

Understanding drivers of intrafirm coopetition: perspective of corporate groups

Drivers of
intrafirm
coopetition

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Abstract

Purpose – Coopetition is ubiquitous in the economy, but managing effectively this type of relationship between firms remains a challenge for many organizations. This paper investigates the coopetition within corporate groups and focus on factors that determine the simultaneous competition and cooperation between subsidiaries therein.

Design/methodology/approach – Drawing on a dataset of 121 corporate groups listed on the Warsaw Stock Exchange (WSE), this paper theoretically advances and empirically validates the impact of 18 factors which determine the coopetition relationship.

Findings – This study's findings confirm the importance of an organizational design among external and internal drivers of intrafirm coopetition. However, the role of an environmental uncertainty as a driver of intrafirm coopetition is not proven. Furthermore, the paper finds that internal determinants explain the phenomenon of coopetition between subsidiaries within a corporate group more than determinants related to the environment.

Originality/value – The paper contributes to the coopetition theory by empirical identification of drivers of intrafirm coopetition and advances the corporate groups studies by exploring internal relationships (cooperation and competition) and the determinants therein.

Keywords Coopetition, Business group, Corporate group, Determinants of coopetition, Intrafirm coopetition

Paper type Research paper

Introduction

Coopetition is a term introduced by [Brandenburger and Nalebuff \(1996\)](#), which involves the simultaneous pursuit of cooperation and competition, whereas both are depicted on two separate continua, thus allowing to distinguish from low to high cooperation and competition ([Luo, 2007](#); [Padula & Dagnino, 2007](#); [Becker-Ritterspach & Dörrenbächer, 2011](#); [Gnyawali & Charleton, 2018](#)). However, coopetition is recently perceived as an interplay between competition and cooperation manifested through mutual pursuit, resource leverage, resource safeguarding and relevant commitments ([Gnyawali & Charleton, 2018](#)), which is described as a tense interaction ([Czakon, Srivastava, Le Roy, & Gnyawali, 2020](#)). Coopetition is a challenging relationship focused on contradictions and interdependent opposites

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(Gnyawali, Madhavan, He, & Bengtsson, 2016) that must be navigated simultaneously and in a balanced manner to generate positive outcomes (Gnyawali & Charleton, 2018).

The mainstream of coopetition research focuses on the interfirm level (dyadic, triadic, network), albeit simultaneous cooperation and competition appear also on the intrafirm level (Tsai, 2002; Luo, 2005; Bouncken, Fredrich, & Kraus, 2020; Bendig, Enke, Thieme, & Brettel, 2018; Nguyen, Ngo, Bucic, & Phong, 2018; Knein, Greven, Bendig, & Brettel, 2020). Intrafirm competition can be portrayed as a relationship between subunits, groups, or teams within an organization or corporate group (Bengtsson & Raza-Ullah, 2016; Dorn, Schweiger, & Albers, 2016). Bengtsson and Raza-Ullah (2016) point out that intrafirm coopetition differs from the interfirm one due to former's different nature and dynamic. Intrafirm competition is more complex than the interfirm one because simultaneous cooperation and competition arise in the same entity and are influenced by power distribution (Bendig *et al.*, 2018).

Walley (2007) states that intrafirm coopetition is an important research area, yet few studies investigate coopetition in corporate groups (Tsai, 2002; Luo, 2005; Song, Lee, & Khanna, 2016; Tippmann, Scott, Reilly, & O'Brien, 2018) so intrafirm competition with its external and internal drivers have receive insufficient scrutiny so far (Becker-Ritterspach & Dörrenbächer, 2011; Dorn *et al.*, 2016; Dziurski, 2020). Some studies focus on intrafirm competition (Tsai, 2002; Birkinshaw & Lingblad, 2005; Luo, 2005; Ritala, Väälimäki, Blomqvist, & Henttonen, 2009; Bendig *et al.*, 2018; Nguyen *et al.*, 2018; Knein *et al.*, 2020; Mierzejewska, 2023), but few examine its drivers (Xing-xiu, Han-Min, & Chun-Xia, 2013; Chambers, 2015; Dorn *et al.*, 2016) despite the call for more research in the field (Ghobadi & D'Ambra, 2012). Notably, there are different perspectives on corporate group definition (Ho, 2012). This study defines corporate group as a set of legally independent firms linked by multiple ties and belonging to the same owner(s) (Riccaboni, Wang, & Zhu, 2021).

Prior studies of intrafirm coopetition drivers remain fragmented, as they are mainly focused on a single driver like culture (Knein *et al.*, 2020), power sharing (Bendig *et al.*, 2018), reward and promotion systems (Song *et al.*, 2016), coordination mechanisms (Tsai, 2002), organizational model (Seran, Pellegrin-Boucher, & Gurau, 2016), or leadership style and organizational structure (Strese, Meuer, Flatten, & Brettel, 2016). Moreover, prior studies examine drivers of intrafirm cooperation and competition separately (Luo, 2005) or focus on one of the two (Gnyawali, Singal, & Mu, 2007). Furthermore, there is limited empirical evidence from large samples as most studies are conceptual or based on a single case study method (Tsai, 2002; Luo, 2005; Song *et al.*, 2016). Therefore, there is a research gap in the comprehensive and quantitative examination of intrafirm coopetition drivers, especially in the context of corporate groups, as intrafirm coopetition research focuses predominantly on cross-functional coopetition (Luo, Slotegraaf, & Pan, 2006; Strese *et al.*, 2016; Knein *et al.*, 2020) or in multinational corporations (MNCs; Luo, 2005; Tippmann *et al.*, 2018; Mierzejewska, 2023). Thus, this article sets out to fill the gap in studies on drivers of intrafirm coopetition by addressing the yet unanswered research question: What are the main drivers of coopetition in corporate groups from the perspective of managers?

Systematic literature reviews reveal both external and internal drivers of intrafirm coopetition (Dorn *et al.*, 2016; Gernsheimer, Kanbach, & Gast, 2021). Thus, the main research assumption is to apply the comprehensive approach to integrate those drivers in one study and examine them on a large-scale sample. This study focused on individual managers' perceptions (Czakov, Klimas, & Mariani, 2020) of intrafirm coopetition in corporate groups in which competition between subsidiaries accompanies cooperation. The lack of quantitative research on coopetition drivers in corporate groups motivated us to develop an inventory of items relevant to the survey-based examination. This study applied factor analysis to jointly identify the most important drivers in two groups.

Our findings contribute to both theory and business practice. First, this study enriches the cooperation literature by focusing on the under-researched topic of intrafirm cooperative behaviors in the context of corporate groups. The study gives insights into similarities and differences between inter- and intrafirm cooperation determinants by proving the important role of organizational design in intrafirm cooperation drivers. Moreover, our research complements previous studies by exploring drivers of intrafirm cooperation in corporate groups in a quantitative manner. Thus, the research can be seen as a rich source for further studies that would aim to explore drivers of cooperation in corporate groups. Second, this study identified the most important drivers of internal cooperation, providing researchers and managers with knowledge on how to manage simultaneous cooperation and competition in corporate groups. On the one hand, one should control intrafirm cooperation drivers to preclude unplanned simultaneous cooperation and competition that would be too intense, while on the other hand, one should stimulate intentional cooperation to improve organizational performance. This study sought to provide knowledge that allows for more effective management of cooperation in corporate groups.

The paper will develop in the following order. The next section will cover theoretical lenses to formulate hypotheses. Section three will present the methodology of the study, while section four focuses on research results. The last two sections will provide a discussion of the research results of the study, conclusions, limitations and recommendations for future research.

Theory

The study focuses on cooperation in corporate groups and its drivers, which differs from determinants of interfirm cooperation (Bengtsson & Raza-Ullah, 2016). The cooperation that emerges between subsidiaries within a corporate group can be driven by environmental and group-specific factors, which agrees with the general cooperation literature that divides drivers into industry-specific and contextual antecedences (Czakoń *et al.*, 2020) or sectoral and corporate factors (Cygler, 2009).

Environmental drivers of intrafirm cooperation

Environmental drivers refer to an industry, market and geographical region in which a corporate group and subsidiaries operate. The literature indicates that environmental uncertainty is one of the most important external drivers of cooperation within corporate groups (Gnyawali & Part, 2011). It is characterized by a great ambiguity of magnitude, speed and dimensions of change (Birkinshaw & Lingblad, 2005), which is mostly expressed by globalization, competitive pressures, innovation and technological development (Chen *et al.*, 2022).

Prior studies argue that corporate groups in high-tech industries experience more internal competition than business groups in medium- and low-tech industries (Dziurski, 2023). Subsidiaries in corporate groups compete for resources and support and win the market for technological solutions (Birkinshaw & Lingblad, 2005). Studies show that in fast-growing high-tech industries, internal competition emerges at different stages of the new product development process (Birkinshaw, 2001), which is often stimulated by the parent company encouraging subsidiaries to develop divergent technological standards at the same time. This strategy of corporate groups seeks to increase the likelihood of having the dominant technology when it appears (Birkinshaw & Lingblad, 2005). Simultaneously, innovative and knowledge-intensive industries necessitate the exchange of knowledge and experience (Bouncken & Kraus, 2013) that provides space for cooperation between subsidiaries. Previous studies prove that technological and market turbulence influence the role of

intrafirm cooperation in innovation process outcomes by attenuating or strengthening the development of distinct types of innovation (Chen, Tang, Wu, & Wang, 2020).

Competitive pressure is another important environmental driver of intrafirm cooperation, as it may cause an increase in the intensity of both competitive and cooperative behaviors (Toh & Polidoro, 2013). The competitive pressure increases the demand for resources and support from the parent company in a corporate group, which intensifies competition between subsidiaries. At the same time, it implies subsidiaries' cooperation to exchange knowledge and increase market power (Luo, 2005).

Environmental drivers of cooperation also refer to the current state of the economy. An unstable economy may lead to a more intense cooperation between subsidiaries within a corporate group in some areas while competing for capital from the parent company. Prior studies argue that subsidiaries are more willing to compete during the growth phase in the business cycle and cooperate during and after a recession (Chambers, 2015).

Next, industry maturity and product market homogeneity – understood as the homogeneity (or heterogeneity) of customer preferences (Birkinshaw & Lingblad, 2005; Chambers, 2015) – strongly influence cooperation between units within a corporate group. Lack of technological standards at the early stage of an industry life cycle enhances competition between units that develop different technological solutions (Birkinshaw & Lingblad, 2005). Moreover, competition between subsidiaries in MNCs is higher, as there is an overlap among products, markets and technologies between subsidiaries (Phelps & Fuller, 2000). The diversity of customer preferences encourages corporate groups to maintain a widely diversified product portfolio. If product groups are organized into separate subsidiaries, these units become natural competitors (Birkinshaw & Lingblad, 2005). Interestingly, they often simultaneously cooperate in promoting entire portfolios of products that use the same brand, sometimes integrating their operations in selected geographical markets. Liu, Jiao and Xia (2019) argue that if there is a network of subsidiaries operating in the same industry and offering similar products in the host country, there is a more intense competition that affects both internal resources and external markets. There is a less-intense competition when subsidiaries located in the same host country operate in different industries.

Previous studies foreground that environmental uncertainty encourages competition between subsidiaries (Birkinshaw & Lingblad, 2005; Dziurski, 2023), while technological pressure in an industry encourages cooperation within a corporate group, as subsidiaries can easily establish and maintain such relations and amplify their benefits (Kumar & Dutta, 2017). Thus, previous studies show that environmental uncertainty may foster cooperation within a corporate group. Internal cooperation is the first option for entities within a corporate group to overcome the challenge of high environmental uncertainty, but it does not mean that the competition is less intense. Growing environmental uncertainty leads to competition for headquarters' resources and other elements like capital, technology, equipment, specialized human resources, training, knowledge and information, along with power and position of subsidiaries, customers, products and services (Becker-Ritterspach & Dörrenbächer, 2011). Hence, we propose the following hypothesis:

- H1. Environment uncertainty is the most important driver among environmental factors of intrafirm cooperation within a corporate group.

Corporate-group-specific drivers of intrafirm cooperation

The second set of drivers refers to corporate-group-specific factors. Among different drivers influencing simultaneous competition and cooperation between subsidiaries, it seems that the most important ones are the strategy and internal organization of a corporate group. Li, Ferreira and Serra (2009) suggest that competition and cooperation of subsidiaries in MNCs

are significantly influenced by the internationalization strategy pursued by the corporation as well as its structural features, including the role of the parent company, communication and reward system. Studies suggest that competition between subsidiaries is greater if the corporation implements a multinational strategy rather than a global strategy (Luo, 2005; Li *et al.*, 2009; Phelps & Fuller, 2000). Global strategy reduces the level of competition between subsidiaries due to clearly defined areas and scopes of activities. The dualism of competition and cooperation features the most in transnational strategy (Luo, 2005; Chambers, 2015).

Corporate groups represent a specific organizational model, so an important factor that determines internal competition is their organization, including clearly defined charters, tasks, competences of subsidiaries, level of centralization, along with communication and reward systems. Competition between subsidiaries may be rooted in the undefined specialization of each unit. When the rights and obligations, objectives and market scope of each subsidiary are not clearly defined, conflicts may arise leading to competition between entities within a group (Li *et al.*, 2009). Previous research shows that competition relationships in MNCs are less frequent if the boundaries of subsidiaries' activities and obligations are well defined (Maurer, 2011).

The list of competition drivers should also include the degree of centralization and formalization (Tsai, 2002; Birkinshaw & Lingblad, 2005; Strese *et al.*, 2016) as coordination mechanisms. Decentralization may increase the intensity of competition between units within a corporate group (Cerrato, 2006), as it encourages managers of subsidiaries to start opting for more attractive areas of market operations. As a result, charters of two or more units may overlap, leading to more intense market competition between them (Birkinshaw & Lingblad, 2005). Previous studies showed that centralization has a strong, negative effect on intrafirm competition, whereas formalization has a positive effect (Strese *et al.*, 2016). However, knowledge transfer still requires centralized coordination conducted by a knowledge broker, along with informal interactions to manage knowledge sharing in internal competition (Chiambaretto, Massé, & Mirc, 2019).

Luo (2005) argues that reward systems in MNCs are the main mechanism that drives domestic managers' motivation to constantly compete for corporate's resources and market expansion. A properly constructed reward system can stimulate both cooperation and competition, which are aimed to generate the best financial results, innovative products and technologies. It turns out that the parent company's effectiveness in the assessment of its subsidiaries results in the appearance of "healthy competition" (Schleimer & Riege, 2009), along with the subsidiaries' efforts to maintain efficiency standards. Song *et al.* (2016) confirmed on the case study of Samsung that the reward and promotion system is the main driver of inter-business cooperation, stimulating affiliates and divisions at every level to continuously compete and cooperate with one another.

Another important driver of competition between subsidiaries is corporate culture. Knein *et al.* (2020) proved that increased level of all distinguished organizational culture values – group, development, hierarchy and rational culture – positively influence intrafirm competition, even though they initially assumed negative relation between hierarchical culture and intrafirm competition. This can be explained by the fact that the driver of competition is a clear and coherent organizational culture. Moreover, Birkinshaw and Lingblad (2005) point out that competition between companies may be influenced by normative integration: the state of unification and harmonization of organizational elements in norms and values. In corporate groups that lack normative integration, managers of subsidiaries focus on their short-term goals, disregarding the wider perspective and interests of the entire group, which may result in value-damaging competition between subsidiaries.

Other drivers of competition within a corporate group relate to the size of units and their endowment with resources. On the one hand, some researchers suggest that smaller units with insufficient resources are more willing to cooperate with larger units, with which they also compete (Tsai, 2002). Moreover, cooperation is also more likely when subsidiaries own

scarce but useful resources (Chambers, 2015). On the other hand, competition between subsidiaries may result from a similar resource base necessary to achieve goals. It turns out that subsidiaries are more prone to competitive behaviors when there is a greater demand for similar resources (Li *et al.*, 2009). Thus, the resource endowment of subsidiaries promotes cooperative behaviors (Xing-xiu *et al.*, 2013), but it may also encourage competition, especially for resources controlled by the parent company.

The list of drivers of cooperation on the intrafirm level can be supplemented by the following factors: strategic interdependence between subsidiaries resulting from the roles they play in a corporate group, their organizational forms, technological bonds, local responsiveness, capability retrogression, product similarity, corporate group age, social communication, entrepreneurial orientation, previous relations between subsidiaries, internal trust, individual characteristics of managers and leadership style (Luo, 2005; Beamish, 2006; Li *et al.*, 2009; Chambers, 2015; Strese *et al.*, 2016; Phookan, 2020).

Previous studies provide many single internal drivers of intrafirm cooperation. Therefore, the list of internal cooperation determinants is long and varied, but also fragmented. However, factors that stand out are related to the resource endowment of a unit (Birkinshaw & Lingblad, 2005; Chambers, 2015), its interdependence (Luo, 2005; Chambers, 2015), centralization (Birkinshaw & Lingblad, 2005; Strese *et al.*, 2016) and implemented strategy (Chambers, 2015; Li *et al.*, 2009; Luo, 2005). Along with implemented strategy, corporate group peculiarities support the view that organizational design or – in a broader sense – organizational conditions (Becker-Ritterspach & Dörrenbächer, 2011) are the most important drivers of intrafirm cooperation. These drivers include (1) internal ecosystems (Letaifa, Gratacap, & Isckia, 2013), in which individual subsidiaries follow common vision and simultaneously reach their own goals, (2) coordination mechanisms halfway between market and hierarchy (Altomonte & Rungi, 2013) and (3) internal solutions enabling resource sharing (Hsieh, Yeh, & Chen, 2010). Thus, we formulate the following hypothesis:

H2. Corporate strategy and organizational design are two of the most important corporate-group-specific drivers of cooperation.

Corporate-group-specific drivers dominate over environmental factors

The literature review proved that we may identify both external (environmental) and internal (corporate-group-specific) drivers of cooperation within a corporate group. However, we will argue that the key drivers of intrafirm cooperation are mostly related to corporate group features.

Corporate group is a collection of entities that operate strategically in multiple markets under common control and ownership. It includes the parent company, direct/indirect subsidiaries and associated companies, each with a separate legal identity (Ho, 2012). Corporate groups have a specific organizational model (Colpan & Cuervo-Cazurra, 2018) which is halfway between market and hierarchy (Altomonte & Rungi, 2013). The modern perspective of corporate groups (especially international ones) highlights their hybrid configurations which adopt market- and hierarchy-like mechanisms and structures (Cerrato, 2006). It means that external and internal incentives for cooperation within a corporate group may be equally important. A distinctive feature of corporate groups is that, on the one hand, they provide incentives for cooperation among units, but on the other hand, they do not relinquish the advantages of market-like competition between the entities. Corporate groups are networks of entities cooperating regularly over long periods (Powell & Smith-Doerr, 1994), but they also intentionally or unintentionally compete (Mierzejewska, 2023). This paradoxical internal characteristic of a corporate group fosters cooperation. Moreover, the concept of subsidiaries' internal embeddedness emphasizes the importance of an internal environment (Ciabuschi, Dellestrand, & Martín, 2011) that creates different opportunities and threats, influencing strategic options for the subsidiaries' managers (Birkinshaw & Lingblad, 2005) and

shaping cooperative and competitive pressures. Thus, we hypothesize that for intrafirm competition within corporate groups, internal environment is more important than the external one:

- H3.* Corporate-group-specific drivers better explain the phenomenon of cooperation between subsidiaries within a corporate group than environmental factors.

Methodology

Sample and data collection

To analyze drivers of intrafirm competition within a corporate group, we used a survey database of 121 corporate groups in Poland sourced from databases of corporate groups whose parent companies are listed on the Warsaw Stock Exchange (WSE). We selected this group of entities for several reasons. First, corporate groups are very complex entities that engage in cooperation between subsidiaries (Mierzejewska, 2020; Mierzejewska & Dziurski, 2023). Second, we chose entities listed on the WSE because it gathers the biggest companies that are very often organized in the form of a corporate group. Third, the sample of entities listed on the WSE gives us access to reliable data that are obligatorily published by every listed company. Fourth, we focused on a single-country analysis to avoid differences in definitions of a corporate (business) group between countries (Claessens, Fan, & Lang, 2006). The single-country analysis can mitigate endogeneity problems that arise from institutional differences between countries (Byun, Choi, Hwang, & Kim, 2013). Moreover, previous studies consider cooperation as a country-dependent strategy (Czakon, Mucha-Kuś, & Rogalski, 2014; Dorn *et al.*, 2016). We focus on Polish corporate groups because there is a lack of studies on cooperation in young economies as the vast majority of cooperation studies refer to well-developed countries (Feela, 2020).

The research was conducted between October 2018 and December 2019. First, we identified 277 corporate groups (excluding financial ones) listed on the WSE based on an extensive analysis of documents published by all entities listed on the WSE. The research was carried out on 121 corporate groups randomly selected from the set of all identified corporate groups. The response rate was 43.68%.

Corporate groups included in the study were moderately differentiated. The sample consisted mainly of large corporate groups (62.0%) with more than 250 employees from manufacturing industries (38.8%), along with the wholesale and retail trade or repair of motor vehicles and motorcycles industries (14.9%) with an international scale of operations (73.6%). Domestic shareholders (81%) of a corporate group dominated the sample alongside individual (44.6%) and industry (32.2%) shareholders.

The research focused on investigating the perception of drivers of intrafirm cooperation by adopting the perspective of the whole corporate group (Becker-Ritterspach & Dörrenbächer, 2011). To capture the perception of different drivers influencing intrafirm cooperation within a corporate group, we relied on a questionnaire survey (Tsai, 2002). All data were acquired from surveys with top managers of parent companies via a standardized questionnaire. We first tested the survey in a pilot study and then used for the top managers from the sample group of entities. We used the CATI (Computer-Assisted Telephone Interviewing) method, which is a well-established tool that allows for systematic and standardized analysis. Additional data and control variables like industry, employee number, shareholders and area of operations were acquired from the Amadeus database and financial statements published by corporate groups.

Measures

The literature review reveals different factors influencing cooperation between subsidiaries within corporate groups. However, it does not provide enough evidence to surmise the

importance of such determinants of cooperation. The literature review showed that no one has ever analyzed internal and external drivers of cooperation on intrafirm level within corporate groups in a single study, so we decided to create a scale of new items (Table 1). All items were evaluated in respect of their impact on simultaneous competition and cooperation between subsidiaries within a corporate group. The study applied a modified five-point Likert scale ranging from 1 “very low impact” to 5 “very high impact,” with the addition of point 0, which meant “no impact.”

Following Czakon, Klimas, Kawa and Kraus (2023), we assessed the reliability, content, face, convergent and discriminant validity of the new scale of intrafirm cooperation drivers. The scale of new items was created based on the literature review, then we discussed and readjusted it in the research team and with external methodological consultants. We conducted the pilot study to confirm that all questions in the questionnaire are well understood by respondents. This process led to several items being dropped or added to ensure content and face validity. Then, we tested the scale’s reliability. We applied Cronbach’s alpha, as we treated the entire set of 18 questions as a single construct measuring

Variable	Referecne	Measure
External drivers (environmental drivers of intrafirm cooperation)		
Level of development of the technological environment (e1)	Birkinshaw and Lingblad (2005), Chen <i>et al.</i> (2020), Dziurski (2023)	The modified five-point Likert-type scale (1 – very low impact, 5 – very high impact) with the additional rate 0 meaning no impact
Customer preferences (e2)	Birkinshaw and Lingblad (2005), Chambers (2015)	
Industry innovation (e3)	Dziurski (2023)	
Industry internationalization (e4)	New item*	
Industry maturity (e5)	Birkinshaw and Lingblad (2005)	
Globalization (e6)	New item*	
Intensity of competition in the industry (e7)	Birkinshaw and Lingblad (2005), Chambers (2015)	
Access to capital (e8)	New item*	
Internal drivers (corporate-group-specific drivers of intrafirm cooperation)		
Internationalization of the corporate group (i9)	Chambers (2015), Luo (2005)	The modified five-point Likert-type scale (1 – very low impact, 5 – very high impact) with the additional rate 0 meaning no impact
Corporate group age (i10)	Strese <i>et al.</i> (2016)	
Corporate group size (i11)	Strese <i>et al.</i> (2016)	
Implemented strategy (i12)	Chambers (2015), Li <i>et al.</i> (2009), Luo (2005)	
Structure of the corporate group (i13)	Strese <i>et al.</i> (2016), Li <i>et al.</i> (2009), Song <i>et al.</i> (2016)	
Interdependence of units (i14)	Chambers (2015), Luo (2005)	
Complexity of the corporate group (i15)	Li <i>et al.</i> (2009)	
Resource endowment of units (i16)	Birkinshaw and Lingblad (2005), Chambers (2015), Luo (2005), Tsai (2002), Li <i>et al.</i> (2009), Xing-xiu <i>et al.</i> (2013)	
Centralization of activities (i17)	Birkinshaw and Lingblad (2005), Cerrato (2006), Li <i>et al.</i> (2009), Strese <i>et al.</i> (2016)	
Characteristic of shareholders (i18)	New item*	

Table 1.
Variables used in the study

Note(s): * the scale was discussed and readjusted within the research team and with external methodological consultants and proceeded by the pilot study was. It led to several items being added

Source(s): Own elaboration

the influence of different drivers on cooperation. Cronbach's alpha was high and amounted to 0.835 (Cronbach & Meehl, 1955). Finally, to assess the convergent and discriminant validity, we implemented the approach based on composite reliability (CR) and average variance extracted (AVE) (Fornell & Larcker, 1981).

Methods

In the study presented, we applied factor analysis as an appropriate and popular method when dealing with large amounts of data in order to facilitate their interpretation (Harman, 1962). For our study, the most appropriate was exploratory factor analysis (EFA), as we investigated the structure of data.

One part of the questionnaire contained 18 questions related to external (e1–8) and internal (i9–18) drivers of cooperation between subsidiaries within a corporate group. As we sought to jointly identify the most important drivers in two groups, we performed the EFA for the entire set of variables.

Because data were of the ordinal type, the standard use of the EFA could have caused biased estimates. Lorenzo-Seva and Ferrando (2006) address this problem with their free software called FACTOR (Ferrando & Lorenzo-Seva, 2017). Our study used the software's latest version (10.10.03). As the assumption of normal distribution of variables (ordinal items) was violated, we performed the EFA based on polychoric correlations instead of the standard Pearson correlation coefficients (Muthén & Kaplan, 1992).

For the best results interpretation, we performed the EFA and further reasonable rotations available in the FACTOR software. We employed two methods for factor extraction: robust unweighted least squares (ULS) method and principal component analysis (PCA) (Youngblut, 1993). Next, we examined the number of rotations. The purpose of the rotations was to obtain more clearly differentiated factor loadings, which was necessary to facilitate interpretation. The Varimax rotation was intended to maximize the variance shared among items. By maximizing the shared variance, results more discretely represented how the data correlated with each factor. The maximization of variance meant that the squared correlation of items related to one-factor increases, while the correlation of any other factor decreased.

We set the number of extracted factors using the eigenvalue criterion, which needs to be greater than 1. In other words, the rationale for using the eigenvalue criterion was that each component should explain at least one variable's worth of variability, so the eigenvalue criterion states that only components with eigenvalues greater than 1 should be retained. To ensure good results validity, we only considered loadings above 0.5. The value of the threshold was based on sample size following Hair, Black, Babin and Anderson (2010), who suggest appropriate factor loadings value should depend on sample size. The sample size was 121, so the factor loadings had to be above 0.5.

Results

The list of drivers of cooperation within a corporate group consisted of 18 items, including both external and internal variables. Table 2 presents descriptive statistics for factors determining cooperation within a corporate group.

Eight drivers (e1, e2, e7, e8, i12, i13, i14 and i17) exhibited high average values of more than 2.5, which we may interpret as the relative importance of these categories for respondents. The mode showed that the dominant answers were e1, e4 and i12. In most cases, the distribution of answers was negative asymmetric (left-side) and with excess kurtosis (platykurtic distribution). The negative kurtosis is considered a "light-tailed" dataset. Preliminary analysis showed that the data set had no typical structure, so we had to engage in further exploration.

	Category	Mean	Confidence interval (95%)		Variance	Asymmetry	Kurtosis	Median	Mode
1	e1	3.066	2.75	3.38	1.797	-1.180	0.350	4	4
2	e2	2.744	2.44	3.05	1.728	-0.992	0.253	3	3
3	e3	2.281	1.93	2.64	2.301	-0.256	-1.017	3	3
4	e4	2.388	2.00	2.78	2.75	-0.581	-1.386	3	4
5	e5	2.050	1.73	2.37	1.865	-0.404	-1.143	2	3
6	e6	2.339	2.01	2.66	1.927	-0.270	-0.633	3	3
7	e7	2.992	2.66	3.33	2.074	-0.806	0.047	3	3
8	e8	2.686	2.31	3.06	2.563	-0.390	-0.680	3	3
9	i9	1.975	1.62	2.33	2.272	-0.396	-1.576	3	3
10	i10	1.702	1.41	2.00	1.581	-0.302	-1.554	2	3
11	i11	2.496	2.21	2.78	1.473	-0.969	0.003	3	3
12	i12	2.835	2.49	3.18	2.121	-0.793	-0.313	3	4
13	i13	2.554	2.21	2.90	2.164	-0.640	-0.546	3	3
14	i14	2.777	2.44	3.11	2.041	-0.938	-0.108	3	3
15	i15	2.455	2.16	2.75	1.620	-0.831	-0.336	3	3
16	i16	2.471	2.15	2.79	1.869	-0.722	-0.674	3	3
17	i17	2.587	2.26	2.91	1.945	-0.853	-0.602	3	3
18	i18	2.240	1.89	2.59	2.199	-0.158	-1.034	3	3

Source(s): Own elaboration

Table 2.
Descriptive statistics
for factors determining
cooperation with a
corporate group

The next step in the research process was the EFA, applied to reveal patterns in relationships of variables. As mentioned above, we investigated different options of the factor model, but we finally obtained the best interpretation in applying the EFA based on robust ULS, normalized Varimax rotation and polychoric correlations.

Moreover, we performed Bartlett's test of sphericity and the Kaiser–Meyer–Olkin (KMO) test, which indicated the suitability of data for structure detection. The value of Bartlett's statistic was 718.5 ($p = 0.000010$), while the value of the KMO test was 0.66. Thus, both test results suggested that the data may be grouped into a smaller set of underlying factors, thus supporting the use of factor analysis.

Table 3 illustrates the factor analysis results and presents the proportion of variance of the analyzed variables explained by six common factors. The first common factor accounted for 27% of the variance, second for 10%, third and fourth for 8% each, fifth for 7% and sixth for 6%. Furthermore, we tested for the common method bias (CMB) (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) by using Harman's single-factor test (Kraus, Rigtering, Hughes, & Hosman, 2012). The potential CMB was of no concern in the study as the total variance for one factor was less than 50%.

Factors	Eigenvalue	Proportion of variance	Cumulative proportion of variance
F1	4.88	0.27	0.27
F2	1.84	0.10	0.37
F3	1.51	0.08	0.45
F4	1.46	0.08	0.53
F5	1.12	0.07	0.60
F6	1.02	0.06	0.66

Source(s): Own elaboration

Table 3.
Proportion of variance
explained by common
factors

The rotated loading matrix (rotation normalized Varimax) for six common factors is presented in Table 4.

The first (F1) and third (F3) common factors accounted for 13% and 11% of the variance of analyzed variables, and they could be interpreted as general and comprehensive, related mostly to the environment of a corporate group and its competitiveness. The first common factor (F1) was the most closely related to e3 and e4, while the third common factor (F3) – to e1 and e7. The other common factors (F2, F4, F5 and F6) accounted for 42% of variance and seemed to link to corporate group characteristics. The second factor (F2) was related to i11 and i16, the fourth common factor (F4) – to i14, the fifth factor (F5) – mostly to i18 and the sixth factor (F6) – to i10.

Moreover, we performed reliability diagnostics. Table 5 presents the CR and AVE for all common factors as well as Cronbach's alpha for the variables in the first, second and third common factors.

Variable	F1	F2	F3	F4	F5	F6
Proportion of variance	0.13	0.12	0.11	0.11	0.10	0.09
1 e1			<i>0.565</i>			
2 e2					0.345	
3 e3	<i>0.814</i>					
4 e4	<i>0.760</i>					
5 e5						0.397
6 e6						0.379
7 e7			<i>0.617</i>			
8 e8			<i>0.478</i>			
9 i9						
10 i10						<i>0.789</i>
11 i11		<i>0.943</i>				
12 i12	0.419				0.330	
13 i13		0.424				
14 i14				<i>0.910</i>		
15 i15				<i>0.454</i>		
16 i16	0.381	<i>0.565</i>				
17 i17				0.455	0.306	-0.311
18 i18					<i>0.958</i>	

Note(s): Loadings lower than 0.3 in absolute value are omitted, loadings above 0.5 are italic

Source(s): Own elaboration

Table 4.
Rotated loading matrix
for common factor
analysis

Factor	Variable	CR	AVE	Cronbach alpha
F1	e3	0.765	0.620	0.798
	e4			
F2	i11	0.742	0.604	0.700
	i16			
F3	e1	0.518	0.350	0.500
	e7			
F4	i14	0.828	0.828	
F5	i18	0.918	0.918	
F6	i10	0.623	0.623	

Source(s): Own elaboration

Table 5.
CR and AVE for all
common factors and
Cronbach's alpha for
the variables in the
first, second and third
common factors

Fornell and Larcker (1981) recommend the CR value of 0.6 or more and AVE greater than 0.5. Our results achieve this in all cases except for F3 (e1 and e7), which showed lower values. Thus, these two variables are differentiated on a level that does not justify their representation in one common factor.

The common factor analysis revealed that among environmental drivers of cooperation, the most important ones were e3 and e4. We decided to exclude e1 and e7 as the values of CR and AVE for the third factor were too low. Therefore, H1 was rejected because the study showed only the importance of industry innovation and internationalization, with the visible irrelevance of other items closely related to environmental uncertainty, such as the level of technological environment development, globalization, or the intensity of competition in the industry.

The factor analysis results partly supported H2. The common factor analysis revealed that among the specific drivers of corporate groups, the most important ones were i10, i11, i14, i16 and i18. We hypothesized that the corporate strategy and organizational design of corporate groups are two of the most important corporate-group-specific drivers of intrafirm cooperation. However, we discovered that implemented strategy does not matter, while drivers like resource endowment of units, interdependence of units and corporate group size (F2 and F4) – that can be classified as organizational design drivers – account for 23% of the variance. Moreover, the age of a corporate group and shareholder characteristics are found to be important internal drivers of intrafirm cooperation.

The factor analysis results support H3, which posited that corporate-group-specific characteristics better explain the phenomenon of cooperation between subsidiaries within a corporate group than environmental factors. Four factors were related to corporate group characteristics and explained 42.6% of the variance. Thus, we may state that drivers related to corporate group characteristics are more important and followed by those related to the environment.

Discussion

Most of the cooperation research focuses on interfirm relationships, while intrafirm cooperation remains greatly underresearched (Gernsheimer *et al.*, 2021). We argue that for a complete understanding of the cooperation phenomenon, scholarship must scrutinize not only interfirm but also intrafirm cooperation. Our study advances the cooperation research by exploring intrafirm cooperation and answering what induces cooperation within corporate groups. To identify the critical factors of intrafirm cooperation, we implemented a factor analysis that covered 18 external (environmental) and internal (corporate-group-specific) drivers of simultaneous competition and cooperation within a corporate group. In this section, we will discuss our findings with the existing literature on intrafirm cooperation drivers, however fragmented it is.

Previous studies proved that environmental uncertainty is one of the most important external drivers of cooperation (Gnyawali & Part, 2011). Our research did not confirm this claim. We found that only industry internationalization and innovation pressures motivate managers to pursue cooperation in corporate groups. Other items are irrelevant. These items are commonly associated with environmental uncertainty in the literature, like the technological advancement of industry, competition intensity, or globalization (Birkinshaw & Lingblad, 2005; Chen *et al.*, 2022). Their irrelevance allows us to highlight the difference between interfirm and intrafirm cooperation mentioned by previous studies (Bengtsson & Raza-Ullah, 2016). Klimas, Czakon and Fredrich (2022) point to customer demand and technology development as the important drivers of interfirm cooperation, while our study does not appreciate them. This study included customer preferences and the level of development of technological environment, but they were not revealed as important drivers

in the EFA. However, they have a high average and also a high mode (Table 2) – in the case of the development level of technological environment – which shows that these factors are not without importance for respondents. These factors may indirectly promote simultaneous competition and cooperation between units in corporate groups by increasing innovation and internationalization pressures exerted by the external environment. Therefore, cooperation research needs to focus more on external drivers to fully understand the factors promoting and hindering intrafirm cooperation.

Prior research conceptualizes a wide range of internal drivers of intrafirm cooperation (Luo, 2005). The factor analysis allowed us to empirically identify the critical drivers among the set of items related to corporate-group-specificity. We found that the most important group of internal drivers can be labeled “organizational design” or, more broadly, “organizational conditions” (Becker-Ritterspach & Dörrenbächer, 2011). This corresponds with other studies, which foreground the role of organizational design for internal cooperation (Schmid & Maurer, 2008; Li *et al.*, 2009; Seran *et al.*, 2016; Strese *et al.*, 2016), but we advance those studies with the large sample research that identified three critical drivers of intrafirm cooperation related to organizational design: resource endowment of units, interdependence of units and corporate group size. Interestingly, this study found no evidence to support the importance of centralization to intrafirm cooperation. The irrelevance of centralization disagrees with previous findings, which showed the negative impact of centralization on intrafirm relationship (Tsai, 2002; Strese *et al.*, 2016).

This study demonstrated that resource endowment is a critical driver not only to interfirm (Klimas *et al.*, 2022) but also intrafirm cooperation. Bengtsson and Raza-Ullah (2016) claim that interfirm and intrafirm cooperation differ despite sharing certain commonalities. We support their assertion by showing that similarities between interfirm and intrafirm cooperation refer to resource necessity. Moreover, we support previous claims regarding the importance of resource scarcity and its use in complex organizations (Xing-xiu *et al.*, 2013), arguing that resource necessity is a critical driver of cooperation between units, particularly in corporate groups. Resources in a corporate group are often possessed by the parent company and key subsidiaries, which leads to cooperative behaviors revealed by the units insufficiently equipped with the resources they require to fulfill their goals. This agrees with international business studies that indicate the units’ resource dependency on parent companies (Gurkov, 2015).

Moreover, cooperation in corporate groups is driven by the interdependence of units understood as work processes interrelations. It surfaces in numerous mutual relationships that result from different strategic roles assigned to subsidiaries (Luo, 2005). Following Luo’s (2005) intrafirm cooperation conceptualization, this study revealed that the interdependence of units is an important driver of cooperation in corporate groups. Our results foreground the internal ecosystem and network theory perspective of a corporate group, which portrays the group as a differentiated interorganizational network of units naturally engaged in different relationships (Khanna & Rivkin, 2006). We elaborate on this perspective by providing evidence for the importance of units’ interdependence and its role in the facilitation of internal cooperation and competition.

Furthermore, prior studies strongly refer to implemented strategy as an important internal driver of intrafirm cooperation (Phelps & Fuller, 2000; Luo, 2005; Li *et al.*, 2009). Our factor analysis rejects the importance of strategy in this case, although as Table 2 clearly shows, the implemented strategy has both high average and mode, showing that still does hold some importance. Our study does not support the results of others, but the scope of their research was different, as previous studies focused on international strategy (Li *et al.*, 2009; Chambers, 2015) while our study sought more general patterns. Moreover, cooperation is an industry-specific strategy (Czakov *et al.*, 2014), so scholarship must examine strategies specific to industry.

Moreover, the age of a corporate group and shareholder characteristics were found to be important internal drivers of intrafirm cooperation. These drivers are closely related to organizational design drivers. First, organizational design evolves as the corporate group ages. Second, shareholders can influence the organizational design via corporate governance mechanisms. These drivers were not examined in prior studies, be it conceptual (Luo, 2005) or empirical research (Strese *et al.*, 2016; Liu *et al.*, 2019). Hence, our study supplemented the list of intrafirm cooperation drivers.

This study showed that external determinants may facilitate cooperation to some extent, albeit internal drivers explain the phenomenon of intrafirm cooperation better than environmental ones. Our factor analysis proved that corporate-group-specific drivers are of great importance, which enriches Luo's (2005) conceptualization of intrafirm cooperation by empirically confirming the importance of internal characteristics of a corporate group in inducing internal cooperation. Moreover, our findings support arguments by Bengtsson and Raza-Ullah (2016) regarding differences between cooperation on different levels.

Prior studies on interfirm cooperation show that the main drivers of simultaneous competition and cooperation stem from industry characteristics (Padula & Dagnino, 2007; Bouncken & Fredrich, 2012; Dorn *et al.*, 2016; Dziurski, 2020; Klimas *et al.*, 2022), but our findings proved internal factors to be more important than external drivers of cooperation. Hence, the difference between interfirm and intrafirm cooperation appears to refer to the source of its main determinants. This enriches cooperation theory by showing that intrafirm cooperation differs from interfirm cooperation not only due to difference in nature and dynamics (Bengtsson & Raza-Ullah, 2016), power distribution that influences intrafirm relationships (Bendig *et al.*, 2018), or different aims of internal simultaneous cooperation and competition compared to external one (Seran *et al.*, 2016). After all, intrafirm cooperation is motivated by different drivers than the interfirm one.

Conclusions

Similarly to interfirm cooperation, intrafirm cooperation is driven by both internal and external factors (Klimas *et al.*, 2022). However, there are differences in the importance of drivers in each type of cooperation, such as the distinct conceptualizations of each type of cooperation (Bengtsson & Raza-Ullah, 2016). We proved that among internal drivers, the most important are those related to organizational design, particularly resource endowment and the interdependence of units. Moreover, we found that only industry internationalization and innovation are relevant drivers of intrafirm cooperation. Other items related to environmental uncertainty were not confirmed as important for the EFA. Moreover, we argue that corporate-group-specific factors of intrafirm cooperation outweigh those related to environmental drivers.

Our study contributes both to theory and practice. First and most importantly, the study contributes to the intrafirm cooperation theory, especially in the context of corporate groups. In a comprehensive and quantitative manner, this study showed that cooperation in corporate groups is internally driven by organizational design as its most important driver. Moreover, our results revealed that corporate-group-specific factors are necessary, while external factors may be seen as supplementary and not obligatory for cooperation to occur. Hence, we provided a multilevel view on intrafirm cooperation drivers that was not implemented in the previous studies.

Second, our study contributes to the cooperation theory by revealing differences (but also some commonalities) in intrafirm and interfirm cooperation drivers. The recent work by Klimas *et al.* (2022) shows that interfirm cooperation can be called a technology-driven strategy to meet customer demand with lesser importance of internal drivers. Meanwhile, our study shows the opposite logic: internal drivers appear to be more important than external

ones. Hence, we support Bengtsson and Raza-Ullah (2016) in their view that each type of cooperation requires a distinct conceptualization to be fully understood.

Third, our study makes a methodological contribution (Gnyawali & Song, 2016). Because previous studies focused on individual factors of intrafirm cooperation or determinants of either cooperation or competition, this study employed a newly developed scale of drivers of intrafirm cooperation within a corporate group. Thus, our study contributes to the cooperation research methodology. Like Klimas *et al.* (2022), we used a survey to identify how top managers of corporate groups simultaneously perceive and evaluate internal and external factors of intrafirm cooperation. We used the EFA to identify the most important external and internal factors of intrafirm cooperation in corporate groups.

Fourth, our study provides vital implications for business practice, by highlighting the importance of organizational design to stimulate cooperation within a corporate group. Managers should especially focus on internal features of a corporate group to successfully manage cooperation, but they should also control the environment, as it is yet another influence on cooperation. Cooperation within corporate groups may be either planned or unintentional, so awareness of these important factors is not only crucial to the implementation of a deliberate cooperation strategy but also to avoid the disadvantages of unplanned cooperation between subsidiaries.

Although our study has realized its goal, it carried unavoidable limitations. First, we examined a relatively small sample of corporate groups, and we collected data only for just one year. Expanding the research sample to numerous observations over a longer period would allow future studies to investigate whether these findings hold. Second, the study focused on corporate groups in Poland, so studying a larger population of entities from different institutional environments would allow future studies to address additional questions on the nature of cooperation and the impact of factors that determine this relationship. Third, we only examined the opinion of top managers from parent companies. A survey that considers opinions from managers of both parent companies and subsidiaries would allow scholars to produce a more complete and objective overview of issues of intrafirm cooperation drivers. Fourth, we did not proceed with our scale's nomological validity, as we could not test the directional relationship between variables. Thus, further validation of the scale was needed. Finally, there appeared statistical and data limitations. The data in the study were obtained before the disruption of Polish market caused by the coronavirus disease 2019 (COVID-19) pandemic and the Russian invasion of Ukraine, which could have influenced the perception of intrafirm cooperation drivers. Moreover, the data were subjective in nature, as we focused on examining the perception of managers regarding the influence of various drivers of internal cooperation within a corporate group.

Therefore, we identify a potential for further studies in expanding the sample both in the period of analysis and the number of observations. Moreover, we see new directions for studies on cooperation in corporate groups. Specifically, what would help to better understand the dynamics of cooperation is the analysis of industry type as well as the institutional environment. Furthermore, we argue that a more detailed focus on drivers of intrafirm cooperation within a corporate group would be another interesting direction of future research. While this study confirmed the crucial role of organizational design and two environmental drivers, the matter requires further elaboration.

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