

MEASUREMENT COSTS AND GOVERNANCE: bridging perspectives of Transaction Cost Economics*

CUSTOS DE MENSURAÇÃO E GOVERNANÇA: construindo perspectivas da Economia dos Custos de Transação

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ABSTRACT

The theory of the firm arose from the production function paradigm and amplified its scope to comprise both coordination between firms and their internal organization. The transaction cost perspective motivated a large number of empirical studies based on quasi-rents appropriation resulting from asset specific investments. Another theoretical approach to the firm - likewise rooted in the transaction cost perspective - is the measurement cost theory, which has not had an equivalent empirical impact. Both theories share similar grounds but differ in terms of internal logic, explicit assumptions and key measurable variables, which suggests methodological implications. The aim of this paper is to contrast both theories, discussing their theoretical and empirical boundaries. Following the introduction, the second part contrasts the theoretical constructs. The third part suggests testable hypotheses and predictions. Part 4 presents a case of contradictory interpretation of similarly observed phenomena, using both lenses. Finally, Part 5 concludes.

Keywords: Measurement costs. Transaction costs. Theory of the firm.

RESUMO

A teoria da firma surge a partir do paradigma da função produção e amplia seu escopo para abarcar tanto a coordenação entre as firmas quanto sua organização interna. A Economia dos Custos de Transação motivou um grande número de estudos empíricos baseados na apropriação da quase-renda resultante de ativos específicos. Outra abordagem teórica da firma – também embasada na perspectiva dos custos de transação – é a teoria dos custos de mensuração, a qual não teve um impacto empírico equivalente. Ambas as teorias compartilham das mesmas bases, mas diferem em termos de lógica interna, pressupostos

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explícitos e variáveis chave, o que indica implicações metodológicas. Este artigo busca contrastar ambas as teorias, discutindo suas fronteiras teóricas e metodológicas. Além da introdução, a segunda parte contrasta os construtos teóricos. A terceira parte sugere hipóteses testáveis e predições. A parte 4 apresenta um caso de interpretação contraditória de fenômenos similares, usando as duas lentes. As conclusões são apresentadas na seção 5.

Palavras-chave: Custos de mensuração. Custos de transação. Teoria da firma.

1 INTRODUCTION

Plainly, an integrated treatment of governance and measurement is ultimately needed (WILLIAMSON, 1996).

The measurement cost approach is applicable to vertical integration. Moreover, it is more general and more operational than that of specific assets (BARZEL, 2003).

The present paper compares two branches of transaction cost economics (TCE), namely: the governance perspective based on quasi-rents protection (KLEIN; CRAWFORD; ALCHIAN, 1978; WILLIAMSON, 1979) and the measurement cost perspective (BARZEL, 1997, 2001). Three elements are herein explored: first, the definition of firm; second, the theoretical structure; and third, testable hypotheses derived from both approaches.

The family of non-Walrasian theories of the firm evolved based on contributions rooted in the work of Coase (1937) followed by Langlois (1992), Demsetz (1995), Hart (1995), Williamson (1996), Barzel (1997) and Foss (1997), amongst others. This set of theories contributed to the broadening of the scope of the theory of the firm, offering a criticism to the production function paradigm to comprise a more general interpretation of coordination mechanisms, including the role of knowledge, property rights, and allowing for the analysis of vertical and horizontal integration and the internal structure of the firms.

Tests of hypotheses based on the transaction cost perspective grounded on the governance paradigm have led to a sizeable volume of empirical studies, as demonstrated in Macher and Richman (2006). According to Williamson (1996, p.87) the governance paradigm – based on the logic of structures designed to protect quasi-rents expropriation – has paved the way for the success of the transaction cost theory.

Another vein of TCE is the measurement cost theory (MCT), rooted in the protection of value of difficult-to-measure transaction dimensions. This theory embraces horizontal and vertical coordination and internal structures but does not present equivalent empirical impact such as that observed in the governance perspective. Both theories share the same objectives but differ in terms of internal logic, unit of analysis, assumptions, and measurable variables, thus bringing methodological implications, which in turn might explain differences in empirical impact. This paper seeks to contrast the two basic constructs, namely, measurement cost and governance, discussing empirical limitations and presenting a case with contradictory results.

Formalization intention absent, this introductory study contributes with the analysis of the modern theory of the firm, framing concepts into a comparative perspective. It runs along the same stream as Gibbons (2004), Poppo and Zenger (1998), seeking for comparative analyses, reflecting the momentum of both theoretical development and empirical analysis.

The paper is organized into five parts. In the second part, theoretical constructs of the measurement cost model and governance perspectives are presented. Part 3 discusses testable hypotheses and predictions, and Part 4 explores some dynamic aspects of both models. Considering that alternative theories may be discriminated according to empirical results, Part 4 also introduces a theoretical connection linking asset specificity (k) to measurement costs, making room for comparative empirical analysis. The same chapter discusses an empirical case that suggests contradictory predictions. Finally, Part 5 concludes by providing comparative theoretical delimitation, empirical perspectives and a discussion on the possible accommodation of eventual frictions between both constructs.

2 THEORETICAL CONSTRUCT

The common proposition presented by the theories of the firm based on the transaction cost perspective is that they question the Walrasian model and the production function paradigm (WILLIAMSON, 1985, p.12, 45; BARZEL, 1997, p.11, 21). The criticism is essentially placed on the zero transaction cost assumption and is based on the Coasian analysis of the firm as a nexus of contracts, where positive costs of transaction apply.

Usually, once the introductory remarks are made, diverse paths are chosen to explain the existence, scope, size and internal organization of firms. The many paths followed by the theories of the firm suggest the need for clearing theoretical interfaces and advancing towards a unified theory that provides explanations for its existence, internal organization, size, scope and inter-firm relations.

The present study represents an incremental effort towards this objective, being limited in the sense that it is focused only on the transaction cost-based theories, namely the measurement cost (BARZEL, 1997, 2001) and the governance perspectives (WILLIAMSON, 1989; KLEIN; CRAWFORD, ALCHIAN, 1978), therefore ignoring, for the moment, other approaches such as the resource-based view and incomplete contract theory.

My motivation for this particular study lies in the potential empirical use for both theories. Although theoretical evolution allowed for analysis of the modern firm, especially within the paradigm of vertical coordination, users remain puzzled as to the competing nature of the theoretical constructs. As stated by Williamson (1996, p.65) in discussing the measurement branch: “Plainly, an integrated treatment of governance and measurement is ultimately needed.” The same author states that both approaches are not independent: “The difference in emphasis is nevertheless real and needs to be highlighted.” (WILLIAMSON, 1975, p. 81)

Likewise, Barzel (2003) considers that it is difficult to distinguish between the many theories of the firm, since assumptions are most often implicit. Further, this author makes special mention of the governance approach, concluding that the notion of measurement cost is more general than that of specific assets, in addition to being more operational. Moreover, Barzel (2003) states that Williamsons’ perspective deals with difficult-to-measure variables and that empirical tests are of fragile nature, whilst MCT is more readily testable.

Here, we start by comparing how the firm is defined in each approach. Under the governance perspective, Williamson sees the “firm as a governance structure, defined as the institutional framework in which the integrity of a transaction, or related set of transactions, is decided” (WILLIAMSON, 1996, p. 11). This definition stresses organizational rather than technological features. Barzel (1997, p. 81) defines the firm as “a set of contracts whose

variability is contractually guaranteed by common equity capital. The firm, then, is a nexus of outcomes guaranteed.” The same author offers this definition (BARZEL, 2001, p. 20):

The firm is a nexus of the agreements and parts of agreements guaranteed by centralized equity capital and enforced without the state’s assistance. The firm’s owners are the individuals who are the residual claimants to the value guarantee capital. The scope of the firm is the ratio of its guaranteeing capital to that of (some sort of) its expected guaranteed payments.

Williamson (1985, p.24) presents a cognitive map of contracts, where both approaches are placed in the same branch of literature, rooted in the efficiency perspective and sharing a transaction cost perspective. The author elects the governance approach and ponders the interdependence between approaches.

The transaction cost argument proposed by Williamson is based on the existence of different measurable transaction characteristics, namely: frequency, uncertainty and asset specificity, which, in the presence of opportunism, define the efficient alignment governance in a discriminatory manner, driven by a transaction cost saving perspective. Williamson (1991) included measurability as a fourth attribute, but this has not been explored empirically.

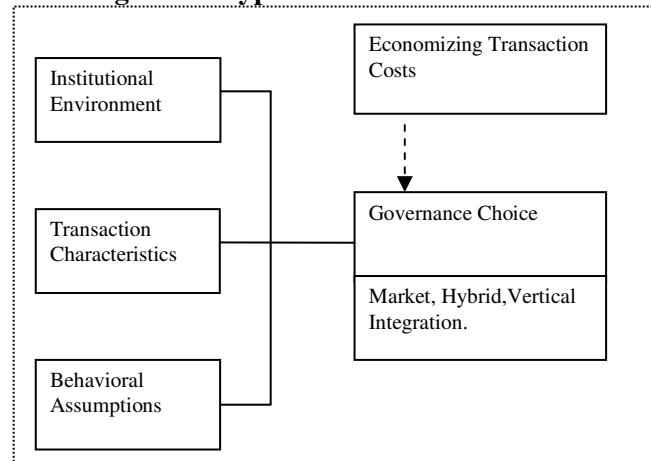
The explicit unit of analysis is the transaction, and individuals follow a decision rule marked by the search for the efficient alignment between the transaction characteristics and choice of governance, given the institutional environment and subject to behavioral assumptions of bounded rationality and opportunism. Individuals decide to place the transaction within the boundaries of the firm, should the risk of ex-post expropriation of valuable specific assets be high. Therefore, strict control is associated with vertical integration, while market transactions are chosen when low asset specificity prevails, leaving less room for expropriation. The theory deals with the need to coordinate independent agents to promote cooperation, recognizes the existence of contract breaches and the possibility of external and unpredictable shocks, in addition to the demand of specific investments in non or partially deployable assets, thus framing the basic structure of the model.

The key argument is that appropriable quasi-rents are associated with specific investments, as proposed by Klein, Crawford and Alchian (op. cit.). The alignment hypothesis is represented in Figure 1, whereby institutional environment, transaction characteristics and behavioral assumptions interact to define an efficient solution of governance, whether market, hybrid forms or vertical integration. Changes in the institutional environment likewise promote shifts in transaction cost minimizing solutions, promoting new alignments. Thus, institutions are considered exogenous constructs of the TCE theory².

The measurement cost model rests on the concept of protection of proprietary rights related with transaction dimensions. The theory explores the differences between economic and legal rights, whereby the former is guaranteed by reputation mechanisms and the latter, by the courts. The main case states that what precludes a Pareto optimal contractual solution is the cost to measure the attributes under transaction. The easy-to-measure dimensions are contracted, whilst the difficult-to-measure attributes make room for capture of value and are expected to remain within the firm. High measurement costs invoke the capture of value. Barzel does not make explicit behavior assumptions, such as opportunism, considering self-oriented competition enough to support the proposed model. The purpose of efficiency is present in the sense that the logic of property allocation follows a value maximization perspective.

² Williamson discusses institutional changes, but the implicit assumption is that given the time horizon of organizations, these may be considered exogenous.

Figure 1 - Alignment Hypothesis in the Governance Paradigm.



Source: Author

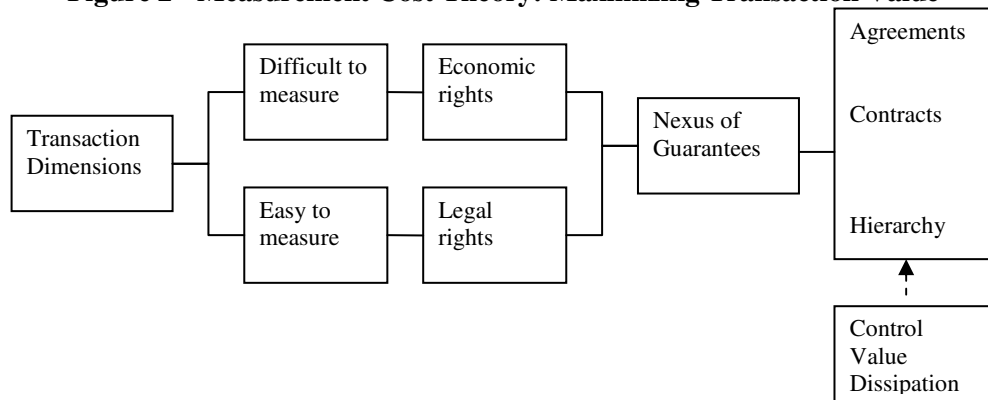
Three building blocks are relevant to MCT. The first is the contractual nature of the firm, where property rights are transacted to generate value³. The protection of value roots the model, identifying the transaction cost perspective. Second, both product and input quality are subject to imperfect measurement, impairing proper allocation of incentives. Measurement costs affect the ease of contract enforcement, precluding the advantages of specialization and allowing some transaction dimensions to fall into public domain. Organizations differ in the way they build mechanisms to protect rights associated with particular transaction dimensions. Under Barzels' lenses, property rights might be of dual nature – legal or economic – differing in the way enforcement is achieved. Both poorly defined proprietary rights and difficult-to-measure transaction dimensions are associated with positive transaction costs.

The third building block of the model refers to the allocation of property based on value maximization criteria. Property is efficiently allocated with the party that affects product variability and is able to offer guarantees, therefore becoming a residual claimant. As Barzel (1997, p. 78) stated, "...as the effect a party exerts on the value of the outcome increases, rights will be better defined if that party assumes a larger share of the variability of outcome," thus playing the role of a residual claimant.

Barzel proposes that the value of economic rights is affected by legal ownership, including the quality of enforcement offered by the State. Should there be disputes the State might offer lower cost solutions as compared to private arrangements. Otherwise, agents prefer to build alternative private solutions to protect their economic rights.

Both theories consider that institutions matter and these are taken as given, thus binding the feasible efficient solution set. For MCT, institutions matter, since legal ownership is based on the state's capacity to offer guarantees to the transaction based on an existing contract (see Figure 2).

³ Barzel distinguishes two kinds of agreements. Self-enforced agreements are kept within the firm and they correspond to difficult-to-measure attributes. Otherwise, they are guaranteed by third parties (namely, the state) and are defined as contracts.

Figure 2 - Measurement Cost Theory: Maximizing Transaction Value

Source: Author

Both difficult-to-measure attributes and poorly defined proprietary rights affect transactions similarly, i.e., they increase the costs of transaction and the likelihood of vertical integration. The existence of the firm depends on its capacity to offer guarantees in relation to the variability of production, or other significant dimensions under transaction⁴. If variability cannot be measured, it cannot be contracted.

Some contrasts between both theories may be highlighted, as follows:

Contrast 1: The governance perspective deals with quasi-rents protection motivated by external shocks, where highly consequential shocks in the presence of asset specific investments are aligned with internal transactions, whereas transactions reached by inconsequential shocks are placed on the market. Under MCT lenses, the size and scope of the firm depends on the cost to measure inputs or outputs and the assurance of guarantees, whether granted by the state or the residual claimant, so ownership is allocated to the one that offers equity capital. Transactions subject to high measurement costs are expected to be held internally.

Contrast 2: Both theories deal with variability. However, the governance view focuses on the existence of external disturbances and its consequences. The alignment hypothesis rests on compatibility between the consequence of external shocks and the need for coordination. The measurement cost perspective, on the other hand, discusses both product and factor of production variability, and recognizes that factors of production and products are not homogeneous. Agents cooperate in production to maximize value subject to positive measurement costs, as well as costs to write and enforce contracts, mitigating the opportunities for capture of value. In the advent of high measurement costs, transacting agents are further exposed to value dissipation risk. In such cases, the internal organization is an efficient response to the coordination issue, namely, one that provides incentives to maximize the value of production thus avoiding losses of capture.

Table 1 explores comparative features for both theories. The construct of the governance view is presented in detail by Williamson (1985, 1996). Barzel's contributions are presented in his books *Economic Analysis of Property Rights* (1997), *A Theory of State* (2002) and several articles, particularly "A Measurement Cost Based Theory of the Firm" (2001, 2003).

⁴ That is why Barzel insists on the importance of defining what is actually being transacted.

Table 1 - Contrasts: Governance Paradigm and Measurement Cost Theory.

	Governance	MCT	Comments
Origin	Institutions matter.	Institutions matter.	Protection of property rights relevant in both constructs.
Unit of analysis	Transaction: decoupled in characteristics of frequency, asset specificity and uncertainty.	Transactions are decoupled in dimensions. A set of economic and legal rights are exchanged and guaranteed by the state or privately.	In the governance view transaction characteristics facilitate empirical analysis. In MCT each dimension carries a level of measurement difficulty.
Assumptions	Opportunism. Incomplete contracts originated from ex-post changes of the state of nature and bounded rationality.	Implicit opportunism ⁵ . Bounded rationality ⁶ . Incomplete contracts, perfect measurement is impossible.	In governance view opportunism adds to the incomplete contracts. In MCT, maximization adds to costly measurement.
Testable hypothesis	Higher level of asset specificity aligned to vertical integration or long term contracts.	Difficult to measure attributes within the firm. Ownership rights are placed with whom offers guarantees.	Both have dynamic implications. Fundamental transformation and changes in measurement costs.
Main case	Transaction characteristics determine governance structure.	Difficulty to measure determines vertical and horizontal interaction, as well as inner structure of the firm.	MCT contemplates the complex inner structure of transactions.
Organizations follow the rationale.	Governance structure results from an alignment perspective. Transaction cost minimization. Decision is taken ex-ante considering ex-post hazards.	Internal organizational structure results from value maximization perspective. Decision is taken at any time.	MCT does not explore inter-temporal elements.

Source: Author

Contrast 3: Both theories consider the relevance of post-contractual hazards, however, they originate from different perspectives. The governance view suggests that opportunistic agents are exposed to incentives to breach contracts should benefits exceed costs of keeping promises. Likewise, MCT proposes that information is costly to produce, motivating errors in the allocation of incentives and therefore ex-post disputes over margins. As Barzel (2003) points out “...errors open the door to the expenditure of resources to capture wealth, because in their presence, among other things, people can pass off their poor performance as a result of random error”.

Contrast 4: On behavioral assumptions: The governance view makes clear statement of the relevance of behavioral assumptions, mostly opportunism and bounded rationality. Since contracts are incomplete, selective or distorted use of information leads to ex-post expropriation. Barzel does not make explicit assumptions in terms of opportunism, but indicates that maximizing behavior suffices to explain incentives for transacting parties to spend resources in capturing unprotected margins. To what extent ex-post expropriation of value relates to margins in the public domain depends on pure maximization or opportunistic

⁵ It would be of relevance to clarify whether MCT relies on maximization behavior or opportunism.

⁶ As stated by Williamson (1975, p. 81) governance problems will vanish if either bounds on rationality or opportunism are presumed to be absent.

behavior, which is a matter of interpretation. One may affirm that opportunistic behavior is present in both models in a relatively explicit manner.

The building blocks of both theories may be contrasted in terms of the unit of analysis, behavioral assumptions – namely rationality and opportunism – definition of firm, and how institutions affect efficient decision making. Each theoretical block has its own empirical implications, as will be discussed in the succeeding sections.

3 EMPIRICAL POSSIBILITIES

Both theories offer alternative explanations for the observed institutional arrangements. Comparative empirical strengths differ, since they relate to the design of refutable hypotheses and the definition of variables that facilitate the handling of empirical analysis.

Non-Walrasian theories of the firm, much like any other theory, may be evaluated based on their capacity to generate refutable hypotheses and their adherence to the real world of organizations. The more clearly one states the main case and better defines the key variables, the easier it is to handle empirical analysis and derive testable hypotheses. Clear identification of the theoretical blocks actually facilitates the adoption of empirical tools.

The governance approach based on quasi-rents appropriation states its fundamental prediction thus: “The higher the level of asset specificity, the more vertical integration is expected to be observed as a way to economize in transaction costs.” Additional elements derive and follow through from this theoretical perspective. First, the alignment perspective allows for the evaluation of effects that observed transaction characteristics – particularly asset specificity – have on the observed governance mechanisms. Uncertainty plays a role and offers an empirical dimension that has been less explored in literature, possibly due to difficulties in measurement. High uncertainty and asset specificity suggest benefits of post-contractual coordination mechanisms for dealing with their consequential impacts. This explains the choice of efficient governance mechanisms based on alternative coordination devices, ranging from vertical integration to markets, including hybrid governance modes.

Focus lies in incentives for cooperation, since mutual adaptation affects the performance of a given institutional arrangement. Transaction frequency enables the handling of reputation mechanisms and relational contracts. Reputation mechanisms associated with repetitive transactions are often subject of study as well as network effects, whereby relevant information is transmitted to players that are not directly involved with the transaction.

The concept of fundamental transformation (WILLIAMSON, 1996, p.13) allows for the study of dynamic elements, particularly how large numbers conditions at the start of a contract may be ex-post transformed into small numbers exchange relations.

By and large, the most relevant explanatory variable from the governance perspective is the level of asset specificity that serves as the basis of most of the existing empirical literature. Highly specific assets, and transaction outcomes of greater uncertainty, are aligned with strong coordination mechanisms that add or protect transaction value. In such cases, vertical integration is the expected solution. Recursive transactions offer a mechanism of transaction stability, in the sense that they increase hold-up costs, suggesting that a larger, self-enforcing contractual range protects the value of specific investments. In such cases, less vertical integration solutions are expected.

Empirical use has been predominantly applied to the study of vertical integration and the governance choice of either internal or market transactions. Theory evolved towards the study of hybrid forms, as discussed by Williamson (1991) and Menard (2004), yet offered fewer empirical evidences shedding light on the organization of hybrid contractual formats. Both authors stress that in the real world one expects to find intermediary formats of organizations.

The measurement cost theory offers an alternative vein for empirical analysis, mostly to handle vertical integration but also coping with hybrid forms. Barzel's basic prediction and testable hypothesis is that "...ownership of assets attributes is expected to gravitate into the hands of those who are the most inclined to affect the income flow." The scope of the firm is defined by the set of contracts that affect product variability. Therefore, the firm is seen as the nexus of outcome guarantees, or a set of contracts guaranteed by the equity capital. Provided that variability and liability are related to residual claimancy, the theory applies to the issue of which services or activities should be owned or contracted. The main application of the theory is similar to the governance view in the sense that both deal with the size and scope of the firm by means of different lenses. For MCT, the scope of the firm is defined by the nexus of agreements that affect product variability, or the variability of a given dimension as part of the transaction.

The role of institutions in MCT is related to the mechanisms of enforcement and guarantees of property rights. If property rights are properly enforced, then agents are expected to be more inclined to contract instead of owning the asset. If contractual hazards are properly handled by courts, then firm value is expected to increase with the choice of an external contract. The lower the costs of measurement, the more efficient it is to place the transaction outside the firm, since more transaction dimensions are contracted and courts face less difficulties in solving disputes. The firm is expected to design contracts and agreements that minimize value dissipation. Both costs to organize and benefits of decreasing value dissipation are contrasted. This means that theory recognizes that cooperation is costly, given the risk of value capturing.

Ownership is associated with the right on income flow generated by the asset. Should the variability of attribute dimensions increase, the more difficult to measure and thus non-owners would have the opportunity to capture margins. Larger variability in production is associated with less predictability of income flow, reducing contracting probabilities.

Comparative Theoretical Dimensions: The governance view states which characteristics of transactions are deemed relevant dimensions of consideration, the distinctive one being asset specificity (*k*) (WILLIAMSON, 1996, p. 45). Moreover, literature offers alternative measures for "*k*", classified as location or site specificity, time, physical and human capital specificity. Different authors such as Joskow (1993), Shelanski, Klein (1995), and Zylbersztajn and Lazzarini (2005) have found evidences of the relevance of different measures of "*k*" to explain vertical integration and contract duration, developing or reporting empirical tests for TCE based on the transaction cost and minimizing alignment hypothesis.

Contrasts between the two approaches have been limited to statements made by the major authors and a handful of empirical studies, as per Poppo and Zenger (1998). Williamson (1985, p.81) criticizes the MCT by affirming that "...the relevant dimensions for asserting where the measurement difficulties reside remain somewhat obscure." On the other hand, Barzel (2003) argues that the notion of measurement costs is more general than that of asset specificity. His argument stresses other mechanisms to protect quasi-rents, particularly considering the relevance of standardization. Moreover, Barzel opens room for a relevant vein yet to be explored, linking in the cost to generate homogeneity, to be addressed in the forthcoming section.

The unit of analysis and decision variables is not explicitly defined in MCT and the key variables are less precise than in the governance perspective. Its strength, however, lies in highlighting the importance of causes of variability decoupled in its measurable dimensions. It follows that the implicit unit of analysis is the transaction decoupled in its dimensions. The MCT approach is general enough to handle transactions of inputs or products, as well as horizontal or vertical transactions.

Under the MCT lenses, there are three aspects to be considered, two of which are discussed in literature, the third introduced herein. The first refers to transaction characteristics, the second to transacting parties' characteristics and the third introduces shifters in the efficient arrangement suggested by the conceptual model. As to the first, any transaction might be decoupled into its different margins, which differ in terms of variability, measurability and the degree they are subject to capture. Each margin may be measured at a different cost according to the dispersion of the attribute, predictability and the existing measurement technology.

The second characteristic is the capacity to offer guarantee of capital, which determines ownership. Differences are due to size and scope of firms. The third point adds a new element, namely, the external factors that alter the efficient decision. Here, three shifter variables are proposed. The first is **measurement technology**, which makes a given measure easier. The second is investments associated with the **generation of homogeneity (standards)**. The third is the **competence of courts (state)** to obtain and interpret relevant information and enforce decisions in the handling of disputes in addition to the private mechanisms for dealing with non-contracted transaction dimensions.

Measurement technology changes through time and affects both the transaction process and measurement costs. If costs are reduced, a new efficient solution emerges. Incentives to develop measurement technology indicators depend on the specific interests of transacting parties, irrespective of government intervention.

The existence of private or public standards also impact the efficient solution, since given the existing measurement technology, enhanced homogeneity reduces measurement costs. Standards, whether public or private, have a selective effect on the technology of production.

Finally, one of the variables for consideration is the competence of courts in handling disputes since, given measurement technology and the accepted standard profile, efficient decisions are affected by the way disputes are handled by the state⁷. The competence of courts to handle disputes is a relevant issue to be taken into consideration in the reform of legal systems.

An agreement can be decoupled into a set of margins that represent the transaction as a whole. If one takes the legal environment, the existing standards and the measurement technology as a given, it determines the predictability of measurement costs. Those variables thus affect the decision to set the transaction internally, i.e., based in mechanisms designed to protect economic rights, or alternatively to set an external transaction, based on legal rights materialized in a contract guaranteed by courts.

Complex contracts: The governance perspective points to the existence of complex contracts or hybrid forms (MENARD, op. cit), but its main empirical case lies in the make or buy paradigm of the vertical coordination domain. The measurement cost perspective handles intermediate cases, horizontal integration and joint asset ownership. Considering that MCT is rooted in property rights allocation of transaction dimensions, it offers a promising vein to further investigate the so-called complex or hybrid forms. For instance, it predicts that two

⁷ For example, courts in some countries have limited access to DNA tests for the purpose of paternity evidence given high costs, limiting the use of producing evidences.

contracting parts, A and B, do not necessarily own an entire asset, but only some of its dimensions. Therefore, if guarantees are too large to be handled by either A or B, then joint ownership can be a value maximizing solution, or alternatively, an external specialized agent might offer guarantees⁸.

Recognizing that both theoretical views, namely governance and MCT, are similar theories, the delimitation of its boundaries, or main cases, may be discussed in terms of their comparative empirical strength. The empirical success of transaction cost economics based on the governance paradigm is unquestionable, but somewhat limited in the sense that it deals predominantly with polar governance modes. On the other hand, MCT potentially handles complex contractual forms, but so far, empirical production is limited. One must acknowledge that the governance paradigm presents far more vigorous empirical literature than MCT, particularly given the structure of the theory, the definition of the key variables, and the adoption of an analytical focus (main case). It is likewise user friendly.

Dynamics: Although both theories point to the importance of changes over time and of equilibrium shifters, many points remain somewhat obscure.

Handling long-term changes in asset specificity is a relevant aspect that is not entirely covered by the concept of fundamental transformation. It is Williamson's understanding that prices (p), safeguards (s) and asset specificity (k) are jointly determined, but the theory does not treat the endogenous nature of asset specificity. The concept of fundamental transformation plays a key role, since it reveals the differences that ex-ante specific investments have on ex-post contract decisions. Langlois (1992) introduced a dynamic perspective considering that firm boundaries are subject to both internal capabilities and/or those contracted outside.

Likewise, measurement costs change over time, as do incentives for changes in measurement technology and in the competence of courts to solve disputes. These dynamic elements are dimensions yet to be incorporated by the MCT model. Similar considerations may be raised concerning the treatment of institutional change provided by both theories⁹.

To some extent, the governance view matured motivating criticisms as expressed by Langlois (1992, 1998) and Langlois and Foss (1999) in relation to dynamic elements and negligence to incorporate routines and capabilities, and Ghoshal (1996) who perceived organizations as having other operational advantages not taken into due consideration by Williamson. Evolution of the governance paradigm prompted comparative empirical studies as expressed by Poppo and Zenger (1998). It is my understanding that the lack of criticisms concerning MCT rests on the existence of limited empirical work – the ultimate ground for comparing theoretical performance.

4 SHAPING THE THEORETICAL BOUNDARIES

Both theories share similar objectives, namely, to explain the size, scope and structure of firms in addition to observed patterns of coordination. Considering that theories may be contrasted, either by the realism of the assumptions or by the predictive power, the aim of this section is to suggest veins to conduct empirical comparative analysis. Considering that governance for quasi-rents protection and measurement costs are driven by value

⁸ Barzel suggests that guarantees present scale economies based on risk-sharing arguments. He does not discuss the possibility of scope economies, based on the concept of portfolio handling.

⁹ Institutions and governance are endogenous to the quasi-rents view, however, for practical purposes in dealing with governance mechanisms, institutions may be deemed exogenous.

maximization purposes, both being equally acceptable, one possible discriminative element is in the empirical strength of each theory, offering explanatory motives and testable hypotheses to distinguish between alternative institutional arrangements. Prior to discussing an empirical example, linkage between both theories might facilitate empirical contrasts, as follows:

4.1 EXPLORING THE THEORETICAL BOUNDARIES

The determinant of vertical limits of firms is discussed by Barzel (2001, 2003) by means of a comparative analysis, raising the following points:

- a) There is a distinction based on the origin of the incentives to integrate, which rests on the protection of quasi-rents, based on an ex-post perspective, and alternatively, of saving on measurement costs. As stated by Barzel, measurement concepts apply at any time while the quasi-rents protection actually represents an ex-ante perspective. Barzel states that the solutions offered by MCT cover a wider range of possibilities, including horizontal integration.

In addition, it can be stated that governance paradigm did not motivate empirical analysis of hybrid contractual forms. In fact, empirical studies have been, by and large, dominated by the vertical integration paradigm strictu sensu.

- b) Barzel (2005) affirms that MCT offers a more general rule: “As the delineation of the rights to the quasi-rents become easier, writing contracts becomes easier, thus the incentive to integrate is reduced.” This generates testable hypotheses, observing the coordination effects of better delineation of rights associated to changes in measurement technology, improvement in the efficiency of courts, plus development and adoption of standards.

The governance approach affirms that the higher the level of asset specificity, the larger the quasi-rents generated, the more likely to observe vertical integration as a form of protecting non re-deployable investments. The general statement also suggests the posing of testable hypotheses, as of measurements of asset specificity and uncertainty, the former being the most common support found in empirical literature.

The question concerning which approach presents better performance can be treated in terms of empirical analysis. Asset specificity and measurement costs are different and independent constructs. In order to leave the circularity of reasons offered by major authors, two points deserve attention: first, what are the limits of the theoretical constructs where predictions differ, and second, what does the empirical analysis suggest as reply to theoretical queries. Let's henceforth explore both aspects.

To contrast both theories, it is necessary to touch their keystones, namely, the variability of relevant transaction attributes and asset specific investments. Considering that both are independent variables, and choosing a particular transaction, four possibilities are stated (Table 2). Considering the condition of $k = 0$ and zero measurement costs (MC), one which applies to perfect asset redeployability and easy-to-measure attributes, whereby both theories predict that external transactions are likely to occur. Quasi-rents and risks of value capture are absent. The quasi-rents view predicts that transaction is expected to be placed on the market

and MCT predicts that external contracts are easily handled by courts that should solve any post-contractual dispute. No private guarantees are necessary.

Table 2 - Contrasting MCT and Quasi-Rents View.

		Asset specificity	
		$k = 0$	$k = \infty$
Measurement Costs	$MC = 0$	Market	Vertical Integration
		External Contract	External Contract
	$MC = \infty$	Market	Vertical Integration
		Vertical Integration	Vertical Integration

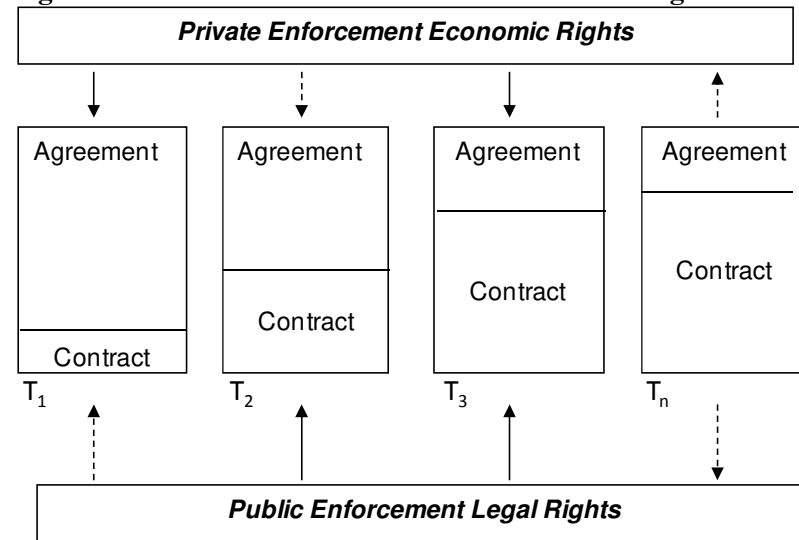
Source: Author

At the opposite extreme, whereby $k = \infty$ and $MC = \infty$ leads to the prediction of internal solution. Vertical integration is expected to economize in post-contractual transaction costs or, otherwise, to avoid capture of value related to difficult-to-measure attributes. Contracts in this case are tough to craft and courts present high costs in solving disputes over property rights.

The most interesting case is pictured in Table 2, which depicts the zone of dispute between both theories. Where $k = \infty$ and $MC = 0$, contradictory results arise. The governance view suggests vertical integration as the efficient solution, while MCT proposes that external contracts are expected to handle the transaction efficiently. Private guarantees are not necessary since courts do not raise issues in solving post-contractual disputes. Contracts are easy to write and govern the transactions outside the firm's limits. However, the high level of asset specificity points to the other solution, namely, vertical integration, to save on ex-post transaction hazards. Similarly, when $k = 0$ and $MC = \infty$, a divergent efficient solution is indicated.

The governance view handles intermediate levels of asset specificity evolving in the direction of complex or hybrid contractual forms. The governance of contractual relations under this approach also enables the analysis of complex patterns of cooperation, including network mechanisms based on reputation and relational aspects, grounded on particular mechanisms to solve disputes and meet contractual breaches. Of particular relevance is the concept of fundamental transformation to handle multi-period contracts.

Complexity is also handled by MCT by decoupling a single transaction into its many dimensions, allowing for the immersion in details of complex transactions. Formal contracts and informal agreements are expected to govern particular dimensions of a given transaction, as pictured in Figure 3, suggesting that governance should be regarded in terms of mechanisms designed to minimize value dispersion of multiple dimensions in a single transaction. In that sense, both approaches are distinct.

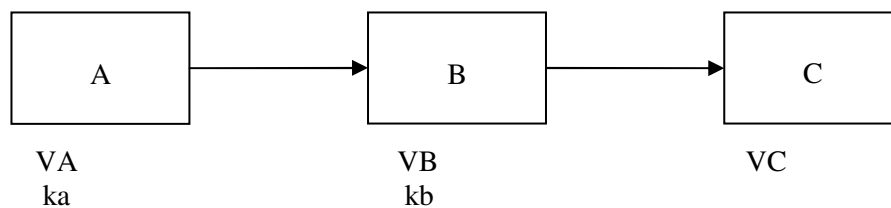
Figure 3 - Transaction Dimensions: Contracts and Agreements.

Source: Author

Therefore, both theories handle complexity yet under different perspectives, leading to possibly complementary explanatory tools. However, in both cases, empirical tests of hypotheses related to the choice of complex forms are, so far, rare and mostly based on descriptive case studies.

4.2 A PREDICTIVE CONTRADICTION

Consider the case of vertical coordination of technologically separable activities, as pictured by Barzel (2003) (Fig 4). Firm A supplies a product to a second firm, B, that delivers to the final consumer, C. Consumers are willing to pay a premium for a reduction in variability in one or more dimensions (D_i) of the product.

Figure 4 - Vertical Coordination, variability and asset specific investments.

Source: Author

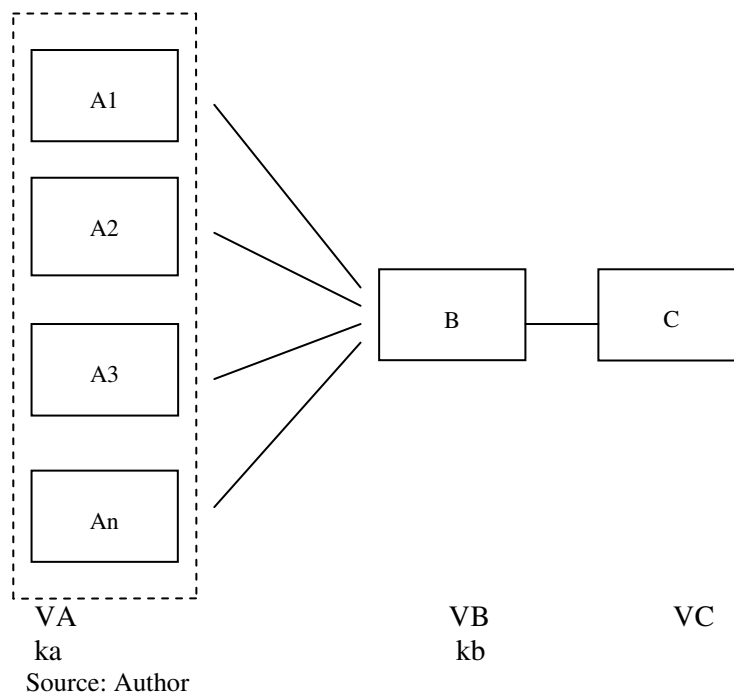
If A and B produce a given state of variability (low) of D_i with no specific investment, they might capture value provided that C is willing to pay for low levels of variability, which leads to a trivial solution. Two alternative situations are worthy of mention. The first, whereby A and B offer an identifiable variability reduction of the valued attribute that results either from independent actions or from joint production efforts. The theory deals with situations where A, B or A+B control variability, rendering arguments concerning efficient allocation of rights and generating testable hypotheses on who captures the value and who offers guarantees.

The second is a puzzling case, whereby A supplies B and makes a highly specific investment associated with the production of homogeneity. Consider that A makes a non re-deployable investment in order to control variability in D_i . In that case, the governance view predicts that A and B are expected to be vertically integrated in order to reduce the potential ex-post risk of hold up. The prediction offered by MCT is quite different, since less vertical integration is associated with the reduction in variability of D_i , allowing for external contracts based on the ability of courts to handle disputes. If courts are equipped to offer guarantees for that measurable dimension, external contracts are expected to be observed. This case represents contradictory predictions based on both constructs.

4.3 AN EXAMPLE OF HORIZONTAL COORDINATION

An example is offered by food production chains, where a given attribute of quality is generated at the farm level and must be carried through the processing stage, to reach the final consumer.

Figure 5 - Simultaneous Vertical and Horizontal Coordination.



Suppose that A represents the farmers, segmented in many independent production units, each offers A_i to B, who in turn, intermediates the transaction with the final consumer C, as represented in Figure 5. A new source of variability is introduced, since each firm A_i owns or hires resources, for instance non-uniform labor, even if the same production technology is assumed to prevail. Random variability applies. If consumers value a given level of variability in the final product, which is related to a maximum variability in A, say, VA_i , this introduces incentives for horizontal cooperation to produce A_i .

In this example, the production or maintenance of a given level of variability is associated with assumptions related to the presence of asset specific investments, as well as different incentives for horizontal coordination that include network externalities or cost sub-additivity. Assuming, for simplicity purposes, that no network externalities or cost incentives are present in A, one can foresee four situations:

- (a) No specific assets are necessary to produce or maintain the desired level of variability.
- (b) Only A_i makes asset-specific investments in order to control V_{Ai}.
- (c) Only B makes specific investments to reach the same result.
- (d) Both A and B make asset-specific investments to reach the desired level of production of attribute variability.

The first situation shows that some horizontal coordination is sufficient and no specific investment is required to produce V_{Ai}. The expected governance mechanism suggested by quasi-rents view is market, which matches the MCT perspective. Case (b) represents a situation whereby production of the desired level of variability is associated with asset-specific investments made by A_i. Two aspects are relevant. First, a given mechanism of exclusion at the horizontal coordination level might be relevant, in order to preclude free riding, especially if investments are undertaken individually. The observability of specific assets or of particular transaction attributes plays a relevant role in ensuring horizontal coordination. The lower variability that results from horizontal coordination adds value to the transaction and implies that contracts are expected to be drafted to coordinate the transaction with B. On the other hand, specific investments made by A induce vertical integration to control transaction costs.

Case (c) indicates a situation whereby variability is controlled by B, who makes specific investments. To A_i, no asset-specific investments have been made, and a high level of variability is maintained. The result is that, under MCT, the high level of variability precludes the draft of contracts with B, and B is not exposed to expropriation risks, since he produces and sells to C the desired level of attribute, generating its own standards. Both theories agree in terms of the coordination mechanisms adopted at transaction between A and B, an example of which are supermarkets when selling branded products and their offering of quality warranties.

Case (d) presents a situation of bilateral specific investments associated with the reduction in variability. Both parties make specific investments and the value depends on the accomplishment of the transaction. The quasi-rents view suggests that an external contract or vertical integration is expected to evolve, since specific investments have been made by both parties in the transaction. MCT points to external contracts, since variability is under control. Therefore, one comes to the same prediction, for different reasons.

This chapter suggests that the choice of transactions governance is affected by the degree of asset specificity and for measurement cost reasons. In some cases, both outcomes are the same, but for different reasons. In others, namely, one whereby low variability is reached through specific asset investment, the predicted governance mechanism differs, suggesting that further empirical comparative work is required.

5 CONCLUSIONS

This paper suggests new veins in the interface of two theories of firms and organization. First, the non-Walrasian theories of the firm are still at a stage of development of formalization that suggests the need for more empirical comparative analysis.

Second, one may notice a greater difference between the amount of empirical results concerning the governance approach and those based on MCT. The contribution offered by Williamson has motivated scholars to undertake empirical analyses in different countries and in almost all areas of economic interest, ranging from auto-industry to agriculture, finance, labor and international trade, amongst others. MCT seems to be at a different stage, presenting a limited number of empirical studies and no surveys to collect the existing literature in a well-organized format.

Third, details matter. One may observe the movement of theory from the polar results of markets or hierarchies, or make-buy discussions, towards the study of hybrid forms. This suggests that MCT offers a promising vein to study the details of complex mechanisms of cooperation. Basically, the possibility of treating a given transaction in its decoupled dimensions opens room for in-depth studies and motivates empirical work based on MCT. The degree of detail is different from that offered by Williamson, who also decouples the transaction in a different manner, i.e., based on asset specificity, uncertainty and frequency characteristics.

Fourth, institutions are relevant in both constructs, suggesting the possibility of comparatively studying the effects of inter-temporal changes, international contrasts of institutional arrangements, effects of reputation mechanisms and of technological advances. The development of competences of courts is one empirical promising venue to explore.

Fifth, some puzzles remain to be considered. For instance, if variability shows a predictable pattern, then it can be contracted. Governance structures can be designed to deal with known patterns of variability. Further, there are the polar cases pictured in the previous chapter, whereby both theories point towards different predictions. This is an opportunity for further comparative empirical analyses.

There are reasons to believe that both theories present complementarities to be empirically explored. Nevertheless, one must lapidate sharp interfaces to unveil the apparent frictions favored by the current stage of knowledge. I do believe that new approaches to interpret complex organizations are being developed, enriching the availability of tools to be empirically tested. Alongside efforts to shape theories, additional comparative empirical tests are required to shed light on this particular matter.

MCT presents a theoretical evolution that lacks the definition of standard variables to be contrasted between transactions, as well as measures of performance. If the theoretical framework is not improved, research based on MCT tends to follow an ad-hoc approach.

One may affirm that the governance perspective has proven to be friendlier to the user than MCT, by having offered to empirical research a wide range of possibilities for the adoption of traditional empirical economic tools, based on better-defined transaction dimensions. Further efforts to evolve empirical analysis based on MCT are ultimately required to clarify both limits and strains of the theory. I consider this an opportunity for empirical work on firms and organizations, particularly on complex contractual arrangements.

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