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Use of Control Mechanisms and Collaborative Performance: Effects of Relational Risk and Trust

ABSTRACT

Objective: This study analyzes the mediating effect of relational risk and trust in the relationship between the use of control mechanisms and collaborative performance between auto parts manufacturers and vehicle assemblers.

Method: A survey was carried out with 107 professionals from auto parts manufacturing companies and for date analysis, structural equation modeling and fuzzy-set qualitative comparative analysis were applied.

Results: The results reveal that the use of control mechanisms positively influences collaborative performance and trust and negatively influences relational risk. There was no mediation of relational risk between control mechanisms and collaborative performance, unlike trust, which showed partial mediation. Three solutions deliver greater collaborative performance: control mechanisms associated with trust; control mechanisms in environments with no relational risk; and presence of asset specificity in relationships with relational risk.

Theoretical/Methodological contributions: This study contributes to the literature by jointly investigating the effects of relational risk and trust in the relationship between control mechanisms and collaborative performance, whose constructs so far have been addressed in isolation and the findings are contradictory and inconclusive; it also reveals the complementarity between control and trust mechanisms for a better collaborative performance in the supplier-buyer relationship in the automotive sector.

Social/management contributions: The results show how control and governance mechanisms can contribute to collaborative performance, to manage relational risks and improve the relationship between supplier and buyer, as organizations need complementary resources from other organizations.

Keywords: Control mechanisms. Relational risk. Trust. Collaborative performance.

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1 INTRODUCTION

Interorganizational relationships emerged as an alternative to increase the competitiveness of organizations in dynamic environments (Dyer & Singh, 1998). In the literature of accounting, they have become a focus of research given the implications on managerial control (ex: Dekker, 2004; Dekker, Sakaguchi & Kawai, 2013; Huang & Chiu, 2018; Dekker, Donada, Mothe & Nogatchewsky, 2019; Zhang, Jin & Yang, 2020). These relationships range from simple sale and purchase relationships to strategic alliances between partner companies, which can occur horizontally, between organizations that need complementary resources, or vertically, between suppliers and customers (Weber & Heidenreich, 2018).

These relationships are characterized by instabilities arising from uncertainty about the partner's future behavior, defined by Das and Teng (1996) as relational risk. To mitigate this risk, companies can employ control mechanisms, of contractual or relational nature, that promote better collaborative performance (Liu, Luo & Liu, 2009), and governance mechanisms such as trust (Abdullah & Khadaroo, 2020). In this study, trust is a psychological state that encourages mutually acceptable behaviors to deal with expected (or not) issues (Abdullah & Khadaroo, 2020).

Control and trust are mechanisms that can improve organizational performance (Emsley & Kidon, 2007; Free, 2008). Still, the relationship between the two is disputed in the literature (Abdullah & Khadaroo, 2020; Das & Teng, 2001b; Langfield-Smith, 2008). On the one hand, they are seen as mutually exclusive, so that control inhibits trust and vice versa (Dekker, 2004). On the other hand, they are often considered complementary to achieve better performances (Emsley & Kidon, 2007).

Dekker *et al.*. (2013) verified how trust and managerial control practices are employed in Interorganizational risk management, but did not delve into their effects on performance. Other theoretical studies have addressed the relationship between risk, trust and control in interorganizational relationships (Das & Teng, 1996; Das & Teng, 2001b; Nooteboom, 2004). However, few empirical studies have analyzed the effect of control mechanisms on risk perception and trust, and the combination of management practices that improve performance in risk environments (Dekker *et al.*., 2013; Dekker, Donada, Mothe & Nogatchewsky, 2019; Langfield-Smith, 2008), such as collaborative performance, which represents the degree of success of a partnership and involves sharing resources such as information, knowledge, and infrastructure (Moshtari, 2016).

Other studies analyzing the relationship between control mechanisms and collaborative performance found contradictory results (Huang & Chiu, 2018). Some indicate a positive relationship between contractual and relational control mechanisms and collaborative performance (Joshi, 2009; Liu *et al.*., 2009; Huang & Chiu, 2018), others share the opposite perception (Jap & Ganesan, 2000, Nielsen, 2010). These results denote a gap that is ever-present in this very study, whose objective is to analyze the mediating effect of relational risk and trust in the relationship between the use of control mechanisms and collaborative performance between auto parts manufacturers and vehicle manufacturers. For that purpose, we investigated the perception of the supplier (manufacturers) on the relationship with their respective automaker (buyer), given the lack of studies that address this perspective.

Research in the automotive sector is justified by the economic relevance in Brazil, which represents 5% of the Gross Domestic Product (GDP) and more than 20% of the GDP of the industry, with the country standing as the tenth largest producer and eighth consumer market in the world (Daudt & Willcox, 2018). Despite being a mature segment, operating margins have been shrinking over time (Dyer & Hatch, 2006). Additionally, vertical

disintegration has brought new delineations to the relationship between supplier and buyer as a result of dependence on the relationship (Augusto, Souza & Carlo, 2018), such as a replacing traditional buying and selling relationships, of competitive and short-term nature, for collaborative and long-term strategic partnerships (Vanalle & Salles, 2011). There is also potential for power asymmetry, given that automakers have greater power over suppliers (Wilhelm & Sydow, 2018). This characteristic may indicate the need for control mechanisms to mitigate relational risk when it comes to auto parts manufacturers.

Organizations may find it difficult to work collaboratively with partner companies, which limits them to their own resources. This difficulty is compounded by the risk of partner organizations not cooperating as desired, which requires particular modes of management (Das & Teng, 2001b; Delerue, 2005). In addition, the retraction or slow growth of the automotive sector in Brazil, in some cases leading to extreme situations (such as that of Ford Motor Company, with the closure of vehicle production in the country), reinforce the challenges inherent to the sector, which include difficulty in following global trends and unfavorable economic scenarios (Barrucho, 2021). Thus, the need to understand the role of control mechanisms to mitigate risks and leverage performance is warranted.

This research contributes to the managerial literature by jointly investigating the effects of relational risk and trust on the relationship between control mechanisms and collaborative performance, as suggested by Dekker *et al.* (2013) and Ding, Dekker e Groot (2013), constructs which had been explored in isolation thus far, and highlight the complementary action between control and trust mechanisms in the context investigated. The study also offers practical contributions by demonstrating that the use of control mechanisms provides greater collaborative performance, increases trust and reduces relational risk in relationships between automakers and auto parts manufacturers.

2 THEORETICAL FRAMEWORK AND HYPOTHESES

The control mechanisms in this study are subdivided into contractual and relational controls. Contractual control, which concerns contracts established in a relationship, is incomplete in nature and rigid in structure, which does not allow for flexibility, adaptability and autonomy of partner companies (Heide, Wathne & Rokkan, 2007; Zhang *et al.*., 2020; Zhou & Xu, 2012). Although it does not contemplate all possible scenarios, contractual control reduces the likelihood of opportunistic behaviors (Anzilago & Beuren, 2022; Li, Xie, Teo & Peng, 2010) and offers legal protection to organizations in strategic alliances (Huang & Chiu, 2018). By making the relationship explicit, behavioral limits and expectations are stipulated (Parkhe, 1993). This control, therefore, represents a mechanism *ex ante* which ensures reciprocity between partners and complements relational control (Liu *et al.*., 2009).

Relational control accounts for informal aspects, such as shared norms from frequent and repeated interactions between the parties (Chakkol, Karatzas, Johnson & Godsell, 2018; Dekker *et al*., 2019; Zhang *et al*., 2020). It encourages long-term orientation, suppresses opportunism (Anzilago & Beuren, 2022; Das & Teng, 2001b; Liu *et al.*., 2009; Tangpong *et al.*., 2010) and facilitates the exchange of knowledge, which contributes to conflict resolution and collaborative performance (Day, Fawcett, Fawcett & Magnan, 2013). Especially in the construction and maturity phases of alliances, relational control provides greater collaborative performance (Huang & Chiu, 2018), which is enhanced when combined with contractual controls (Liu *et al.*., 2009).

Previous studies indicate a relationship between control mechanisms and collaborative performance, however, they point in opposite directions, especially with regard to contractual

control (Huang & Chiu, 2018; Jap & Ganesan, 2000; Joshi, 2009; Liu *et al.*., 2009; Nielsen, 2010). Nevertheless, the joint use of contractual and relational control mechanisms is expected to have a positive influence on collaborative performance, since contractual control provides a legal and institutional structure that guides and monitors the fulfillment of tasks and specifies the responsibilities of the parties involved, while relational control allows adaptation to change in the environment and encourages value creation activities (Liu *et al.*., 2009). Considering the abovementioned, we can assume that:

H_1: There is a positive effect of the use of control mechanisms on collaborative performance.

Strategic alliances are vulnerable to relational risk (Das & Teng, 2001b). According to Cheng (2011), relational risk refers to the probability of occurring opportunistic behaviors, dysfunctional conflicts and power asymmetry. Opportunism represents one of the main sources of relational risk, given that companies tend to pursue their own interests (Anzilago & Beuren, 2022). Dysfunctional conflict is characterized by the distortion of information that impairs decision-making, while power asymmetry refers to a company's control over the resources a partner needs (Das & Teng, 2001b).

In order to control exposure to relational risk, companies use contractual and relational control mechanisms as safeguards (Jap & Ganesan, 2000). Contractual control emphasizes social values and norms (Li *et al.*., 2010; Liu *et al.*., 2009), fosters relationship stability and involves behavior monitoring (Cao & Lumineau, 2015, Li *et al.*., 2010; Wang & Fulop, 2007). Researches highlight that relational risks persist throughout the life cycle of a strategic alliance. In the course of the relationship, organizational goals change (Anderson, Christ, Dekker & Sedatole, 2014; Dekker, 2004), which involve realignment of incentives, coordination of tasks and constant control (Schreiner, Kale & Corsten, 2009). Thus, we can suppose that:

H_2: There is a negative effect of the use of control mechanisms on relational risk.

Companies operating in supply chains and strategic alliances have not only production costs, but also transaction costs (Nooteboom, 1999) relative to resources spent to plan and monitor interactions with partners in order to ensure contractual terms are met (Williamson, 1991). These costs come from human and transactional factors described as behavioral assumptions and transaction attributes, addressed by Transaction Cost Theory (TCT) (Williamson, 1985). Agents have limited rationality, and informational asymmetry can be employed opportunistically (Augusto *et al.*., 2018; Williamson, 1973).

Thielmann (2013) states that transaction costs are defined by the uncertainties inherent to the process, the degree of frequency in which transactions take place and the specificity of the assets. According to Williamson (1985), asset specificity represents the dimension of greatest influence on transaction costs. According to Silva (2013), it refers to the value of investments made in specific assets that will only have relevance within the contractual relationship. Therefore, the investor will have losses if the contract is broken, which makes it subject to opportunism.

In the Brazilian automotive sector, there is a tendency to vertical disintegration, which leads to greater dependence and specificity of assets (Augusto *et al.*., 2018). Due to the dependence created, exposure to delays and opportunism increases, which induces a greater need for control mechanisms (Speklé, 2001; Dekker *et al.*., 2013). Asset specificity requires information sharing (Dekker *et al.*., 2013) and results in greater perception of

interorganizational risks (Langfield-Smith, 2008), which must be managed through control mechanisms (Anderson & Dekker, 2014; Dekker & Van den Abbeele, 2010). In view of this, we can suppose that:

H_3: Asset specificity negatively moderates the relationship between the use of control mechanisms and relational risk.

The use of control mechanisms in strategic alliances can contribute to collaborative performances among partners, especially if there is trust (Huang & Chiu, 2018; Liu *et al.*., 2009; Schreiner *et al.*., 2009). Moreover, the presence of relational risk can influence the positive effect that control mechanisms have on collaborative performances. Sources of relational risk such as opportunism, dysfunctional conflicts, and power asymmetry (Cheng, 2011) can hinder collaboration between partners, as the pursuit of self-interest prevails at the expense of the collective (Das & Teng, 2001a).

That way, even if control mechanisms provide superior collaborative performance (Day *et al.*., 2013; Huang & Chiu, 2018), under the presence of relational risk, this performance can be negatively affected. The perception of relational risk causes one of the parties to lose trust in the partner and thus fear being exploited for private and non-collaborative purposes. Thus, we theorize that:

H_4: Relational risk negatively mediates the relationship between use of control mechanisms and collaborative performance.

Control and trust are commonly seen as means for the success of interorganizational relationships (Emsley & Kidon, 2007; Free, 2008). However, the relationship between the two is complex, as research provides diverse and contradictory interpretations of how trust and control are related. Conflicting results, however, can be explained by other factors, such as life cycle phase and transaction characteristics of the strategic alliance (Abdullah & Khadaroo, 2020).

A well-known discussion concerns the substitute or complementary effect between control and trust: the substitute perspective states that control and trust are inversely related, so that high levels of trust are associated with limited control and that low levels of trust require greater control (Dekker, 2004); while the complementary perspective suggests that trust and control reinforce one another and contribute to interorganizational cooperation (Emsley & Kidon, 2007).

Coletti, Sedatole and Towry (2005) found that control mechanisms can increase the level of trust in partnerships. Similarly, Emsley and Kidon (2007) present the influence of control on the behavior of partner organizations in order to increase the level of trust between them, especially in the early stages of the relationship, during which there are no previous interactions that motivate mutual trust. The findings of Abdullah and Khadaroo (2020) reveal that control mechanisms did not undermine trust in a public-private partnership, as suggested by proponents of the substitute perspective, but contributed to trust building over time.

Although the topic remains relatively underexplored in the management accounting literature, there is potential to broaden understanding about the relationship between control and trust, both present in strategic alliances, in order to provide support for better managerial decisions (Nooteboom, Berger & Noorderhaven, 1997; Van der Meer-Kooistra & Vosselman 2000; Poppo & Zenger 2002). Therefore, we propose that:

H_5: There is a positive effect of the use of control mechanisms on trust.

The managerial literature, whose focus for decades has been on control as a governance mechanism, has come to recognize the importance of trust in intra-and interorganizational relationships (Costa & Bijlsma-Frankema, 2007). Due to technological innovation, competition and market maturation, Trust has not only become a complementary mechanism to control (Bisbe & Sivabalan, 2017; Emsley & Kidon, 2007; Minnaar, Vosselman, van Veen-Dirks & Zahir-ul-Hassan 2017), but a precondition for gaining competitive advantage and improving performance in complex business environments (Free, 2008).

The control mechanisms foresee behaviors and responsibilities for each strategic alliance partner, in order to coordinate activities and meet partnership goals. Control, sometimes highly formalized, leads to behavioral restrictions (Balboni, Marchi & Vignola, 2018). Control mechanisms also have limitations due to the impossibility of specifying all contingencies *ex ante*, which can be mitigated by trust between partners, ensuring the continuity of cooperation when unforeseen events arise, especially in uncertain and dynamic environments (Poppo & Zenger, 2002).

A minimum level of trust is necessary for control mechanisms to be effective (Das & Teng, 1998). Without trust, it becomes difficult to maintain a long-term relationship (Costa & Bijlsma-Frankema, 2007). Trust therefore contributes to the effectiveness of control mechanisms and plays a role in reducing partners' resistance to investing in the relationship (Mellewigt, Madhok & Weibel, 2007; Zhou, Poppo & Yang, 2008; Cao & Lumineau, 2015). With that in mind, we postulate that:

H_6: Trust positively mediates the relationship between use of control mechanisms and collaborative performance.

Based on the above, we propose the theoretical model presented in Figure 1.

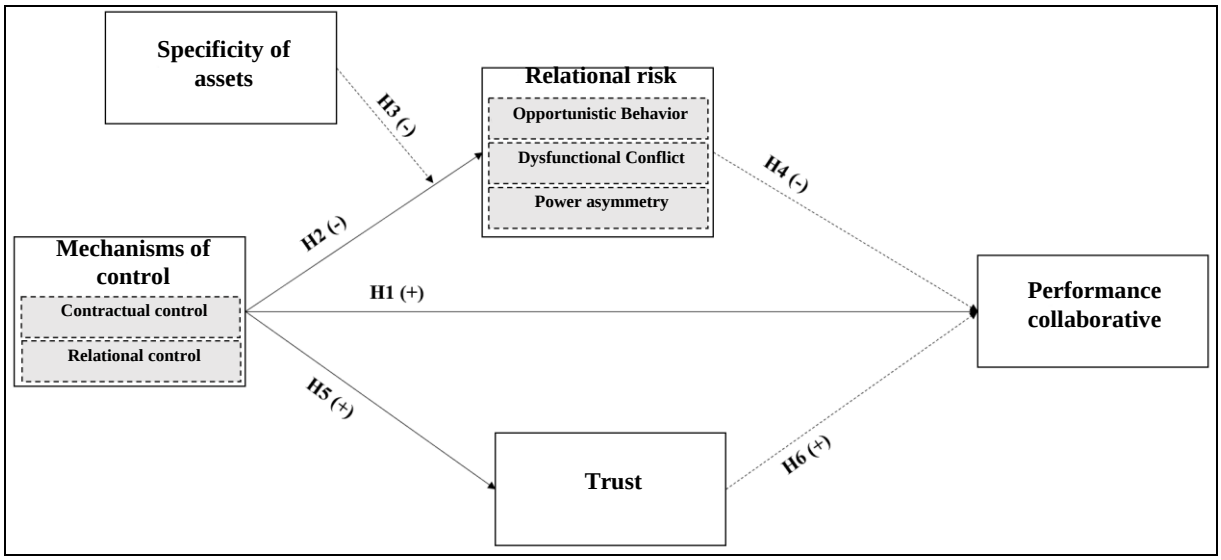

Figure 1. Theoretical model of research
Note: The dotted line indicates indirect relationship. The constructs of relational risk and control mechanisms are second-order.

We assume that the use of control mechanisms has a positive relationship with collaborative performance and that relational risk and trust mediate this relationship. Furthermore, we expecte that asset specificity intensifies the relationship between the use of control mechanisms and relational risk.

3 METHODOLOGICAL PROCEDURES

3.1 Sampling and data collection

The research population comprises 378 companies listed in the National Union of Automotive Components Industry (Sindipeças) and the Brazilian Association of Auto Parts Industry (Abipeças). Under the premise that they have knowledge of the scope of the alliances established with the automakers, we identified professionals in positions of higher hierarchical levels related to the areas of sales, supply chain, logistics and controllership of these companies in the professional social network *LinkedIn*. A total of 662 registered professionals were identified, up to a limit of five professionals per company, among whom 323 accepted the invitation to participate in the study.

In the period from January 11th to February 2nd, 2021, a sample of 107 valid responses was obtained (16% response rate), which exceeds the minimum number required (77 responses) estimated in the G*Power 3.1.9.2 *software* (Ringle, Silva & Bido, 2014). For this estimate we considered the largest number of arrows directed to the dependent variable, mean effect of 0,15, significance level of $\alpha = 5\%$ and sample power of $1\text{-}\beta = 0,8$ (Cohen, 1977). The nonresponse bias was determined by the difference in responses of the first and last 25% respondents, on the argument that late respondents resemble nonrespondents (Af Wåhlberg & Poom, 2015). The t test did not indicate significant differences, which indicates the absence of this bias. We found no bias of the common method, based on Harman's single factor test (Mackenzie & Podsakoff, 2012), in which the first factor presented a total explained variance of less than 0,5.

The sample is composed mostly of managers (47%), directors (18%), coordinators and supervisors (11% each) and *controllers* (8%), who operate mainly in the areas of sales (38,32%), controllership (19,63%) and logistics (17,76%). Male respondents prevailed (94,39%), with an average age of 43 years. The main areas of academic training were: engineering (39,25%), administration (23,36%) and accounting (14,95%). The time of relationships between auto parts manufacturers and their main automaker is on average 23 years (standard deviation = 8 years). Auto parts manufacturers have an average of 3.754 employees (standard deviation = 21.776 employees), which shows a great difference in the size of the companies. Only 7,47% of the companies in the sample sell exclusively to an automaker.

3.2 Study variables

The research constructs were measured from assertions already validated in the literature. We used a process of *back-translation* (translation and retranslation of the assertions into the original language) to assure the appropriateness of the assertions translated. The research instrument is composed of 32 assertions in a *Likert*-type scale of seven points, from strongly disagree (1) to strongly agree (7).

Relational risk was measured in second order, based on nine assertions adapted from the study by Cheng (2011). These assertions are about opportunistic behaviors, dysfunctional conflict, and power asymmetry. We measured trust using nine statements that reflect the organization's trust in the buyer, adapted from the study by Reusen and Stouthuysen (2020). These assertions include aspects of benevolence and integrity, that is, trust of goodwill and trust in the competence of the supplier, respectively. The three assertions on asset specificity were adapted from Artz and Brush (2000). The construction covers specific investments, team

qualification and unique skills aimed at the needs of the automaker. Use of control mechanisms is a second-order construct, which was measured through seven assertions, which encompass contractual control (formal aspects) and relational control (informal aspects), in line with Zhou and Xu (2012). Finally, collaborative performance among supplier and automaker is about meeting the objectives established for collaboration between the parties, the overall performance of the collaboration, and satisfaction with the performance of the collaboration, either by the focal company (auto parts manufacturer), or the partner (vehicle manufacturer), measured according to Dubey *et al.*. (2019).

As control variables, we asked questions about the characteristics of the auto parts manufacturer and the partnership relationship with the automaker, such as size (number of employees), duration of the relationship and production exclusivity, which were not used due to the low variance of the answers.

3.3 Data analysis procedures

For data analysis, we used structural equation modeling estimated from the Partial Least Squares. The evaluation of the measurement model was performed using the PLS algorithm, with the definition of 300 iterations with 7 stop criteria. In the structural model, *bootstrapping* is used to verify the relationships between the constructs of the study, and *blindfolding* to observe the accuracy of the structural model (Hair Jr., Hult, Ringle & Sarstedt, 2016). The SmartPLS version 3 software was used.

Additionally, we applied the *fuzzy set qualitative comparative analysis* (FsQCA) to assess how simultaneous behavior from multiple backgrounds predict collaborative performance. The constructs were calibrated in the percentiles 25%, 50% (crossing point) and 75%, as proposed by Fiss (2011). Combining Boolean algebra and set theory (*fuzzy-set theory*) allowed us to identify specific pathways that demonstrate specific results (Ragin, 2009), whether complementary or substitutes (Fiss, 2011).

4 ANALYSIS OF RESULTS

4.1 Presentation of results

The analysis of structural and equation modeling was performed in two moments. Initially, the measurement model was analyzed to verify the adequacy of the constructs from the criteria of validity (convergent and discriminant) and reliability (internal and external), according to Hair Jr. *et al.*. (2016). All assertions of the research instrument were maintained, since they scored higher than 0,6, as recommended by Hair Jr. *et al.*. (2016). The results of the measurement model are shown in Table 1.

Table 1
Measurement model

Constructs	Cronbach's Alpha	Composite Reliability	AVE	Discriminant Validity				
				CM	RR	AS	TRST	CP
CM	0,843	0,861	0,756	**0,722**				
RR	0,863	0,879	0,715	-0,333	**0,773**			
AS	0,812	0,889	0,731	0,077	0,297	**0,855**		
TRST	0,918	0,932	0,608	0,487	-0,564	0,004	**0,780**	
CP	0,902	0,931	0,772	0,577	-0,421	0,095	0,596	**0,879**

Note: CM = Control Mechanism; RR = relational risk; AS = Asset Specificity; TRST = Trust; CP = Collaborative Performance.

We can see that the values of Cronbach's Alpha and Composite Reliability are higher than 0,70, which testifies to the reliability due to adequacy and absence of sample biases (Hair Jr. *et al.*., 2016). Among the constructs, trust presented the highest alpha (0,918), followed by collaborative performance (0,902) and relational risk (0,863). Regarding the convergent validity criteria, it is met when presenting the AVE of the constructs superior to 0,50 (Hair Jr. *et al.*., 2016). Discriminant validity, on the other hand, is met by the Fornell-Larcker criterion, when evidencing the distinction between the constructs.

In the second stage of structural equation modeling, the structural model was analyzed, with hypotheses testing and verification of the relationships between the constructs, using a path diagram with statistical validity (Hair Jr. *et al.*., 2016). Table 2 shows the coefficients of the paths and the significance of the relationships between the constructs.

Table 2

Coefficient of paths and evaluation of the structural model

Relationship between constructs	β	*T-value*	f^2	*P-value*	Hypotheses
CM → CP	0,369	3,799	0,194	0,000***	H_1 confirmed
CM → RR	-0,145	1,826	0,028	0,068*	H_2 confirmed
CM X AS → RR	-0,152	1,503	-	0,133	H_3 rejected
CM → RR → CP	0,013	0,769	-	0,442	H_4 rejected
CM → TRST	0,487	6,605	0,311	0,000***	H_5 confirmed
CM → TRST → CP	0,177	3,352	-	0,001***	H_6 confirmed

Note: N = 107. Significance at the level of *p<0,10; **p< = 0,05; ***p<0,01; f^2 = effect size. Adjusted R^2 = CP (0,439); Q^2 = CP (0,331); X = moderating effect of asset specificity on the relationship between control mechanisms and relational risk.

We can observe that the use of control mechanisms has a positive and significant relationship with collaborative performance (0,369, p<0,01), which supports the non-rejection of H_1, at a significance level of 1%. It appears that the more auto parts manufacturers use control mechanisms for their relationships with the automaker, the higher the collaborative performance of the relationship.

For H_2, the use of control mechanisms reduces relational risk (-0,145, p<0,10), so as not to reject the hypothesis at the significance level of 10%. In this relationship between control mechanisms and relational risk, the moderating effect of the specificity of the assets was investigated, but the results do not indicate significance, therefore H_3 is rejected.

H_4 was rejected because relational risk did not negatively mediate the relationship between control mechanisms and collaborative performance. We can infer that in the relationship between Auto Parts Manufacturers and automakers, relational risk is present, but it does not negatively impact collaborative performance from the use of control mechanisms.

The trust hypotheses are all significant (H_5 and H_6). For H_5, we noticed the use of control mechanisms positively influencing the Auto Parts Manufacturers' trust in the automaker (0.487, p<0.01). In H_6, trust acts as a (partial) mediator in the relationship between the use of control mechanisms and collaborative performance, at a 1% significance level (0,177, p<0,01).

Regarding the evaluation of predictive validity, we found a 45,2% Pearson's coefficients of determination (adjusted R^2), which indicates that the model has a high predictive power of collaborative performance for the area of applied social sciences (Cohen, 1988). The size of the effect (f^2) cannot be measured for mediations and moderations. Thus, considering Cohen's parameters (1977) of small effect (f^2 = 0,02), medium effect (f^2 = 0,15) and large effect (f^2 = 0,35), direct relationships have medium (H1 and H5) and small (H2) effects. In turn, the predictive relevance, indicated by Q^2, attests to the accuracy of the model

(35,1%).

In the qualitative analysis we found how the antecedents of collaborative performance behave, from an asymmetric approach (Kaya, Abubakar, Behravesh, Yildiz & Mert, 2020). The FsQCA technique was used to verify solutions that provide better collaborative performance. At a 0,80 consistency limit (Ragin, 2009), sufficient combinations were observed, as shown in Table 3.

Table 3
Combinations that lead to collaborative performance

Configuration	1	2	3
Control mechanisms	●	●	
Relational risk	⊗		●
Trust		•	
Asset Specificity			●
Raw coverage	0,32	0,67	0,71
Single coverage	0,03	0,05	0,24
Consistency	0,97	0,98	0,87
General solution coverage		0,94	
General solution consistency		0,89	

Note: Black circles indicate the presence of the condition - large ones indicate central conditions; small ones indicate peripheral conditions; circles with "x" indicate absence; and white spaces indicate that the condition does not matter.

The results indicate three combinations as possible solutions. We observe as central conditions (parsimonious solution) that control mechanisms, relational risk and asset specificity (large circles) predict collaborative performance. These same variables are also observed in the intermediate solutions, from combinations with other variables. Trust, on the other hand, appears only as an intermediate solution (small circle), which indicates a peripheral condition. Only with the presence of other variables (use of control mechanisms, specifically) does the presence of trust become an antecedent of collaborative performance.

The first solution suggests that the combination of control mechanisms and absence of relational risk predicts high collaborative performance. That is, in relationships where auto parts manufacturers do not observe relational risk on the part of the automaker, the use of control mechanisms leads to better collaborative performance. This solution is shared by 32% of respondents and has a consistency of 0,97.

The second solution suggests combining the use of control mechanisms and trust in the partner in predicting collaborative high performance. These findings confirm the measurement model by presenting trust as a mediator of the relationship between control mechanisms and collaborative performance. This solution is shared by 67% of respondents and has a consistency of 0,98.

The third solution suggests that the combination of relational risk and asset specificity predicts high collaborative performance. The solution is shared by 71% of the survey participants, with 0,87 consistency. It is worth mentioning that companies that have specific assets for the relationship with the main automaker, even presenting relational risk due to the high level of specificity of the assets, demonstrate high collaborative performance. A possible explanation may be the partner dependence factor, that is, even with the presence of relational risk, the organization acts specifically for the partner, which provides collaborative performance. In general, there is consistency in the solution, with a 89% level, which suggests high association between the variables examined in the research.

4.2 Results discussion

Figure 2 shows the research findings, in which the results provide full support to accept hypotheses H_1, H_2 and H_5, partial for H_6, and rejection of H_3 and H_4.

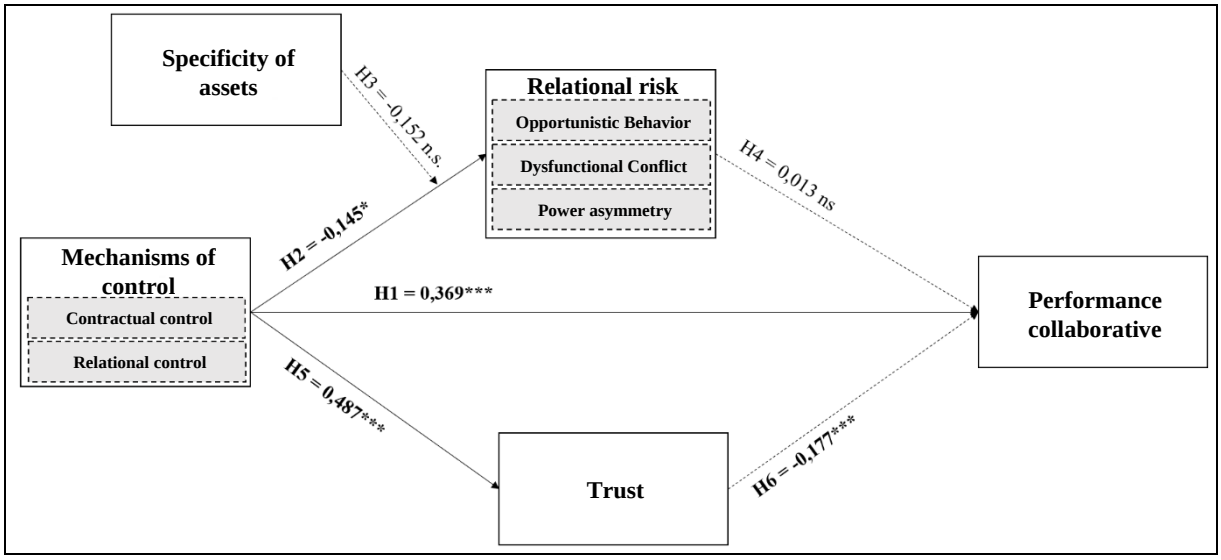

Figure 2. Research results

The findings reveal that the use of control mechanisms positively influences collaborative performance (H_1) between auto parts manufacturers and their respective automakers, which corroborates the results of studies by Joshi (2009), Liu *et al.*. (2009) and Huang and Chiu (2018) in other contexts. Jap and Ganesan (2000) and Nielsen (2010) showed that control can undermine collaboration between partners, by limiting autonomy and encouraging defensive and opportunistic behaviors. However, in the scenario investigated, control is associated with greater collaborative performance, considering legal protection for buyers and suppliers (contractual control) and norms and shared values (relational control).

Control mechanisms encourage both buyers and suppliers to commit to the mutual exchange relationship and promote collaborative relationships (Anzilago & Beuren, 2022; Liu *et al.*., 2009; Tangpong *et al.*., 2010; Huang & Chiu, 2018). From the results, we can understand that contractual and relational control mechanisms act as complements in the supplier-buyer relationship, instead of substitutes, so that situations not covered by contractual control are contemplated by relational control and vice versa (Liu *et al.*., 2009).

The relational risk (H_2) is also influenced by control mechanisms, but in a negative way. The results suggest that control mechanisms in the relationship established with their clients provide greater predictability regarding the partner's future behavior, due to predetermined agreements and foreseen sanctions, which reduces the perception of relational risk. This finding is in agreement with that evidenced by Cao and Lumineau (2015), Read *et al.*. (2010) and Wang and Fulop (2007).

With regard to H_3, there was no moderating effect of asset specificity on the relationship between control mechanisms and relational risk. Thus, the results diverge from the literature defending that high specificity of the assets generates dependence between the parties, which increases the exposure to relational risk and the need for more control to safeguard the interests of each organization (Dekker & Van den Abbeele, 2010; Langfield-Smith, 2008). We understand that the level of product specificity provided by auto parts manufacturers to automakers does not intensify the negative influence of the use of control mechanisms on relational risk.

Although the literature presents a negative relationship of relational risk in collaboration between partner companies (Das & Teng, 2001a), the results of this study show that relational risk does not significantly impact the relationship between the use of control mechanisms and collaborative performance (H_4). That is, even in the presence of relational risk, companies that use control mechanisms do not have their collaborative performance significantly impaired. These findings may reflect the dependence of auto parts manufacturers on the automaker and the specificity of assets. Vanalle and Salles (2011) corroborate this understanding by verifying that relationships in the Brazilian automotive sector have evolved towards cooperative and long-term perspectives, but also towards greater dependence.

In the investigated context, there is a tendency to vertical disintegration, which results in dependence and specificity of assets (Augusto *et al.*., 2018). Still, the risks associated with these transactions can be controlled (Dekker *et al.*., 2013). Companies tend to manage the risks that come from relationships and collaborate to achieve mutual goals. With vertical disintegration, automakers need the products supplied by manufacturers, which are often specific and tailored to their needs. Similarly, manufacturers depend on automakers to survive and compete, and the automaker's performance in the market, in number of sales and quality perceived by the consumer, reflects on its operations. That way, they are encouraged to collaborate.

The results also indicate that control mechanisms contribute to greater trust in the partner (H_5), as defended by Coletti *et al.* (2005), Emsley and Kidon (2007) and Abdullah and Khadaroo (2020). Trust is built over time, and control mechanisms contribute to the organization assessing the conduct of its partners. Control makes relationships more predictable, acting as a precondition for trust. Also, we found that trust positively mediates the relationship between control mechanisms and collaborative performance (H_6), in order to contribute to the effectiveness of control mechanisms and to reduce partner resistance, corroborating the studies of Mellewigt, Madhok and Weibel (2007), Zhou, Poppo and Yang (2008) and Cao and Lumineau (2015).

It should be noted, however, that this study presents some limiting factors. In addition to the generalization of the results, which should be parsimonious due to the delimitations of the research, the cross-sectional nature of the research also characterizes a limitation, since the respondents could have different answers if questioned in other periods. We should also point out that the answers stem from perceptions, and that exclusively quantitative approaches may not capture other factors that influence the investigated context. However, the researchers followed the methodological rigor and performed procedures to ensure the validity and reliability of the results obtained.

5 CONCLUSIONS

The results of this study revealed that the use of control mechanisms has a positive influence on collaborative performance and trust, and a negative influence on relational risk, which indicates its importance in the relationship between auto parts manufacturers and vehicle manufacturers operating in Brazil. They also showed that trust partially mediates the relationship between the use of control mechanisms and collaborative performance, which suggests complementarity between control mechanisms and trust.

The study presents theoretical implications when analyzing together control mechanisms, collaborative performance, trust and relational risk, until then addressed in isolation, and when considering the perception of the supplier, previously little contemplated by the literature. That way, we contribute to the literature by verifying that trust positively

mediates the relationship between control mechanisms and collaborative performance, which reinforces the complementarity between both in the supplier-buyer relationship, as opposed to the perspective of substitution. We also contribute in verifying that relational risks can be managed through control mechanisms, and that the specificity of the assets does not influence the relationship between control mechanisms and relational risks.

Practical implications are also noted. The results can encourage companies to use control mechanisms to improve collaborative performance, increase trust and reduce relational risk, inherent to interorganizational relationships. The supplier-buyer relationship can be characterized by opportunism, dysfunctional conflicts, and power asymmetry. Both the auto parts manufacturer (supplier) and the automaker (buyer) can manage their relationships with that in mind, through control and trust mechanisms to reduce the likelihood of negative events occurring and affecting their results. The use of control mechanisms does not arise from distrust in the partner, but as a means of safeguarding the interests of companies.

The research findings should be interpreted with care due to their limitations. Caution is warranted with the generalization of the results, since they refer to the perception of professionals who make up the sample and represent the perspective of the auto parts manufacturers about the relationship with the automakers. Future studies may include the perspective of the automaker, or a dyadic analysis. Although the results show significant relationships, other methods may be adopted, such as case studies or experiments. Longitudinal studies can assess how these relationships between variables occur during the life cycle of the relationship, since the combined effect between control and trust mechanisms can change during the life cycle. Other variables can be investigated in the relationship between Auto Parts Manufacturers and automakers, such as partner dependence. A different focus on control mechanisms may point to relevant findings, since this study was limited to investigating contractual and relational control mechanisms.

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Uso de Mecanismos de Controle e Desempenho Colaborativo: Efeitos do Risco Relacional e da Confiança

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RESUMO

Objetivo: *Este estudo analisa o efeito mediador do risco relacional e da confiança na relação do uso de mecanismos de controle com o desempenho colaborativo entre fabricantes de autopeças e montadoras de veículos.*

Método: *Uma survey foi realizada com 107 profissionais de empresas fabricantes de autopeças e para análise dos dados aplicou-se modelagem de equações estruturais e fuzzy-set qualitative comparative analysis.*

Resultados: *Os resultados revelam que o uso de mecanismos de controle influencia positivamente o desempenho colaborativo e a confiança e negativamente o risco relacional. Não se observou mediação do risco relacional entre mecanismos de controle e desempenho colaborativo, ao contrário da confiança, que apresentou mediação parcial. Três soluções proporcionam maior desempenho colaborativo: mecanismos de controle associado à confiança; mecanismos de controle em ambientes com ausência de risco relacional; e presença de especificidade dos ativos em relacionamentos com risco relacional.*

Contribuições teóricas/metodológicas: *Este estudo contribui para a literatura ao investigar de forma conjunta os efeitos do risco relacional e da confiança na relação entre mecanismos de controle e desempenho colaborativo, cujos construtos até então foram abordados de forma isolada e os são achados contraditórios e inconclusivos. Revela ainda a complementaridade entre mecanismos de controle e confiança para um melhor desempenho colaborativo na relação fornecedor-comprador no setor automotivo.*

Contribuições sociais/para a gestão: *Os resultados evidenciam como os mecanismos de controle e governança podem contribuir para o desempenho colaborativo, para gerenciar os riscos relacionais e melhorar a relação entre fornecedor e comprador, visto que as organizações necessitam de recursos complementares de outras organizações.*

Palavras-chave: Mecanismos de controle. Risco relacional. Confiança. Desempenho colaborativo.

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