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Determinants of collaborative hybrid organisations in the construction industry of the Republic of Croatia

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Abstract: Given that the literature indicates a lack of cooperation and outdated supply chains in construction, which are based mainly on short-term relationships and coordination through price, hybrid organisations between major contractors and subcontractors in construction in Croatia were investigated. The study aimed to define the determinants of collaborative hybrid organisations in the construction industry of the Republic of Croatia, and to investigate the motives and obstacles to their emergence as well as their differences with respect to control variables. Determinants, motives and obstacles are defined by detailed secondary research of theoretical works, while the differences between them are determined by the results of variance analysis. The research indicates that construction companies do not organise their upstream parts of supply chains only on the authority and position of power, but also use other management mechanisms, especially collaboration based on trust.

Keywords: hybrid organisations, collaboration, construction supply chain

1 Introduction

The research context of this paper is set in one industry in the sense of industrial organisation as a discipline because industry specifics play a significant role in proving any assumptions about the factors influencing organisational design. As such, the construction industry in the Republic of Croatia is observed, and is characterised by cyclicality, labour intensity and project orientation. It is a highly fragmented and competitive industry characterised by offering deals with the lowest price model that is repeated throughout the supply chain. Due to the significant share and value of construction work that construction companies do not perform independently, the complexity and risk of the construction process is transferred upstream to business networks, clusters or hybrid organisational models with subcontractors, whose importance is thus raised.

So far, research on the construction supply chain concept has focussed more on the relationship between the main contractor and the client, while the impact of subcontractors has been neglected. Therefore, shifting the emphasis from the supply chain (directed to price-quality ratios to the customer) to a hybrid organisation directed to organising the relationship with subcontractors can improve project quality and execution times, and impact business performance.

The content of this paper consists of five parts and focuses on defining the determinants of hybrid relationships between subcontractors and the main contractor and examining their differences and obstacles and motives for their emergence. The first part is an introduction which talks about the context of research, followed by the second part that gives the definition of a hybrid organisation and the determinants of hybrid organisations that base their coordination mechanisms on collaboration. The third part conceptualises collaborative hybrid organisations. The fourth part elaborates on the sample structure and research results, while the fifth part provides concluding remarks and recommendations.

2 Theoretical background

2.1 Hybrid organisations

Hybrid organisations are diverse organisational solutions, i.e. variations of relatively permanent business

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connections (goods and information flows) between technological units that statutory-legally belong to independent legal entities. They are mainly based on agreements, and the ownership connection of the entities appears. This creates a management structure that combines elements of the price mechanism and hierarchy and shares and exchanges technology, products, services and capital. Thus, they find their position on the **continuum** of organisational solutions between price-coordinated markets and orders-coordinated hierarchies. Organisational solutions are the result of an efficient match between the transaction attributes and the most relevant governance structure (Raynaud et al. 2019).

Hybrid organisations have been studied since the end of the last century through the perspectives of various theories. Economic organisation from the perspective of transactional theory is studied on the principle of the contractual concept. Only the organisation of the transaction, i.e. feasible and unfeasible ways of contracting, distinguish the assumptions of limited rationality and opportunism (Willamson 1989, 139), while efficiency determines the way of managing the transaction. The efficiency or minimisation of resource allocation costs is determined by the characteristics of the transaction (Willamson 1985, p. 41), of which the specificity of assets is particularly important.

Menard (2008, p. 297, 2018) points out that long-term contractual relations or hybrids will be realised when stronger coordination is needed than markets can provide, and yet investments between partners are specific enough to create contractual risks without justifying integration.

If hybrid organisations are observed from the perspective of resource theories, it is necessary to focus on scarce, difficult to mimic and substitute resources (Barney 1991). By using such resources that are outside the company, the value of the organisation is maximised. Pfeffer and Salancik (2003, p. 144) link coordination between organisations with the possibility of controlling interdependence. Organisations create hybrid connections with the environment by drawing resources from it, avoiding control and stabilising outcomes.

The relational view focuses on the relationship between organisations. This relationship, which is characterised by a special way of management, is a critical resource of a hybrid organisation. Such relational management is characterised by joint action and harmonisation with the use of relational norms mechanisms that protect inter-organisational relations and achieve common goals. The processes and routines of these relationships between organisations represent the value of the relationship.

2.2 Collaborative hybrid organisations

Hybrid organisations collaborate through vast number of collaboration mechanisms (Duong and Chong 2020), such as mutual trust of partners, lower levels of opportunism, commitment, joint problem solving, joint planning and open communication.

Trust is fundamental element for collaboration (Dubey et al. 2019). It is a security mechanism that is not time-limited. It reduces the level of opportunism and enables the realisation of specific investments, i.e. pooling of resources with significantly lower transaction costs (Dyer 1997). Trust as a way of dealing with uncertainty and opportunism stems from past actions, social ties and the concerned partner's reputation. It is a belief in the moral integrity and good intentions of others that is created through interpersonal interactions, which lead to psychosocial links of common norms of feeling and friendship (Homans 1962 – according to Ring and Van de Ven 1994).

The coordination mechanism of collaborative hybrid organisations is based on the exchange of information with separate ownership and decision-making. Information exchanged in in-depth relational relationships typically consists of data on profitability, production costs, strategic directions and organisational practices (Uzzi 1997). Parties in deeper relationships are oriented towards maintaining a relationship with a partner and wish him success, and therefore actively provide information on potential threats and opportunities (McEvily and Marcus 2005).

Hybrid organisations based on the collaboration of companies through the supply and value network explore ways to constantly innovate and improve the delivery of products and services to customers in a profitable way. It is an approach to interdependence management that requires unity and pooling of knowledge and higher levels of joint decision-making, goal setting and information sharing in order to achieve common and individual goals (Zacharia et al. 2009). Collaboration and long-term orientation increase the networking between organisations (Uddin et al. 2020).

Such organisations require constant investment and work. They must be encouraged and protected and are based on investments in routines, which share knowledge between companies and the specific assets of the relation.

These investments will create greater potential for relational rents (Dyer and Singh 1998). The incentive to create added value outside the original agreement is found in the security of fair distribution of relational rents.

When collaborating, companies do not play the zero-sum game, i.e. the benefits of one must not spill over into the losses of the other, and their sum of benefits must be positive, i.e. the benefits must be mutual.

High levels of collaboration between companies are achieved by close functionally interdependent relationships (Jap 2001), and coordinated efforts between customers and suppliers distinguish true collaborative relationships from market ones (Jap 1999). These relationships are crucial since companies become acquainted with each other and thus better understand the ways in which they conduct operations. This will also reduce the number of partners as companies single out companies with the greatest potential (Bhote 1987 – according to Handfield and Bechtel 2002) to create synergies that create beneficial results for all, including greater value for the end customer. Working with fewer partners reduces transaction costs. The level of fear of opportunism decreases due to the expectation of long-term collaboration and an increase in the exchange volume, while the repetition of collaboration provides more opportunities to correct inequalities and thus reduce the costs of negotiations. By entering into deeper collaborative relationships at a higher level, companies increase the level of knowledge with which they jointly solve problems and take advantage of opportunities that they could not explore and utilise on their own. Businesses create alliances to manage dependence but this is done with companies in a trusted social position (Pfeffer and Salancik 2003, xviii).

Moreover, it should be noted that such relationships based on trust cost money because they involve the opportunity cost of an unrealised opportunity to work with a partner who offers lower prices for products and services when it arises (Dyer 1997).

Through strategic networking and organisational and business transformation, which is manifested in the construction and maintenance of network relationships based on trust and long-term commitment, companies create a number of benefits for members of the hybrid organisation. This management based on social relations stands in contrast to the classic form of management based on contractual relations. Therefore, business owners and management should consider the determinants of strategic networking when defining their business strategies (Morić Milovanović 2013, 2014).

Organisations collaborate to gain access to combinations of resources that create new or improved capabilities, which enable organisations to do things they cannot do on their own (Hardy et al. 2003), as well as strengthen the organisational capability to muster the required resources, improve the financial position and carry out the relevant service improvements after a need has arisen to respond and recover following a disruption (Duong and Chong 2020). Collaboration with other companies also brings the necessary expertise (Hara et al. 2003). Dyer (1997) points out that production networks that simultaneously realise the benefits of specialisation of assets and lower transaction costs have an effective advantage over less specialised networks with higher transaction costs. Also, companies within supply chains with a higher level of collaboration gain a competitive advantage over supply chains with a lower level of collaboration (Themistocleous et al. 2004; Myhr and Spekman 2005). They have a positive impact on a company's financial performance (Vickery et al. 2003; Wisner 2003; Johnston et al. 2004) and reduce the bullwhip effect (Holweg et al. 2005).

Therefore, the strategic effect of collaboration is focussed primarily on the withdrawal and transfer of all types of resources that the company finds in its environment.

3 Conceptual model

The review and analysis of previous research by Wang and Wei (2007), Liao et al. (2010), Omar et al. (2012), Wu et al. (2014), Zheng et al. (2019), Huo et al. (2020) and Pandiyan Kaliani Sundram et al. (2020) observed the positive impact of different forms of hybrid organisations management based on long-term connectivity, integration, partnership and collaboration on the business performance of the company, especially its flexibility. Therefore, for the purposes of this paper, the model of hybrid organisation is formed based on the characteristics of collaboration that is lacking in hybrid organisations in construction. The conceptualisation itself was performed through the variables *Relational Governance* (*RG*), *Level of Information Sharing* (*LIS*) and *Subcontractor Network Design* (*SND*), which are characterised as essential determinants of hybrid organisations. They enable the functioning of an efficient business model by which the main contractor structures the upstream business network of companies and activities, creates a communication system that will enable the flow and sharing

of information and manages the relationship with the subcontractor network.

3.1 Relational governance

Relational governance research is focussed on establishing mechanisms for maintaining and controlling relational transactions. A relational transaction has its own history and longer duration and reflects an ongoing process, as opposed to a discrete transaction that is short and has an exact beginning and end (Dwyer et al. 1987 – according to Morgan and Hunt 1994). Relational governance is defined as the use of mechanisms such as relational norms and joint actions used by supply chain partners to preserve relationships based on common goals (Heide and John 1992; Josi and Campbell 2003 – according to Wang and Wei 2007). It influences opportunistic behaviour through relational norms that are in fact bilateral expectations that transactional partners will help each other for the duration of their relationship (Larson 1992, p. 96 – according to Josi and Campbell 2003). These are all activities aimed at achieving, developing and maintaining a successful relational transaction, and are based on formal, contractual and legal informal psychosocial processes. These processes must be kept balanced if long-term collaboration is to be achieved (Ring and Van de Ven 1994; Handfield and Bechtel 2002). Relational governance of personal relationships that develop between transactional parties shapes the structures of collaborative inter-organisational relationships. Higher levels of collaboration and closer inter-organisational relations are characterised by higher levels of commitment (Kanter 1994), joint decision-making, setting common goals (Lee and Choi 2003; Zacharia et al. 2009) and higher levels of trust (Zaheer and Venkatraman 1995; Johnston et al. 2004). Relational and contractual governance are both effective at reducing transaction cost as well as in improving relationship performance (Filatotchev et al. 2020 – according to Wang et al. 2021)

Trust is one of the most significant RG mechanisms (Zheng et al. 2019). It is a way of dealing with uncertainty through a belief in the moral integrity and good intentions of others that are created through interpersonal interactions that lead to psychosocial links of common norms of feeling and friendship (Homans 1962 – according to Ring and Van de Ven 1994). Mutual trust helps run construction processes smoothly, provides flexibility to deal with uncertainty, increases efficiency, maintains long-term relationships (Lau and Rowlinson 2010) and enables organisations to be open to potential value creation through resource sharing and combining (Kim et al. 2010). An atmosphere of collaboration and trust enables effective and useful action without much discussion and thus ensures a quick and non-bureaucratic response in critical situations (Lönngren et al. 2012).

Joint problem solving is the degree to which transaction partners share responsibility for maintaining relationships and problems that arise over time (Heide and Miner 1992; p. 275 – according to McEvily and Marcus 2005). Relational relationships between transaction partners have routines that solve problems as they arise. Joint problem-solving arrangements enable learning through an exchange relationship, because transactional parties do not leave the relationship when a problem arises but resolve it by receiving direct feedback on activities and operations (McEvily and Marcus 2005). Joint problem solving creates mutually satisfactory solutions and contributes to the success of the relationship, and can serve as a management process that controls the transactional relationship and encourages collaboration between companies (Wang and Wei 2007).

Operational coordination is related to the day-to-day, operational and tangible elements of managing multiple flows between the main contractor and subcontractors at the project level. It achieves better synchronisation of short-term flows, and manipulation of materials and works on the construction site (Swink et al. 2007). Focussing on time and production plans and jointly establishing project milestones and making them visible will enable greater involvement of participants in project execution (Salem et al. 2006). Its goal is to properly and efficiently manage the interdependent flows of materials, information and finances. It is clear that by coordinating all participants in the construction process, especially subcontractors, operational activities are performed efficiently and effectively. Coordination of the internal functions of the company and effective connection with the external operations of the supplier and the customer is the basis of an effective supply chain (Vickery et al. 1999).

Commitment is a lasting desire of the main contractor to maintain a valuable relationship with the subcontractor (Moorman et al. 1993). It is a partner's belief that an ongoing relationship with the other party is so important that it will guarantee the sustenance of maximum effort (Morgan and Hunt 1994). Transaction parties have identified commitment as key to achieving valuable outcomes (Morgan and Hunt 1994), with flexibility being one of them.

For the purposes of this paper, the operationalisation of the variable *RG* was performed using a numerical

indicator containing 21 statements, 12 of which were taken from Wang and Wei (2007) and adapted for the construction industry and further expanded with 9 own statements. The measurement was performed using a 5-point Likert rating scale (1 = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, and 5 = strongly agree).

3.2 Level of information sharing

The LIS implies a quantitative aspect of effective information communication between partners in a hybrid network. It is the degree to which each party discloses information that can facilitate the other party's activities (Heide and Miner 1992, p. 275 – according to McEvily and Marcus 2005). Information sharing is a component of a successful hybrid network, and Moberg et.al (2002) divide it into operational and strategic. Operational information sharing includes short-term quantitative information that reduces order times, stock levels, or customer satisfaction. Strategic information sharing covers long-term qualitative sensitive information related to business strategies that improve collaboration among network partners. Information exchanged in in-depth relational relationships typically include data on profitability, production costs, strategic directions and organisational practices (Uzzi 1997). Information sharing improves supply chain learning (Huo et al. 2020) and performance (Zhang et al. 2019, Pandiyan Kaliani Sundram et al. 2020). In order for the flow of products and services, i.e. the construction process itself, to be efficient and effective, companies must share information, thus enabling them to benefit from a combination of resources that they do not have within the boundaries of their own organisation. If the information flow takes precedence over the flow of goods in the supply chain, there is the possibility for the decline of inventory levels needed to be maintained, and efficient use of resources (Graham and Hardaker 2000 – according to Sezen 2008). Supply chain partners who regularly exchange critical and proprietary information are able to act as one body (Stein and Sweat 1998). After a disruption takes place, organisations constituting a supply chain need to share information to improve decision-making, better match demand and supply, and improve performance (Shen et al. 2019). As the links between the main contractor and subcontractor network deepen, information sharing becomes more detailed. Parties in deeper relationships are oriented towards maintaining a relationship with a partner and wish him success and therefore actively provide information on potential threats and opportunities (McEvily and Marcus 2005).

In this paper, the operationalisation of the variable *LIS* was performed using a numerical indicator containing five statements taken from Li et al. (2006) and adapted for the construction industry. The measurement was performed using a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, and 5 = strongly agree).

3.3 Subcontractor network design

Subcontractor network design is the process of configuring the structure and relationships with subcontractors in a hybrid network and is one of the crucial factors affecting an organisation's operational flexibility. There is no single measure to express this variable and different authors apply different dimensions. Sezen (2008) implies that the structure refers to the number of suppliers and the strength or looseness of their bonds, whereas Sammadar et al. (2006) point out the vertical structure (number of levels), the horizontal structure (number of channels) and the location in the network. Supplier network design includes decisions on the number of subcontractors, their proximity, selection, evaluation, capacity planning, definition of contract terms and reaction to disagreements (Chopra and Meindl 2004 – according to Sezen 2008). Proximity and direct contracting with subcontractors indicate flatter and thinner structures, while the process of subcontractor selection and long-term cooperation with them indicate the main contractor turn towards key suppliers, which reduces their number and simplifies the structure. Major contractors in the construction industry often rely on a large number of multi-level subcontractors with relationships that are mostly based on the lowest cost of works. Such behaviour does not create the possibility of long-term coordination and collaboration between the main contractor and subcontractors (Speakman 1988). Yixuan et al. (2018) emphasise that project based collaborative networks become dense over the time. Many companies in other industries look for less intensive connections to reduce overall logistics costs and improve customer service (Kumar 1996 – according to Moberg et al. 2002), and have reduced the supply base to a few certified suppliers (Inman and Hubler 1992 – according to Ndubisi et al. 2005). Collaboration leads to a reduction in the number of suppliers as companies single out suppliers with the greatest potential for partnerships. This process is called supplier base optimisation (Bhote 1987 – according to Handfield and Bechtel 2002). Reducing the subcontractor base rests on a process of selecting key subcontractors, and relationships with them are characterised by mutual

trust, commitment, joint problem solving, joint planning and open communication (Speakman 1988; Handfield and Nichols 2002, pp. 15–17). Single sourcing leads to a reduction in uncertainty and costs due to economies of scale and increased collaboration and communication. Collaborative relationships are characterised by long-term connections with fewer subcontractors, resulting in simpler and flatter supply chain network structures. Extending the time horizon in which recurring transactions take place, i.e. creating long-term relationships with a network of subcontractors, reduces the likelihood of opportunistic behaviour due to the possibility of retaliation. From a game theory perspective, in long-term relationships, the common expectation of parties that there will be a recurrence of transactions provides an incentive for collaboration (Axelrod 1984; Telser 1987; Kreps 1990 – according to Sako 1992, p. 46).

Operationalisation of the variable *SND* was performed using an own numerical indicator containing 10 statements based on the long-term nature of the subcontractor relationship, clearly defined subcontractor selection criteria and their proximity and direct contact with the subcontractor. A 5-point Likert rating scale was used for the measurement (1 = strongly disagree, 2 = disagree, 3 = somewhat agree, 4 = agree, and 5 = strongly agree).

4 Research

4.1 Instrument and structure of the research sample

This empirical study was conducted on Croatian enterprises engaged in construction. The sample is based on a list of enterprises extracted from the Amadeus database. A total of 1,623 construction entities were found in the database, 200 of which were singled out and addressed in person or by e-mail. Respondents who completed the survey questionnaire were asked to forward it to their colleagues in other construction companies.

A total of 132 survey questionnaires had been collected, out of which two were not fully completed, and were thus removed from further analysis. Moreover, seven questionnaires were received from the same enterprise, in which case those from a respondent in a hierarchically higher position were taken for further statistical processing.

The research instrument used to collect primary data is divided into two parts.

The data obtained from the first part of the survey questionnaire were used for quantitative analysis and operationalisation of the variables of the conceptual model: '*Relational Governance*' (*RG*), '*Level of Information Sharing*' (*LIS*) and '*Subcontractor Network Design*' (*SND*).

The second part of the questionnaire (questions 14–23) collected general data on respondents (name and position in the enterprise) and enterprises (year of establishment, number of employees and headquarters) and data on the core area of business (building or infrastructure facilities, level in the supply chain and geographical distribution of business). The data are shown in the Tables 1–7.

Tab. 1: Respondents' function in enterprises.

Function	*F*	%
Senior management	77	62.6
Middle level management	32	26.0
Lower level management	14	11.4
Σ	123	100.0

Source: Author.

Tab. 2: Distribution of enterprises by headquarters.

Headquarters	*F*	%
Zagreb	32	26.0
Karlovac County	24	19.5
Primorje-Gorski Kotar County	9	7.3
Split-Dalmatia County	8	6.5
Osijek-Baranja County	8	6.5
Zagreb County	7	5.7
Istria County	6	4.9
Brod-Posavina County	5	4.0
Bjelovar-Bilogora County	4	3.2
Vukovar-Syrmia County	4	3.2
Zadar County	4	3.2
Požega-Slavonia County	3	2.4
Varaždin County	3	2.4
Šibenik-Knin County	2	1.6
Dubrovnik-Neretva County	1	0.8
Koprivnica-Križevca County	1	0.8
Krapina-Zagorje County	1	0.8
Sisak-Moslavina County	1	0.8
Σ	123	100.0

Source: Author.

Tab. 3: Sample structure by the legal entity of the enterprise.

Legal entity	*F*	%
LLC	94	76.4
SC	24	19.5
Others	5	4.1
Σ	123	100.0

Source: Author.

Tab. 4: Sample structure by the size of the enterprise (number of employees).

Enterprise size (number of employees)	*F*	%
0–40	40	32.5
40–100	42	34.1
100+	41	33.3
Σ	123	100.0

Source: Author.

Tab. 5: Sample structure by the status of the contractor in the value chain.

Status of the contractor in the value chain	*F*	%
Main contractor	84	68.3
Subcontractor	39	31.7
Σ	123	100.0

Source: Author.

Tab. 6: Sample structure by the type of construction projects in which enterprises participate.

Project type	*F*	%
Building	35	28.5
Infrastructure facilities	86	70.9
Others	2	1.6
Σ	123	100.0

Source: Author's processing.

Tab. 7: Sample structure by the location of construction projects in which enterprises participate.

Location of projects	*F*	%
Locally	60	48.8
The Republic of Croatia	53	43.1
Croatia and other countries	10	8.1
Σ	123	100.0

4.2 Differences of determinants of collaborative hybrid organisations

The results of the variance analysis are shown below, which tests the differences in the quality of *RG* of construction companies, the *LIS* and the *SND*.

Table 8 shows all the scales that constitute the variables of the researched model of this paper. The first variable, *RG*, consists of 21 scales. The second variable consists of five scales while the third consists of 10 scales. The same table also shows the impact of control variables: ownership form, company size and contractor status, with variance analysis showing that they have no significant effect on individual elements of independent variables except in the case of: '*Established routines between our company and subcontractors*' (p = 0.001), '*Openness in the sharing of ideas with the aim of solving problems*' (p = 0.001) and '*Retaining the same subcontractor for the purpose of the same types of work*' (p = 0.001). Furthermore, as can be seen in Table 10, no statistically significant differences were found at the aggregate level of the independent variables with respect to ownership, company size and main contractor status. Table 9 shows the level of affirmation that accompanies each scale depending on the ownership form of the company, its size according to the number of employees and the contractor status. All statements were on average affirmative except for the four statements in the '*RG*' category, two statements in the '*LIS*' category and three statements in the '*SND*' category. The statement '*We stayed with our subcontractor because we feel like part of his family*' was statistically significantly affirmative only in the case of small companies (up to 40 employees) (μ = 3.50; p = 0.002) and those companies that participate in projects as subcontractors (μ = 3.59; p = 0.001). The statement '*We stayed with our subcontractor because we were attracted to the issues he supported as a company*' was not statistically significantly affirmative in the case of joint-stock companies (μ = 3.58; p = 0.010) and medium-sized companies (40–100 employees) (μ = 3.44; p = 0.008). The statement '*Subcontractors have sacrificed for us on past projects*', although positive on average, was not statistically significantly affirmative in any subgroup of the company (μ = 3.27; p = 0.109, μ = 3.13; p = 0.524, μ = 3.38; p = 0.045, μ = 3.17; p = 0.313, μ = 3.22; p = 0.152, μ = 3.20; p = 0.043; μ = 3.36; p = 0.099). Furthermore, in the subgroup of joint-stock companies, the following statements were not statistically significantly affirmative: '*Different opinions are resolved to mutual satisfaction*' (μ = 3.92; p = 0.110), '*We inform subcontractors in advance about changes in our needs*' (μ = 3, 91; p = 0.032), '*We inform each other about events and changes that may have an impact on other partners*', (μ = 4.04; p = 0.266) and '*Cooperation with our subcontractors has a long-term character*' (μ = 4.33; p = 0.396). Also, medium-sized and large companies and those in the status of the main contractor did not statistically significantly affirm the following statements: '*We contract the same type of work with one subcontractor*' (μ = 3.24; p = 0.215, μ = 2.90; p = 0.617, μ = 3.12; p = 0.352) and '*We use informal guarantees with our subcontractors*' (μ = 3.29; p = 0.123, μ = 2.88; p = 0.453, μ = 3.11; p = 0.359).

Tab 8: Differences in *RG*, *LIS* and *SND* with regard to legal form, company size and contractor status (scales individually).

		Legal form			Size of the company				Contractor status		
		Ltd	JSC	*p*	MP	SP	VP	*p*	GI	PI	*p*
RELATIONAL GOVERNANCE	We can count on our subcontractor to keep their promises	3.78	3.58	0.504	3.88	3.60	3.76	0.273	3.71	3.79	0.600
	We can count on the honesty of our subcontractor in doing business with our company	3.77	3.67	0.306	4.03	3.64	3.65	0.030	3.73	3.87	0.332
	Our subcontractor is a company that keeps its word	3.89	3.52	0.073	4.08	3.67	3.75	0.059	3.76	3.97	0.177
	We have full confidence in the motives of the subcontractors	3.86	3.79	0.539	4.15	3.60	3.78	0.015	3.79	3.95	0.347
	Subcontractors are open to us	3.81	3.70	0.798	4.08	3.62	3.73	0.036	3.78	3.85	0.701
	The relationship built with subcontractors is based on a fair relationship	4.20	4.17	0.927	4.40	4.12	4.07	0.136	4.13	4.33	0.191
	We stayed with our subcontractor because we feel like we are part of his family	3.28	2.92	0.198	3.50	3.12	3.07	0.140	3.06	3.59	0.009
	We stayed with our subcontractor because we were attracted to the issues they supported as a company	3.63	3.58	0.841	3.95	3.44	3.51	0.033	3.50	3.92	0.024
	We expect that the relationship and cooperation with the subcontractor will last for several projects	4.37	3.96	0.039	4.50	4.19	4.24	0.185	4.27	4.38	0.483
	Subcontractors are committed to our cooperation	3.89	3.67	0.244	4.18	3.67	3.73	0.008	3.80	3.97	0.260
	Subcontractors have sacrificed for us on past projects	3.27	3.13	0.804	3.38	3.17	3.22	0.654	3.20	3.36	0.445
	The various jobs and work activities between our company and subcontractors fit together very well	3.94	3.63	0.170	4.05	3.83	3.76	0.173	3.80	4.05	0.073
	Employees of our company and subcontractors who had to work together did the job properly and efficiently	4.31	3.88	0.027	4.38	4.12	4.17	0.249	4.17	4.34	0.215
	Routines between our company and subcontractors are well-established	4.11	3.42	**0.001**	4.05	3.93	3.85	0.560	3.92	4.00	0.603
	Activities with subcontractors are well-coordinated	4.12	3.71	0.060	4.10	4.05	3.98	0.788	4.01	4.10	0.566
	Our subcontractors' enterprises and our enterprise complement each other very well	4.15	3.88	0.078	4.28	4.07	4.00	0.261	4.06	4.23	0.259
	When conflicts arise, our company and the concerned subcontractor would jointly find an appropriate solution	4.19	3.79	0.024	4.33	4.07	3.95	0.042	4.06	4.23	0.199
	If the subcontractor's execution was not in line with our expectations, we would help him or make a proposal	4.40	4.33	0.897	4.62	4.36	4.17	0.013	4.33	4.47	0.296
	When our company encountered construction problems, the subcontractor gave us helpful opinions	3.88	3.70	0.591	4.08	3.80	3.63	0.090	3.77	3.97	0.253
	We openly exchange ideas with a subcontractor in order to solve problems	4.22	4.04	0.268	4.58	4.05	3.95	**0.001**	4.12	4.34	0.179
	Divergent opinions are resolved to a mutual satisfaction	4.15	3.92	0.340	4.30	4.00	4.00	0.153	4.02	4.26	0.136
LEVEL OF INFORMATION SHARING	We inform subcontractors in advance about changes in our needs	4.10	3.92	0.471	4.28	3.98	3.90	0.102	4.01	4.13	0.464
	Our subcontractors share business knowledge with us about core business processes	3.86	3.29	0.013	4.03	3.64	3.56	0.036	3.60	4.05	0.006
	Our subcontractors inform us fully on issues that affect our business	3.61	3.29	0.078	3.79	3.52	3.41	0.128	3.49	3.74	0.136
	We share information with our subcontractors to help establish business planning	3.80	3.67	0.467	4.00	3.79	3.61	0.175	3.74	3.92	0.312
	We inform each other about events and changes that may have an impact on other partners	3.84	4.04	0.564	3.98	3.88	3.85	0.793	3.94	3.82	0.460

(*Continued*)

Tab 8: Continued

		Legal form			Size of the company				Contractor status		
		Ltd	JSC	*p*	MP	SP	VP	*p*	GI	PI	*p*
SUBCONTRACTOR NETWORK DESIGN	Direct contact with our subcontractors is important for our company	4.53	4.33	0.425	4.65	4.43	4.41	0.197	4.46	4.56	0.436
	We contract the same type of work with any one particular subcontractor	3.45	2.75	0.005	3.85	3.24	2.90	**0.001**	3.12	3.77	0.005
	We invest a lot of effort in building a good and close relationship with subcontractors	4.28	4.13	0.634	4.38	4.31	4.05	0.137	4.26	4.21	0.710
	We select our subcontractors according to clearly defined criteria	4.28	4.04	0.406	4.30	4.15	4.27	0.664	4.23	4.26	0.861
	Contracts with our subcontractors contain detailed specifications and adaptive clauses	3.89	3.92	0.672	3.92	3.90	3.88	0.978	3.89	3.92	0.865
	Cooperation with our subcontractors is repeated on several projects	4.41	4.29	0.394	4.68	4.24	4.27	0.015	4.30	4.59	0.048
	Cooperation with our subcontractors has a long-term character	4.32	4.33	0.831	4.58	4.24	4.20	0.044	4.29	4.44	0.313
	The intensity of cooperation with subcontractors is high	3.90	3.63	0.291	4.00	3.74	3.76	0.302	3.77	3.95	0.282
	Relationships with our subcontractors are very strong	3.88	3.67	0.049	4.13	3.71	3.78	0.034	3.81	4.00	0.199
	We use informal warranties with our subcontractors	3.38	2.79	0.044	3.70	3.29	2.88	0.003	3.11	3.67	0.009

Source: Author.
LIS, *Level of Information Sharing*; *RG*, *Relational Governance*; *SND*, *Subcontractor Network Design*.

4.3 Differences of motivations and obstacles to concluding collaborative hybrid organisations

The next part of the research examines the elements of motivation and obstacles that are the pros and cons of entering into collaborative relationships with subcontractors. Regarding the motives for concluding collaborative relations with subcontractors, the participants in the research commented on the nine statements offered. Variance analysis showed that the control variables did not have a significant impact on the motives for entering into a collaborative relationship. Although there were no statistically significant differences, the subgroup 'Limited Liability Companies' highlights the most important on average: *Operational flexibility* ($\mu = 4.43$), *Achieving lower costs with increased workload* ($\mu = 4.15$) and *Lack of own capacity* ($\mu = 4.12$). The subgroup 'Joint-Stock Companies' emphasises: *Complementarity of resources and synergy* ($\mu = 4.39$), *Lack of own capacities* ($\mu = 4.33$) and *Operational flexibility* ($\mu = 4.21$). The subgroup 'Small and Medium-sized Enterprises' respectively emphasises: *Operational flexibility* ($\mu = 4.48$, $\mu = 4.33$), *Achieving lower costs with increased workload* ($\mu = 4.15$, $\mu = 4.19$) and *Competitive advantage* ($\mu = 4.15$, $\mu = 4.17$). The subgroup 'Large Enterprises' emphasises: *Operational flexibility* ($\mu = 4.27$), *Complementarity of resources and synergy* ($\mu = 4.24$) and *Lack of own capacities* ($\mu = 4.20$). The subgroup 'Main Contractor' emphasises: *Operational Flexibility* ($\mu = 4.31$), *Achieving lower costs with increased workload* ($\mu = 4.10$) and *Competitive Advantage* ($\mu = 4.08$). The subgroup 'Subcontractor' emphasises: *Operational Flexibility* ($\mu = 4.31$), *Lack of own capacity* ($\mu = 4.10$) and *Competitive advantage* ($\mu = 4.08$) (see Table 11). Also, as can be seen in Table 13, it was confirmed that there existed a statistically significant affirmation of all the above statements related to the motives for concluding collaborative relations with subcontractors.

Regarding the obstacles to concluding collaborative relations with subcontractors, the participants in the research responded to the six statements offered. Variance analysis found that control variables did not have a significant impact on obstacles to collaborative relationships. Although there were no statically significant differences, the subgroup 'Limited Liability Companies' points out as the most important on average: *Satisfaction with market relations based on price* ($\mu = 3.4$). The subgroup 'Joint-Stock Companies' emphasises: *Satisfaction with market relations based on price* ($\mu = 3.61$), *Information leakage* ($\mu = 3.39$) and *Risk of subcontractors taking over customers and becoming competitors* ($\mu = 3.23$). The subgroup 'Small and Medium-sized Enterprises',

Tab. 9: Importance of *RG*, *LIS* and *SND* with regard to legal form, company size and contractor status.

		Legal form				Company size						Contractor status			
		Ltd	*p*	JSC	*p*	MP	*p*	SP	*p*	VP	*p*	GI	*p*	PI	*p*
RELATIONAL GOVERNANCE	We can count on our subcontractor to keep their promises	3.78	0.000	3.58	0.001	3.88	0.000	3.60	0.000	3.76	0.000	3.71	0.000	3.79	0.000
	We can count on the honesty of our subcontractor in doing business with our company	3.77	0.000	3.67	0.000	4.03	0.000	3.64	0.000	3.65	0.000	3.73	0.000	3.87	0.000
	Our subcontractor is a company that keeps its word	3.89	0.000	3.52	0.007	4.08	0.000	3.67	0.000	3.75	0.000	3.76	0.000	3.97	0.000
	We have full confidence in the motives of the subcontractors	3.86	0.000	3.79	0.000	4.15	0.000	3.60	0.000	3.78	0.000	3.79	0.000	3.95	0.000
	Subcontractors are open to us	3.81	0.000	3.70	0.001	4.08	0.000	3.62	0.000	3.73	0.000	3.78	0.000	3.85	0.000
	The relationship built with subcontractors is based on a fair relationship	4.20	0.000	4.17	0.000	4.40	0.000	4.12	0.000	4.07	0.000	4.13	0.000	4.33	0.000
	We stayed with our subcontractor because we feel like we are part of his family	3.28	**0.012**	2.92	**0.732**	3.50	0.002	3.12	**0.472**	3.07	**0.680**	3.06	**0.595**	3.59	0.001
	We stayed with our subcontractor because we were attracted to the issues they supported as a company	3.63	0.000	3.58	**0.010**	3.95	0.000	3.44	**0.008**	3.51	0.002	3.50	0.000	3.92	0.000
	We expect that the relationship and cooperation with the subcontractor will last for several projects	4.37	0.000	3.96	0.000	4.50	0.000	4.19	0.000	4.24	0.000	4.27	0.000	4.38	0.000
	Subcontractors are committed to our cooperation	3.89	0.000	3.67	0.001	4.18	0.000	3.67	0.000	3.73	0.000	3.80	0.000	3.97	0.000
	Subcontractors have sacrificed for us on past projects	3.27	**0.019**	3.13	**0.524**	3.38	**0.045**	3.17	**0.313**	3.22	**0.152**	3.20	**0.043**	3.36	**0.099**
	The various jobs and work activities between our company and subcontractors fit together very well	3.94	0.000	3.63	0.002	4.05	0.000	3.83	0.000	3.76	0.000	3.80	0.000	4.05	0.000
	Employees of our company and subcontractors who had to work together did the job properly and efficiently	4.31	0.000	3.88	0.015	4.38	0.000	4.12	0.000	4.17	0.000	4.17	0.000	4.34	0.000
	Routines between our company and subcontractors are well-established	4.11	0.000	3.42	0.000	4.05	0.000	3.93	0.000	3.85	0.000	3.92	0.000	4.00	0.000
	Activities with subcontractors are well-coordinated	4.12	0.000	3.71	0.000	4.10	0.000	4.05	0.000	3.98	0.000	4.01	0.000	4.10	0.000
	Our subcontractors' enterprises and our enterprise complement each other very well	4.15	0.000	3.88	0.000	4.28	0.000	4.07	0.000	4.00	0.000	4.06	0.000	4.23	0.000
	When conflicts arise. our company and subcontractor would jointly find an appropriate solution	4.19	0.000	3.79	0.000	4.33	0.000	4.07	0.000	3.95	0.000	4.06	0.000	4.23	0.000
	If the subcontractor's execution was not in line with our expectations. we would help him or make a proposal	4.40	0.000	4.33	0.000	4.62	0.000	4.36	0.000	4.17	0.000	4.33	0.000	4.47	0.000
	When our company encountered construction problems, the subcontractor gave us helpful opinions	3.88	0.000	3.70	0.000	4.08	0.000	3.80	0.000	3.63	0.000	3.77	0.000	3.97	0.000
	We openly exchange ideas with a subcontractor in order to solve problems	4.22	0.000	4.04	0.000	4.58	0.000	4.05	0.000	3.95	0.000	4.12	0.000	4.34	0.000
	Divergent opinions are resolved to a mutual satisfaction	4.15	0.000	3.92	**0.110**	4.30	0.000	4.00	0.000	4.00	0.000	4.02	0.000	4.26	0.000

(*Continued*)

Tab 9: Continued

		Legal form				Company size						Contractor status			
		Ltd	*p*	JSC	*p*	MP	*p*	SP	*p*	VP	*p*	GI	*p*	PI	*p*
LEVEL OF INFORMATION SHARING	**We inform subcontractors in advance about changes in our needs**	4.10	0.000	3.92	**0.032**	4.28	0.000	3.98	0.000	3.90	0.000	4.01	0.000	4.13	0.000
	Our subcontractors share business knowledge with us about core business processes	3.86	0.000	3.29	0.001	4.03	0.000	3.64	0.000	3.56	0.000	3.60	0.000	4.05	0.000
	Our subcontractors inform us fully on issues that affect our business	3.61	0.000	3.29	0.000	3.79	0.000	3.52	0.000	3.41	0.001	3.49	0.000	3.74	0.000
	We share information with our subcontractors to help establish business planning	3.80	0.000	3.67	0.000	4.00	0.000	3.79	0.000	3.61	0.000	3.74	0.000	3.92	0.000
	We inform each other about events and changes that may have an impact on other partners	3.84	0.000	4.04	**0.266**	3.98	0.000	3.88	0.000	3.85	0.000	3.94	0.000	3.82	0.000
SUBCONTRACTOR NETWORK DESIGN	Direct contact with our subcontractors is important for our company	4.53	0.000	4.33	0.000	4.65	0.000	4.43	0.000	4.41	0.000	4.46	0.000	4.56	0.000
	We contract the same type of work with any one particular subcontractor	3.45	0.000	2.75	0.000	3.85	0.000	3.24	**0.215**	2.90	**0.617**	3.12	**0.352**	3.77	0.000
	We invest a lot of effort in building a good and close relationship with subcontractors	4.28	0.000	4.13	0.000	4.38	0.000	4.31	0.000	4.05	0.000	4.26	0.000	4.21	0.000
	We select our subcontractors according to clearly defined criteria	4.28	0.000	4.04	0.000	4.30	0.000	4.15	0.000	4.27	0.000	4.23	0.000	4.26	0.000
	Contracts with our subcontractors contain detailed specifications and adaptive clauses	3.89	0.000	3.92	0.001	3.92	0.000	3.90	0.000	3.88	0.000	3.89	0.000	3.92	0.000
	Cooperation with our subcontractors is repeated on several projects	4.41	0.000	4.29	0.001	4.68	0.000	4.24	0.000	4.27	0.000	4.30	0.000	4.59	0.000
	Cooperation with our subcontractors has a long-term character	4.32	0.001	4.33	**0.396**	4.58	0.000	4.24	0.000	4.20	0.000	4.29	0.000	4.44	0.000
	The intensity of cooperation with subcontractors is high	3.90	0.000	3.63	0.000	4.00	0.000	3.74	0.000	3.76	0.000	3.77	0.000	3.95	0.000
	Relationships with our subcontractors are very strong	3.88	0.000	3.67	0.002	4.13	0.000	3.71	0.000	3.78	0.000	3.81	0.000	4.00	0.000
	We use informal warranties with our subcontractors	3.38	0.000	2.79	0.000	3.70	0.000	3.29	**0.123**	2.88	**0.453**	3.11	**0.359**	3.67	0.001

Source: Author.

LIS, *Level of Information Sharing*; *RG*, *Relational Governance*; *SND*, *Subcontractor Network Design*.

Tab. 10: Differences in *RG*, *LIS*, *SND*, *Operational flexibility* and *Enterprise performance* with regard to legal form, company size and contractor status (aggregate).

	Legal form			Company size				Contractor status		
	Ltd.	JSC	*p*	MP	SP	VP	*p*	GI	PI	*P*
RG	3.91	3.91	0.97	3.96	3.91	3.88	0.83	3.95	3.86	0.42
LIS	3.82	3.77	0.75	3.87	3.70	3.89	0.40	3.83	3.78	0.69
SND	3.97	4.00	0.83	4.01	3.96	4.01	0.90	4.06	3.86	0.07

Source: Author.

LIS, *Level of Information Sharing*; *RG*, *Relational Governance*; *SND*, *Subcontractor Network Design*.

Tab. 11: Differences in the importance of motives for concluding collaborative relations with subcontractors with regard to the legal form, company size and the contractor status.

	Legal form					Company size							Contractor status				
	Ltd	R	JSC	R	*p*	MP	R	SP	R	VP	R	*p*	GI	R	PI	R	*p*
Access to new technologies	3.95	6	3.92	6	0.889	4.08	7	3.98	6	3.76	8	0.288	3.90	6	4.00	5	0.599
Achieving lower costs with increased workload	4.15	**2**	4.17	4	0.923	4.15	2	4.19	2	4.10	4	0.866	4.20	**2**	4.03	4	0.247
Operational flexibility	4.43	**1**	4.21	**3**	0.138	4.48	**1**	4.33	1	4.27	1	0.337	4.38	**1**	4.31	**1**	0.558
Cost-sharing	3.85	9	3.71	9	0.525	4.05	8	3.81	7	3.61	9	0.122	3.77	9	3.92	7	0.428
Risk reduction	3.95	7	3.92	7	0.890	4.10	5	3.76	8	3.90	5	0.252	3.90	7	3.95	6	0.816
Competitive advantage	4.09	4	4.04	5	0.822	4.15	3	4.17	3	3.83	7	0.102	4.04	5	4.08	**3**	0.797
Complementarity of resources and synergy	4.06	5	4.39	**1**	0.076	3.98	9	4.12	5	4.24	2	0.306	4.20	**3**	3.92	8	0.064
Reputation	3.91	8	3.83	8	0.670	4.13	4	3.69	9	3.85	6	0.054	3.88	8	3.90	9	0.911
Lack of own resources	4.12	**3**	4.33	**2**	0.223	4.10	6	4.17	4	4.20	3	0.852	4.18	4	4.10	**2**	0.612

Source: Author.

Tab. 12: Differences in the importance of obstacles in collaboration with subcontractors regarding the legal form, company size and the contractor status.

	Legal form					Company size							Contractor size				
	Ltd	R	JSC	R	*p*	MP	R	SP	R	VP	R	*p*	GI	R	PI	R	*p*
Satisfaction with market relations based on price	3.4	**1**	3.61	**1**	0.371	3.33	**1**	3.43	**1**	3.63	**1**	0.383	3.46	**1**	3.46	**1**	0.985
Subcontractor dependence	2.87	5	3.21	4	0.165	3	4	2.93	4	3	4	0.94	3	**3**	2.92	6	0.710
Loss of discretion in decision-making	2.98	**2**	3.13	5	0.557	3.13	**2**	2.93	5	3	5	0.717	2.98	4	3.1	**2**	0.553
Risk of subcontractors taking over customers and becoming competitors	2.81	6	3.23	**3**	0.134	2.88	5	2.9	6	2.87	6	0.99	2.85	6	2.95	5	0.680
Information leakage	2.95	**3**	3.39	**2**	0.091	3.1	**3**	2.98	**3**	3.03	**3**	0.885	3.01	**2**	3.08	**3**	0.771
Legal uncertainty	2.93	4	3.13	6	0.458	2.88	6	3.05	**2**	3.07	**2**	0.711	2.98	5	3.05	4	0.741

Source: Author.

respectively, emphasises: *Satisfaction with market relations based on price* ($\mu = 3.33$, $\mu = 3.43$), *Legal uncertainty* ($\mu = 3.05$, $\mu = 3.07$) and *Information leakage* ($\mu = 3.10$, $\mu = 2.98$). The subgroup 'Large Enterprises' emphasises: *Satisfaction with market relations based on price* ($\mu = 3.63$), *Legal uncertainty* ($\mu = 3.07$) and *Information leakage* ($\mu = 3.03$). The 'Main Contractor' subgroup emphasises: *Satisfaction with price-based market relations* ($\mu = 3.46$), *Information leakage* ($\mu = 3.01$) and *Subcontractor dependence* ($\mu = 3.00$). The 'Subcontractor' subgroup emphasises: *Satisfaction with price-based market relations* ($\mu = 3.46$), *Loss of discretion in decision-making* ($\mu = 3.10$) and *Information leakage* ($\mu = 3.08$) (See Table 12). Also, as can be seen in Table 13, no statistically significant affirmation of the above statements related to obstacles to concluding collaborative relationships with subcontractors was confirmed, except in the case of the statement: *Satisfaction with market relations based on price* ($p = 0.000$).

Tab. 13: Statistical significance of affirmation of motives and obstacles in collaborative relations (sorted by size).

	μ	p
MOTIVES		
Operational flexibility	4.36	0.000
Lack of own capacities	4.15	0.000
Achieving lower costs with increased workload	4.15	0.000
Complementarity of resources and synergy	4.11	0.000
Competitive advantage	4.05	0.000
Access to new technologies	3.93	0.000
Risk reduction	3.92	0.000
Reputation	3.89	0.000
Cost-sharing	3.82	0.000
OBSTACLES		
Satisfaction with market relations based on price	3.46	0.000
Information leakage	3.03	**0.747**
Loss of discretion in decision-making	3.02	**0.869**
Legal uncertainty	3.00	**1.000**
Subcontractor dependence	2.98	**0.799**
Risk of subcontractors taking over customers and becoming competitors	2.88	**0.282**

Source: Author.

5 Conclusion and recommendations

Analysing the differences in the determinants of hybrid organisations: *Relational Governance, Level of Information Sharing* and *Subcontractor Network Design* with regard to legal form, company size and contractor status at an individual level, it can be said that limited liability companies have more established routines in comparison with joint-stock companies, and that the size of the company (measured by the number of employees) is negatively correlated with open sharing of ideas in order to solve problems and the tendency to continue using the services of any one particular subcontractor for the same types of work arising in the future. It should also be noted that at the group level of variables, no statistically significant differences were found regarding the ownership form, company size and the contractor status or control variables are not important for the formation of collaborative hybrid organisations between business entities. When examining the affirmation of individual claims by which collaborative hybrid relationships were operationalised, it can be noticed that the respondents were positive about most of the claims. All this points to the exercise of collaborative hybrid relationships between companies in the construction industry. Construction companies do not organise their upstream parts of supply chains only on the authority and position of power, but also use other management mechanisms, especially collaboration based on trust.

Control variables did not have a significant impact on obstacles to achieving collaboration and the most important obstacle is *Satisfaction with market relations based on price*, which is also the only one that is statistically significantly affirmative, and this indicates the importance and use of organising transactions in the construction industry in this way. Such a price-based transaction decision-making mechanism can be largely present as a tool for testing and examining the market and real prices. Statistically significant differences in the motives for concluding collaborative hybrid organisations were not noticed and the most important motive is *Operational flexibility* for all groups except for joint-stock companies for which it is *Complementarity of resources and synergy*. *Operational flexibility* as the main motive for organising hybrid relationships indicates the importance of operational actions and activities and putting the construction process in the strategic focus of the respondents.

Detailed secondary research of transaction cost theory, resource dependence theory and relational view and their unification and operationalisation defined the determinants of collaborative hybrid organisations, which contributed to the expansion of the theoretical corpus of the concept of hybrid organisational forms.

The motives and obstacles identified in the present study for the conclusion of collaborative hybrid organisations will help management structures in correcting their way of doing business, solving business problems and using the benefits provided by hybrid organisations. Managers in this temporary-nature project-based industry should form more long-term complex networks between the main contractor and subcontractors. Also, their main motive should be transferred more from operational to strategic level.

The limitations of the conducted research are the basis and foundation of recommendations for future research. The first limitation of this research stems from the method of collecting the data, as well as sample size, which reduces the possibility of generalising the obtained research results to the entire population, and which, however, does not preclude the possibility of drawing certain conclusions.

Another limitation of the research stems from the fact that the constructs were measured using the perceptions of the respondents. Thus, the researcher relies entirely on the assessment of only one respondent within the organisation, which can lead to a biased, subjective view of the matter.

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