RELATED-PARTY TRANSACTIONS AS AN INSTRUMENT OF CORPORATE FRAUD IN BRAZILIAN BANKS

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ABSTRACT

Related-party transactions are transactions that auditors, shareholders and academics fear may be carried out in a way that diverges from their true financial purpose. The literature regards related-party transactions as a proxy for an opportunity to commit fraud. Corporate fraud can be best understood when analyzed by the Cressey Fraud Triangle (1953). The purpose of this article is to determine whether related-party transactions have an effect on the likelihood of corporative fraud occurring in publicly-traded Brazilian banking institutions. This was determined through an estimate of logistic random effects regression based on data from 24 publicly-traded Brazilian banks in the period from 2010 to the second quarter of 2019. Our main result confirmed that related-party transactions make it more probable that corporate fraud will occur and the type of transaction that proved to be significant was *propping [proprietary (¨prop¨) trading]*. It can be concluded that *¨propping¨* transactions (involving liabilities) can take place in several ways or for various reasons and it should not be assumed that all the transactions are carried out for fraudulent purposes. The results of the study suggest that that there is an increased likelihood of fraud in the companies studied. The concerns of the auditors are justified and this study makes a research contribution on the impact made by the related- party transactions on the entities.

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TRANSAÇÃO COM PARTE RELACIONADA COMO INSTRUMENTO DE FRAUDES CORPORATIVAS EM BANCOS BRASILEIROS

RESUMO

Transações com partes relacionadas são transações que auditores, acionistas e acadêmicos temem que sejam utilizadas de maneira destoante do seu propósito econômico. A literatura considera transação com parte relacionada como uma *proxy* para a oportunidade de se cometer uma fraude. A fraude corporativa pode ser mais bem compreendida e analisada pelo triângulo de Cressey (1953). Este artigo tem por objetivo verificar se transações com partes relacionadas impactam na probabilidade de ocorrência de fraudes corporativas em instituições bancárias brasileiras de capital aberto. Para verificar a probabilidade da ocorrência de fraude foi estimada regressão logística com efeitos aleatórios, com dados de 24 bancos brasileiros de capital aberto, no período de 2010 ao segundo trimestre de 2019. Como principal resultado, verifica-se que transações com partes relacionadas aumentam a probabilidade de ocorrência de fraude corporativa, e o tipo de transação que se mostrou significante foi o *propping*. Conclui-se que transações passivas (*propping*) podem se dar de diversas maneiras ou motivos, mas não se deve considerar que todas as transações sejam realizadas para propósitos fraudulentos. O resultado do trabalho dá uma indicação de haver um aumento da probabilidade na ocorrência de fraude nas empresas estudadas. As preocupações dos auditores são válidas, e o estudo contribui para pesquisas sobre a importância e o impacto das partes relacionadas nas entidades.

Palavras-Chave: Transação com parte relacionada. Fraude corporativa. *Propping*. *Tunneling*.

1 INTRODUCTION

The banking sector is of extreme importance for the economic system by making credit available, allowing the movement of capital and conducting financial operations. It should be remembered that the failures of banking corporations can lead to economiuc crises such as the events following the collapse of Lehman Brothers in 2007/2008, which was a landmark in the so-called *subprime* crisis. There have been several instances of fraud involving banks and related-party transactions, such as for example, the case of Panamericano (2010). This bank falsified its accounts and was involved in various transactions with organizations that belonged to the same group of companies and carried out the sale of financial assets without recording its losses in the balance-sheet, altered its financial indicators, published unrealistic profits and issued financial statements for fraudulent purposes (Borges & Andrade, 2018).

As well as the risk of fraud being practised by the banks themselves, these entities are also used in fraudulent practices involving schemes of embezzlement and money-laundering. How these take place can be inferred from the problems

detected in the lava jato [´car-wash´] operation, which began in March 2014, and disclosed various schemes of corruption involving private and public companies. It was a sophisticated scheme in so far as it involved the acquisition of Meinl Bank Antígua by Odebrecht as a means of paying kickbacks for fraudulent purposes and its activities were characterized as related-party transactions (G1, 2016). Another illustrative example is the case of fraud perpetrated by Adelphia (EUA), in 2002; in this case the company was used as a personal bank by its owner members.

The types of cases that have been detected of corporate fraud can be analyzed with the aid of a fraud theory, in particular, the Cressey Fraud Triangle (1953). Schuchter and Levi (2014) state that this theory requires three factors to establish the existence of fraudulent practices: (i) pressure – when the manager thinks that fraud is the only way to solve a problem (ii) the moral dimension – the manager does not see any moral objections to his/her course of action; and (iii) opportunity – a particular occasion or the right environment to commit the crime. Regardless of any motivation, there must be an opportunity for the fraud to occur.

By referring particularly to the link between frauds and related-party transactions, Abdullahi and Mansor (2015) demonstrated that a related-party transaction is a proxy for werghing up the opportunity to commit a fraud by emphasizing the frequency of these transactions in cases of fraud. Cohen, Ding, Lesage and Stolowy (2010), analyzed 39 cases of fraud from 1992 to 2005, and stated that 8 of them involved related-party transactions. Thus, they suggest that this type of transaction can be used as a mechanism to falsify accounting information. Kohlbeck and Mayhew (2016) found that this type of transaction signals a warning of fraud and is linked with the republication of issued statements. In this way, these transactions can be used to falsify or manipulate bank statements and can thus be linked to the republishing of information.

In light of this, and bearing in mind the importance of the banking sector to the economy, (as well as the lack of analytical studies on the links between related party transactions and corporate fraud) a serious problem can be raised: do related-party transactions, (when regarded as mechanisms for accounting results), influence the occurrence of corporate fraud in publicly-traded Brazilian banking institutions?

The purpose of the study is to determine whether related-party transactions (categorized as either *propping* or *tunneling),* affect the likelihood of corporate fraud occurring in publicly-traded Brazilian banking institutions. The condition of *propping,* is defined by Friedman *et al.* (2003) as when a parent company transfers assets to another parent; *tunneling* (according to Pizzo, 2011) is the reverse process - when the second parent transfers assets to the former one.

The justification for the study is: i) that generally works about fraud in Brazil make a decision to remove the names of financial companies from their study (Borges & Andrade, 2018), and ii) that there are few empirical studies that seek to provide evidence of the influence of related-party transactions in the occurrence of fraud. In commenting on the research into these transactions, El-Helaly (2018) refers to how the lack of available data outside Asia poses a challenge to the literature on the subject and that this probably affects the degree of interest shown by researchers in this field of study. This study seeks to fill this gap and make an additional contribution to the discussion about the occurrence of fraud. It also conducts an empirical test to find out if the concerns of researchers, auditors and

regulators over the use of this type of transaction can be harmful and, finally, it is designed to assist the regulators in determining if the rules in force are proving to be effective in combating the dishonest use of the kind of transaction.

The work is structured in the following way and includes: a discussion of the theoretical framework, a reliance on the Fraud Triangle and an examination of related-party transactions concerning corporate fraud. This is followed by an outline of the methodology and an analysis of the results; finally the findings are summarized in the Conclusion.

2 REVIEW OF THE LITERATURE

The theoretical framework is established for the fraud triangle. The following subtopic addresses the question of corporate fraud by making a link between its occurrence and related-party transactions. Finally there is an outline of the research hypothesis.

2.1 The Fraud Triangle

Pedneault (2009) states that fraud is a concept that can elicit different responses depending on each individual and his/her values. For the purposes of this study, it is defined by the concept of Coenen (2008), who regards it as an intentionally false representation of a serious matter that causes damage to the victim – for example, when someone lies about an important factor and someone else loses money as a result. Most frauds are easy to prove because it is usually clear when something is false and if someone has lost money.

When fraud is perpetrated either against or on behalf of a company (Singleton, Singleton, Bologna and Lindquist, 2006), it can be divided into two categories: (i) fraud directly against the company – when the company is the victim and the employee the beneficiary. For example, the embezzlement of the company´s funds can be cited with suppliers, clients or others bribing the employee concerned; and (ii) fraud that benefits the company – tax evasion, a violation of environmental laws and the manipulation of accounting data. In the view of Pedneault (2009), the most common fraudulent schemes include early acknowledgment of receipts, capitalization of operating costs, failure to record or disclose liabilities, dummy stocks, improperly deferred costs and related-party transactions.

In light of this, it can be inferred that fraudulent processes are complex. Cressey (1953) provided a clearer understanding of how fraud arises by postulating the fraud triangle which presupposes the need for three key factors: pressure, rationalization and opportunity. The fraud triangle was employed as a theoretical framework for several studies to explore and categorize the risk of fraud (Schuchter & Levi, 2014). Figure 1 below provides an illustration of the triangle.
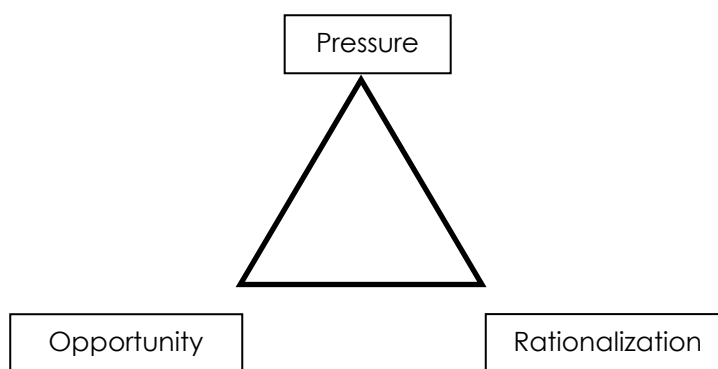
Figure 1 The Fraud Triangle.
Source: Pedneault (2009, p.55).

Pressure occurs when the defrauder is under stress and believes that the only solution to a problem is to perpetrate fraud. Abdullahi and Mansor (2015) believe that pressure can be caused by financial, non-financial, political and social factors. Cressey (1953) discusses several cases of fraud and looks at the question from the standpoint of the defrauder, as well as the reasons summarized by the fraud triangle, to explain the illicit act. All the cases discussed by the author have one thing in common: there is a financial problem that has to be solved and the only means of doing so, is to carry out an illicit act. This is the kind of problem that cannot be shared and for this reason, the person concerned feels pressurized to commit an illict act.

Rationalization is a conception through which the defrauder attempts to formulate an acceprtable moral justification for committing the fraud. In the view of Abdullahi and Mansor (2015) rationalization is a means of finding a justification or pretext for an unethical act. Cressey (1953) argues that someone who is financially trustworthy has to justify his actions and resorts to verbal expression after the act to explain why he has perpetrated the fraud.

In the opinion of Abdullahi and Mansor (2015), opportunity is provided by an inefficient control of the system of governance which allows someone to perpetrate fraud against an organization. Coenem (2008) states that an opportunity arises when the defrauder is given access to the accounts, or important personnel and information, or in other words, is accustomed to having a key position in the company and being in a situation of power. Cressey (1953) defines opportunity as being when someone is put in a position of trust and abuses this to carry out an illicit act.

2.2 Related-Party Transactions and Corporate Fraud

In Brazil, the National Monetary Council (CMN), issued a ruling through Resolution nº 3.750, (2009), which declared that all institutions authorized to operate by the BCB [Central Bank of Brazil] must disclose information on related-party transactions in accordance with the statement by the CPC [Accounting Standards Committee] 05 – Disclosure of Related-Party Transactions, correlated with International Accounting Standards (IAS) 24. In 2020, the standards were updated through Resolution CMN nº 4.818, when it was stipulated that with effect

from January 2021, financial institutions must adhere to the criteria of CPC 05 (R1) in their disclosure of related-party transactions. This standardization meant that from 2009/2010 onwards, the disclosure of related-party tansactions by Brazilian banking institutions had to comply with the disciplinary procedures set out by the International Accounting Standards Board (IASB) and the CPC, notwithstanding the discrepancy found in the revised version (R1) of the CPC 05. With regard to the links between related-party transactions (RPT) and the occurrence of fraud, these can be referred to the dimension of ¨opportunity¨ in the Cressey Fraud Triangle (1953). This is because of their capacity for expropriation without independence, as well as *ex-post* facto occurrences – that is, those only found out after the event, as explained by Cheunget *et al.* (2006). The nature of these transactions can create an environment that is conducive to fraud, as in the case of Enron.

Shirur (2011) underlines the importance of paying attention to TPR when analyzing the cases of Enron and Satyam, in which Enron acknowledges the problem of the agency effect, whereas the Satyam case is characterized by *tunneling*. The author argues that it would be impossible to ban this type of transaction since there are several situations in which it can provide financial benefits to the shareholders and there is a need to take account of the synergy between the different parties. At all events, these cases illustrate the potential of TPR to be employed as a means of perpetrating fraud. Abdullahi and Mansor (2015) argue that related-party transactions are used as a *proxy* for opportunity. Koholbeck and Mayhew (2016) and Mangala and Kumari (2016) support the views and belief of the auditors that this type of transaction can be used for expropriation and is thus a cause of concern. In their work, Koholbekc and Mayhew (2016) reveal that companies that carry out TPR tend to republish their balance-sheets more often and that those where there are even more cases of TPR, tend to pay more for auditing. In the view of the authors, these procedures are evidence that the auditors recognize the risks incurred by related-party transactions.

Although several studies have drawn attention to the adverse effects of carrying out related-party transactions, El-Helaly (2018) has noted that not all the authors agree that these transactions are always harmful or signs of fraud and there is evidence that in certain cases and situations, there are incidences of these transactions being advantageous to companies.

The Enron case of 2001, can still be used as the best example of a related-party transaction that can be harmful. The company attempted to make itself more attractive to the risk classification system by making use of a special purpose entity (SPE). Enron contributed a number of tangible assets and a debt related to the SPE and in exchange was granted their participation. Following this, the SPE provided loans either to purchase shares or to finance other business deals and thus the assets or liabilities did not appear on the annual financial balance-sheet drawn up by Enron. This provided evidence of a greater ROA (Return on Assests) and reduction of bank debt, (i.e. the ratio between total assests and liabilities, Thomas, 2002).

Banking and financial institutions can also make use of related-party transactions to carry out fraud. Oda (2011) examines the events surrounding Agrenco (2008), in which one of its consultancy firms rendered advisory services with regard to the public distribution of the *Brazilian Depositary Receipts* (BDR). The investment bank which coordinated the scheme only had a single analyst for

coverage initiated stock and worked for the company. Another case was in Italy following the merger of Fonsai and Unipol in 2012, when Unifol devised a plan to make use of related-party transactions to integrate the insurance market of Fonsai, even though this involved a number of conflicts of interest. The situation became critical and the President of the Committee for related party transactions had to offer his resignation, owing to the lack of disclosure about the transactions.

In his analysis of scandals and the lessons to be learnt from them, Giroux (2008) showed that there are two factors that provide an incentive for fraud between related parties, the remuneration of the executive and the attainment of targeted values by the analysts. There is still concern about the investment banks where there is an incentive to falsify the accounts and carry out fraud. The scandals give evidence of how people are encouraged to invest in related companies and thus inflate the value of shares in an artificial way.

Jiang, Lee and Yue (2010) confirm that in the case of related-party transactions in China, the corporate loans are huge and are used by the controlling shareholder to obtain funds from the companies. These loans represent a significant proportion of the assets and capitalization of the Chinese market and the transactions are widely used for transferring funds. Companies that have loans of a high value are those that in future tend to achieve a lower performance since they are candidates for being de-listed from the Stock Exchange.

Pozzoli and Venuti (2014) believe that the cases of fraud involving related-party transactions, can lead to a situation in which society in general is given the impression that they occur more often than they really do. Hence, studies are needed either to refute or corroborate this impression.

The case of the Goldenberg scandal (1993) is a good illustration of the use of a related-party transaction for perpetrating fraud. The case was explained by Akelola (2012) and took place in Kenya. Goldenberg International Limited and Exchange Bank Limited had a number of shareholders, officials and directors. The government of Kenya offered incentives for the export of gold and diamonds and then purchased gold from the Congo and exported it as if it came from Kenya, thus taking advantage of the incentive scheme. These operations were carried out by the Exchange Bank Limited for export compensation, currency exchange and other services. Even though it took several years to expose the scandal, it affected the economy of Kenya. The bank was used as a means of operating the fraud.

Scandals over fraud both in Brazil and the rest of the world, like those of Enron, Satyam and the Panamerican Bank, to some extent, involve related-party transactions, since technically, they include a director or executive. Borges and Andrade (2018) refer to several cases of fraud in banking institutions in Brazil, such as Bamerindus Bank, Banestes, BVA, Econômico, Cruzeiro do Sul, Santos, Nacional, Morada, Panamericano and Schahin. Among these examples, related-party transactions through the PCDL [First Boundary Commission] were found in the Panamerican Bank and Cruzeiro do Sul.

The case of the Panamerican Bank involved the Panamerican company that issues credit cards. The bank transferred its debts in a situation of default by a related party, through a transaction that was not audited by the Central Bank of Brazil (G1, 2012). During the period 2007-2012, the Banco Cruzeiro do Sul made use of the businesses to obtain the administrative funds supplied by Verax. The fraud

occurred because there was no disclosure of the transactions carried out outside market values. There were also disclosures involving the Patrimonial Maragato company. Although the fraud involved transactions not carried out directly by the banking institution, funds were drawn on and paid to benefit the managers. (Oliveira, 2016). The above-mentioned cases show how this kind of transaction can be used for fraudulent purposes.

Borges and Andrade (2018) found that a team of specialists (auditors and academics) who were concerned with detecting banking fraud or carrying out research in this area, were mainly concerned with the following: a weak corporate governance, the presence of related-party transactions, a highly competitive atmosphere/ pressure on performance, a wide range of classified accounts, PCLD and low liquidity. A large proportion of the interviewees (90.48%) believed that there is a link between related-party transactions and the occurrence of fraud.

Kohlbeck and Mayhew (2004) and Lu (2017) found there was a link between related-party transactions and remunerations paid to executives and also noted that the greater independence of directors can be attributed to their limited use of TPR. Lu (2017) stated that an appropriated remuneration allows a better control of TPRs and suggests that some types of transaction are appropriated more for expropriation.

The expropriation of the shareholder can take place by other means, as pointed out by Berkman, Cole and Fu (2007). The authors show how related-party guarantees for loans can be used to expropriate the minority shareholder. Smaller firms that were more profitable or had better expectations of growth, were those that had fewer loan guarantees and the article provides some evidence with regard to *tunneling*, the net worth of the company and its financial performance.

As well as the question of loan guarantees, Cheung *et al.* (2006) show that the purchases and sales between related parties can be a means of expropriating theshareholder when the companies pay for shares above the normal value of the market and sell them at a rate below the price for normal market transactions. Thus related-party transactions provide various opportunities for managers to commit illicit acts.

In Brazil, Alves and Alves (2008) determined the disclosure of accounting policies and argued that the category of companies linked to related parties is what has the lowest percentage rate of disclosure (16.7%). This low disclosure rate might be a sign of a dishomest use of this type of transaction. In the opinion of Petrucelli (2012), however, an inadequate disclosure does not necessarily imply that this information is fraudulent, although it is very likely to be the case. This is corroborated by Wells (2011) when he states that the non-disclosure of a related-party transaction might be a warning signal.

There is an expression. In Portuguese "a ocasião faz o ladrão" [opportunity makes the thief], which is an old saying of popular wisdom that expresses the belief that before a thief can take action, he must be given an opportunity. In the view of Schuchter and Levi (2014), regardless of any question of motivation on the part of a manager, any dishonest act requires an opportunity. The literature establishes a theoretical link between related-party transactions and the occurrence of fraud. Banks are placed in a complex and regulated environment and this can be a driving-force for opportunistic behavior. This gives rise to the following research hypothesis:

H₁: ***There is a positive link between the volume of related-party transactions and the likelihood of corporate fraud in publicly-traded Brazilian banks.***

3 METHODOLOGICAL PROCEDURES

This study makes use of logistic regression with a view to evaluating the research hypothesis which involves conducting empirical tests with the aim of determining if there is a link between the likelihood of fraud and the level of related-party transactions. Thus in this section, the participants of the study are described, together with the sampling period, the type of data collection and details of the model and the variables used for the statistical estimates.

3.1 Population Sample, Period and Data Collection

The population sample consists of 24 publicly-traded Brazilian banks registered with the Securities and Exchange Commission (CVM), and covers quarterly data from 2010 to the second quarter of 2019, making a total of 864 observations. The decision to restrict the period to the beginning of 2010 can be explained by the fact that this was the time for making forecasts about related-party transactions and for mitigating the effects arising from the changes in the requirements for disclosure. The data on the banking institutions was obtained either from the IF Report [International Financial Reporting Standards (IFRS)], or directly from the page in the Internet of the Central Bank of Brazil (BCB), during the second quarter of 2019. The handling of the data and statistical estimates was carried out with STATA® software.

3.2 Variables and Regression

In seeking to determine if there is a link between related-party transactions and the occurrence of fraud, the study made use of descriptive statistics (average, median, frequency, maximum /minimum and standard), as well as statistical tests (logistic regression) with a view to answering the research question.

This study employs the occurrence of fraud as a *proxy* for the dependent variable (*OcorFr*), in a similar way to that of Machado and Gartner (2018). This means it is a *dummy* variable which has a value of 1 for companies convicted by the Appeals Council of the National Finance System (CRSFN) and 0 for the others. It should be made clear that the administrative procedures of the banking institutions that were analyzed, were tried and convicted by the CRSFN during the period of the research. After the reading of each legal settlement issued by the CRFN and documentation made available in the process, only the period revealed in the conviction, was ruled to be fraud or the perpetration of a fraudulent act.

It should be stressed that the CRSFN is the body responsible for conducting punitive administrative proceedings of BCB for a second instance trial. Thus the sample was divided into two groups: those that involved or did not involve corporate fraud. What is more, the classification was in line with the standard laid down by Machado and Gartner (2018), according to which the concept of corporate fraud is based on the definition of Singleton *et al.* (2006) and in this way,

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the processes involving the entity were analyzed – in this case, publicly-traded banks.

The following were collected for the measurement of the independent variables: (i) related-party transactions in the explanatory notes of the balance sheets; (ii) total assets and liabilities in the IF Data of the BCB; and (iii) the level of related-party transactions in accordance with the method employed by Supatmi *et al.* (2019), which defines this threshold in terms of the resource concepts of an output matrix for the related party and the input of subsidiary resources for the matrix.

The output is defined by the ratio between the total amount of receivables from related parties (CPR) divided by total assets (AT). Generally regarded as *tunneling*, the term is defined by Shirur (2011) as being the transfer of assets and profits outside the firm. For the purposes of this study, this results are taken as the volume of active transactions or non-performing assets (NPAs). In contrast, the input is defined as the ratio between the total number of accounts payable with related parties (RPR) divided by total liabilities (PT). With regard to the nature of *propping*, the term is defined by Friedman *et al.* (2003) as the condition when the related parties transfer funds to the parent company. The result of this equation is the level of silent related party transactions (NPRP). This set of representative variables of the level of related-party transactions (NPR) is expressed in Equation (1):

$$NPR_{it} = \frac{CPR_{it}}{AT_{it}} - \frac{RPR_{it}}{PT_{it}}, \text{ isto é: } NPR_{it} = NPRA_{it} - NPRP_{it} \qquad (1)$$

After the dependent variables (*OcorFr*) and independent variables of interest (*NPR*, *NPRA* and *NPRP*) have been defined, there remains the need to define the control variables which will be used in this study. The control variables are those related to size, macroeconomic relationships and variables related to the three sides of the fraud triangle (Pressure, Rationalization and Opportunity).

With regard to these variables, it was decided not to make use of Rationalization owing to the situations noted by Brazel, Jones and Zimbelman (2009), such as the need for more human resources, and a greater degree of collusion, which thus made measurement and identidication tasks more difficult. The variables of the model with regard to ¨opportunity¨ are the shareholding interest of the principal shareholder and the change of auditing. In the case of the domain of ¨pressure¨, the size was employed which is measured by the natural lograthm of total assets, deferred losses, the gross national product of the country and asset returns.

Table 1 provides a summary of dependent variables of interest and control, that are used in the estimated version of the model to find the determining factors for the occurrence of fraud.

Table1
Dependent variables of interest and control for estimating the occurrence of fraud

Variable	Dimension	Formula	Signal	Source	Authors
Dependent Variable					
OcorFr (Occurrence of fraud)		*dummy Variable :* 1 for companies convicted in the CRSFN and 0 for the others.		Administrative procedures of P CRSFN	Machado and Gartner (2018)
Variables of Interest					
NPR (Level of TPR)		*NPRA – NPRP* (defined in the next section)		Explanatory notes and IF.Data	Supatmi *et al.* (2019)
NPRA (Level of TPR assets)		Relationship between the credits/receivables from the related parties and total assets		Explanatory notes and IF.Data	Supatmi *et al.* (2019)
NPRP Level of TPR liabilities)		Relationship between the accounts payable to the related parties and total liabilities		Explanatory Notes and IF.Data	Supatmi *et al.* (2019)
Control Variables					
Ownership concentration [OWN]	Opportunity	Percentage of shareholder participation by the main shareholder (total shares)	+	Reference Form	Supatmi *et al.* (2019) Chen, Zhu and Wang (2011)
Size of the entity [TAM]	Pressure	Natural logarithm of total assets	+	IF.Data	Koholback and Mayhew (2010) Supatmi *et al.* (2019), Chen *et al.* (2011) Lou and Wang (2009)
Harmful effects	Pressure	Dummy Variable: 1 for companies that caused harm in the previous period and 0 for the others	+	Financial balance sheets	Firth, Rui and Wu (2011) Koholback and Mayhew (2010) Lou and Wang (2009)
ROA (return on assets)	Pressure	Relationship between net profit and total assets at the end of the period	-	IF.Data	Koholback and Mayhew (2010) Supatmi *et al.* (2019), Chen *et al.* (2011)

Variable	Dimension	Formula	Signal	Source	Authors
GNP (Gross National Product)	Pressure	Quarterly variations in GDP	_	IBGE [Brazilian institute of Geography and Statistics]	Botinha & Leme (2019)
MudAudit (change of auditor)	Opportunity	Dummy variable in which 1 stands for change of auditor and 0 for the others	+	Explanatory Notes	Skousen, Smith and Wright (2009)

Source: Prepared by the authors.

The variable of governance (*Own*) is based on the assumption that corporate governance has a great impact on this type of transaction, by serving to mitigate its harmful effects and thus a negative sign is expected for this variable (Chen *et al.*, 2011; Koholback & Mayhew, 2010; Lo *et al.*, 2010 e Supatmi *et al.*, 2019). The feeling of being controlled by some aspects of governance is due to the nature of this type of transaction, in which the majority shareholder can resort to the use of TPR to expropriate the minority shareholders and thus a positive sign can be expected from this variable.

The other control variables are employed for the size and macroeconomic environment (*GNP*). The Tam variable was employed to control possible differences arising from the size of the company (Chen *et al.*, 2011, Koholback & Mayhew, 2010 and Supatmi *et al.* 2019). Lou and Wang (2009) since there is a close link between the size of the company and fraud and hence one can expect a positive sign for this variable. The GNP variable was used to control the level of economic activity and given the fact that the growth rate is linked to corruption, where there is low economic growth, there is a rise in the occurrence of fraud, which means one can expect a negative sign.   (Botinha & Lemes, 2019).

The obsolete *ROA* and *dPrej* variables are used to control companies that are experiencing financial pressure, a situation which the authors believe can cause harm (Firth *et al.*, 2011, Lou & Wang, 2009 and Koholback & Mayhew, 2010). The COSIF accounts [Chart of Accounts for Institutions of the National Finance System] were used for the calculation of the ROA and the balance sheet of the creditors (7.0.0.00.00-9) plus that of the debtors (8.0.0.00.00-6), divided by the sum of the total assets in circulation and long-term receivables (1.0.0.00.00-7) together with permanent assets (2.0.0.00.00-4). The reason the MdAudit variable is applied is that the literature believes that there is a rise in the incidence of failings and disputes immediately after the change in auditing, a fact that was noted by Skousen *et al.* (2009). The *NPR*, *NPRA* and *NPRP* variables of interest are used to determine the level of related-party transactions in the sample which means a positive sign is expected (Supatmi *et al.*, 2019).

Since the regression used was logistic, when making the first estimate of the parameters of a logistic model, with panel data (*PooledLogit*), account should be taken of the existence of robust standard errors grouped across individuals with the aim of controlling the correlation in the error terms, even though the time is fixed and it is not the most suitable model. The parameters for fixed or random effects are more suitable than the PA *logit*, because this model includes the average coefficient of the population. Thus the probabilistic model that must be measured is *logit* with random effects, since it covers little variability in the subjects and the

(2)

variabilities that are omitted are not correlated with the model. (Allison, 2009). Thus the model takes on the following expression:

$$P(OcorFr)_{it} = \frac{e^{(\alpha_i + \beta_1 NPR_{it} + \beta_2 Own_{it} + \beta_3 Tam_{it} + + \cdots + \beta_6 \text{MudAudit}_{it})}}{1 + e^{(\alpha_i + \beta_1 NPR_{it} + \beta_2 Own_{it} + \beta_3 Tam_{it} + \cdots + \beta_6 \text{MudAudit}_{it})}}$$

In this way, the state of multicollinearity was determined through the VIF (*Variance Inflation Factor* (VIF) statistic, which becomes problematic when there is a high correlation between the explanatory variables. Fávero & Belfiore (2017) state that multicollinearity exists when the value of the VIF is above 10.

4 ANALYSIS AND DISCUSSION OF THE RESULTS

The quarterly data for publicly-traded Brazilian banks were analyzed in the period from 2010 to the second quarter of 2019. In this period, an entity (HSBC) wound up its activities while another made changes in the controlling shareholder (Industrial Bank of Brazil) and was now called the China Construction Bank. In this last situation, the banks were treated as two different institutions owing to the related-party changes. Table 2 shows the descriptive statistics of the work variables.

Table 2
Descriptive statistics: control variables and the level of related –party transactions

	NPR	NPRP	NPRA	ROA	Own	Tam	GDP
Nº Observations	848	847	848	848	852	848	875
Minimum	-0.614	0	0	-0.051	7.3	14.352	-4.500
Maximum	0,163	0.614	0.381	0.107	100	21.156	7.500
Average	-0.064	0.097	0.032	0.0051	57.949	17.204	1.375
Median	-0.017	0.035	0.001	0.005	55.75	16.535	1.400
Standard Deviation	0.138	0.136	0.058	0.009	28.325	1.843	3.078

In which *NPR* is the level of TPR; *NPRA* is the level of TPR assets; *NPRP* is the level of TPR liabilities; *ROA* corresponds to the return on assets; *Own* is the shareholder concentration, represented by the participation of the five principal shareholders; *Tam* is the *proxy* for the size of the entity, measured by the natural logarithm of total assets; and GNP represents the economic activity shown by the variation in the GNP

Source: Research Data.

The representative variables of the level of related-party transactions show that, on average, the company has more liability transactions than asset transactions and thus more transactions of the the *propping* type than *tunneling*. In this way, the matrix company receives more money than its affiliates/partners. There are some companies in the sample that do not show asset transactions (*tunneling*) or liability transactions (*propping*) with their affiliates and in the explanatory notes of the company there is no mention of any reason for the non-existence of this type of transaction in the period.

The descriptive statistics show that the financial sector had an average ROA of 0.005, which characterizes the high leverage that is an inherent part of the banking system. With regard to control, the publicly-traded Brazilian banks only have one financial controller and he has more than 50% of the shares, which thus

creates a situation that encourages opportunistic behavior. Geroux (2008) believes that the manager could encourage related-party investment with a view to boosting the share price. The GNP variable shows that, on average, Brazil achieved a quarterly growth of 1.37%, with periods of both low growth (-4.5%) and high (7.5%), where the periods of low growth are periods that can encourage dishonest behavior on the part of the manager.

With regard to the qualitative variables in the occurrence of fraud, it was found that 7.55% (64) of the samples showed the occurrence of fraud in the entities analyzed. An occurrence may only take into account the processes identified as charges and convictions. With regard to periods of harm in a previous period, 11.38% (99) of the sample caused harm in the period under study, most of them during the time when the Brazilian banks experienced profitability. With regard to the change of auditors, 11.76% (100) of the sample experienced this, which was thus a sign of a degree of stability.

The results of the estimate of the logistic regression are shown in Table 3.

Table 3
Logistic Regression for the occurrence of corporate fraud

Variables	Fraud	OR	Fraud	OR	Fraud	OR
NPR	-9.60186*	0.00006*				
	(-4.11)					
NPRA			-5.02180	0.00659		
			(-1.48)			
NPRP					9.05634*	8572.789
					(3.90)	
Own	0.081144*	1.08452*	0.04340***	1.04435***	0.06648*	1.06874*
	(2.98)		(1.93)		(3.17)	
Tam	-3.13793*	0.04337*	-0.81028	0.44473	-2.61755*	0.07298
	(-2.76)		(-1.01)		(-3.83)	
dPrej	-0.05618	0.94536	0.20760	1.23072	0.25345	1.28847
	(-0.09)		(0.35)		(0.43)	
ROA	-54.36284	2.46e-24	-33.25707	3.60e-15	-46.69214	5.27e-21
	(-1.35)		(0.35)		(-1.23)	
PIB	.26005**	1.297**	0,19086**	1.21030	0.32116*	1.37873
	(2.41)		(2.03)		(3.04)	
MudAudit	3.08126	21.78595	2.38192	10.82572	2.81473	16.68868
	(1.38)		(1.52)		(1.51)	
Cons	18.91821	1.64e+08	-3.20383	0.04060	17,24482	3.09e+07
	(1.10)		(-0.25)		(1,52)	

Where OR is the ratio of chance; *NPR* is the level of TPR; *NPRA* is the level of TPR assets; *NPRP* is the level of TPR liabilities; *ROA* corresponds to the return on assets; *Own* is the degree of shareholder concentration, represented by the five principal shareholders; *Tam* is the *proxy* for the size of the entity, measured by the natural logarithm of the total assets; *dPrej* is a dummy variable indicative of the occurrence of harm in a previous period ; *GNP* shows the level of economic activity represented by the variation of the GNP; and *MudAudit* is a dummy variable representing the alteration of the auditors responsible for issuing a statement about financial balance sheets.
*p<0,01, ** p<0,05, p<0,1. *ZScore* in brackets.
Source: Research data.

The regression employed was the random effects panel model which was tested to find out if there are problems of multicollinearity in the database. It was determined that there was an average VIF of 1.16. The TAM variable was

converted into itsnatural logarithm to correct any possible problems of multicollinearity and heterocedasticity. No problems were found with *outliers*.

In the logistic regression in question, the coefficient of the variable indicated the probability of the occurrence of fraud. In this way, the positive coefficient indicates a rise in the trend towards the occurrence of fraud and a negative signal shows a reduction. Hence, when the *NPR* is statistically significant with a positive coefficient, the hypothesis can be accepted that related-party transactions increase the likelihood of fraud - a result corroborated by the views of Abudullahi and Mansor (2015), Mangala and Kumari (2016) and Koholbeck and Mayhew (2016). Thus it follows from the literature on the subject that within the fraud triangle, these transactions can be a *proxy* for the opportunity for fraud.

By analyzing the *NPRA* and *NPRP* variables, it can be determined what kind of transaction (asset or liability) can either increase or reduce the probability of the occurrence of fraud. The results show that the NPRP variable is positive and has a statistical significance. Thus, in transactions where a bank makes up liabilities on its balance sheet (which is related to ¨*propping*¨) there is an increase in the likelihood of fraud (i.e the rise in the threshold of liability transactions increases the probability of fraud by 8572,789%) - this is a result similar to that of Jiang, Lee and Yue (2010), where a related-party transaction can be used to transfer funds. The fact that the the increase in probability is greater than the increase in the asset-related party transactions (0,06%), might be an indication that only liability-related transactions are relevant to fraud. The research hypothesis cannot be rejected that related-party transactions are closly linked to the probability of corporate fraud in publicly-traded Brazilian banks and as an added factor, the transactions made, involve liabilities (i.e. *propping*).

Propping can be defined as transactions where the principal shareholder has some economic right over controlled undertakings, whether they be service contracting, loans, or purchase of goods, among other transactions. The database does not allow one to deduce what kind of transaction involving libailities can exert an influence although the influence of this kind of transaction has already been established. The same constraints in the database can also be mentioned as applying to transactions involving assets (*Tunneling) It is impossible to show what kind of transaction is exerting an influence in a positive/negative way* on the probable occurrence of fraud, but there are signs that since the principal shareholder might be contracted by related parties for loans and other transactions, he/she might have less influence on the probability of fraud.

The relative control variable with regard to the principal shareholder (*Own*) has proved to be significant for the three models. The result shows that the greater the shareholding control, the greater the probability of the occurrence of fraud. Since the probabilities in the three models are similar, (108%, 104% and 106%), this strengthens the notion that the greater the control, the greater the likelihood of the perpetration of fraud. This result can be linked to the motivation of remuneration referred to by Koholbeck and Mayhew (2004). The most concentrated form of the entity might be restricting the Independence of the directors and as a result, the majority shareholder might be taking advantage ofthis type of transaction as an opportunity to commit fraud. Lu (2017) believes that some types of transactions are more suited to fraud and the results obtained from the sample analyzed show that transactions involving liabilities (*propping*) affect the degree of probability of the occurrence of fraud.

With regard to size, this proved to be significant for *NPR* and *NPRP*. The size of the comapny reduces the trend towards fraud and the result is the opposite of that of Lo and Wang (2009). The authors think that the largest companies are subject to fraud but in the case of publicly-traded banks, it is expected that owing to their social and economic importance, they will be subject to stricter constraints which will thus inhibit any harmful activities by the minority shareholders. However, in the case of the model with asset transactions, the probability of the size (44%) proved to be higher than that of the other two models (Transaction levels (4%) and liabilities 7%), and this result can be related to volume, in so far as in the case of larger companies, it is expected that transactions will more often be made with affiliates. Previous examples of harm such as profitability and *ROA*, did not have a statistical significance and thus had no effect on the probability of the occurrence of fraud.

With regard to the economic indicator GNP, a statistical significance was found for the three models during a period of economic growthwhen it is more susceptible to the occurrence of fraud (the probability found is higher than 1); this result was corroborated by the work of Botinha & Lemes (2019), who state that economic growth is linked to fraud. Following this, the same result can be found for the other variables and the kind of transaction where there is a greater tendency to fraud in transactions involving liabilities (*propping*), which underlines the view that publicly-traded banks can make use of related-party transactions involving liabilities with the aim of forming a protective shield. The pressure variables of the fraud triangle (*Tam*, *dPrej*, *ROA* and *GNP*), have managed to expose the socioeconomic pressures exerted by banks, which have an effect on the occurrence of fraud. This result might be a sign that within the study of fraud, banking institutions are more susceptible to the kind of pressures that can lead to the perpetration of fraud.

Finally, in the case of the variable related to the change of auditing (*MudAudit*) there was no statistical significance and so this kind of change did not affect the probability of the occurrence of banking fraud – a result that contradicts the findings in the literature of Machado (2015), Oda (2011) and Skousen *et al.* (2009). Since there are limitations to the database, it is not possible to offer a reason for this different result which perhaps can be attributed to regulatory, social, temporal or economic factors. Moreover, the model for changes in auditing was unable to reflect the issue of opportunity in the fraud triangle.

5 CONCLUSION

The research sought to analyze whether there is validity in the concern of the auditors shown by Borges and Andrade (2018) that related-party transactions are linked to the occurrence of fraud. A logistic regression was employed to check if it is possible to support the research hypothesis that related parties have a positive effect on the likelihood of corporate fraud being committed in publicly-traded Brazilian banks. The results confirm the hypothesis in the cases of operations involving banking liabilities which are characterized as ¨*propping*¨.

The fraud triangle is one of the methods employed that is designed to rationalize the motivations for fraud, including these types of transactions. This also takes account of the statement by Shirur (2011) that it is irrational to ban this kind

of related-party transaction since it has become necessary to understand its effects in an objective way. Apart from revealing its economic effects on corporate governance and society, these events can lead to the occurrence of fraud, as is demonstrated by empirical evidence.

By affecting the likelihood of fraud, related-party transactions can be used as a *proxy* for an opportunity to commit fraud, as is clear from the perspective of Abdullahi and Mansor (2015), Mangala and Kumari (2016) and Koholbeck and Mayhew (2016). An additional finding of the research was that bank liability transactions (*propping)* are those that increase the tendency towards fraud while asset transactions (*tunneling*) were not found to be linked to this statistic.

Liability transactions (*propping*) can take place in several ways or for various reasons, but it should not be assumed that all these types of transactions are carried out for fraudulent purposes (Pozzoli &Venuti, 2014). The results of this study give an indication that there was an increase in the probability of fraud in the companies under study. For this reason, the concerns of the auditors examined by Borges and Andrade (2018) are valid.

Related-party transactions are standard procedures in the market but require much greater attention from the auditors. Research can be of assistance to investors, those who set standards, auditors and investigators, in several ways. It is for investors to recommend the need to reconize the importance of these transactions, while in the case of audits and those setting standards, there is a need for more advanced legislation, greater transparency and a means of corporate governance, that are designed to constrain self-interested transactions. With regard to the researchers, the importance of the subject became evident, as well as the need for a full investigation of related-party transactions. This study showed the limitations of research with regard to variables, and drawing on the volume of transactions, regardless of the realization of abnormal gains. Hence, it was not possible to analyze the impact of the probability of the occurrence of fraud on companies which had these abnormal related-party transactions because there is no analysis of the quality of the accounting information. In view of this, no attempt was made to determine other means of perpetrating fraud, as this is beyond the scope of this article. The study was also limited by time constraints and the fact that it only takes account of fraudulent practices followed by convictions. Charges which are still being examined by courts were not included and it is recommended that future research should find out if there is a link between related-party transactions and fraud in other financial institutions. Similarly, there is a need to determine other means and opportunities that affect the probability of fraud and investigate whether external factors (such as economic and political crises or the existence of a pandemic) are likely to lead to this crime.

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Contributions	Júlio César Gomes Mendonça	Michele Rílany Rodrigues Machado	Ercilio Zanolla	José Alves Dantas
1. Idealization and conception of the research subject and theme	✓	✓		
2. Definition of the research problem	✓	✓		
3. Development of Theoretical Platform	✓	✓		
4. Design of the research methodological approach	✓	✓		✓
5. Data collection	✓			
6. Analyses and interpretations of collected data	✓	✓		✓
7. Research conclusions	✓	✓	✓	✓
8. Critical review of the manuscript	✓	✓	✓	✓
9. Final writing of the manuscript, according to the rules established by the Journal.	✓	✓	✓	✓
10. Research supervision		✓		