Revista de Educação e Pesquisa em Contabilidade
Journal of Education and Research in Accounting

Periódico Trimestral, digital e gratuito publicado pela Academia Brasileira de Ciências Contábeis | Available online at www.repec.org.br

REPeC, Brasília, v. 15, n. 3, art. 7, p. 374-392, Jul./Sep. 2021 | DOI: http://dx.doi.org/10.17524/repec.v15i3.2900 | ISSN 1981-8610

Related-party transactions among companies in pyramid structure: a comparison of explanatory factors in parent companies and affiliates

Silvia Amélia Mendonça Flores
https://orcid.org/0000-0002-0424-8375

Igor Bernardi Sonza
https://orcid.org/0000-0001-5403-3279

Abstract

Objective: In the absence of mechanisms to protect minority shareholders, controlling companies may seek private gains using mechanisms such as Related-Party Transactions (RPTs) or the deviation of rights. This study's objective is to analyze explanatory factors of RPTs among controlling/controlled and affiliate companies with a pyramid structure in Brazil.

Method: Data concerning RPTs were obtained from the Reference Forms of 153 companies from 2010 to 2017. Quantile regression was performed to find the factors (pyramid structure, performance, firm's value, and corporative governance) that best explain RPTs among controlling/controlled and affiliate firms.

Results: The explanatory factors for RPTs between parents/subsidiaries include deviation of rights, leverage, foreign shareholders, and independent auditors. The explanatory factors for affiliate companies include effects of return on assets (ROA), tangibility, and being audited by one of the Big four accounting firms.

Contributions: This study shows that pyramid structures influence RPTs among parents/subsidiaries and the performance of affiliate firms, while corporate governance did not moderate/mitigate conflicts of interest. Therefore, topics characterized by concentrated ownership structures, seldom explored in the Brazilian literature or emergent markets were addressed here, presenting alternatives to agency relations.

Keywords: Related-party transactions; Pyramid structure; Controlling/controlled companies; Affiliates.

Published in Portuguese and English. Original Version in Portuguese.

Received in 4/18/2021. Ask to Revise on 6/16/2021. Resubmitted on 7/9/2021. Accepted on 8/18/2021 by Dr. Vinícius Gomes Martins (Assistant Editor) and by Dr. Gerlando Augusto Sampaio Franco de Lima (Editor). Published on 9/30/2021. Organization responsible for the journal: Abracicon.

1. Introduction

From the perspective of the Agency Theory, in the absence of mechanisms to protect minority shareholders, controlling companies may seek private gains (Cho & Lim, 2018) and some methods can be used to maximize their interests, e.g., related-party transactions (RPTs) and deviation of rights, and consequently, expropriate minority shareholders (Cheung, Jing, Lu, Rau, & Stouraitis, 2009). RPTs can be understood as business connections as they correspond to transactions (e.g., assets, goods, equity, among others) performed with shareholders, members of the board of directors, or affiliated companies or subsidiaries (Cho & Lim, 2018).

RPTs are commonly carried out among companies affiliated with business groups. Groups tend to organize in a pyramid structure, forming family business groups (Almeida & Wolfenzon, 2006; Bena & Ortiz-Molina, 2013; Claessens, Djankov, & Lang, 2000), and RPTs are analyzed according to the companies' position within this structure, which can be that of a controlling owner/subsidiary or affiliate. Affiliates are those with a significant shareholding in other companies, without, however, controlling them. Controlling owner/subsidiaries, on the other hand, are characterized by a relationship of subordination through stock ownership (Almeida, 1987).

Another form of expropriation of minority shareholders refers to the deviation of rights in the pyramid structure, i.e., the difference between voting rights and cash flow rights (Kang, Lee, Lee, & Park, 2014). A company (or individual, family, or government) in a pyramid structure controls multiple companies through a hierarchical ownership relationship (Almeida & Wolfenzon, 2006). In these ownership structures, the controlling shareholder exercises control through at least one publicly listed company (La Porta, Lopez-de-silanes, & Shleifer, 1999).

The traditional view of pyramid structures is based on an attempt to maximize deviation between voting rights and cash flow rights based on the companies' intermediate levels, generating differences between control and ownership (Aldrighi & Mazzer Neto, 2005). Therefore, deviation of rights and related-party transactions are ways to expropriate minority shareholders. Furthermore, the relationship between these concepts is based on the assumption that voting power, caused by deviations, can ensure controlling shareholders a greater capacity and flexibility to become involved in RPTs for their own benefit (Rahmat, Amin, & Saleh, 2018). Given the preceding discussion, the general objective is to analyze the explanatory factors of RPTs, in parent/subsidiaries and affiliate companies with a pyramid structure in Brazil.

This study's relevance lies in investigating related-party transactions in companies with indirect ownership structure; a topic seldom explored in the Brazilian literature. Therefore, it is worth analyzing the explanatory factors of these transactions, considering the companies' positions (parent/subsidiaries or affiliates) in the pyramid structure. Additionally, conducting it in an emergent market is relevant as RPTs are prevalent in these economies due to failures in corporate governance and the widespread presence of groups controlled by families via pyramid structure and cross-ownership structures (Wang, Cho, & Lin, 2019).

To analyze the relationship between RPTs and pyramid structures, data were collected from the Reference Forms of 153 companies listed on the stock exchange. In addition, quantile regressions were estimated for the 2010 to 2017 period. In general, the results show that pyramid structures are an explanatory factor for RPTs involving parent/subsidiary companies. However, no statistically significant differences were found among affiliate companies for deviation of rights in RPTs. Regarding the remaining results, the firms' performance and corporate governance influenced RPTs with affiliate companies. However, in the parent/subsidiary model, corporate governance does not decrease the amount transacted between these companies.

From a theoretical perspective, this study advances in the context of agency relations based on differences between control structure and ownership structure (deviations). The objective is to examine RPTs in pyramid structures, considering the effect of business relationships. Most studies analyze transactions broadly. Therefore, a theoretical contribution consists of showing that subordination between parent/subsidiaries may encourage RPTs. The results are relevant because they show a positive association between RPTs and levels of deviation of rights, ratifying the hypothesis of conflicts of interest in which controlling shareholders may use transactions to obtain private benefits. As a result, RPTs and deviation of rights can be considered channels for the expropriation of minority shareholders. In this sense, the greater the level of deviations (measured via quantile regression), the greater the likelihood of a company using RPTs between parent/controlled companies.

This paper is structured into five sections, starting with the introduction. The second section presents the theoretical framework, with questions addressing related-party transactions and pyramid structure. The third section presents the methodology, and the fourth section the results. Finally, the last section presents final considerations with some reflections intended to better understand the topics addressed here.

2. Related-party transactions in pyramid structures: conceptions and hypotheses

2.1 Related-party transactions

RPTs are commonly performed among companies affiliated to a business group, conceptualized by economic sociology as a set of companies that are legally separated, however, linked by persistent and/or informal relationships (Granovetter, 2005). Business groups in the Brazilian context refer to groups of companies, which in addition to being strictly controlled by the same entity, comprise at least one company listed in the capital market (listed-firm business groups) or have diversified business units in at least three sectors (diversified business groups) (Aldrighi & Postali, 2010).

Thus, the literature recognizes three motivations for RPTs: tunneling, propping, and earnings management (Cheung et al., 2009). The tunneling concept was introduced by Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000) and is an important contribution to the RPTs topic. According to the authors, tunneling refers to the transference of resources from one company at the base of the pyramid to those on higher levels, increasing the controlling companies' gains (Johnson, La Porta, Lopez-de-Silanes, & Shleifer, 2000). The inverse also occurs and is called propping, the objective of which is to help companies at the base of the pyramid (Bertrand & Mullainathan, 2003; Jian & Wong, 2010). Aggressive accounting choices and profit manipulation are related to earnings management, which, in RPTs, may come from cash sales between related parties (Jian & Wong, 2010).

RPTs regulation in Brazil is based on technical pronouncement CPC No. 5/R1 (CVM, 2010, p.4), which defines transactions as "transfers of resources, services or obligations between an entity that reports the information and a related party, regardless of whether a price is charged in counterpart". CPC 5/R1 presents some examples of transactions that must be disclosed, such as (i) purchases or sales of goods (finished or unfinished); (ii) purchases or sales of property and other assets; (iii) provision or receipt of services; (iv) leases; (v) research and development transfers; (vi) transfers under license agreements; (vii) transfers of a financial nature (including loans and contributions to capital in cash or equivalent); (viii) provision of guarantees, endorsements or sureties; (ix) assumption of commitments in case a particular event occurs in the future, including contracts to be executed (recognized or not); and (x) settlement of liabilities on behalf of the entity or by the entity on behalf of a related party.

For users of financial statements to have an insight into the effects of the relationships between the parties, companies must disclose transactions that have a total value greater than BRL 6 million, 1% of the company's total assets or which, in the opinion of the administrators, are considered relevant. Hence, the companies must detail information, such as the amount of the transaction and existing balances, including terms and conditions, and the relationship between the reporting entity with the respective related party, in addition to other factors that characterize the transaction, according to the Securities and Exchange Commission (CVM, 2010).

In the specific case of RPTs and company value, two competing aspects are addressed in the literature (Bona-Sánchez, Fernández-Senra, & Pérez-Alemán, 2017; Kang et al., 2014). The first is called the efficient transactions hypothesis, which shows that RPTs may minimize transaction costs and contribute positively to a firm's value (Gordon, Henry, & Palia, 2004). On the other hand, in the hypothesis of conflicts of interest, RPTs are thought to reduce a firm's value due to conflicts between majority and minority shareholders (Gordon et al., 2004; Johnson et al., 2000). Next, it is shown how pyramid structures may influence these RPTs.

2.2 Pyramid Structure

Pyramid structures exist through indirect control of a corporation exercised by another corporation (Tirole, 2006), with discrepancies between control and property rights being the primary way of measuring them (Aldrighi & Postali, 2011). These are more common in countries with poor shareholder protection, enabling the creation of new companies through pyramid control (Almeida & Wolfenzon, 2006). The chain of ownership formed by the pyramids allows the ultimate owner to control all companies, including those with no direct ownership (Bertrand & Mullainathan, 2003).

The traditional view of the formation of pyramid structures is based on an attempt to maximize the deviation between voting rights and cash flow rights, based on the intermediate levels of companies, generating differences between control and ownership (Aldrighi & Mazzer Neto, 2005). Voting rights come from ordinary shares, determining company control, while cash flow rights result from the number of shares held by a shareholder, with or without voting rights (Bortolon, 2010). Thus, an excess of voting rights may increase the power of large shareholders and, consequently, represent a potential for expropriating minority shareholders (Aldrighi & Mazzer Neto, 2005; La Porta et al., 1999).

Almeida and Wolfenzon (2006) developed an alternative theoretical model to explain the formation of pyramid structures, being one of the papers most frequently cited in the literature addressing this subject. According to the authors, pyramids are characterized by companies that need high levels of investment and/or with low profitability. The advantage of financing allows families who already publicly control other companies to develop new ventures, indirectly owning shares in a new company. This pyramid structure may allow families to benefit from this new 'financing', which will not appear profitable to outside investors (Almeida & Wolfenzon, 2006).

Pyramid structures are prevalent in some countries, such as Continental Europe, Asia, and South America, often organizing themselves into family business groups (Claessens et al., 2000). Therefore, the interconnection between business groups and pyramid structures lies in the firms' ownership relations, as pyramids are the primary form in which these groups are organized (Almeida & Wolfenzon, 2006).

Brazil is an interesting case to be studied due to its stock market structure (two classes of shares are issued) and changes in corporate governance rules. According to the law, companies can issue registered ordinary shares and registered preferred shares. The first class of shares has voting rights, while the second has preference in receiving dividends and capital reimbursement in the event of the company's dissolution. Therefore, companies can use the two classes of shares in pyramid structures to maintain their voting power and seek investments in the capital market. Thus, the issuance of two classes of shares and pyramid structures are considered techniques for deviating from the "one share, one vote" principle (La Porta et al., 1999; La Porta, Lopez-de-silanes, Shleifer, & Vishny, 2000).

In this case, pyramid structures may use RPTs to obtain benefits along the hierarchical chain, according to the relationships established between the companies. Among these relationships, there is the presence of parent/subsidiary and affiliate companies. Souza, Knupp, and Borba (2013) showed that a larger number of affiliate and controlled companies results in greater values involved in RPTs. For the authors, this fact suggests that RPTs may have strategic or financial purposes linked to the existing corporate nature, such as equity participation (affiliate companies) or control influence (controlling companies/subsidiaries). Therefore, it is expected that the most significant deviation of rights arising from the pyramid structure influences RPTs. Based on this context, the following research hypothesis is proposed:

Hypothesis 1: There is a positive association between RPTs between controlling/controlled companies and/or affiliates and deviation of rights in pyramid structures

In this context, the relationship between RPTs and pyramid structures lies in the option of controlling shareholders to use transactions to obtain private benefits along the ownership chain. Thus, a pyramid structure may encourage RPTs, with a positive association between them (Kang et al., 2014; Maheshwari & Gupta, 2018).

Incentives for RPTs may also be related to a firm's performance and value. For example, empirical results show that RPTs are negatively associated with a firm's value due to conflicts of interest (Bona-Sánchez et al., 2017; Cheung, Jing, et al., 2009). Also, trading with higher related parties is associated with worse company performance (Wang et al., 2019), as these companies may have incentives for opportunistic gains (Kang et al., 2014).

On the other hand, RPTs between companies in the same group can positively influence a firm's value (Wong, Kim, & Lo, 2015), as well as companies with greater similarity and vertical integration in the group, can obtain better performance from RPTs (Wang et al., 2019). Organizing companies into groups can reduce transaction costs and allow for the formation of internal markets. Internal markets facilitate interrelationships among affiliated companies, providing economies of scope and better allocation of resources, leading to better performance when carrying out RPTs (Wang et al., 2019). For example, Maheshwari and Gupta (2018) found a positive association between RPTs and performance, confirming the synergy that may exist in domestic markets. However, the literature generally indicates that RPTs are associated with firms' poor performance and value. As a result, the following research hypothesis is considered:

Hypothesis 2: There is a negative association between RPTs with controlling/controlled and/or affiliated companies and firm value.
Hypothesis 3: There is a negative association between RPTs with controlling/controlled and/or affiliated companies and performance.

Another aspect reported in the literature as a potential explanatory factor for RPTs is corporate governance. Considering that control and ownership structures can determine the companies' corporate governance, an increase in the level of investor protection is expected to result in a lower number of pyramid structures (Almeida & Wolfenzon, 2006) and RPTs (Kang et al., 2014). In the case of RPTs, most of the literature shows that RPTs are more likely to occur when corporate governance mechanisms are weak (Bhuiyan & Roudaki, 2018; Kang et al., 2014; Rahmat et al., 2018). As a result, the following research hypothesis is proposed:

Hypothesis 4: There is a negative association between RPTs with controlling/controlled and/or affiliated companies and corporate governance.

Thus, in general, these are the main aspects of the RPTs analyzed in this study. Based on the RPTs between companies of the same group, it is relevant to analyze the effect of these operations on the parent/subsidiary and affiliate companies. Thus, it is possible to identify the explanatory factors for RPTs according to the existing relationships between companies. The method is presented in the next section.

3. Method

3.1 Characterization of the sample and variables

Annual data concerning Brazilian companies listed in [B][3] were accessed via reference forms for the 2010 to 2017 period to identify pyramid structures. Data were extracted using the R package GetDFPData (Perlin, Kirch, & Vancin, 2019), allowing access to information from the companies' financial statements and the CVM's reference forms. Filters can be used in the latter to list the items one intends to access.

The criteria used to select the sample was the definition of pyramid structures proposed by La Porta et al. (1999), in which pyramids are companies in which the controlling shareholder exercises control through at least one publicly traded company. The sampling process resulted in an unbalanced panel, with 961 observations and 155 companies adjusted according to the exclusion criteria of companies/year with negative Tobin's Q greater than 10 (Kirch, Procianoy, & Terra, 2014). Thus, the final sample consists of 929 observations and 153 companies with a pyramid structure in Brazil. Among these, related-party transactions carried out between parent companies/subsidiaries and affiliates were selected.

The total value of RPTs performed with parent companies/subsidiaries and affiliates was the dependent variable, considering its magnitude may represent more significant tunneling potential (Chen, Li, & Chen, 2017). To adapt to the model, inflation was adjusted, and the natural logarithm was applied to the total values (Silveira, Prado, & Sasso, 2008).

Deviation of rights was calculated to represent the pyramids' control and ownership structure. It is found from existing ownership chains and results from the difference between the share of voting rights and the share of cash flow rights. Therefore, data collection began by identifying the direct shareholders of each company, filtering out only those of a legal nature. Upon verifying the existence of a listed legal shareholder, the company was included in the sample and its direct shareholders were identified, which are, therefore, indirect shareholders of the company in the sample. This procedure was repeated until it reached the controlling shareholders in each property chain.

The share of cash flow rights was calculated as the product of equity interests (total shares) in companies along the chain (Aldrighi, 2014; Bortolon, 2010). In turn, the share of voting rights in indirect ownership depends on the existence of control. For example, if the largest shareholder (MAU) is the controlling shareholder (with at least 50% of the voting rights), the share of voting rights is equal to the direct participation that the last intermediate in the ownership chain holds in the voting capital of the company analyzed. On the other hand, if MAU is not the controlling company, the calculation is identical to the share of cash flow rights, that is, the product of the interests (Aldrighi, 2014).

To identify the effect of firm performance and the value of firms on RPTs, return on assets (ROA) and Tobin's Q were considered, which are measures widely adopted in the literature for this purpose (Kang et al., 2014). As for the expected sign of these variables concerning the RPTs, it can be positive or negative. Companies with high performances and value can use RPTs to maintain/increase their results from the perspective of efficient transactions, which reduce costs (Wong et al., 2015). On the other hand, companies with financial restrictions will be more likely to use this type of operation to obtain opportunistic gains (Kang et al., 2014; Wang et al., 2019).

Corporate governance was analyzed as a way to mitigate the expropriation of minority shareholders. In this case, governance was measured considering three dummy variables: (1) company adherence to the differentiated segment of the New Market; (2) presence of independent members on the audit committee (Kang et al., 2014; Rahmat et al., 2018); and (3) external audit performed by one of the four most prominent companies in the field (Deloitte, Ernst & Young, KPMG or PricewaterhouseCoopers - PwC) (Bhuiyan & Roudaki, 2018; Rahmat et al., 2018).

To complement the analysis, control variables were included. "Company size" was selected because larger companies are more likely to conduct a more significant number of RPTs (Kang et al., 2014). Leverage is related to performance issues and monitoring on the part of creditors. Firms with vulnerable financial positions tend to participate in RPTs to overcome difficulties (Bhuiyan & Roudaki, 2018). On the other hand, leverage may imply greater monitoring on the part of creditors (Aldrighi, 2014), a situation that could decrease RPTs (Matos & Galdi, 2014).

As for tangibility, fixed assets can serve as guarantees in RPTs, and, therefore, a positive relationship is expected between tangibility and the greater occurrence of these contracts. Intangible assets are more difficult to monitor and, consequently, may be subject to management decisions (Himmelberg, Hubbard, & Palia, 1999), facilitating RPTs. Regarding foreign capital, companies with foreign shareholders are expected to engage in more transactions with each other (Cheung et al., 2009).

Table 1 shows the definitions of the variables used in this study, starting with related-party transactions, which represent the dependent variables. Next, the explanatory factors for RPTs are described, which comprise the pyramid structure (deviation of rights), performance, firm value, and corporate governance. These relationships were mediated by control variables related to the topics, including important measures for analyzing results, such as size and leverage. The variables were selected and described based on the literature presented in the references. Next, the regression model is described.

Tabela 1
Variáveis da Pesquisa

Variables and Acronym	Measure	References	
Total value of RPTs between parent/ subsidiaries (LVC)	Log (LVC) per company/year	Silveira et al. (2008); Matos and Galdi (2014)	
Total value of RPTs with affiliate companies (LVCOL)	Log (LVCOL) per company/year		
Variable and Acronym	**Measure**	**References**	**ES**
Deviation (LD)	Log (D), where D= DVMC − DFC where: DVMC: right to vote due to the existence (or not) of a controller MAU	Aldrighi (2014); Aldrighi et al. (2018)	(+)
Return on Assets (ROA)	ROA = $\frac{Operating\ Result}{Total\ Assets}$	Kang et al. (2014); Maheshwari and Gupta (2018); Wang et al. (2019)	(+) or (-)
Tobin's Q (QT)	QT = $\frac{VMAO + VMAP + DIVT}{Total\ Assets}$ where: VMAO: market value of ordinary shares; VMAP: market value of preferred shares; DIVT: book value of liabilities (current + noncurrent) minus current assets, after excluding inventories	Bona-Sánchez et al. (2017); Maheshwari and Gupta (2018)	
Presence in the New Market (NM)	Binary variable equal to (1), if the company participates in the New Market; and (0) otherwise	Aldrighi et al. (2018)	(-)
Big Four (Big4)	Binary variable equal to (1), if the company is audited by one of the Big four; and (0) otherwise	Bhuiyan and Roudaki (2018); Rahmat et al. (2018)	
Independent auditing (Audit)	Binary variable equal to (1), if the company has independent members in the audit committee; and (0) otherwise	Kang et al. (2014); Rahmat et al. (2018)	
Size (LRCL)	Log (RCL), where RCL= net sales revenue	Kang et al. (2014)	(+)
Leverage in relation to Total Assets (Alav)	ALAV = $\frac{Current\ Liabilities + Noncurrent\ Liabiities}{Total\ Assets}$	Aldrighi (2014); Aldrighi et al. (2018); Maheshwari and Gupta (2018)	(+) or (-)
Tangibility (Tangib)	TANGIB = $\frac{Fixed\ Assets}{Total\ Assets}$	Souza e Bortolon (2014); Aldrighi et al. (2018)	
Foreign Capital (Estrang)	Binary variable equal to (1), if there are ordinary shares and/or preferred shares by foreign capital; and (0) otherwise	Cheung et al. (2009)	(+)
Temporal Fixed Effects	Binary variable where 1 indicates the year the data is generated and (0) otherwise	Kang et al. (2014); Bona-Sánchez et al. (2017)	

Legend: *the RPTs' quantitative variables considered the period of reference disclosed by the companies and not specifically the transaction date, as many transactions remain active for the long term. ES (expected sign) corresponds to the association between dependent and independent variables. The expected sign is based on the empirical literature review.

Source: Developed by the authors (2021).

3.2 Quantile Regression Model

The model adopted here is derived from the estimator proposed by Machado and Santos Silva (2019), developed for panel data with fixed effects, considering linear and non-linear specifications. Linear estimation was chosen, in which individual effects can affect the entire distribution, based on conditional quantiles. Thus, panel data with individual effects, considering the estimation with conditional quantiles for probability distributions (location and scale), have the pattern described in Equation (1).

$$Y_{it} = \alpha_i + X'_{it}\beta + (\delta_i + Z'_{it}\gamma)U_{it} \quad (1)$$

With Pr $\{\delta_i + Z'_{it}\gamma > 0\} = 1$. The parameters ($\alpha_i$, δ_i), capture the individual fixed effect (i) and Z is defined before. The sequence $\{X_{it}\}$ is strictly exogenous, *i.i.d* for any fixed i, and independent between i. U_{it} é *i.i.d* (through i and t), statistically independent of X_{it} and normalized to satisfy the moment conditions. Model 1 implies Equation 2.

$$Q_\gamma(\tau|X_{it}) = \left(\alpha_i + \delta_i q(\tau)\right) + X'_{it}\beta + Z'_{it}\gamma q(\tau) \quad (2)$$

Where $\alpha_i(\tau) \equiv \alpha_i + \delta_i q(\tau)$ is called the scalar coefficient of the quantile fixed effect (τ) for individual i or the distribution effect in (τ). The distribution effect differs from the usual fixed effect in that it is not, in general, a displacement. That is, the distribution effect represents the effect of time-invariant individual characteristics that, like other variables, may have different impacts on different regions of the Y conditional distribution. The fact that $\int_0^1 q(\tau)d\tau = 0$ implies that α_i can be interpreted as the average effect for individual i. Thus, the quantile regression for a panel of data with fixed effects is then estimated via Method of Moments (MM-QR), allowing for dynamic relationships that function with orthogonality conditions (Hansen, 1982).

As it is a robust model, quantile regression for panel data with fixed effects was estimated to understand the explanatory factors of RPTs in parent/subsidiaries and affiliated companies. Therefore, as in the traditional panel, the RPTs represent the dependent variable, which corresponds to the total value of RPTs over time. The main independent variables refer to deviations of rights, performance, firm value, and corporate governance. Finally, the control variables contributing to the interpretation of the coefficients were included.

The use of quantile regression is justified by the need to analyze the effect of each level of deviation of rights on the respective levels of values of the RPTs. Higher levels of deviations are expected to encourage a greater volume or value of transactions. Furthermore, in quantile regression, outliers can be used because the method is robust for these values. Regarding the chosen estimator for quantile regression (Machado & Santos Silva, 2019), no application was found in Brazil, so the recently developed data panel is appropriate, which characterizes this study's robustness and originality.

Regarding fit, traditional linear models use the coefficient of determination (R^2) as a reference. This statistic can be understood as the percentage of variability of the response variable explained by the independent variables. In the quantile regression, the pseudo-R^2 for each quantile is estimated. However, this measure may not be adequate, so that the regression specification error test is recommended to analyze the adjustment of quantile regression with panel data and fixed effects (Machado & Santos Silva, 2019).

The Regression Specification Error Test (RESET) proposed by Ramsey (1969) aims to identify specification errors in a regression. In RESET, a model under the null is compared with an alternative one, an undeclared generalization of that model. Thus, it seeks to identify nonlinearities in its functional form (Greene, 2012). The null hypothesis establishes that the model is correctly specified. Therefore, failing to reject the null hypothesis (p-value>0.05), suggesting that the model is valid, and its coefficients can be interpreted. Next, the results and discussion are presented.

4. Results and Discussion

To characterize the companies in the sample, the sectors of activity were analyzed, according to CVM classification (industrial goods; cyclical consumption; non-cyclic consumption; financial and others; basic materials; oil, gas, and biofuels; health; information technology; telecommunications; and public utility). The three most representative sectors were public utility (32.40%), finance and others (20.02%), and industrial goods (18.57%). Before the application of quantile regression, descriptive statistics were analyzed, as shown in Table 2.

Table 2
Descriptive Statistics of Variables

Variable/ Statistics	Mean	Median	Standard Deviation	Minimum	Maximum	p10	p25	p75	p90
VT CT*	4.29	0.26	9.36	0.00	36.10	0.00	0.03	1.68	16.40
LN CT	19.40	19.47	2.98	12.89	24.32	15.33	17.68	21.33	23.61
VT CG*	2.32	0.03	6.61	-0.03	26.00	0.00	0.00	0.36	5.62
LN CG	17.75	17.77	3.56	10.32	24.20	12.46	15.59	19.81	22.82
Deviation	0.31	0.19	0.34	0.00	0.94	0.00	0.00	0.61	0.90
ROA	0.05	0.05	0.11	-0.22	0.27	-0.08	0.01	0.12	0.22
Qtobin	0.95	0.77	0.69	0.07	3.05	0.27	0.56	1.10	1.87
RCL*	2.80	0.59	4.49	0.00	16.80	0.00	0.02	3.63	8.70
ALAV	0.53	0.58	0.26	0.02	0.95	0.13	0.33	0.74	0.87
Tang	0.11	0.00	0.19	0.00	0.65	0.00	0.00	0.16	0.46

Legend: * represents BRL Billion. VT CT: total in BRL of related-party transactions between controlling/controlled companies; LN CT: natural logarithm of the total in BRL of related-party transactions between controlling/controlled companies; VT CG: total in BRL of related-party transactions with affiliate companies; LN CG: natural logarithm of the total in BRL of related-party transactions corresponding to affiliate companies; ROA: return on total assets; RCL: net sales/ service revenue; ALAV: leverage by total assets; Tang: tangibility of assets.

Source: Study's data.

Table 2 shows that the mean total value of transactions for parent/controlled companies is R$ 4.29 billion and R$ 2.32 billion for affiliates. Additionally, these variables were used in natural logarithm to include them in the panel data model. Note that the mean and median for these data are very close, showing the adequacy of the information obtained by the tests performed.

Performance information also shows that data showed consistency due to the proximity of the mean and median, meaning that companies show a positive return of 6% on average. About the firm's value, measured by Tobin's Q, the market value represents 95% of the equity value. In leverage terms, third-party capital represents 53% of total assets, with fixed assets corresponding to 11.8% of this same variable.

After identifying the profile of the variables, the correlation between them was tested, noting that they were suitable to be used in quantile regression models. The results are shown in Table 3.

Table 3
Correlation of Variables

	Deviation	LN CT	LN CG	ROA	Qtobin	RCL	ALAV	Tang
Deviation	1							
LN CT	-0.07	1						
LN CG	-0.26	0.45	1					
ROA	0.17	0.08	0.00	1				
Qtobin	-0.10	0.11	0.11	0.08	1			
RCL	0.06	0.15	0.22	0.13	0.00	1		
ALAV	0.19	0.08	0.19	0.07	0.05	0.37	1	
Tang	-0.02	0.18	0.29	0.04	-0.05	0.15	0.10	1

Legend: LN CT: natural logarithm of the total value in BRL of related-party transactions between parent/controlled companies; LN CG: natural logarithm of the total value BRL of related-party transactions associated. ROA: return on total assets; RCL: net sales/services revenue; ALAV: leverage by total assets; Tang: tangibility of assets.

Source: study's data.

The correlation test was applied to check whether the variables were highly related. The results show that most variables have a low correlation. In addition, the Variance Inflation Factor (VIF) was tested, in which the mean did not exceed 5. Therefore, the variables did not show multicollinearity, enabling their use in quantile regression models.

In this sense, after characterizing the sample and the study variables, the quantile regression models were estimated for the parent/subsidiary and affiliate companies. It was evident that the explanatory factors in the relationship between the amount transacted with parent companies and subsidiaries are: deviations of rights, leverage, auditing, and the presence of foreign shareholders (Table 4). The model coefficients are valid, considering the adequacy test (p-value 0.3280). Furthermore, the deviations are significant in the 50% and 75% quantiles, with a 1% increase in this variable increasing the RPTs by about 0.01%. Statistical significance is concentrated in the highest quantiles, showing that these transactions become more frequent as the deviations between voting rights and cash flow rights increase.

These results confirm hypothesis 1 and corroborate the literature (Kang et al., 2014; Maheshwari & Gupta, 2018), showing that RPTs can be a channel for expropriation based on the deviation of rights. From a practical perspective, the organization of companies in pyramid structures can facilitate the use of RPTs along the subordination chain between parent/subsidiaries. Under the hypothesis of conflicts of interest (Gordon et al., 2004), these transactions can be a way for companies to obtain private gains; therefore, it is essential to analyze their explanatory factors.

Regarding other aspects, note that leverage is negatively and significantly associated at the 50% and 75% quantiles. That is, an 1% increase in leverage causes a 0.16% increase in RPTs. Matos and Galdi (2014) found that debt negatively influences RPTs with parent/controlled companies because of creditors' greater monitoring. Also, this fact can be attributed to the development of an internal capital market among companies belonging to a given group. The relationships between these companies may reduce transaction costs and increase debt capacity (Cai, Zeng, Lee, & Ozkan, 2016). However, leverage can influence RPTs up to certain levels of value or occur only in periods of crisis, when there is a greater transaction of resources between companies (Almeida, Kim, & Kim, 2015).

Regarding audit committees, the model coefficients have the greatest impact, significant in almost all quantiles considered (except for the 10%). In this sense, the amount transacted between these related parties increases with the presence of independent auditors. The expected relationship was contrary, concluding that governance mechanisms may not be efficient in controlling RPTs. The positive influence of independent auditors on the value of transactions may be associated with the fact that governance variables have a limited impact on the prices of RPTs with controlling shareholders (Cheung, Qi, Raghavendra Rau, & Stouraitis, 2009).

The non-significant results regarding corporate governance are similar to previous studies conducted in Brazil and refute hypothesis 4. For example, Oda (2011) analyzed the RPTs and the market value of companies belonging to the New Market but did not infer a relationship between corporate governance mechanisms and the outcome of RPTs. Souza et al. (2013) also reported that there is no evidence that the value of RPTs can have any relationship with the adoption of differentiated levels of corporate governance in Brazil.

Other Brazilian studies (Silveira et al., 2008; Souza & Bortolon, 2014) found negative relationships between the level of RPTs and the quality of corporate governance, while the adoption of effective corporate governance mechanisms may minimize the impact of RPTs on company value. Due to these differences, corporate governance is a topic that future studies should explore further to understand the mechanisms of RPTs better.

Table 4

Explanatory factors RPTs between controlling/controlled companies

Variables	Log Total Value of RPTs between Controlling/Controlled Companies				
	Quantile 0.10	Quantile 0.25	Quantile 0.50	Quantile 0.75	Quantile 0.90
LD	0.0113	0.0122	0.0133**	0.0142*	0.0149
ROA	0.1433	0.0533	-0.0583	-0.1506	-0.2259
Qtobin	0.0018	-0.0032	-0.0094	-0.0145	-0.0187
LRCL	0.0153	0.0148	0.0143	0.0138	0.0134
Alav	-0.1413	-0.1494	**-0.1594****	**-0.1677***	-0.1745
Tang	0.1148	0.0556	-0.0179	-0.0787	-0.1283
Audit	0.1758	**0.1970****	**0.2234*****	**0.2451*****	**0.2629*****
Big4	0.0525	0.0322	0.0070	-0.0137	-0.0307
NM	0.0453	0.0229	-0.0048	-0.0278	-0.0465
Estrang	**0.1776***	**0.1834*****	**0.1905*****	**0.1964*****	**0.2013*****
EF Year	Yes	Yes	Yes	Yes	Yes
Nº Obs.	261	261	261	261	261

(***), (**), (*) Statistically significant at 1%, 5%, and 10%, respectively.
Legend: this table presents the results of the quantile regression model with a fixed panel considering operations with controlling/controlled companies, where LD: logarithm of the deviation of rights; ROA: asset profitability to measure performance; QTobin: Tobin's Q to measure the company's value; LRECL: log of net revenue to measure size; Alav: leverage measured by total assets; Tang: tangibility; Audit: dummy for the presence of independent members in the audit committee; Big4: dummy for companies audited by Big4; NM: dummy for presence in the New Market; Estrang: dummy for the presence of foreign capital in the control structure and ownership structure. Note: The mean value of the variance inflation factor (VIF) for this model is 1.21.

Source: study's data.

Another statistically significant variable in this model was the presence of foreign shareholders. Significance was obtained in all quantiles, increasingly and positively related to RPTs, indicating that the presence of these shareholders in the ownership and control structure of pyramid companies may encourage RPTs (Cheung, Jing, et al., 2009).

This same model was estimated for the RPTs with affiliates to understand the explanatory factors of the RPTs in these companies (Table 5). Related-party transactions with these companies were less frequent, as there is significant shareholding but no control. The results show that the indirect structure of the affiliate companies is not an explanatory factor for the RPTs, because, despite finding a negative relationship between the variables, this was not significant for any of the quantiles.

Table 5
Explanatory factors for RPTs and affiliate companies

Variables	Log of Total Value of RPTs with Associated companies				
	Quantile 0.10	**Quantile 0.25**	**Quantile 0.50**	**Quantile 0.75**	**Quantile 0.90**
LD	-0.0096	-0.0068	-0.0047	-0.0027	-0.0011
ROA	-0.0224	-0.0064	0.0055	0.0169**	0.0261**
Qtobin	0.0181	-0.0322	-0.0698	-0.1057	-0.1349
LRCL	0.0169	0.0181	0.0189	0.0198	0.0205
Alav	-0.1057	-0.0614	-0.0284	0.0032	0.0289
Tang	**-0.1352****	**-0.1242*****	**-0.1159*****	**-0.1080*****	**-0.1017*****
Audit	0.5006	0.3834	0.2959	0.2122	0.1443
Big4	-0.5298	**-0.4141***	**-0.3277****	**-0.2452****	-0.1782
NM	-0.1921	-0.0382	0.0767	0.1866	0.2758
Estrang	0.2665	0.2222	0.1891	0.1574	0.1317
EF Year	Yes	Yes	Yes	Yes	Yes
Nº Obs.	78	78	78	78	78

(***), (**), (*) Statistically significant at 1%, 5%, and 10%, respectively.
Legend: this table presents the results of the quantile regression model with a fixed panel considering operations with affiliate companies, where LD: logarithm of the deviation of rights; ROA: asset profitability to measure performance; QTobin: Tobin's Q to measure the company's value; LRECL: log of net revenue to measure size; Alav: leverage measured by total assets; Tang: tangibility; Audit: dummy for the presence of independent members in the audit committee; Big4: dummy for companies audited by the Big4; NM: dummy for presence in the New Market; Estrang: dummy for the presence of foreign capital in the control structure and ownership structure. Note: The mean value of the variance inflation factor (VIF) for this model is 1.26.

Source: study's data.

This result partially rejects hypothesis 1 and may be related to the fact that affiliate companies have a significant shareholding in other companies but do not control them. Thus, controlling companies may not be interested in carrying out RPTs with these companies. This result corroborates Souza et al. (2013), which reports that parent/subsidiary companies are more frequently involved with RPTs than affiliate companies. The authors believe that companies adopting RPTs prefer having a power relationship (control) when investing in other companies.

The explanatory variables of these operations include ROA, tangibility, and Big four auditing companies. In this case, return on assets has positive and significant coefficients at the 75% and 90% quantiles. Its effect on the value of RPTs is small (approximately 0.01%), showing that higher performances positively contribute to increasing transacted values, refuting hypothesis 3. Statistical significance in the upper quantiles shows that ROA is an explanatory factor for RPTs with affiliate companies when they reach a certain level.

Overall, the relationship between RPTs and performance has shown that there is a negative effect of these operations (Wang et al., 2019), as companies may have incentives for opportunistic gains (Kang et al., 2014), harming their performance. However, from the perspective of efficient transactions, RPTs can reduce costs and result in financial growth (Maheshwari & Gupta, 2018; Wang et al., 2019; Wong et al., 2015), which explains this study's findings.

Regarding tangibility, there is a negative influence present in all the quantiles, with coefficients ranging from 0.10% to 0.13%. This effect shows that fixed assets reduce the volume transacted between affiliate companies, corroborating Souza and Bortolon (2014).

The last explanatory factor of RPTs with affiliate companies corresponds to auditing firms being one of the Big four auditing companies. As expected in the literature (Kang et al., 2014), corporate governance, based on the previously mentioned variable, reduces the volume of RPTs with affiliate companies. The result corroborates hypothesis 4. Significance was found for three quantiles, with coefficients ranging between 0.24 and 0.41.

From this perspective, some variables were not significant. Comparatively, significance for the firms' value, represented by Tobin's Q, size, and adhesion to the New Market, was not found in any of the models. Regarding the firms' value, the trend in the literature is towards a negative association with RPTs, due to possible opportunistic interests on the part of controlling companies (Bona-Sánchez et al., 2017; Cheung, Jing, et al., 2009). As for size, a positive influence was expected due to larger companies being more likely to engage in RPTs. It is noteworthy that the associations reported in these two variables generally occur in general models, that is, models that do not separate RPTs between parent/controlled and affiliate companies.

Concerning corporate governance, some measures were significant in the models and some quantiles. In this sense, knowing that controlling shareholders can use RPTs to leverage their voting power, it is essential to understand how and which corporate governance measures can reduce these sources of private benefits. Therefore, the variables for which significance was not found could be addressed in future studies.

Under the theoretical framework of the Agency theory, if there are different interests between the parties, conflicts may occur between the capital holder and the administrator. Along the same lines, countries with poor legal protection against expropriation accumulate another conflict of interest generated by majority and minority shareholders. Therefore, controlling companies can use mechanisms that maintain/increase their voting power, a situation that might reduce a company's value and expropriate minority shareholders. Among these mechanisms, RPTs and pyramid ownership were addressed in this study. Evidence supports the relationship between these factors, showing that companies are likely to conduct RPTs through the pyramid ownership structure and maintain control with the lowest investment level, generating rights deviations. Next, the conclusions are presented.

5. Conclusions

This study's objective was to analyze the explanatory factors of RPTs in parent/controlled and affiliate companies with a pyramid structure in Brazil. This longitudinal study was conducted from 2010 to 2017 in 153 companies with a pyramid structure. Quantile regressions were estimated to identify explanatory factors. The conclusion is that a pyramid structure is one explanatory factor for RPTs in transactions between parent/controlled companies, not rejecting hypothesis 1. However, affiliate companies showed no influence of deviation of rights in the RPTs' total value. It may be related to the volume transacted between these parties since there are more operations with parent companies than with associates. Silveira et al. (2008) showed that operations with parent/controlled companies correspond to 75.6% of the total, while only 1.4% corresponds to affiliate companies. As a result, the existence of subordination between parent/controlled companies may encourage RPTs for specific interests, increasing the level of deviations.

As for the analysis of accounting performance, empirical evidence revealed that this is a positive explanatory factor for RPTs with affiliate companies. Because there are few transactions with these parties, RPTs may not have the power to affect the value of these firms. As for Tobin's Q, this was not significant for any analysis, and this result may be associated with the level of deviation of these companies. For Kang et al. (2014), a firm's value is only harmed by RPTs when conflicts of interest between controlling and minority shareholders are severe.

Regarding the influence of corporate governance on RPTs, it moderated transactions only with affiliate companies. The sign was opposed to the expected in the parent/subsidiary model; the expected sign was the opposite, showing that corporate governance does not reduce the amount transacted between these companies. Previous evidence has shown that governance mechanisms have little impact on RPTs, and results remain inconclusive (Cheung, Qi, et al., 2009; Oda, 2011).

The theoretical contribution of this study is that RPTs are a subject seldom explored in the Brazilian context, especially considering the particularities of relationships, such as operations with controlling/controlled and affiliate companies. Furthermore, in Brazil, the reasons for the formation of pyramid structures are controversial and require empirical evidence, given a lack of literature on this topic (Aldrighi & Postali, 2011).

The empirical contribution consists of applying the quantile regression method for panel data, which is innovative and suitable for longitudinal analyses. Thus, the results contribute to the Brazilian literature, showing how a pyramid structure influences each of the levels of values of RPTs performed between controlling/controlled and affiliate companies.

The results can help improve information disclosure processes concerning companies listed on the stock exchange. For example, many descriptions of RPTs are general, not clearly describing the operation performed. Thus, due to the recent mandatory disclosure of RPTs (2010), standardization and improved disclosure of information can be sought, with valuable results for institutions regulating the capital market.

In addition, the fact that corporate governance showed no moderating role might indicate that the legal environment in the Brazilian market allows controlling shareholders to use strategies to ensure their voting power. Consequently, the results are of interest to minority shareholders, who may pay attention to RPTs among companies belonging to a pyramid structure, given the risk of expropriation and private benefits. In short, considering the breadth of topics such as firm value, performance, and corporate governance, evidence from the Brazilian context is important, particularly when considering RPTs and pyramid ownership.

General limitations are inherent to the research method used, which is susceptible to the endogeneity present in corporate governance studies. Another intrinsic limitation of this study is the definition of variables, such as, for example, the use of binary variables for some aspects addressed here.

Another limitation refers to the time frame; 2017 was the last year for which data were available in the database. The first year considered in the analysis refers to the time when data started being disclosed in the reference form. Additionally, note that due to the focus in this study, the selection criterion for pyramid structures was based on the existence of at least one intermediary listed. This definition was used to verify whether access of this intermediary to the stock exchange would be relevant for RPTs.

Suggestions for future research include more descriptive studies addressing RPTs. Due to the number of qualitative information, it would be appropriate to separate transactions according to nature and verify their determinants. RPTs can also be analyzed from other perspectives; as such operations are used as a way to expropriate minority shareholders. Literature is found regarding the interaction between RPTs, performance, and firms' value, but empirical results for Brazil are still scarce, especially addressing the same time frame as the one addressed here. Evidence basically serves to guide the formulation of new research hypotheses, which can contribute to a better understanding of the motivations for forming pyramid structures and RPTs in the Brazilian market.

References

Aldrighi, D. M. (2014). Concentração da Propriedade do Capital e Controle das Empresas no Brasil. In: XIV Encontro Brasileiro de Finanças.

Aldrighi, D. M., & Mazzer Neto, R. (2005). Estrutura de Propriedade e de Controle das Empresas de Capital Aberto no Brasil. *Revista de Economia Política*, *25*(98), 115–137.

Aldrighi, D. M., & Postali, A. F. (2010). Business Groups in Brazil. In A. M. Colpan, T. Hikino, & J. R. Lincoln (Eds.), *The Oxford Handbook of Business Groups* (Oxford Uni). Nova York: Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199552863.001.0001

Aldrighi, D. M., & Postali, A. F. (2011). Propriedade Piramidal das Empresas no Brasil. *Revista EconomiA*, *12*(1), 27–48.

Aldrighi, D. M., Postali, F. A. S., & Diaz, M. D. M. (2018). Corporate Governance and Pyramidal Ownership: The Role of Novo Mercado. *Brazilian Review of Finance*, *16*(1), 5–38.

Almeida, M. R. de. (1987). Sociedades coligadas, controladas e controladoras (holding). *Revista de Ciência Política; v. 30, n. 2 (1987)*. Retrieved from http://bibliotecadigital.fgv.br/ojs/index.php/rcp/article/view/60140/58457

Almeida, H., Kim, C. S., & Kim, H. B. (2015). Internal Capital Markets in Business Groups: Evidence from the Asian Financial Crisis. *Journal of Finance*, *70*(6), 2539–2586. https://doi.org/10.1111/jofi.12309

Almeida, H., Park, S. Y., Subrahmanyam, M. G., & Wolfenzon, D. (2011). The structure and formation of business groups: Evidence from Korean chaebols. *Journal of Financial Economics*, *99*(2), 447–475. https://doi.org/10.1016/j.jfineco.2010.08.017

Almeida, H., & Wolfenzon, D. (2006). A Theory of Pyramidal Ownership. *The Journal of Finance*, *56*(6), 2637–2680. https://doi.org/10.1111/j.1540-6261.2006.01001.x

Bebchuk, L. A., Kraakman, R., & Triantis, G. G. (2000). Ownership and Dual Class Equity: The Mechanisms and Agency Costs of Separating Control from Cash-Flow Rights. In *Concentrated Corporate Ownership* (pp. 445–460). University of Chicago Press.

Bena, J., & Ortiz-Molina, H. (2013). Pyramidal ownership and the creation of new firms. *Journal of Financial Economics*, *108*(3), 798–821. https://doi.org/10.1016/j.jfineco.2013.01.009

Bertrand, M., Mehta, P., & Mullainathan, S. (2002). Ferreting Out Tunneling : An Application to Indian Business. *The Quarterly Journal of Economics*, *117*(1), 121–148.

Bertrand, M., & Mullainathan, S. (2003). Pyramids. *Journal of the European Economic Association*, *1*(2–3), 478–473.

Bhuiyan, M. B. U., & Roudaki, J. (2018). Related party transactions and finance company failure: New Zealand evidence. *Pacific Accounting Review*, *30*(2), 199–221. https://doi.org/10.1108/PAR-11-2016-0098

Bona-Sánchez, C., Fernández-Senra, C. L., & Pérez-Alemán, J. (2017). Related-party transactions, dominant owners and firm value. *BRQ Business Research Quarterly*, *20*(1), 4–17. https://doi.org/10.1016/j.brq.2016.07.002

Bortolon, P. M. (2010). *Determinantes e consequências das decisões de estrutura de propriedade: estrutura piramidal e unificação de ações*. Universidade Federal do Rio de Janeiro. Tese.

Cai, W., Zeng, C. C., Lee, E., & Ozkan, N. (2016). Do business groups affect corporate cash holdings? Evidence from a transition economy. *China Journal of Accounting Research*, *9*(1), 1–24. https://doi.org/10.1016/j.cjar.2015.10.002

Carvalhal da Silva, A. L. (2005). *Governança Corporativa e Decisões Financeiras no Brasil* (Mauad). Rio de Janeiro.

Chen, W., Li, S., & Chen, C. X. (2017). How much control causes tunneling? Evidence from China. *China Journal of Accounting Research*, *10*(3), 231–245. https://doi.org/10.1016/j.cjar.2016.10.001

Cheung, Y. L., Jing, L., Lu, T., Rau, P. R., & Stouraitis, A. (2009). Tunneling and propping up: An analysis of related party transactions by Chinese listed companies. *Pacific Basin Finance Journal*, *17*(3), 372–393. https://doi.org/10.1016/j.pacfin.2008.10.001

Cheung, Y. L., Qi, Y., Raghavendra Rau, P., & Stouraitis, A. (2009). Buy high, sell low: How listed firms price asset transfers in related party transactions. *Journal of Banking and Finance*, *33*(5), 914–924. https://doi.org/10.1016/j.jbankfin.2008.10.002

Cho, S., & Lim, K. M. (2018). Tunneling by Related-party Transactions: Evidence from Korean Conglomerates. *Asian Economic Journal*, *32*(2), 147–164. https://doi.org/10.1111/asej.12146

Claessens, S., Djankov, S., & Lang, L. H. . (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics*, *58*(1–2), 81–112. https://doi.org/10.1016/S0304-405X(00)00067-2

CVM. (2010). Aprova o pronunciamento técnico CPC 05 (R1) do comitê de pronunciamentos contábeis, que trata das divulgações sobre partes relacionadas. Rio de Janeiro.

Da Silva, Á. F., & Neves, P. (2018). Portugal: changing environment and flexible adaptation. In *Business Groups in the West: Origins, Evolution, and Resilience* (p. 592). Oxford University Press.

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, *65*, 365–395. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.520.9523&rep=rep1&type=pdf

Fang, J., Pittman, J., Zhang, Y., & Zhao, Y. (2017). Auditor Choice and Its Implications for Group-Affiliated Firms. *Contemporary Accounting Research*, *34*(1), 39–82. https://doi.org/10.1111/1911-3846.12276

Firth, M., Fung, P. M. Y., & Rui, O. M. (2007). Ownership, two-tier board structure, and the informativeness of earnings - Evidence from China. *Journal of Accounting and Public Policy*, *26*(4), 463–496. https://doi.org/10.1016/j.jaccpubpol.2007.05.004

Gordon, E. A., Henry, E., & Palia, D. (2004). Related Party Transactions and Corporate Governance. *Advances in Financial Economics*, *9*, 1–27. https://doi.org/10.1016/S1569-3732(04)09001-2

Granovetter, M. (2005). Business Groups and Social Organization. In *The handbook of economic sociology* (pp. 3–25).

Greene, W. H. (2012). *Econometric Analysis* (Vol. 2). New York: Pearson.

Hansen, L. P. (1982). Large Sample Properties of Generalized Method of Moments Estimators. *Econometrica*, *50*(4), 1029–1054. https://doi.org/10.2307/1912775

Himmelberg, C. P., Hubbard, G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics*, *53*, 353–384. https://doi.org/10.1016/S0304-405X(01)00085-X

Huyghebaert, N., & Wang, L. (2012). Expropriation of Minority Investors in Chinese Listed Firms: The Role of Internal and External Corporate Governance Mechanisms. *Corporate Governance: An International Review*, *20*(3), 308–332. https://doi.org/10.1111/j.1467-8683.2012.00909.x

Jian, M., & Wong, T. J. (2010). Propping through related party transactions. *Review of Accounting Studies*, *15*(1), 70–105. https://doi.org/10.1007/s11142-008-9081-4

Johnson, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Tunneling. *American Economic Review*, *90*(2), 22–27. https://doi.org/10.1257/aer.90.2.22

Kang, M., Lee, H. Y., Lee, M. G., & Park, J. C. (2014). The association between related-party transactions and control-ownership wedge: Evidence from Korea. *Pacific Basin Finance Journal*, *29*, 272–296. https://doi.org/10.1016/j.pacfin.2014.04.006

Kim, S. H., & An, Y. (2018). The effect of ownership-control disparity on the Chinese firm's real activity earnings management. *Pacific Accounting Review*, *30*(4), 482–499. https://doi.org/10.1108/PAR-01-2018-0003

Kirch, G., Procianoy, J. L., & Terra, P. R. S. (2014). Restrições financeiras e a decisão de investimento das firmas brasileiras. *Revista Brasileira de Economia*, *68*(1), 103–123. https://doi.org/10.1590/s0034-71402014000100006

La Porta, R., Lopez-de-silanes, F., & Shleifer, A. (1999). Corporate Ownership around the World Corporate Ownership Around the World. *Journal of Finance*, *54*(2), 471–517.

La Porta, R., Lopez-de-silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of Financial Economics*, *58*, 3–27. https://doi.org/10.1016/S0304-405X(00)00065-9

Lei, A. C. H., & Song, F. M. (2011). Connected transactions and firm value: Evidence from China-affiliated companies. *Pacific Basin Finance Journal*, *19*(5), 470–490. https://doi.org/10.1016/j.pacfin.2011.07.002

Machado, J. A. F., & Santos Silva, J. M. C. (2019). Quantiles via moments. *Journal of Econometrics*, *213*(1), 145–173. https://doi.org/10.1016/j.jeconom.2019.04.009

Maheshwari, Y., & Gupta, P. (2018). Ownership structures and effects of related lending and loan guarantees on firm performance in business groups. *Asian Journal of Accounting and Governance*, *9*, 77–86. https://doi.org/10.17576/ajag-2018-09-07

Matos, O. M. da S. P., & Galdi, F. C. (2014). O Impacto Das Transações Com Partes Relacionadas Na Performance Operacional Das Companhias Listadas Na Bm&Fbovespa. *Contabilidade Vista & Revista*, *25*(2), 84–97.

Oda, P. (2011). *Transações com partes relacionadas, governança corporativa e desempenho: um estudo com dados em painel*. Universidade de São Paulo. Dissertação.

Perlin, M. S., Kirch, G., & Vancin, D. (2019). Accessing financial reports and corporate events with GetDFPData. *Revista Brasileira de Finanças*, *17*(3), 85–108.

Rahmat, M. M., Mohd Amin, H. A., & Mohd Saleh, N. (2018). Controlling Shareholders' Proxy and Multiple Directorships: Insight Evidence from Related Party Transactions. *Asian Journal of Accounting and Governance*, *9*, 27–40. https://doi.org/10.17576/ajag-2018-09-03

Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis. *Journal of the Royal Statistical Society: Series B (Methodological)*, *31*(2), 350–371. https://doi.org/10.1111/j.2517-6161.1969.tb00796.x

Silveira, A. D. M. da, Prado, V. M., & Sasso, R. (2008). Transações com partes relacionadas: estratégias jurídicas e relação com a governança corporativa e valor das empresas no Brasil. *Estudos Em Governança Corporativa*, 1–73.

Souza, J. A. S., & Bortolon, P. M. (2014). Transações com partes relacionadas: determinantes e impactos no desempenho das empresas. XIV Encontro Brasileiro de Finanças.

Souza, M. M., Knupp, P. de S., & Borba, J. A. (2013). Características Associadas às Transações com Partes Relacionadas nas Empresas de Capital Aberto Brasileiras. *Contabilidade, Gestão e Governança*, *16*(3), 124–137.

Tirole, J. (2006). *The Theory of Corporate Finance* (Princeton, Vol. 67). New Jersey.

Wang, H. Da, Cho, C. C., & Lin, C. J. (2019). Related party transactions, business relatedness, and firm performance. *Journal of Business Research*, *101*(January), 411–425. https://doi.org/10.1016/j.jbusres.2019.01.066

Wong, R. M. K., Kim, J. B., & Lo, A. W. Y. (2015). Are related-party sales value-adding or value-destroying? Evidence from China. *Journal of International Financial Management and Accounting*, *26*(1), 1–38. https://doi.org/10.1111/jifm.12023

Yeh, Y. H., Shu, P. G., Lee, T. S., & Su, Y. H. (2009). Non-tradable share reform and corporate governance in the Chinese stock market. *Corporate Governance: An International Review*, *17*(4), 457–475. https://doi.org/10.1111/j.1467-8683.2009.00754.x