *et al.*, 2020). Coopetition research indicates that the partners avoid including customer-near activities when coopeting (Chin *et al.*, 2008; Ritala *et al.*, 2009). However, empirical coopetition research has discovered that competitors also cooperate in, for example, sales and marketing (Virtanen and Kock, 2022). We therefore argue that coinnovation simultaneously with customers and competing partners is eligible.

Service innovations are most often introduced by firms that engage in knowledge exchange with customers and competitors (Love *et al.*, 2010). Coopetition and cooperation with customers together impact innovation performance positively (Le Roy *et al.*, 2016; Pekovic *et al.*, 2020). Coopetition gives firms access to external resources, capabilities and knowledge, whereas noncompetitors, such as customers, additionally provide market-based information (Mention, 2011).

Service coproduction in interaction with customers (inseparability) defines services, highlighting the importance of customer involvement and pinpointing cocreation of value (e.g. Grönroos, 2006; Heinonen *et al.*, 2010). The market offerings are realized, and the needed benefits (in the form of service activities and processes) are generated together with the customers. This is enabled by the firm's resources, capabilities and knowledge.

Therefore, service innovation can hardly be isolated from customers (Mention, 2011). On the contrary, it is related to the results obtained by customers as something new is introduced into their way of solving their problems (Barcet, 2010). Kandampully (2002) pointed out that in service innovation, the firms need to think on behalf of the customers, thus emphasizing the significance of customer interaction in innovation activities. Edvardsson *et al.* (2010, p. 301) likewise noted that "a higher degree of customer integration means a change from service innovation for the customer to service innovation with the customer". Studies have verified a positive correlation between working closely with customers and a firm's service innovation performance (Hsueh *et al.*, 2010; Santamaría *et al.*, 2012), especially in the fuzzy first stages of the innovation process (Alam, 2006). Xie *et al.* (2021) also verified that customer involvement significantly contributes to service innovation performance. The capacity to absorb knowledge and learning further increases the impact of customer involvement. Accordingly, our fourth hypothesis is:

H4. In coopetition, cooperation with customers is positively related to service innovation.

Our model is portrayed in Figure 1. We argue that cooperation with competitors (*H1*) is related to service innovation. Furthermore, in a coopetitive relationship, the partners' geographical proximity (*H2*), the innovation focus of the firms (*H3*) and their cooperation with customers (*H4*) are according to the hypotheses also related to service innovation.

3. Methodology

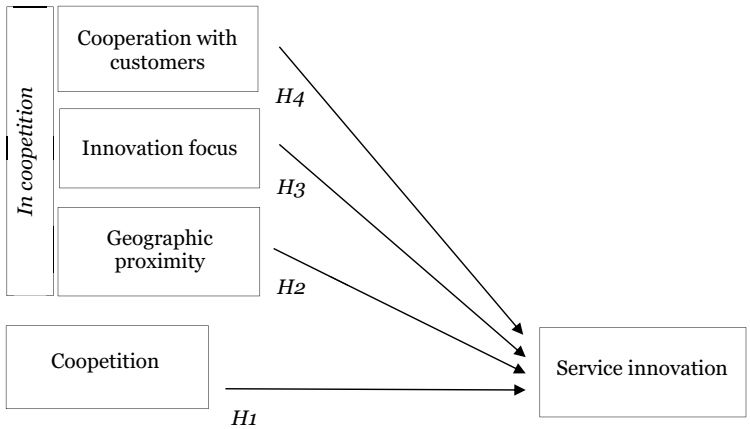
This study employs a quantitative research approach for two primary reasons (Ghauri and Grönhaug, 2010). First, previous research provides a foundation for developing a theoretical framework to be tested. Second, access to large-scale, international data facilitate a comprehensive quantitative analysis. There is still a dearth of coopetition studies based on large samples (Yadav *et al.*, 2022), involving international partners (Xie *et al.*, 2023), which increases the validity and generalizability of the research (Bouncken *et al.*, 2015).

3.1 Description of data sets

This study's data set origins from the Eurostat CIS 2018. The survey investigates the prevalence and characteristics of firms' innovation activities. It is conducted biannually by national statistical offices in the EU member states. In the CIS, the units of analysis are the firms, not their innovations individually. The survey encompasses firms that employ at least 10 people in the manufacturing industry and certain service sectors.

The CIS is a harmonized survey that collects data about a broad set of indicators on, for example, firm strategies, innovation activities, type of innovations and effects, innovation expenditures, public support, innovation cooperation and the main factors hampering innovation activities. Innovation-hampering factors may, according to the survey, be a lack of financing, skills, knowledge and partners in

Figure 1 Hypothesized model



Source: Authors' own work

innovation, high costs, market uncertainties and management priorities. The survey also gathers basic demographic information about the firms. The data are mainly collected online or through mail. The CIS represents a reliable source; indeed, data sets from previous waves of the CIS have been used in coopetition research (e.g. Bagherzadeh *et al.*, 2022; Carvalho Santos *et al.*, 2021; Fernandes *et al.*, 2019; Marcovic *et al.*, 2020; Navío-Marco *et al.*, 2019). Moreover, Pekovic *et al.* (2020) combined CIS data with data from other surveys.

CIS data are available, either remotely as scientific-use files (partially anonymized data), or as secure-use files, which are accessible physically at Eurostat's Safe Center in Luxembourg. Only scientific-use files are analyzed in this study because Eurostat's premises were closed during the pandemic. The data cover a three-year period from 2016 to 2018. Scientific-use files were available for 14 countries. Data sets from the rest of the EU countries were not available. Estonia is excluded from the initial data set because the dependent variable in this study (service innovation) is measured differently in their national survey. The analysis covers all industries and sectors included in the CIS. Thus, the final data set includes a total sample of 99,068 firms. Of all firms in the sample, 13,723 indicate that they are service innovators, of which 1,009 indicate innovating with competitors.

3.2 Measures and methods of analysis

The CIS explains innovation of services as new or improved services that differ significantly from the firm's previous services that have been implemented in the markets. The definition includes significant changes to the service design and digitalization of the service concept. Thus, service innovations represent a discontinuous change (Toivonen and Tuominen, 2009). The innovations may be radical or incremental. The definition does not define who, if anyone, should orchestrate the activities. The *dependent variable* in the study, service innovation (Inno_Serv), is a nonmetric, nominal-scale variable. The value assigned is 1 = yes when the firm had introduced new or improved services at any point from 2016 to 2018. Otherwise, the value is 0 = no.

According to the CIS, innovation cooperation involves active participation with other firms or organizations in innovation activities. Pure contracting is excluded. Commercially both partners do not need to benefit from the cooperation. The definition pinpoints the partners' mutual activity and strategic intent (Gnyawali and Charleton, 2018). It also highlights the compatibility of the partners' goals in the cooperative relationship (Virtanen and Kock, 2021). The CIS introduces ten types of cooperation constellations: with consultants, suppliers, customers, competitors, other external enterprises, enterprises within the enterprise group, universities, government and public institutes, customers from the public sector and nonprofit organizations. We focus on two types of cooperation as *independent variables* in our study, namely, cooperation with competitors (Cooperation with competitors) (to test *H1*) and cooperation with customers (Cooperation with customers) (to test *H4*). The firms were also in this part of the questionnaire asked to identify the localization of the cooperation partner(s) (to test *H2*), which defines their geographical proximity, from among three alternatives: home country, EU or EFTA country and all other countries (Coop_Comp_Nat/EU/Non-EU) (Crick and Crick, 2019). The independent variables are binary coded, either with the value 1 = yes when cooperation had occurred with at least one partner belonging to the respective group in the three-year study period, or with the value 0 = no when cooperation had not occurred. To test *H3*, firms were asked how important it is to focus on introducing new services as a measure of service innovation focus (Service innovation focus). This independent variable was measured on a four-point scale (high, medium, low, not important).

To enhance the internal validity and to follow the practices of other researchers' (Fernandes *et al.*, 2019; Markovic *et al.*, 2020) control variables were also used in the regression analysis. The first *control variable* measures the firms' perception of how important a customer orientation strategy is for economic performance. Whether it is of high, medium low or no importance to focus on attracting new customers (Focus_New_Cust). The second control variable measures

the respondents' perception of available collaboration partners for innovations or lack thereof (Hamp_Coll_Part). The third control variable measures firms' turnover (Turn) as a dummy variable, 1 = firms with an annual turnover of €10M or more, 0 = otherwise. The choice of control variables is based on variables other researchers have used to analyze similar data (Fernandes *et al.*, 2019), and what seems plausible discussion factors influencing innovation activities in firms.

We used logistic regression to conduct the analyses for this study because our single dependent variable (Inno_serv) is binary (Hair *et al.*, 1998). The coopetition–service innovation relationship was first evaluated as a summary variable, to be separated into cooperation with national/EU and EFTA/Non-EU competitors in the second run. Instead of using a multiple regression analysis, three single regression analyses were conducted due to the multicollinearity among the independent variables. It is evident that firms that cooperate with competitors in their home country also to some extent cooperate with competitors in other EU countries as well as with competitors outside Europe. With the same basic logic of modeling, the third and fourth run also included selected control variables (Focus_New_Cust), perception of available suitable collaboration partners (Hamp_Coll_Part) and turnover (Turn). A similar analysis structure was used to investigate the impact of innovation focus in the firms (Service innovation focus) and cooperation with customers on service innovation.

4. Results

Before we tested the hypotheses, we processed descriptive statistics related to the demographics of the subset of firms that reported having engaged in coopetition in service innovation ($n = 1{,}009$). With the statistics, we also describe the partners' location. Finally, we provide data on the number of coopetitive service innovations that have emanated from the respective focal EU country and present descriptive statistics for variables included in the modeling.

4.1 Descriptive statistics

The descriptive statistics of the subset of firms are outlined in Table 1. A first analysis indicates that most (71.3%) of the firms coopeting in service innovation are small- and medium-sized firms. Coopetition in service innovation occurs mostly in the information and communication industry (20.4%), in professional, scientific and technical services (17.9%), in wholesale and retail (6.5%) and finally, in the financial and insurance sector (5.3%). The firms that are coopeting are relatively young, with an age of 23 years on average (at the time of the survey). The respondents' coopetition partners are mostly located in the respondents' home countries (81.1%) or in the EU and EFTA countries (41.3%). Coopetitive service innovation is most prominent (in relation to the total population of service innovating firms in the respective country) in Slovakia (13.2%), Lithuania (12.0%) and Germany (11.4%).

Table 2 reports that 14% of the total sample of firms engage in service innovation, and evidence that cooperation with competitors located in the home country (Coop_Comp_Nat) is somewhat more popular than cooperating with competitors in the EU or EFTA (Coop_Comp_EU) or with competitors in other countries (Coop_Comp_Non-EU). On a scale from 0 to 3, the firms find it of "medium" (1.93) importance to reach out to new customers, and to focus on introducing new services (1.52). Firms' decision to start innovation activities seems not to be hampered by a lack of cooperation partners (Hamp_Coll_Part) as the mean value is 0.86. Finally, the number of firms cooperating with customers in the home country (Coop_Cust_Nat) is marginally higher than firms cooperating with foreign customers (Coop_Cust_EU, Coop_Cust_Non-EU). The low correlations between the explanatory and control variables eliminates the risk of multicollinearity.

4.2 Results for the relation between coopetition, partner proximity and service innovation

Based on the findings presented in Table 3, coopetition (cooperation with competitors) is significantly and positively related to service innovation ($\beta = 1.296$, $p < 0.01$) (Model I). The geographical location of the coopeting partner is not significant as the parameter estimates for the effect of proximity on service innovation located in the same country (Coop_Comp_Nat) is not higher than för partners in other EU or EFTA countries (Coop_Comp_EU) and partners in other parts of the World (Coop_Comp_Non-EU). Thus, hypotheses *H1*, "Coopetition is positively related to service innovation" is accepted, and *H2*, "In coopetition, geographical proximity to the partner is positively related to service innovation" is rejected. The models are further assessed with the inclusion of control variables, as depicted in Table 4 (Models III and $IV_{a,b,c}$).

The findings presented in Table 4 (Models III and $IV_{a,b,c}$) including three control variables demonstrate that the relation between coopetition and service innovation remains ($\beta = 1.150$ $p < 0.01$; $\beta a = 1.957$, $p < 0.01$; $\beta b = 1.895$, $p < 0.01$; $\beta c = 2.022$, $p < 0.01$) and that firms which find it important to reach out to new customers (Focus_New_Cust) are more service innovative. The size of the firms in terms of turnover (Turn) does also have a positive and significant effect on the companies' propensity to introduce new services. The results indicating that firms which consider lack of cooperation partners as a service innovation hampering factor (Hamp_Coll_Part) are more service innovative can probably be explained by the fact that these firms are more active in searching for partners. Consequently, these firms more often face the issue of finding suitable partners.

4.3 Results for the relation between coopetition, innovation focus of the firm and service innovation

There is a positive and significant relationship between the innovation focus of the firms (on novel services) and service innovation ($\beta = 1.006$, $p < 0.01$) (Table 5, Model V), a relationship that remains in models including coopetition ($\beta = 0.985$, $p < 0.01$) (Table 5, Model VI) and the control variables ($\beta = 0.969$, $p < 0.01$) (Table 5, Model VII). These findings confirm Hypothesis 3, "In coopetition, innovation focus on novel services is positively related to service innovation".

Table 1 Descriptive statistics ($n = 1{,}009$)

Dataset	Community Innovation Survey 2018, scientific use files		
Population	Total number of firms	99,068	
	Total number of firms service innovating	13,723	
	Total number of firms service innovating in coopetition	1,009	
		%	*Frequency*
Industry (most occuring)	Information and communication (NACE 58–63)	20.4	206
	Professional, scientific and technical activities (NACE 69–75)	17.9	181
	Wholesale and retail (different sectors) (NACE 45–47)	6.5	66
	Financial and insurance activities (NACE 64–66)	5.3	53
Firm size and age	Under 50 employees	41.0	396
	50–249 employees	30.3	293
	250 and more employees	28.7	277
	Year of establishment on average 1995 ($\sigma = 22{,}7$)		
Cooperation partner in service innovation*	Competitor in home country	81.1	818
	Competitor from EU or EFTA	41.3	417
	Competitor from all other countries	20.4	206
Occurrence of service innovation in coopetition** **(among firms service innovating in respective country***)**	Slovakia	13,2	35**/266***
	Lithuania	12.0	58 / 484
	Germany	11.4	158 / 1,391
	Greece	11.3	134 / 1,186
	Hungary	10.4	82 / 788
	Croatia	8.0	58 / 723
	Latvia	7.6	22 / 291
	Romania	7.4	45 / 606
	Spain	6.1	204 / 3,341
	Malta	5.2	21 / 405
	Bulgaria	5.1	76 / 1,477
	Portugal	4.3	81 / 1,867
	Czech Republic	3.9	35 / 898

Notes: *The cumulative percentage exceeds 100.0 because the sample contains data from both dyadic and multipartner coopetition (e.g. partners from different countries)
Source: Authors' own work

Table 2 Descriptive statistics and variable correlations included in the modeling

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. INNO_SERV	0.140	0.347	1										
2. COOP_COMP_NAT	0.015	0.121	0.148	1									
3. COOP_COMP_EU	0.007	0.086	0.107	0.435	1								
4. COOP_COMP_NON-EU	0.003	0.058	0.079	0.292	0.520	1							
5. FOCUS_NEW_CUST	1.930	1.070	0.167	0.046	0.041	0.028	1						
6. HAMP_COLL_PART	0.860	0.982	0.070	0.045	0.034	0.026	0.229	1					
7. TURN	0.244	0.429	0.070	0.045	0.051	0.038	0.074	−0.021	1				
8. FOCUS_NEW_SERV	1.520	1.048	0.297	0.085	0.072	0.048	0.535	0.236	0.105	1			
9. COOP_CUST_NAT	0.038	0.192	0.230	0.396	0.282	0.208	0.085	0.075	0.062	0.153	1		
10. COOP_CUST_EU	0.020	0.141	0.157	0.277	0.408	0.291	0.064	0.053	0.070	0.126	0.492	1	
11. COOP_CUST_NON-EU	0.009	0.093	0.123	0.214	0.324	0.399	0.046	0.035	0.047	0.087	0.353	0.538	1

Source: Authors' own work

In a more detailed analysis of the combined impact of the coopetition partners' location and the innovation focus of the firm on service innovation, the findings prove that cooperation with competitors in the home country ($\beta = 1.731$ $p < 0.01$), in the EU and EFTA ($\beta = 1.591$, $p < 0.01$) and in non-EU countries ($\beta = 1.776$, $p < 0.01$) is positive and significant. These results further underline the combined positive impact of having an innovation focus on novel services in firms and cooperation

Table 3 Logit regression, relation between coopetition and service innovation, no control variables

	Model I Coefficient (Odds ratio)	Model IIa Coefficient (Odds ratio)	Model IIb Coefficient (Odds ratio)	Model IIc Coefficient (Odds ratio)
Intercept	−1.870*** (0.154)	−1.870*** (0.154)	−1.843*** (0.158)	−1.830*** (0.160)
Independent variables				
Cooperation with competitors#	1.296*** (3.655)			
Coop_Comp_Nat		2.094*** (8.114)		
Coop_Comp_EU			2.105*** (8.206)	
Coop_Comp_Non-EU				2.252*** (9.510)
Control variables				
−2 Log Likelihood	77939.961	77988.012	78678.254	79017.936
Nagelkerke *R* square	0.027	0.026	0.013	0.007

Notes: *$p < 0.10$ level; #Cooperation with competitors is a summary variable; **$p < 0.05$ level; ***$p < 0.01$ level
Source: Authors' own work

Table 4 Logit regression, relation between coopetition and service innovation, including control variables

	Model III Coefficient (Odds ratio)	Model IVa Coefficient (Odds ratio)	Model IVb Coefficient (Odds ratio)	Model IVc Coefficient (Odds ratio)
Intercept	−3.263*** (0.038)	−3.270*** (0.038)	−3.256*** (0.039)	−3.257*** (0.039)
Independent variables				
Cooperation with competitors#	1.150*** (3.159)			
Coop_Comp_Nat		1.957*** (7.081)		
Coop_Comp_EU			1.895*** (6.649)	
Coop_Comp_Non-EU				2.022*** (7.553)
Control variables				
Focus_New_Cust	0.535*** (1.708)	0.537*** (1.711)	0.538*** (1.712)	0.540*** (1.717)
Hamp_Coll_Part	0.103*** (1.109)	0.103*** (1.109)	0.109*** (1.116)	0.112*** (1.119)
Turn	0.348*** (1.414)	0.358*** (1.430)	0.358*** (1.431)	0.372 (1.450)
−2 Log Likelihood	68258.427	68278.230	68753.792	68997.790
Nagelkerke *R* square	0.086	0.086	0.077	0.072

Notes: *$p < 0.10$ level; #Cooperation with competitors is a summary variable; **$p < 0.05$ level; ***$p < 0.01$ level
Source: Authors' own work

Table 5 Logit regression, relation between coopetition, innovation focus of the firm and service innovation, including control variables

	Model V Coefficient (Odds ratio)	Model VI Coefficient (Odds ratio)	Model VII Coefficient (Odds ratio)
Intercept	−3.709*** (0.024)	−3.711*** (0.024)	−4.126*** (0.016)
Independent variables			
Cooperation with competitors#		1.024*** (2.785)	0.975*** (2.652)
Innovation focus	1.006*** (2.734)	0.985*** (2.677)	0.969*** (2.635)
Control variables			
Focus_New_Cust			0.127*** (1.135)
Hamp_Coll_Part			0.031*** (1.032)
Turn			0.226*** (1.254)
−2 Log Likelihood	69557.243	68678.521	62441.977
Nagelkerke *R* square	0.168	0.183	0.193

Notes: *$p < 0.10$ level; #Cooperation with competitors is a summary variable; **$p < 0.05$ level; ***$p < 0.01$ level
Source: Authors' own work

Table 6 Logit regression, relation between coopetition, cooperation with customers and service innovation, including control variables

	Model VIII Coefficient (Odds ratio)	Model IX Coefficient (Odds ratio)	Model X Coefficient (odds ratio)
Intercept	−1.945*** (0.143)	−1.949*** (0.142)	−3.275*** (0.038)
Independent variables			
Cooperation with competitors#		0.501*** (1,036)	0.343*** (1.409)
Cooperation with customers	1.174*** (3.235)	1.045*** (2.845)	0.990*** (2.691)
Control variables			
Focus_New_Cust			0.520*** (1.681)
Hamp_Coll_Part			0.084*** (1.088)
Turn			0.296*** (1.344)
−2 Log Likelihood	79096.236	75954.650	66646.847
Nagelkerke *R* square	0.060	0.062	0.117

Notes: *$p < 0.10$ level; #Cooperation with competitors is a summary variable; **$p < 0.05$ level ***$p < 0.01$ level
Source: Authors' own work

with competitors on service innovation, independent of where they are located.

4.4 Results for the relation between coopetition, cooperation with customers and service innovation

Based on previous research on the importance of customer involvement in service innovation, this study tested hypothesis *H4*, "In coopetition, cooperation with customers is positively related to service innovation". Our empirical findings presented in Table 6 prove a positive and significant relationship between cooperation with customers and service innovation ($\beta = 1.174$, $p < 0.01$). Furthermore, in Table 6, Model IX proves how cooperation with competitors and cooperation with customers have positive effects on service innovation, a relationship which remains including control variables (Table 6, Model X). Thus, we accept our fourth hypothesis (*H4*).

With a particular focus on cooperation with customers and their geographical proximity, the findings give a reason to conclude that cooperation with customers in the home country ($\beta = 2.110$, $p < 0.01$) has the same significant positive effects on service innovation as cooperation with customers in other EU and EFTA countries ($\beta = 1.946$, $p < 0.01$), and as cooperation with customers in non-EU countries ($\beta = 2.206$, $p < 0.01$).

5. Discussion and conclusions

The importance of networking to cope in the competitive global arena cannot be overstated. Understanding how coopetition, which evolves through networking, may influence innovation activities represents a crucial area of research (Wang and Chen, 2022; Xie *et al.*, 2023; Yadav *et al.*, 2022). This study seek to explain the impact of coopetition on service innovation, considering the partners' geographical proximity, innovation focus and cooperation with customers, to resolve the conflicting results produced by previous studies on the coopetition–innovation relationship (Bagherzadeh *et al.*, 2022; Della Corte, 2018; Fernandes *et al.*, 2019; Navío-Marco *et al.*, 2019; Pekovic *et al.*, 2020) and to answer the call for research that considers factors impacting the relationship (Bagherzadeh *et al.*, 2022; Crick and Crick, 2021; Xie *et al.*, 2023). For example, a strong competitive intensity between the partners impacts innovation performance negatively, whereas resource constraints, high market uncertainty and compatibility between the partners may have a positive impact. However, this study focuses on other critical factors.

The findings of previous studies have emphasized the importance of obtaining access to resources, capabilities and knowledge from external actors to service innovation, results that are verified by the current study. First, our findings reveal that coopetition is positively related to service innovation (supporting Hypothesis 1). Engaging in coopetition may be a viable strategic choice to enhance the development of services. Second, the findings can also be used to argue that the impact of geographical proximity on service innovation is not undeniable. The results indicate that partners for innovation can be sought from within the home country, but also internationally (rejecting Hypothesis 2). Previous studies have indicated that firms tend to search for coopetition partners from geographically distant countries, prioritizing competition over cooperation in the home markets (Crick and Crick, 2021; Navío-Marco *et al.*, 2019). On the contrary, this study does not verify that the exact location is important. The partners value access to external resources, capabilities and knowledge in service innovation activities, regardless of the partners' origin.

Third, our findings also reveal that the primary objective in coopetitive service innovation is to introduce novel services (supporting Hypothesis 3) and not to develop existing services. Service innovation through coopetition carries risks due to the inherent conflicting logic and lack of trust. Given the risks, the prospect of return on coopetition must be substantial to justify the endeavor (Virtanen and Kock, 2022). Finally, cooperating with customers is vital to strengthening service innovation, thus confirming previous studies by Love *et al.* (2010), Marcovic *et al.* (2020) and Mention (2011). In fact, customers' input of market-based, complementary information and knowledge decreases the risks in the development and adoption stages in service innovation (Mention, 2011). Hence, interaction and value cocreation with customers help to define coopetitive service innovation, which is the foundation in the customer-

dominant logic (e.g. Heinonen *et al.*, 2010). This study concludes that it is relevant to both cooperate with competitors and customers at the same time (supporting Hypothesis 4). Thus, according to the results, competitors do not tend to avoid including customers in their coopetitive endeavor.

5.1 Theoretical implications

This empirical study notably contributes to our understanding of the relation between coopetition and service innovation. Reportedly, this is the first study devoted to examining coopetition as a service innovation strategy in a European context. Although the coopetition–service innovation performance relationship has received some scholarly attention (e.g. Marcovic *et al.*, 2020), the topic remains underresearched (Wang and Chen, 2022). Generally, coopetition studies have been conducted as either case studies or as surveys with small-scale, national samples (Yadav *et al.*, 2022). The value of this study is that it is based on an international, large-scale sample, which is needed to develop and test theories and hypotheses.

The findings reveal that coopetition is an alternative to other types of networking strategies to reach established goals in service innovation. Hence, this study adds to the research on service innovation in networks (e.g. Mustak, 2014; Rusanen *et al.*, 2014) by pointing out that coopetition could be stronger integrated into the literature. Based on their literature review, Mahavarpour *et al.* (2023) argued that there has been limited effort to develop a strategic approach for service innovation. Despite the risks, coopetition is a strategic means to an end for open innovation and leveraging multiple actor resources and dynamic capabilities for cocreating competitive service innovations.

This study also provides empirical evidence on the importance of coopetition as a viable strategy for service innovation, hence extending the coopetition literature. Previous research has demonstrated that coopetition may impact innovation performance both positively (e.g. Gnyawali *et al.*, 2006) and negatively (e.g. Bengtsson *et al.*, 2010; Gnyawali *et al.*, 2016). The focus of these studies has mainly been on product innovation. Mention (2011) discovered in her study that coopetition influences service innovation negatively. However, this study confirms the results from previous studies by Broløs (2009), Wang and Chen (2022) and Yami and Nemeh (2014). Xie *et al.* (2023) also found in their meta-analysis that later research confirms a significantly positive relation between coopetition and innovation performance. We add to the insights by empirically verifying that coopetition amplifies service innovation.

Theoretical implications also stem, for example, from insight into the conditions under which coopetition is beneficial for service innovation for firms operating in different service sectors. First, previous studies on the geographical proximity of the partner in coopetition have not produced unanimous results. Crick and Crick (2021) found that coopetition occurred more often between international partners than between domestic ones, due to the experienced direct rivalry among the domestic firms. On the other hand, Albert-Cromarias *et al.* (2022) argued for coopeting locally to mutually create and capture value. Our results add to the previous studies by verifying that the partners' localization has not a statistically significant impact on service innovation (see also Zhang *et al.*, 2010). Local, national and international partners are equally relevant, depending on the aim with the coopetition. This result strengthens Klimas's (2020) argument that there is an indirect, nonlinear relationship between geographical proximity and innovation. The partner's location may in future studies be of even less importance. The COVID-19 pandemic has prompted the use of digital interaction tools, which makes it easier to interact with, for example, more distant partners.

This study also adds to prior research on the impact of coopetition on innovation novelty. Previous studies have discovered both a positive (e.g. Chen *et al.*, 2021) and a negative (e.g. Nieto and Santamaría, 2007) relation between coopetition and innovation novelty. The relation may be positive if the partners can integrate each other's knowledge in the innovation process. On the other hand, the risks and lack of trust when coopeting may hamper innovation outcomes. However, previous studies on the impact of coopetition on innovation novelty have focused on product and not on service innovation. To the best of our knowledge, this is the first study to explore the relationship between coopetition and innovation novelty, when focusing on services. The results confirm that the partners in coopetition give priority to developing novel services, which is a new finding. Our results fill the gap by showing that when the aim is to develop novel service innovations, partnering with suitable competitors who share the same goals could be considered.

As a final note, our results show that cooperation with customers, in combination with coopetition, amplifies service innovation, which, for example, Le Roy *et al.* (2016) and Pekovic *et al.* (2020) also reported. To both compete and cooperate in customer-near functions may cause conflicts due to direct competition for market shares. However, this risk may be overridden by the potential, higher benefits of also including customers in innovation activities. According to the results, cooperating competitors seem to include customer-near activities in their relationships. This complements previous research by, for example, Chin *et al.* (2008), Ritala *et al.* (2009) and Virtanen and Kock (2022), who discuss whether competitors can cooperate in customer-near activities or not.

Thus, this study extends our knowledge of the conditions of coopetition and answers the request for more research (Bagherzadeh *et al.*, 2022; Crick and Crick, 2021), by adding to the literature that the partner's focus on more novel innovations and cooperation with customers amplifies coopetitive service innovation. On the contrary, the partners' geographical proximity does not.

5.2 Practical implications

Traditionally, any interaction with a competitor has been considered as "sleeping with the enemy." It is time to change this traditional, negative view of competitors. Managers should be aware that coopetition may be a relevant strategy because competitors operate in the same context, face the same challenges and problems and pursue similar goals and interests, capturing the opportunities in their markets. It is true that coopetition entails many risks, but the benefits may outweigh the drawbacks.

Sometimes competitors should not be trusted, and the related rivalry may be challenging. However, coopetition allows for access to external resources, both tangible and intangible. If

these external resources are acquired and internalized effectively, they may contribute significantly to a firm's innovation capacity. The opportunity is lost if a firm has a traditional focus on rivalry and not on potential partnering. Accordingly, a firm should recognize the opportunities and consider adopting a positive, coopetition-oriented mindset.

From a policy perspective, policymakers ought to have an interest in facilitating coopetition for service innovation. This study proves that coopetition boosts service innovation, which in the end benefits the customers. Where the partners are geographically located is of less importance. Thus, policymakers can attempt to enhance connections between both near and overseas competitors, possessing relevant resources, capabilities and knowledge for service innovation. Similar, nonexisting geographical effects can be observed when studying the impact of cooperation with customers on service innovation. According to the results, it is equally relevant to cooperate with national, as well as international customers. Competitors enable access to needed resources, capabilities and knowledge, whereas customers possess needed, local market-based information for innovation. Furthermore, policymakers should be aware that coopetition may be a relevant strategy for novel service innovation, because the firms that focus on this goal are, according to the results, prone to innovate.

This study focuses on coopetition in a dyadic setting. From a policy perspective, it is eligible to also support coopetition and coinnovation in a network setting, including multiple for-profit and nonprofit organizations. Multiple actors, including competitors, allow for tapping into a pool of resources, capabilities and knowledge, creating collective synergies that transcend traditional, dyadic firm boundaries. Coopetitive innovation networks can catalyze local, regional and national growth.

6. Limitations and suggestions for further studies

The first limitation of this study is that the survey data are gathered from a one-sided description of dyadic relationships. However, this is not uncommon in research on coopetition (e.g. Bouncken *et al.*, 2020b; Raza-Ullah, 2020) due to the difficulty of obtaining data from both sides of the dyad. The survey is based on answers from individual respondents. Although the survey includes many instructions and definitions, the respondents' answers may be slightly subjective, for example, due to their perceptions of and involvement in innovation activities. Furthermore, the CIS only considers firms with over 10 employees, potentially omitting a substantial population of firms that could be interesting to examine.

Second, the data do not reveal the strength of cooperation and competition in the focal, coopetitive relationships. Previous research (e.g. Bouncken *et al.*, 2020b; Novais Santos, 2021; Park *et al.*, 2014) has discussed the contradictory forces and the impact on innovation performance. However, in the survey, coopetition is measured as a dichotomous variable, not considering the cooperation–competition balance between the partners. A suggestion for further research is to also measure this balance when assessing the impact on service innovation performance. A balanced or optimal combination of competition and cooperation can generate innovation (Della Corte, 2018) and mitigate risks (Gernsheimer *et al.*, 2021) and therefore favor competitive advantage. Combining competition and cooperation can be achieved by leveraging integration and separation principles. These principles help manage the tension that arises from the contradictory forces of competition and cooperation. (Virtanen and Kock, 2022; Yadav *et al.*, 2022). Thus, an interesting research avenue is to more deeply explore the specific principles and optimal mix of them for effectively handling this tension in the context of coopetitive service innovation.

Third, cooperation with both competitors and customers can vary from low-intensive cooperation with few innovation activities and weak input of resources, capabilities and knowledge to high-intensive cooperation with a broad range of innovation activities and strong input of resources, capabilities and knowledge. Network embeddedness (Hsueh *et al.*, 2010) and close relationships (Eisingerich *et al.*, 2009) impact service innovation positively. However, the impact of cooperation intensity and the various inputs of resources, capabilities and knowledge on service innovation cannot be determined due to the dichotomous measurement of cooperation in the survey. This should be considered in future research. Besides intensity, adding a cross-border perspective on networks for coopetitive innovation (Xie *et al.*, 2023), on different levels (e.g., single-level, multilevel and cross-level) and of different types (e.g., platforms, open-source and ecosystems) would strengthen the research (Yadav *et al.*, 2022).

A fourth limitation is that the degree to which the firms deemed coopetition as important to their service innovation activities cannot be directly assessed because it is not measured in the survey. Data that grade the importance of coopetition and assess the level of success of service innovation would more precisely define the impact of coopetition on service innovation (see also Hipp, 2010). We analyzed cross-sectional data in this study; future research can use a longitudinal research design to further explore the relation between coopetition and service innovation. A topical theme in coopetition research is timing (Gernsheimer *et al.*, 2021), for example, how the intensity between competition and cooperation, the interdependencies and the strategic focus in the coopetitive relationship change over time. Focus on timing would give stronger insights into the causes and levels of impact on different types of innovation.

We limited this study to the selected variables—coopetition, partner's geographical proximity, the firm's innovation focus and cooperation with customers—which together may explain the innovativeness of services in firms. However, other explaining variables, such as access to external knowledge (e.g. Mention, 2011), formal mechanisms to protect knowledge (e.g. Estrada *et al.*, 2016) and IP-rights (Gernsheimer *et al.*, 2021), or cooperation with other partners like suppliers (e.g. Marcovic *et al.*, 2020) may also be relevant. Aside from geographical proximity, other types of proximity could play a crucial role in coopetitive relationships (Albert-Cromarias and Dos Santos, 2020; Klimas, 2020). These other types may significantly influence service innovation, as they, for example, enhance communication, shared knowledge and understanding. Further research can take a comprehensive approach by integrating a variety of conditions that enhance the innovativeness of services. The importance of extending the

discussion on factors influencing coopetitive service innovation is to be found in the models tested in this study when control variables are added. However, models with moderating variables could also be developed. Further research can also take an interpretive, qualitative approach to develop a richer, theoretical understanding of which conditions enhance the coopetition–service innovation relationship. Despite the accomplishment of prior research, comparing and generalizing the understanding of coopetition in service innovation as a phenomenon remains challenging.

Furthermore, the wider context of coopetition in different firms, in other words, in small- and medium-sized enterprises (SMEs), start-ups and family firms are promising avenues to further explore (Bouncken *et al.*, 2015; Della Corte, 2018; Gernsheimer *et al.*, 2021). The size and type of firm surely impacts how they, for example, innovate services. Our suggestions for further research will enable researchers to find a path to expand the research domain on coopetition. There is room for further action, and this article aids in mapping the route.

Note

1 This article is based on data from the 2018 Eurostat Community Innovation Survey. The responsibility for all conclusions drawn from the data lies entirely with the authors.

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