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Strategic contractual relationships in the automotive sector

Relações contratuais estratégicas no setor automotivo

Relaciones contractuales estratégicas en la industria automotriz

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Abstract

The aim of the present study is to understand contractual relations through the complementarity of the Transaction Costs Theory, Measurement Costs Theory, and the Resource-Based View. Initially, we sought to define an analytical model appropriate to the complementarity objective, considering the categories of each approach. The proposition was: given the possibility of measuring the attributes of products, the contractual relationship can be used to guarantee property rights over assets of high specificity and strategic value, avoiding the costs of vertical integration. Secondly, a qualitative descriptive cross-cut (2014 and 2015) study was carried out. In this phase, the complementarity proposition was analyzed based on data obtained through semi-structured interviews with logistics, production, and purchasing managers of automakers located in the state of Paraná, and some of their direct suppliers. Our proposition indicates that when there is the possibility of measuring product attributes, the contractual relationship can be used to secure property rights of high-specificity assets and strategic resources, avoiding the costs of vertical integration. This proposition was verified because, in the case of high-specificity auto parts, the measurability of their dimensions ensures protection of specific and residual property rights. In the case of strategic resources, when there is a possibility of measurement and control, contracting is allowed, even including the acquisition of innovations that bring competitive advantage (Bluetooth, integrated GPS with SD card, back-up sensor, air bags). It was observed that, even though competitive advantages constitute valuable and rare resources for automakers at their launch, this did not prevent contracting. Verification can offer an alternative path to rational Transaction Costs Theory, as proposed by Williamson, and the use of vertical integration as a form of controlling strategic resources, recommended by the Resource-Based View, which still requires further studies in order to overcome persistent limitations in the model.

Keywords: Contracts; Measurement attributes; Specific assets; Resources and strategic capabilities; Automakers

Resumo

Neste artigo, objetivou-se compreender as relações contratuais por meio da complementaridade da Teoria dos Custos de Transação, Teoria dos Custos de Mensuração e Visão Baseada em Recursos. Para tanto, buscou-se definir um modelo analítico adequado ao objetivo de complementaridade, considerando-se as categorias de cada abordagem. A proposição elaborada indica que, na possibilidade de mensuração dos atributos dos produtos, a relação contratual pode ser utilizada para garantir os direitos de propriedade sobre ativos de elevada especificidade e recursos estratégicos, evitando-se os custos da integração vertical. Em um segundo momento, a partir de uma pesquisa qualitativa descritiva, com recorte no ano de 2015, realizou-se a fase empírica da proposta. Nessa fase, analisou-se a proposição de complementaridade a partir de dados obtidos por meio de entrevistas semiestruturadas com gerentes de logísticas, produção e compras das montadoras automotivas localizadas no Estado do Paraná, e alguns de seus fornecedores diretos. A proposição

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foi ratificada ao se constatar que, no caso de autopeças de elevada especificidade, a capacidade de mensuração de suas dimensões garante a proteção de direitos de propriedade específicos e residuais. No caso dos recursos estratégicos, na possibilidade de mensuração e controle, a contratação permitiu a aquisição de diversas inovações geradoras de vantagem competitiva (*bluetooth*, o GPS integrado no veiculo, com cartão SD, o sensor de ré, *air bags*). Observou-se que, mesmo se constituindo em recursos valiosos e raros para as montadoras no seu lançamento, esse fato não impediu que esses fossem adquiridos por intermédio da contratação. Conclui-se que essa ratificação pode oferecer um caminho alternativo ao racional da TCT, proposto por Williamson, e à orientação pela integração de recursos, como forma de controle, preconizado pela VBR, o que ainda carece de maiores estudos visando a superar as limitações ainda presentes no modelo apresentado.

Palavras-chave: Contratos; Mensuração de atributos; Ativos específicos; Recursos e capacidades estratégicos; Montadoras de veículos

Resumen

El propósito en este artículo es entender las relaciones contractuales por medio de la complementariedad de la Teoría de los Costos de Transacción, Teoría de los Costos de Medición y de Visión Basada en los Recursos. Para ello, se ha buscado establecer un modelo analítico apropiado al objetivo de complementariedad, teniendo en cuenta las categorías de cada enfoque. La proposición elaborada indica que, en la posibilidad de medición de los atributos del producto, la relación contractual puede utilizarse para asegurar los derechos de propiedad de activos de alta especificidad y recursos estratégicos, evitándose los costos de la integración vertical. En una segunda etapa, a partir de un estudio cualitativo descriptivo, con sección en el año 2015, se ha llevado a cabo la fase empírica de la proposición. En esta fase, se ha analizado la proposición complementaria, a partir de datos obtenidos por medio de entrevistas semiestructuradas con los directores de logística, producción y adquisición de plantas ensambladoras automotrices ubicadas en el estado de Paraná, y algunos de sus proveedores directos. La proposición ha sido ratificada por la constatación de que, en el caso de autopartes de alta especificidad, la capacidad de medición de sus dimensiones asegura la protección de los derechos de propiedad específicos y residuales. En cuanto a los recursos estratégicos, en la posibilidad de medición y control, la contratación ha permitido la adquisición de una serie de innovaciones generadoras de ventaja competitiva (bluetooth, GPS integrado en el vehículo, con tarjeta SD, sensor de marcha atrás, air bags). Se advierte que, aunque constituyan recursos valiosos y raros para los fabricantes de automóviles en su lanzamiento, este hecho no ha impedido que éstos fueran adquiridos por medio de la contratación. Se concluye que dicha comprobación puede ofrecer un medio alternativo al camino racional de la TCT, propuesto por Williamson, y a la orientación hacia la integración de los recursos, como medio de control, preconizado por la VBR. Es necesario que se realicen más estudios para superar las limitaciones todavía presentes en el modelo.

Palabras clave: Contratos; Medición de atributos; Activos específicos; Capacidades y recursos estratégicos; Ensambladoras automotrices

Introduction

The essential idea guiding this work concerns the transactional and strategic characteristics which influence decisions to outsource production among auto assembly plants in the state of Paraná, Brazil. Understanding the motivation behind these decisions indicates paths for understanding organizations in their forms and limits, as well as productive and relational dynamics. Historically, vertical integration and disintegration movements, through contracting, have always been part of the strategic decisions of automakers, in their headquarters and extending throughout their subsidiaries, including those in Brazil. An understanding of the motivating factors behind these movements helps define relevant subsidies for investment decisions in the sector, in both the public and private spheres (Ferreira & Serra, 2010; Melo, 2006).

Presently, in the Brazilian case, there is a trend toward vertical disintegration, that is, externalization of production. In recent years, automakers have started focusing on more specialized activities at the product level, prioritizing skills related to the creation of characteristics that differentiate the product in the consumer market (Cerra & Maia, 2008; Costa & Henkin, 2012; Melo, 2006). According to Melo (2006) and Costa and Henkin (2012), suppliers have assumed responsibility for activities considered non-strategic by automakers, or those that require knowledge divergent from that which forms the basis of automakers' core competencies.

Within this framework of outsourcing activities, the dominant governance structure in the coordination and attainment of automakers has been contractual arrangements with direct suppliers (Augusto, 2015; Ferrato, Carvalho, Spers, & Pizzinatto, 2006). According to Casotti and Goldenstein (2008), contracts between assemblers and suppliers can range between more distant, as well as closer relationships, such as those in which suppliers install themselves in the assembly plant (modular consortium). In this case, Ferreira and Serra (2010) affirm that the maturity of this sector facilitates the choice of this structure, since it is inserted in a context of efficiency, where conditions reduce market imperfections and dangers in transactions, especially opportunistic behavior.

In this paper, we focus on the closer relations between automakers and their direct suppliers, taking into account the flow of formal commercial transactions that are established between these parties. These relationships, contractual arrangements guiding transactions between manufacturers and direct suppliers, involve a context of resource interdependence, such as knowledge, technology, and innovation, as well as reciprocal lines of communication (Dias, Galina, & Silva, 2008;

Sacomano Neto & Iemma, 2004). In addition, these transactions are characterized by the sharing of risks and investments, and by cooperation and partnerships with suppliers in productive spaces (Sacomano Neto & Iemma, 2004). It is also considered that the control and competitive efficiency of automakers reduces transaction costs in relation to other agents (Ferreira & Serra, 2010).

The study of contractual forms may find support in theories addressed at the micro-analytical level of the New Institutional Economics (NIE), notably the Transaction Costs Theory or TCT (Coase, 1937; Klein, Crawford, & Alchian, 1978; Williamson, 1975, 1985, 1996; Zylbersztajn, 1995, 2009) and the Measurement Costs Theory or MCT (Barzel, 1997, 2002, 2005; Coase, 1937; Zylbersztajn, 2009). These approaches have their origin in an article by Coase entitled "The nature of the firm," published in 1937, which laid the basis for the study of contractual organizational forms. This set complements the discussion on property rights. Mahoney (2001) argues that Barzel (1989), following the premise put forward by Coase (1960), unifies the discussion involving property rights and organization, in view of the difficulty of securing property rights under difficult measurement conditions. This set, under the NIE, has been taken into consideration in this article.

In addition to transaction (TCT) and measurement (MCT) costs, another factor taken as an influence in contracting decisions in the present investigation refers to strategic resources and capabilities. In the treatment of these resources, the Resource-Based View (RBV) is taken as the theoretical approach. RBV has its origin in Economic theory, especially from the studies of Penrose (1959) in her work "The theory of the growth of the firm." This approach focuses on the characteristics of organizational resources in order to clarify whether they can be strategic, i.e. sources of competitive advantages (Foss, 2005). In Barney's (1991) perception, to enable the creation of a competitive advantage, the resources must be rare and valuable. To create sustainable competitive advantages (VCS), in turn, they must also be imperfectly imitable and irreplaceable.

From this perspective, RBV appears as a complementary approach to TCT and MCT for the understanding of contractual forms. Attempts to address the complementary aspects involving at least two of these approaches have already been observed in the Firm Theory literature. One of them is the integration of RBV with TCT, indicating the influence of strategic resources in the choice of governance structure (Argyres & Zenger, 2008, 2012; Augusto, Souza, & Cario, 2013; Combs & Ketchen, 1999; Crook, Combs, Ketchen, & Aguinis, 2013; Foss, 2005; Jacobides & Winter, 2005; Langlois, 1992; Leiblein, 2003; Lundgreen, 2013; Mahoney, 2001; Neves, Hamachera, & Scavarda, 2014; Saes, 2009; Williamson, 1999). TCT, in turn, has also been discussed through links to MCT, showing that assets measurement, in some situations, becomes more operational than its specificity (Barzel, 2005; Zylbersztajn, 2005, 2009). However, we are unaware of any theoretical–empirical studies that seek to discuss a complementary perspective on TCT, MCT, and RBV.

The search for the complementarity of these theories arises from the identification of their limitations when individually addressed within the understanding of governance structures. The consideration of specific assets by TCT, and the view of strategic resources within RBV—when taken as fundamental attributes in the choice of vertical integration—suggest some provisos when disregarding aspects of measurement. In this case, the question arises: could assets of high specificity or strategic importance in the transaction be contracted if the measurement of their dimensions was feasible? The answer, from the perspective of the MCT, may offer an alternative path to the rationale of the TCT, as proposed by Williamson (Williamson, 1975, 1985), and to orientation through the integration of resources as a form of control, as advocated by RBV (Barney, 1991; Foss, 2005; Peteraf, 1993).

Within the framework of this theoretical discussion, it is observed empirically that direct relations between automakers and their suppliers suggest the possibility of a closer relationship, due to the interdependence of resources, optimization of communication, sharing of risks and investments, and the development of cooperation. On the other hand, the transaction and measurement costs inherent to the management of these transactions and the strategic risks related to the sharing of resources and capabilities indicate coordination challenges which should be taken into consideration. In this framework, the following research question emerges: How are the contractual forms configured in the relationships between automakers and their direct suppliers, considering the presence of strategic resources and the resulting transaction and measurement costs?

The objective of this research is to understand how the contractual forms are configured from a complementary perspective of transaction costs, measurement costs, and strategic resources, in relations involving manufacturers and their direct suppliers in the state of Paraná. It is noteworthy that the automotive industry in Paraná, the object of this study, stands out due to its transactional and strategic characteristics, which present possibilities for exploring theoretical aspects of the different approaches in a complementary way. Additionally, it is the state with the third largest automotive sector in Brazil (Anfavea, 2016).

In addition to this introduction, this study comprises a section giving the theoretical background on TCT, MCT, and RBV, which presents relevant aspects for discussion and proposition of the theoretical model. A third section describes the methodological procedures adopted for the construction of the theoretical model and the accomplishment of empirical work. In the fourth section, the results are presented and analyzed, indicating how the findings have ratified the proposed model. A fifth section deals with findings that indicate changes in thinking about specific, measurable, and strategic assets in the study of efficiency and vertical relationships in organizations, indicating limitations that will enable future work. Finally, the references used are all listed.

Theoretical reference

The theory of contractual firms, and particularly the Transaction Costs Theory and Measurement Costs Theory, emerged from two important references initiated by Ronald Coase, in 1937 and 1960. It can be considered that Williamson's proposal (1985), recognized as the Transaction Costs Theory, is based on

Coase's proposal of 1937. Williamson locates these references (TCT and MCT) in what he calls the efficiency branch, with two ramifications: the incentive ramification, where Coase's influence is quite clear (1960), and which contemplates the Agency Theory as well as the Property Rights Theory; the other consists of transaction costs, which involves the expense of governance and measurement. Although Williamson (1985) himself recognizes the direct relationship of TCT and MCT together with the Property Rights Theory in considering the importance of ownership, he emphasizes the transaction costs generated from governance choices.

Although this paper's focus is based on Williamson's (1985) proposal, when treating measurement and governance as interdependent in the discussion of transaction costs, it incorporates important points from the Property Rights Theory. This is especially true when dealing with measurement and the forms of organization necessary to guarantee property rights, in terms of residual control rights and contract law (currently known as the New Property Rights Approach), with emphasis on the works of Grossman and Hart (1986), Barzel (1989), Hart and Moore (1990) and Hart (1995).

It is noted that, in their vast majority, inter-organizational relations take contractual forms, which formalize the commitments between two legally independent organizations. This section describes and characterizes these contractual forms, and proceeds to discuss and justify them in light of the TCT, MCT, and RBV.

Contract forms

In general, governance structures are defined by the decision of a company to carry out an activity itself or to purchase from another independent company. Within this framework, according to Williamson (1985, 1996), governance structures can be classified into: (1) the option to buy in the market; (2) own production, in the hierarchical form (vertical integration); and (3) the hybrid form (contracts).

Contracts are one of the three main types of governance structures identified by Williamson (1996, p. 58). Zylbersztajn (1995, 2009) states that contracts, positioned between market and hierarchy, avoid hierarchy costs and also control variability and mitigate market risks.

Ménard (2004) states that hybrid forms are presented in the daily life of companies as the almost vertical integration of a set of subcontractors: franchise networks; strategic alliances; clusters; productive, technological, and commercial joint ventures; consortia; and contractual relationships. The author points out that, over time, contracts can be improved due to the gradual decline of informational asymmetry. In addition, as the parties become better acquainted with each other, the use of informal mechanisms such as reputation, trust, information sharing, and mutual aid are increased, and subsequently used to coerce agents. Following this line of reasoning, Crook et al. (2013) argue that managers increasingly use extra-contractual means (relational governance), such as trust and cross-equity holdings of capital, which allow them to build stable relationships.

Events which are understood as breaches of contract or hold-ups occur when formal contractual relationships are interrupted (Klein, 1996; Klein et al., 1978). Klein (1996, p. 444) indicates that hold-ups "occur when unanticipated events destabilize the contractual relationship outside the self-enforcing range." In this context, the concept of opportunistic contractual break is investigated by the authors based on rent appropriation incentives arising from investments in specific assets. Thus, if a part of the contract makes specific investments which generate rent, in the absence of safeguards part of its value can be expropriated *ex-post* by the other party. Di Gregorio (2013) called this movement "inter-organizational value appropriation."

Contractual forms from the TCT, MCT, and RBV perspective

The treatment of contractual forms based on the individual analysis of the TCT, MCT, and RBV approaches can have different results. According to Williamson (1985, 1996), in the case of TCT, the choice of contractual form occurs when moderate levels of investment in specific assets occur, allowing for the use of intermediate-type structures capable of restraining opportunism, without the extra costs of hierarchy. For highly specific assets, the author emphasizes vertical integration as the most efficient option of structure to restrain opportunistic behavior.

Together with asset specificity, frequency and uncertainty complete the set of transaction attributes that may influence the choice of contractual forms (Williamson, 1985, 1996). In addition, together with opportunism as a behavioral assumption, Williamson (1975) takes Simon's (1979) concept of limited rationality into consideration. This concept indicates the information processing limitations of the agents and the consequences of this assumption on the contractual incompleteness of the transaction (Williamson, 2002).

For Barzel (2005), when considering MCT, measurability, information, and property rights are fundamental aspects affecting the conduct of transactions and the choice of governance structures. The intention is to ensure the benefits of contract control through measurability, availability of information, and consequent guarantee of the property rights of those involved in the transaction.

The possibility of measuring attributes of the product makes it possible to use contracts to regulate the transaction, since it enables and offers guarantees of the required specificities. Barzel (2002) emphasizes the influence of information asymmetry in the measurement process (MCT), since this can have an impact on the distribution of rents and property rights of those involved in the transaction.

This understanding of property rights is aggregated in the premises associated with the New Property Rights Approach, from the distinction between specific control rights and residual control rights, which define the property configuration of a particular asset, in the tradition of the proposals by Grossman and Hart (1986), Hart and Moore (1990), and Hart (1995). The specific control rights can be defined and directly assigned through contractual means. In Barzel's words (1997, p. 4), "Legal rights are the rights recognized and enforced, in part, by the government. [. . .] A major function of legal rights is to accommodate

third-party adjudication and enforcement." The residual control rights, in turn, are obtained through the legal ownership of the assets and imply, according to Hart (1995, p. 371): "[. . .] right to decide on usages of the asset in uncontracted-for contingencies." For Monteiro and Zylberzstan (2011, p. 100), the residual control right "corresponds to the agent's ability, in expected terms, to consume the goods or services associated with a given asset, directly or indirectly (i.e. through exchange)."

Thus, residual control rights cover not only the rights to use assets, but also to decide on when to use them or even when to sell them. Therefore, the economic importance of ownership stems from the ability of the owner to exercise residual control rights over the assets.

Although the rationale proposed by Williamson (1985, 1996) and Barzel (2002, 2005) is presented in a structured way and indicates an analytical path for the choice of contractual forms, some criticisms point to gaps in the presented models. The overvaluation of the institution's function as a way of reducing transaction costs and the limited use of production costs as a guide for the choice of governance structure are aspects of this model which have been criticized (Baumol, 1986; Pitelis, 1994).

The extremes between the market approach and vertical integration have also been questioned, since the same conditions of exchange—asset specificity and opportunism for instance—that hamper market performance also hinder the performance of hierarchical exchanges (Barney & Hesterly, 2004; Klein et al., 1978; Poppo & Zenger, 1998). In addition, by focusing on cost minimization as essential for organizations, firm theory ends up considering strategies as secondary (Barney & Hesterly, 2004).

Bronzo and Honório (2005) criticize the approach for being focused primarily on transactions involving physical assets, leaving aside intangible assets such as knowledge economies, dynamic capabilities, and the reputation of firms. Barzel (2005), in turn, criticizes the TCT for the low operationalization of assets specificity evaluation as the main attribute in the decision to make or buy, indicating that the difficulty of measurement is more operable.

The RBV, on the other hand, does not deal with contracting, emphasizing only the function of vertical integration to justify the possession and protection of strategic resources (Argyres & Zenger, 2012; Barney, 1991; Combs & Ketchen, 1999; Crook et al., 2013; Foss & Klein, 2010; Jacobides & Winter, 2005; Peteraf, 1993). However, in this study the importance of these features in the design of contracts is assumed, either because such resources can be traded or because of its influence on the configuration of the contracts. In addition, it is considered that strategic resources do not only occur from internal sources, but can also be present due to a combination of different external factors, thus placing a demand on contracting.

As for the transaction of strategic resources, Silverman (1999) points out that the RBV generally under-emphasizes the possibility that companies can exploit resources through market arrangements, focusing only on expanding the firm's boundaries. The author points out that several empirical and theoretical studies have identified conditions in which technological resources, including strategic ones, can be exploited through contractual means. Contracting, in Silverman's (1999) view, would be a viable alternative, unless the technological knowledge involved is highly tacit (where contracts are difficult to track and enforce), or easily transferable and weakly protected (in cases where attempts to negotiate a license are fraught with problems related to the information paradox, and secrecy is needed for adequate returns to technology).

Following this line of reasoning, Argyres and Zenger (2012) state that RBV focuses almost exclusively on organizations and does not discuss the role of the market and contracts, or their comparative dynamics with the hierarchical approach in the formation of internal capacities. In the same way, Poppo and Zenger (1998, p. 19) also affirm that RBV, as well as the actual firm's theory:

> [. . .] have focused primarily on the failures of markets and the contrasting virtues of hierarchy. However, the focus of these theories on directionally explaining vertical integration seems at least somewhat misplaced given the apparent trends in recent decades towards disintegration, downsizing, and refocusing.

It is also important to highlight the influence of strategic resources on the routing and configuration of contracts. For Langlois (1992), Combs and Ketchen (1999), Argyres and Zenger (2008, 2012), and Saes (2009), RBV focuses on the identification of strategic resources based on the conditions that these resources can present for the acquisition and support of competitive advantage. However, in addition to their role in gaining competitive advantage, strategic resources, especially those related to learning, can also influence the choice of governance structures.

Langlois (1992, p. 105) states that "[. . .] one cannot have a complete theory of the boundaries of the firm without considering in detail the process of learning in firms and markets." The author considers it essential that a growth theory of the firm should take into account that in the long term, the parties involved go through a learning process, allowing them to gain more information from each other.

On the other hand, TCT and MCT can serve to support the discussion of coordination of these resources, providing theoretical support on which governance structures can be made more efficient in order to exploit the strategic resources of the firm. Within this framework, Argyres and Zenger (2008, 2012) also claim that RBV assists managers in understanding what resources are required in order to take a position and be competitive in various aspects, and organizational economics provides them with information about the supply and organization of such resources.

From the foregoing, it is possible to induce that the definition of contractual forms is based on the consideration of both the transaction costs (TCT and MCT) and strategic resources (RBV) approaches. Within this framework, the following proposition is presented for the treatment of contractual forms: Given the possibility of measuring the attributes of the transacted products, the contractual relationship can be used to guarantee property rights on high-specificity assets and strategic resources, avoiding the costs of vertical integration.

Thus, the measurement factor offers an alternative to vertical integration, in considering the contractual form as an efficient structure to govern a transaction: if the measurement can be carried out, it is therefore proposed that transactions of high-specificity assets, as well as strategic resources transactions, can occur by contract. More details of this proposition are given in the following sub-propositions:

a) High-specificity assets can be governed by contracting, as long as they involve easily measured contracted dimensions;
b) Strategic resources can be governed by contracting, provided they have easily measured contracted dimensions.

Di Gregorio (2013) states that resources play a key role because they are outcomes of value creation and are exploited in the process of value appropriation. Within this setting, Foss (2005) emphasizes that the interaction between value creation and value appropriation should be better explained in RBV, with firm theory as a useful means for this purpose. According to the author:

> Much of the modern economic theory of the firm revolves around it, the 'hold-up problem' (Hart, 1995; Williamson, 1996), being an important manifestation of the expected sharing of surplus, impacting on the creation of that surplus (through the effect on investment incentives) (Foss, 2005, p. 75).

Foss (2005) argues that this insight remains conspicuously and surprisingly absent in RBV. When considering asset ownership from an economic perspective, Foss and Foss (2004) recognize that assets have multiple attributes, and that they can be captured in a world of positive measurement and enforcement costs. This implies that the notion of resource ownership is problematic. Moreover, as Foss and Klein (2010) point out, it is not made clear how resources are conceptualized, dimensioned, and measured, and it is not made clear how resources arise and are altered by the action of individuals.

It is thus perceived that the possession of strategic resources implies value creation by the *ex-ante* and ex-post barriers (Peteraf, 1993) in their construction, without considering the appropriation of value. In an environment with positive transaction costs, when considering TCT and MCT, this value can be captured simultaneously by appropriating rents and property rights over non-measurable dimensions. Following this line of thought, Silverman (1999) and Saes (2009) indicate that the proposition of the RBV, in which rare and costly replication resources are important for generating income, says very little about how these resources—and which ones— should be brought together to create and Sustain Competitive Advantage (SCA).

As discussed, some of the criticisms directed at firm theory refer to the unilateral approach present in the choice of company boundaries. In other words, the definition of governance structures involves more than the presence of specific assets, measurable dimensions, opportunistic behavior, and transaction costs, as presupposed by NIE approaches. In-house resources and capabilities, which generate sustainable competitive advantages, can influence the configuration of a firm's boundaries.

In short, identifying a firm's strategic resources is not sufficient for dealing with issues of value catchment and governance of these resources. Taking TCT and MCT into consideration contributes to minimize this criticism, indicating how structures will tend to be configured in order to ensure property rights and proper distribution of value in transactions. Similarly, these features affect the way these structures are configured. In this context, contractual forms appear as mechanisms not only to reduce transaction costs, but also to obtain and sustain superior competitive conditions.

While TCT and MCT focus on the transaction as the unit of analysis, a consensus on the RBV analysis unit is not yet available. While Barney (1991) considers strategy, Peteraf (1993) does so with resources. Thus, for the purpose of this study, the transaction is maintained as the unit of analysis. However, the strategic condition of the resource is inserted as an additional element influencing the choice of contracting, together with specific assets, and their measurability. The identification of the constructs in the presented rationales and their direct and indirect influences are detailed in the methodological procedures section.

Methodological procedures

The present research is qualitative, and of the descriptive and theoretical–empirical type, with a transversal crosscut, carried out in 2015. The object of study were the manufacturers of automobiles and light commercial vehicles located in the State of Paraná and some of their direct suppliers. As the third most important automobile manufacturing center in Brazil after São Paulo and Rio Grande do Sul, there are three car and light truck manufacturers in Paraná, all located in São José dos Pinhais (Anfavea, 2016), which were investigated in the present study. According to this source, these automakers jointly accounted for about 26% of the total number of vehicles sold in the Brazilian market in 2014. All the assemblers interviewed have an effective participation in the international and national market, of which one stands out not only for its tradition, but also for the volume of vehicles sold.

In order to carry out the research, we first sought to identify the basic principles of each theory individually, and from this discuss its theoretical complementarity based on the authors presented. Secondly, the primary data were collected and compared with the proposed complementarity model. At all times, we sought to meet Reay's (2014) indications regarding the delineation of qualitative research, namely to present quality in the data obtained, make use of relevant literature, provide and detailed descriptions of procedures and data.

Conceptual model and propositions

Fig. 1 presents the research analysis scheme, which considers the main constructs of each theoretical approach used: transaction costs (TCT), measurement costs (MCT), and strategic resources (RBV). From these constructs, indicated in the

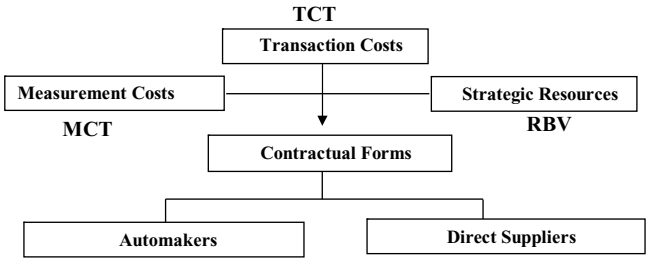

Fig. 1. Theoretical analytical model.
Source: Elaborated by the authors.

theoretical rationale of each of these approaches, primary influential categories were identified in the definition of contracting: specific assets; ease of measurement; and strategic resources that generate competitive advantage.

These points were treated complementarily and in sequence, through the proposition on contracting involving TCT, MCT, and RBV. This proposition was based on guidelines put forward by Bacharach (1989), Whetten (2007), Suddaby (2010), and Ennen and Richter (2010), which deal with the construction of theoretical models.

Bacharach (1989: 498) defines a theory as "[. . .] a system of constructs [. . .] in which constructs are related to one another through propositions." Along the same vein, Whetten (2007) indicates the need to present the constructs and their interrelationships, as seen in Fig. 2. It indicates the central proposition of this research, its sub-propositions, and the identification of the influence and interactions between the categories derived from the constructs.

In the view of Ennen and Richter (2010, p. 208): "The total economic value added by the combination of two or more complementary factors in a production system exceeds the value that would be generated by the application of these factors of production in isolation." This concept is applied in the present study and indicates that the sum of the result of each theory individually, in the understanding of contractual choice, has different results when considering the complementarity of these theories. Without considering the possibility of measurement, the presence of specific assets or strategic resources would *per se* indicate a need for vertical integration, not contracting.

Following this line of thought, Suddaby (2010) highlights four fundamental notions that should be considered in order to obtain clarity in a theoretical construction, which this study adheres to. The first is to present definitions capable of persuasively creating precise categorical distinctions between concepts. In this sense, we sought to select and delimit categories for each approach elaborated in this investigation: specific assets (TCT); measurable assets (MCT); and resources (RBV). The second is to outline the conceptual circumstances and scope conditions under which the construction will or will not apply. As far as this is concerned, we sought to define the conceptual aspects related to contracting, linked to the theory of the firm and RBV, as well as the sector under investigation.

The third notion indicated by Suddaby (2010), in convergence with Whetten (2007), is to show the semantic relation with other related constructs. This relation between the constructs, and respective categories, was worked out in the formulation of the sub-propositions, as seen in Fig. 2. The fourth and final notion is to demonstrate a degree of coherence or logical consistency of the construction in relation to the general theoretical argument. It can be seen that the proposition and sub-propositions constructed are directly related to the objective of theoretical complementarity of the present investigation, whose reasoning is indicated in Fig. 3. It shows how propositions "a" and "b" influence the configuration of governance structures, and consequently the efficiency of the segments involved.

Primary and secondary data collection

After formulating our propositions, we started with primary data collection, which was carried out through semi-structured interviews with the purchasing, quality, and logistics managers of the three automakers in the State of Paraná. In addition, we interviewed the logistics managers of seven direct suppliers as well as the industrial and automotive coordinators of the

Governance	Complementary Propositions (TCT, MCT, RBV)	Sub-propositions	Sub-analysis scheme
Contracts	Given the possibility of measuring the attributes of the transacted products, the contractual relationship can be used to guarantee the property rights of highly specific and strategic resources, avoiding the costs of vertical integration.	a) Assets of high specificity can be governed by contracting, since they are easily measured in contracted dimensions. (a + b = C) b) Strategic resources, generators of competitive advantage (valuable and rare), can be governed by contracting, provided the contracted dimensions are easy to measure. (a + c = C)	(c) Specific Asset (a) Easy to measure → Contracting C (b) Strategic Resources

Fig. 2. Propositions, sub-propositions and scheme of analysis.
Source: Elaborated by the authors.

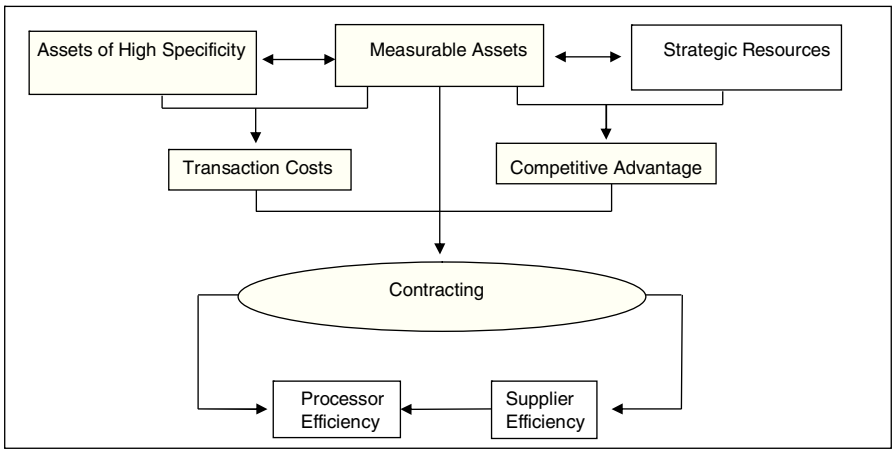

Fig. 3. Complementarity model—influence of specific, measurable, and strategic assets in the definition and efficiency of contractual governance structures.
Source: Elaborated by the authors.

Federation of Industries of the State of Paraná (FIEP). The selection of interviewees was made according to the relevance of the areas of purchase, quality, and logistics based on the relationship with direct suppliers of auto parts. The FIEP coordinators, in turn, were included as key agents in the interviews to provide a systemic and impartial view of the assemblers. All the interviewees, a total of fifteen, had more than ten year's experience in the area, reflecting their capacity to contribute to the objective of this study.

The interviews were carried out during the first quarter of 2015, at the respective offices of the assemblers and suppliers and at the FIEP headquarters, all located in the region of São José dos Pinhais in Paraná state. Since the purchasing area of one of the automakers is based in São Paulo, the interview with its manager was held at this office. Three interviews were also carried out with logistics managers of direct suppliers whose headquarters are located in São Paulo.

The interviews, which amounted to fifteen hours of recording, were transcribed and are available in electronic media. Two specific interview guides were formulated: one directed at the managers of the automakers and the FIEP coordinators, and another for the managers of auto part supply companies. These interview guides, which share a similar structure, were elaborated and organized into three groups of questions. The first group was intended to characterize the companies under study, notably involving characteristics of contracted products. Aspects related to transaction costs, measurement costs, and strategic resources made up the second set of questions. In the third set, questions that dealt directly with the measurement of specific assets and strategic resources were added, in order to answer our propositions and sub-propositions. Secondary data, in turn, were collected through websites and institutions specialized in the treatment of industry data, such as ANFAVEA, and through studies that discussed the industry's dynamics.

Results

Considering the objective outlined for this research, this section seeks to develop propositions and sub-propositions as well as offer theoretical and empirical analysis related to the complementarity of TCT, MCT, and RBV in the configuration of contractual forms. To accomplish this, the interviews with representatives of the automakers, their direct suppliers, and FIEP were taken as our reference.

The proposition about contracting considers that, given the possibility of measuring the attributes of the products, the contractual relationship can be used to guarantee property rights over both assets of high specificity and strategic resources, generating competitive advantage and thereby avoiding the costs of vertical integration.

This proposal was confirmed by the automotive sector of Paraná. Despite the high level of specificity of transacted auto parts, the contractual relationship was identified as predominant in the interviews. In this case, even highly specific or strategic assets—generators of competitive advantage—are transacted through contracts, rather than through vertical integration. Measurability was considered by the interviewees as an essential factor for using contracts to conduct transactions for auto parts of high specificity and which are generators of competitive advantage. The assertions of these analyses, relating to sub-propositions (a) and (b), are detailed below.

Sub-proposition (a): specific and measurable assets

In general, contracts can be used to obtain auto parts in two different situations: standardized assets and specific assets. In the case of standardized assets, whose presence was previously ratified by Melo (2006), and Costa and Henkin (2012), respondents were unanimous in stating that their acquisition could occur through the market, but this option is unsuitable for automakers given the need for traceability. Thus, contracts emerge as mechanisms to ensure this traceability, and ensure the property rights of manufacturers, as highlighted by Ferrato et al. (2006), Casotti and Goldenstein (2008), and Augusto (2015). However, according to Barzel (2002), this is because automakers are able to measure the attributes of the auto parts acquired, especially technical specifications such as quality, quantity, width, weight and origin.

This is clearly demonstrated by the response of the manager of Supply Company 3: "Since the contract can guarantee the assemblers that we will deliver, why will they take responsibility for making these standardized, more basic parts? It's much cheaper and smarter to leave it up to us." Logistics Manager of Automaker A–B adds:

> The contract guarantees our rights very effectively, because there are many ways to guarantee; this is all very well planned, every little thing is detailed and we know what to detail. There is a lot of control and if the supplier does not comply, he will be the loser. He will be fined and he will be replaced, so the cost is very high for him to risk doing so. For him it's much more interesting to have a long-term relationship with the automaker, because his volume of sales increases a lot. I worked eight years in engineering and never saw any problem related to the leaking of information or anything. If they do, they will break [the contract].

The situation is the same when it comes to highly specific auto parts. In the first case, even when dealing with transactions for high-specificity auto parts, which would justify vertical integration given the possibility of opportunistic behavior, as proposed by Williamson (1985, 1996), and Ménard (2004), there was still a predominance of contractual relations. This predominance is justified, according to respondents, by the existing safeguards, stemming from the possibility of measuring auto parts and reducing transaction costs, as stated by Ferreira and Serra (2010). Therefore, as emphasized by Barzel (2005), the presence of feasible measurement in the auto parts purchased by the automakers (color, weight, width, and technical specifications in general), makes it possible to have a satisfactory guarantee of property rights over them.

The Quality Manager of Automaker A–B clarifies: "I have a very specific auto part, but I contract, so you ask me why? Because I have more advantage in contracting, I have the means of control; why should I produce if someone does it better and I can control?" Likewise, the Logistics Manager of Supplier Company 5 claims: "The question is: why not contract? Even for specific parts, they control all the details. If there is a mistake, they find out with a recall, and worse, they can track every component that we and our suppliers put in."

In view of the above considerations, it is valid to assume that high-specificity assets can be governed by contracting as long as they have clear measurable dimensions, thus validating the sub-proposition. In other words, even in the case of the high-specificity assets characteristic of the automotive sector (Williamson, 1985, 1996), contracting and control inhibits opportunistic behavior, given the possibility of measurement (Barzel, 2005), favoring the parties with a guarantee of property rights.

It is worth noting that the interviewees affirm that measurement cannot always be exact, so there is a certain measure of tolerance practiced by the automakers. This situation is exemplified by the Purchasing Manager of Assembler A-B: "My measurement might not always be accurate, but if it goes past me, it can be accepted, because it is within what we quote or produce, so in a way I guarantee that I am not losing in the exchange: sometimes there are acceptable losses." Typically, tolerance in error acceptance relates to the recognition that suppliers have the ability to meet the stated design specifications.

Sub-proposition (b): strategic and measurable resources

In addition to specific assets, several strategic resources generating competitive advantage are also transacted, and even developed, in the relationships between the automakers and their suppliers. It is worth remembering that the resources that generate competitive advantages, using Barney's classification (1991), are those considered rare and valuable, and thus differ from the generators of SCA that, besides these characteristics, must also be difficult to imitate and replace.

It is worth noting that in the process of our investigation several resources generating competitive advantage, which today are common among competitors, were considered innovative at the time (Bluetooth, integrated GPS with SD card, reversing sensor, air bags, among others). In such cases, these are considered valuable and rare resources for automakers (Barney, 1991). At the time of release, many of these features had been developed jointly with the more innovative suppliers present in the sector. It was noted that the control exercised by the automakers, enabled by means of measurement, is satisfactory through a contractual relationship because it allows the exercise of specific rights (Barzel, 1997) and, in most cases, residual control rights (Hart, 1995; Monteiro & Zylberzstan, 2011).

Respondents reported that specific control rights are exercised in all auto parts transactions, including cases where the supplier is responsible for mold development and auto parts manufacturing. In these cases, control is ensured through the design of the contract and the existing legal apparatus, supporting Barzel's proposition (2002, 2005). In situations where the automaker is responsible for the development of the auto part mold, and situations in which this development occurs in conjunction with the supplier, the assembler also obtains the ownership of the mold, exercising residual control rights (Barzel, 1989; Crook et al., 2013; Grossman & Hart, 1986; Hart, 1995; Hart & Moore, 1990). Therefore, the automaker can decide on the use of some auto parts in situations not foreseen by contract, because it owns the property.

The Logistic Manager of Assembler A–B support this statement: "Whether the automaker passes a mold to the supplier or whether it is jointly developed, the automaker always retains ownership: the mold is at the supplier but it belongs to the automaker, so if they want to pick it up and take it away, they can. All automakers are like this." The possibility of specific control, and also residual control, through contractual relationships therefore makes contracting feasible. This characteristic of transactions is explained by the FIEP Industrial Development Coordinator: "Normally the structure is very synergistic, very ingrained, where the automaker pulls all its suppliers and controls everything, in many cases even the molds of the auto parts. The responsibility of action is on the supplier, but the assembler may own the rights over the mold in some cases."

Similarly, residual rights may also occur, as stated by the Logistics Manager of Supply Company 5: "There are times when

Types of resources	Related governance structures
Strategic resources generating SCA	Vertical integration
Strategic resources generating CA	Vertical integration or contracts
Non-strategic resources (standardized)	Contracts or market

Fig. 4. Strategic resources and governance structures, based on the automotive sector.
Source: Elaborated by the authors.

they participate together with us in the development of a more differentiated part for the market, and they infiltrate so much that they can control each item, because they know how to. They pay us to develop the car part, but then the property rights of the car part are theirs." Thus, contracting also occurs in the case of strategic auto parts, generating competitive advantage, because the automaker acquires legal rights, and often residual rights, over them.

In the case of transacting more valuable or rare auto parts, such as Bluetooth and GPS, quality control is even more effective and is often developed in conjunction with the supplier. In this case, measurement is used to control the dimensions related to the quality of these auto parts in the transactions, given their importance for the generation of competitive advantage at their launch. This control by measurement is usually exercised, according to the interviewees, because the automakers must guarantee the quality aspects of auto parts of this nature, since failure would directly affect their image in the market. The Quality Manager of Automaker C states:

> In the case of auto parts that have specific measurements, from the simplest to the most strategic, where control of specifications is possible, for each lot that comes in from the supplier we have samples taken to the Measurement Room. There they go through a 3D x-ray that confirms their exact measurements in relation to what they should be for the requested project. So everything is controlled there, thickness, size, width, raw material, height, everything that is measured goes there to be checked for any fault, before that part is placed in the car. In the case of large suppliers – the more strategic [the part], the greater the control.

The validity of the sub-proposition (b) is evident, in that strategic resources generating competitive advantages (valuable and rare) can also be governed by contracting, provided they have clear measurable dimensions. Although the specific properties of each transacted auto part, valuable or rare, suggest the possibility of opportunistic behavior (Klein et al., 1978; Williamson, 1985, 1996), and information asymmetry is present in transactions to a greater or lesser degree (Barzel, 2002; Ménard, 2004), the possibility of measurement allows for the use of contracts.

Strategic, specific, and measurable resources and contracting: a general analysis

The use of contracts in the relationship between suppliers of auto parts and automakers is viable due to the measurability of specific and strategic assets, limiting the appropriation of value. It is observed that, in a transaction, the consideration of resources viewed as strategic solves the problem pointed out by Barney and Hesterly (2004), regarding the lack of primary focus of TCT on strategic aspects of the company. On the other hand, it is evident that the limitation of RBV, as pointed out by Foss and Foss (2004), Foss (2005), and Foss and Klein (2010), regarding the issue of creation and appropriation of strategic resources, can also be mitigated by considering measurement to guarantee property rights. In addition, its use reduces hold-up problems in contractual relations, as discussed by Klein et al. (1978).

Considering the treatment of strategic resources in isolation, some guidelines can be proposed regarding the choice of possible governance structures to coordinate transactions, when the generation of competitive advantage, or not, is taken as a variable. This proposal is based on the proposition of complementarity, and offers an opportunity to minimize the limitations of RBV, which focuses on organizations and does not discuss the role of the market and contracts in capacity-building. Fig. 4 identifies this alignment, considering the strategic resources generating competitive advantage, the VCS generators, and non-strategic resources, in relation to possible governance structures for their coordination and protection. It is observed that the RBV, considered in the context of governance, is subject to the variation of mechanisms for the protection of strategic resources.

The possibility of control by automakers over the specifications and measurability of auto parts which generate competitive advantage is due to the knowledge and skills they have gained throughout the outsourcing process. In some situations, however, contracting may be an option for automakers due to their lack of knowledge or lack of capacity to dominate the production process. Measurement mechanisms can also be enhanced through a trusting and joint learning relationship with the supplier, discouraging the inappropriate capture of rent by both parties. In addition, safeguards arise in the face of the learning process related to the recurrence in transactions, improving the measurement mechanisms and thereby promoting positive effects on contracting.

The information obtained, identifying the contractual relationships related to the strategic capabilities of the automakers, confirms the influence of trust on relationships as a non-contractual mechanism, as discussed in Ménard (2004) and Crook et al. (2013). They also highlight the influence of the learning process on the organizational transactions of strategic resources generating competitive advantages, applied in this case to the measurement aspects. as discussed by Langlois (1992), Combs and Ketchen (1999), Saes (2009), and Argyres and Zenger (2008, 2012). In the same way, information, treated in Barzel (2002), assumes a primary role in the sector, since its availability makes it possible to learn about aspects of measurement.

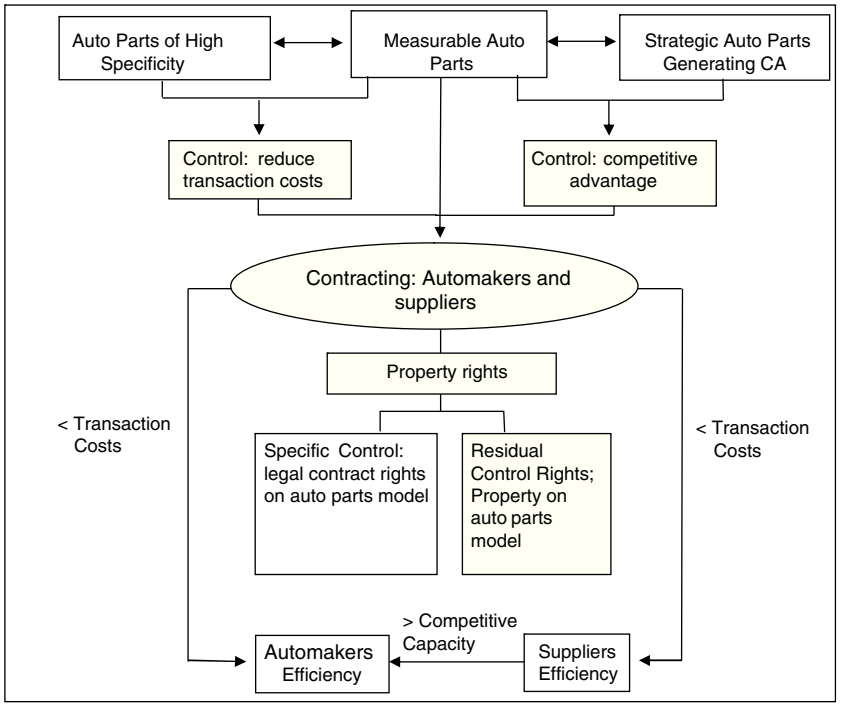

Fig. 5. Complementarity model: highly specific and measurable assets and strategic resources in the definition and efficiency of the contractual structures: empirical aspects.
Source: Elaborated by the authors.

Given the above, it is clear that even in the presence of auto parts with high specificity and which generate competitive advantage, which would justify vertical integration, the hybrid form was predominant in the companies studied. This can be explained by the presence of a high level of development, and the use of control mechanisms, measurement, and guarantee of ownership of these auto parts, in addition to the superior capacity of market supply. In this case, although there is an increase in measurement and transaction costs due to the wide use of contracts in the sector, the production costs would be avoided if vertical integration were used. The theoretical–empirical reasoning inherent to the use of contracts is expressed in Fig. 5.

It is worth noting that each strategic resource pointed out by the automakers bears some contribution from suppliers, who have developed knowledge through their frequent participation in the construction of these differentials. In this case, the automaker is always responsible for directing the strategy, but the supplier plays an essential role in its viability. Moreover, in some cases, the differential developed by the automaker is conserved because they control the specifications of the auto parts, and often the supplier's chain of production.

Conclusions

The purpose of seeking a better understanding of contractual relations through complementarity, involving the TCT, MCT, and RBV theories, was carried out through the development of the theoretical model and its validation through empirical research.

As a result, it was observed that the proposition of complementarity over contractual forms indicates that specific assets and strategic resources can be governed by contracting, since they are easy to measure. From this premise, the sub-propositions about contracting involved the presence of: (a) specific assets and ease of measurement; and (b) a condition of strategic resources, generators of CA, and ease of measurement.

The sub-proposition (a) was corroborated by the finding that contracting occurs even in the case of auto parts with a high level of specificity. However, this option is justified by measurability, ensuring the protection of specific and residual property rights, as well as avoiding the costs of vertical integration. The verification of the sub-proposal (b) was due to the possibility of measurement and control, and thus contracting was used in the acquisition of several innovations capable of generating competitive advantage (Bluetooth, GPS integrated in the vehicle with SD card, reversing sensor, air bags). It was observed that even though these advantages constituted valuable and rare resources for automakers at their launch, companies were able to prevent acquisition through contracting.

It was noticed that, once the contract was chosen as an option to coordinate specific assets or strategic resources generating competitive advantage, its use provides some advantages. Besides capturing or developing assets and resources for which the automaker has no expertise or capacity (RBV), contracting provides protection against opportunistic behavior (TCT), through contractual safeguards. It also defines the measurement mechanisms and control over acquired auto parts (MCT).

The main contribution of this investigation is to indicate that the insertion of measurability and strategic resources to the study

of the contractual firm allows for the inclusion of new theoretical orientations to the efficiency arm, as proposed by Williamson (1975, 1985), and to the control of strategic resources, as proposed by RBV. When considering the measurement of specific and strategic assets in the model proposed by the author, a new assumption is created—a modification of the predictive rationale established to explain the choice of contractual forms.

Among the possible limitations of this research is the focus on only three automotive manufacturers, since the consideration of other automakers could complement the findings. Future studies should extend research to other automakers in order to advance developments in the proposed model. Methodologically, quantitative research can be structured to explain the cause-effect relationships involving the choice of contracting from the proposed model. From the proposition of complementarity presented in this article, future studies can explore the rationale related to vertical integration and the choice of market relations, considering strategic aspects and transaction costs.

These suggestions and new ideas, involving the complementarity of the notion of transaction costs and strategy in defining firm boundaries, present a rich path of discussion and possibilities. The present research, despite the inherent theoretical and empirical limitations, sought to take a further step in this direction. Ultimately, the goal is that new questions arise, and with them new challenges for researchers in discussions about organizational boundaries and contractual forms.

Conflicts of interest

The authors declare no conflicts of interest.

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