
SPONSORSHIP INFLUENCE OF *PRIVATE EQUITY* AND VENTURE CAPITAL FUNDS IN THE EARNINGS MANAGEMENT IN COMPANIES THAT UNDERTOOK IPO IN BRAZIL

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ABSTRACT

The current study aims at analyzing the influence exercised by the participation of the venture capital, Private Equity and Venture Capital managers in the earnings management of publicly traded Brazilian companies, from 2011 to 2019 (quarterly), which undertook Initial Public Offering (IPO) by using quantile regression. This investigation was motivated by the existing gap in the domestic literature on the relation between management by real operational decisions and the companies invested by these funds. To calculate earnings management by accruals, the Kothari, Leone and Wasley (2005) model was used, whereas to calculate real earnings management, the model by Roychowdhury (2006) was used. The results showed that the companies that undertook IPOs in Brazil, sponsored by Private Equity and Venture Capital funds, had a lower level of earnings management by operating activities in 3 analyzed quantiles (low, medium and moderate). However, this relation for the earnings management by discretionary accruals occurred only at quantiles 0.75 and 0.95, that is, moderate and high. This research main contribution was to demonstrate the importance of carrying out a joint analysis of the different types of earnings management, in addition to complementing the domestic literature that has not investigated the earnings management by real operations in IPOs of companies with the participation of venture capital managers.

Keywords: Private Equity and Venture Capital Funds. Real Earnings Management. Earnings Management by Accruals.

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INFLUÊNCIA DO PATROCÍNIO DE FUNDOS DE PRIVATE EQUITY E VENTURE CAPITAL NO GERENCIAMENTO DE RESULTADOS EM EMPRESAS QUE REALIZARAM IPO NO BRASIL

RESUMO

O objetivo deste estudo consiste em analisar a influência exercida pela participação de gestores de capital de risco, Private Equity e Venture Capital, no gerenciamento de resultados de empresas brasileiras de capital aberto, no período de 2011 a 2019 (trimestralmente), que fizeram Initial Public Offering (IPO), empregando-se regressão quantílica. Esta investigação foi motivada pela lacuna existente na literatura nacional da relação entre gerenciamento por decisões operacionais reais e as empresas investidas por esses fundos. Para o cálculo do gerenciamento de resultados por *accruals* foi utilizado o modelo Kothari, Leone e Wasley (2005), enquanto para o cálculo do gerenciamento por decisões operacionais reais foi utilizado o modelo de Roychowdhury (2006). Os resultados demonstraram que as empresas que realizaram IPO no Brasil, patrocinadas por fundos de Private Equity e Venture Capital, apresentaram menor nível de gerenciamento de resultados por atividades operacionais em 3 quantis analisados (baixo, médio e moderado). No entanto, essa relação para o gerenciamento de resultados por *accruals* discricionários ocorreu apenas nos quantis 0,75 e 0,95, ou seja, moderado e alto. A principal contribuição da pesquisa foi demonstrar a importância de se realizar análise conjunta dos diferentes tipos de gerenciamento de resultados, além de complementar a literatura nacional que não investigou o gerenciamento de resultados por operações reais em IPO de empresas com a participação de gestores de capital de risco.

Palavras-Chave: Fundos de Private Equity e Venture Capital. Gerenciamento de Resultados por Decisões Operacionais. Gerenciamento de Resultados por *Accruals*.

1 INTRODUCTION

According to Kothari, Mizik and Roychowdhury (2016) the earnings management may occur by two ways: earnings management by real operational decisions and earnings management by *accruals*. The first one is defined by Roychowdhury (2006) as deviations of the normal operational practices, induced mainly by the managers' interest in ensuring that some interested parties trust in reaching goals in the normal course of the operations oriented by the reported financial report. The second one occurs when the managers use discretion via the choices that are allowed by the accounting norms, by aiming at altering the users' perception on the real information of the financial-economic performance of entities (Dechow & Skinner, 2000).

Cohen and Zarowin (2010), when observing that the earnings management may occur both by real operational decisions and by *accruals*, boost the importance of analysing both strategies. Additionally, the research carried out by Zang (2012) presents consistent pieces of evidence that the managers use

strategies for manipulations by real operational decisions and earnings management based on *accruals* as substitutes.

Due to the fact that the earnings management practices may enhance the agency problems, the corporate governance actions become mechanisms normally observed as efficient ones in order to mitigate them (El Diri, Lambrinoudakis & Alhadab, 2020). In this regard, El Diri et al. (2020) highlight that the composition of the the Management Board is a key component of the corporate governance structure and Gioielli (2008) explains that the Management Board has the major role to supervise the administrators' performance. Thus, a Management Board that has venture capital managers tend to cooperate for the improvement of the corporate governance and the earnings quality, mainly through the strong monitoring that it exercises.

Among the existing venture capital managers, the *Private Equity* and *Venture Capital* funds are highlighted, which comprise an investment fund modality that aims to, by the equity participation of companies with potential growth and wide valuation expectancy, generate relevant financial return by valuation and subsequent sale of the shareholding (disinvestment) in the medium or long-term (Meirelles, Pimenta Junior & Rebelatto, 2008). In order to ensure a higher resale value, there is a need from part of the funds for both the investees and the fund itself to present a good reputation before the market. This is the main assets (non-financial) that ensures the funds the success in their activities before the competitive market (Black & Gilson, 1998).

The Private Equity and *Venture Capital* funds promote a complete organizational restructuring, in such a way that the companies that have them as investors present an improvement in the adopted accounting procedures (Cumming, Schmidt & Walz, 2010). Hence, the accounting in the *Private Equity* investment environment plays an important role, because according to Zimmerman (2016), the *Private Equity* funds are based on the financial statements in order to support how to manage the existing conflicts of interest in the environment in which they operate.

Researches carried out by Morsfield and Tan (2006), Gioielli (2008), Katz (2009), Lee and Masulis (2011), Hochberg (2012), Gioielli, Carvalho and Sampaio (2013), Wongsunwai (2013), Dhankar and Malik (2017), Meij (2019), Carvalho, Pinheiro and Sampaio (2020) and Premti and Smith (2020) indicate that the *Private Equity* and *Venture Capital* funds improve the quality of the accounting report by reducing the earnings management.

The study by Wongsunwai (2013), obtained by using a sample of IPOs undertaken in the United States from 1990 to 2004, investigated the monitoring effect in companies backed by *Venture Capital* in the earnings management, both by real operational decisions and by *accruals*. Additionally, the author segregated the *Venture Capital* quality and/or reputation in different levels, when dividing the *Venture Capital* of superior and inferior quality. Wongsunwai's results (2013) pointed that companies backed by the superior quality *Venture Capital in the market* presented less aggressive financial reports, in such a way that their portfolio companies seem to have no involvement in any kind of manipulation (by real operational decisions and by *accruals*), even when they have strong

incentives to do so. This study indicates the need for assessment in other markets to identify possible similarities and/or differences of the obtained findings.

By analysing the domestic literature on earnings management, it should be highlighted that only the relation of the earnings management by *accruals* with companies sponsored by *Private Equity* and *Venture Capital* was observed at the time of this study. Thus, the earnings management by real operational decisions and their relation with the investees by such funds have not been explored yet. By taking the studies by Graham, Harvey and Rajgopal (2005), Cohen and Zarowin (2010) and Zang (2012) as a basis the results found in the national domestic researches (Gioielli, 2008, Gioielli et al., 2013, Meij, 2019 and Melo & Lamounier, 2020) may be covering the real extension of the earnings management practiced by the companies because they analysed only the earnings management by *accruals*.

Also on the earnings management, Teoh, Welch and Wong (1998) assured that, in the *Initial Public Offering* process, there is a strong pressure on the managers. In order to have a successful IPO, this moment becomes a particularly convenient one for the earnings management by providing the managers with motivation and opportunities in order to manage gains with the intention of creating demand for the offered stocks and, thus, receive the sale expected resources.

Based on the above considerations and on the observed blank in the domestic scenario, the objective of the current study consists in analysing the influence by the participation of the *Private Equity* and *Venture Capital* managers in the earnings management of Brazilian publicly held companies from 2011 to 2019 (quarterly), which undertook IPO.

The study is justified because the wide literature on the earnings management concentrates itself largely in the earnings management by *accruals* (Li, 2019), besides enhancing the current knowledge on earnings management by real operational decisions and the mitigation by the funds in their investments, as the domestic researches (Gioielli, 2008, Gioielli et al., 2013, Meij, 2019 and Melo & Lamounier, 2020) were limited to the analysis by *accruals*. From the market point of view, the present survey is timely, because according to Chen, Hope, Li and Wang (2011), there is a positive association between the earnings quality and the efficient resource allocation; hence, the earnings may help Investors or potential ones who are interested in the resource allocation in companies that practice less earnings management.

2 THEORETICAL FRAMEWORK

2.1 Earnings Quality and Earnings Management (EM)

According to Beyer, Guttman and Marinovic (2019), the earnings quality together with the *earnings* management are central topics in the theoretical and empirical research in Accounting. For Biddle, Hilary and Verdi (2009), the earnings quality refers to the capacity of the financial reports to represent information on the company operations, especially on its expected cash flow. Thus, as the

earnings management is some practice that may impact directly the cash flow, its use culminates in the earnings quality directly.

According to Dichev, Graham, Harvey and Rajgopal (2013), the earnings quality is substantial to Accounting, despite the fact that its definition and forms of measurement are under wide discussion among researchers. Dechow, Ge and Schrand (2010) define a higher earnings quality as the one that reports information on the characteristics of an entity financial performance that becomes relevant for a specific decision maker in a specific decision. Lo (2008) explains that the earnings management is related to the earnings quality, in such a way that most of the scholars agree that earnings/profits strongly managed present a low earnings quality.

El Diri (2018) states that there is not a single definition for earnings management. According to Walker (2013), it is the manager's use of the discretionary action on the accounting choices that are permitted by the norms, in addition to report choices and real economic decisions to influence the user perception of how the events are reflected. Martinez (2013) explains that there are two categories of earnings management, namely: the earnings management by *accruals* and the real earnings management. The author emphasizes that a fundamental difference between them consists in the impact regarding the operational cash flow.

Kothari et al. (2016) highlight that the profit consists of *accruals* and cash flows. Due to such reason, a manager can use both *accruals* and the cash flow for the earnings management practices. The management by *accruals*, based on the accrual basis of accounting, occurs when the estimates used in certain transactions and balances in the financial statements change (Zang, 2012). El Diri (2018) explains that while the earnings management by *accruals* is involved in the manipulation of provisions by means of accounting choices, allowed by the norms, such management does not influence the operational cash flow directly, so that it does not interfere in the company underlying economy, but it changes this economy presentation of accounts, for example, in the determination of depreciation rates, inventory assessment, methods and calculation of default.

The management by real operational decisions refers to an intentional action to manipulate the earnings reported in a certain direction, modifying the time or the structure of an operation, investment or financing (Zang, 2012). The real earnings management is involved in economic decisions such as, for example, in the increase of sales by granting higher discounts to clients (Cohen & Zarowin, 2010). This way, such mechanism eventually interferes directly in the operational cash flow, influencing, negatively, the operational performance and the return of the company future stocks (Kothari et al. 2016).

By observing and highlighting the negative impact that both earnings managements have on the companies, it is worth deducing the main points that motivate the managers to adopt such practice. For Healy and Wahlen (1999), one of the main motivations for the earnings management lies in the capital market, in which the managers perform this action with the purpose to change the company external assessments, influencing the change of sales prices for potential buyers.

Dichev et al. (2013), via a study carried out with 169 financial directors in the United States, present that for these managers most of the earnings manipulations in fact occurs in the attempt to influence the stock price, through the strong internal pressure in order to reach the *benchmarks* of gains, as well as with the purpose to avoid an adverse compensation and career consequences for the executives.

Regarding the incentives for the earnings management, Walker (2013) recognizes three main reasons that boosts the use of the discretionary action by the earnings management, namely: i) the scope of contractual conditions or goals related to the financial reports; ii) expectancy induction on the cash flows and/or the company's risk perceptions for financial intermediary and/or external investors; iii) a set of information provision to external users who are interested in the financial-economic performance, by highlighting current and potential competitors, clients, suppliers, employees, regulatory bodies, tax authorities and political groups.

2.2 Earnings Management and *Private Equity* and *Venture Capital Funds*: Empirical Evidence and Research Hypothesis

The pioneer study by Morsfield and Tan (2006) demonstrated that the companies backed by *Venture Capital* funds, associated to the strong exercised monitoring, had lower earnings management in share public offerings. From then on, in the accounting literature, more researches tested the relation between the earnings management and the exercised monitoring by the *Private Equity* and *Venture Capital* funds and the capacity of these funds to mitigate the earnings management.

As Morsfield and Tan (2006) found, Gioielli (2008), via a sample with Brazilian companies, also found that the level of earnings management of the companies with *Private Equity* and *Venture Capital* investment is significantly inferior to the level presented by the companies that did not receive this kind of capital subsidies. Additionally, the study by Katz (2009) identified that the companies backed by the *Private Equity* funds involve themselves less in earnings management, besides reporting in a more conservative way before and after the IPO.

By advancing in this discussion on the Influence of the funds on the backed companies, Lee and Masulis (2011) analysed if the level of the fund reputation influenced the earnings management. The earnings showed that the *Venture Capital* funds with lower reputation in the market do not have a significant effect on the earnings management, whereas the most respectable *Venture Capital* investors significantly reduced the earnings management. In a complementary way, when analysing both the earnings management by *accruals* and the real earnings management, Wongsunwai's earnings (2013) showed that the companies backed by high quality *Venture Capital* present less aggressive financial reports. Hence, he concluded that the companies in his portfolio do not involve in any kind of manipulation (*accruals* or *real ones*), even when they have strong incentives to do so.

Hochberg (2012) concluded that the companies backed by *Venture Capital* have lower levels of earnings management and better practices of corporate governance. The study by Gioielli et al. (2013), in the IPO phases in companies that went public in Brazil, detected that for the IPOs of companies with *Private Equity* and *Venture Capital* investment, the earnings management is marginal, generally related to the characteristics of companies and little related to the IPO phases.

Dhankar and Malik (2017) analysed the international quality via the persistence of *accruals* in the operational cash flow. The authors studied the investment impact of *Private Equity* funds in comparison to companies that are not backed by these funds in India, from 2005 to 2014, totalling a sample of 269 companies. They found that the companies that are backed by *Private Equity* funds presented higher earnings quality, in comparison to the non-backed ones, based on the cash flow and on the *accruals* analysis.

Meij (2019) analysed the earnings management in IPOs in Brazil and the role of *Private Equity* and *Venture Capital* in making such practice difficult. He concluded that the sponsored companies have a lower earnings management in comparison to the non-sponsored ones. He also noted that Kothari, Leone and Wasley's model (2005), also known as Modified Jones with ROA, is more sensitive in such relation analysis.

Carvalho et al. (2020) investigated the earnings management dynamics in IPOs and the role of *Venture Capital* in preventing such practice. The authors verified that the sponsored companies end to perform more earnings management in the pre-IPO period and less in two subsequent periods. Additionally, the authors found that non-sponsored companies increase profits during the IPO period and deflate in the Lock-up and Post-lock-up periods, while sponsored companies increase gains in the pre-IPO period and deflate gains only in the Lock-up period.

Premti and Smith (2020) investigated the characteristics related to the earnings management during the IPO process. The earnings showed that the companies with higher leverage and that are not backed by venture capital have less probability to manage profits before the IPO. Additionally, they identified that IPOs in countries with a strong rule of law have less probability to involve themselves in earnings management.

There is hardly unanimity in the findings of a certain theme. In the international literature, the earnings presented by Sosnowski (2018), for example, do not verify the presence of funds (*Private Equity* and *Venture Capital* ones) as an inhibiting factor in the earnings management. Melo and Lamounier (2020), in a domestic research, also achieved similar results, that is, that companies that are backed by these funds manage less than the non-sponsored ones.

Even in the event of some conflicting scientific results, most of the studies in different scenarios and periods, such as those by Morsfield and Tan (2006), Gioielli (2008), Katz (2009), Lee and Masulis (2011), Hochberg (2012), Gioielli et al. (2013), Wongsunwai (2013), Dhankar and Malik (2017), Meij (2019), Carvalho et al. (2020) and Premti and Smith (2020) found that the *Private Equity* and *Venture Capital* funds exert strong monitoring, which encourages to detect the investee

opportunistic actions, in addition to searching the zeal so that both the investees and the fund itself present a good reputation before the market. Therefore, this research was grounded on the following hypothesis:

H1: The companies that undertook IPO in Brazil, sponsored by *Private Equity* and *Venture Capital* funds, present lower level of earnings management by *accruals* and by real activities in comparison to the non-sponsored ones.

3 METHODOLOGICAL PROCEDURES

3.1 Sample Selection

The research population consists of all companies that undertook IPO in Brazil, from 2011 to 2019, totalling 45. The fact that 2011 is the year for the initial period choice is based on Cardoso, Souza and Dantas' research (2015) who, by investigating the IFRS impacts on the discretionary *accrual*, presented that the earnings management is significantly different between the pre-IFRS period and the post-IFRS one. The authors concluded that it is not methodologically adequate that a sample gathers accounting data from pre-IFRS and post-IFRS periods. The closing year of 2019 is justified by the fact that in the period in which this research was carried out it was the most recent year that would make the use of post-IPO data possible, which are the data collected in 2020.

In order to obtain the research sample, 6 companies that fitted as financial institutions, insurance brokers and insurers were excluded, due to presenting particularities in their accounting rules, which could influence and bias the earnings analysis from the earnings management models. Therefore, the sample of 39 companies was obtained, with 1.007 observations.

Subsequently, the names of the shareholders were collected from the company share issuing prospectuses and, afterwards, it was verified if the funds were *Private Equity* and *Venture Capital* ones. Hence, of the 39 IPOs, it was verified that 25 were backed by *Private Equity* and *Venture Capital* funds, that is, they held the managers' venture risk shareholding in their shareholding structure.

3.2 Variable Selection and Econometric Models

In order to achieve the goal, the earnings management estimates were performed. For the *accruals* estimates, the Modified Jones model with ROA (Kothari et al., 2005) was used, whose variable that deals with the total *accruals* was calculated by the cash flow approach according to equation 1.

$$TA_t = Profit - CFO \tag{1}$$

In which:

TA = company total accruals in the period;

Profit = net profit;

CFO = operational cash flow.

Thus, the residues obtained from applying equation 2 (Jones Model Modified with ROA) represent the earnings management by *accruals*.

$$TA_{it} = \beta_0 + \beta_1 \left(\frac{1}{AT_{it}}\right) + \beta_2 (\Delta R_{it} - \Delta CR_{it}) + \beta_3 (PPE_{it}) + \beta_4 (ROA_{it}) + \varepsilon_{it} \quad (2)$$

In which:

TA_{it} = i company total *accruals* in the t period, weighted by the total assets at the end of t-1 period;

AT_{it} = company total assets at the end of t-1 period;

ΔR_{it} = variation of i company net revenue of t-1 period for the t period, weighted by the total assets at the end of t-1 period;

ΔCR_{it} = variation of i company receivables (clients) from the t-1 period to the t period, weighted by the total assets at the end of the t-1 period;

PPE_{it} = balances of the fixed and deferred assets (gross) of i company at the end of the t period, weighted by the total assets at the end of the t-1 period;

ROA_{it} = i company return on assets at the end of the t period, weighted by the total assets at the end of the t-1 period.

Regarding the real earnings management, Roychowdhury Model was used (2006), so that the residues of equations 3, 4 and 5 were estimated and the Real Earnings Management (REM) is represented by the sum of these residues according to equation 6.

In Roychowdhury model (2006), sales manipulation is measured by the abnormal level of the operational cash flow (OCF). Therefore, one can estimate the OCF normal level by the regression as follows, being the abnormal level represented by the estimated residue, and the REM_{FCXO} variable will be generated from its residues:

$$\frac{CFO_{it}}{AT_{it-1}} = \beta_0 + \beta_1 \left(\frac{1}{AT_{it-1}}\right) + \beta_2 \left(\frac{V_{it}}{AT_{it-1}}\right) + \beta_3 \left(\frac{\Delta V_{it}}{AT_{it-1}}\right) + \varepsilon_{it} \quad (3)$$

In which:

CFO_{it} = i entity operational cash flow in t period;

AT_{it-1} = total assets in the beginning of i entity of (t-1) period;

V_{it} = net revenue of entity i in t period;

ΔV_{it} = net revenue of entity in t period– net revenue t-1 period.

The manipulation of sales expenditures, general and administrative ones, which are the manager's discretionary power, is calculated by using the following equation, and the REM_{EXPEND} variable will be generated from its residues:

$$\frac{Desp_{it}}{AT_{it-1}} = \beta_0 + \beta_1 \left(\frac{1}{AT_{it-1}}\right) + \beta_2 \left(\frac{V_{it}}{AT_{it-1}}\right) + \varepsilon_{it} \quad (4)$$

In which:

$Desp_{it}$ = i entity discretionary expenditures in t period, represented by the administrative, sales and general expenditure sum;

AT_{it-1} = total assets in the beginning of i entity of (t-1) period;

V_{it} = sales of i entity in t period.

Finally, in order to verify the manipulation of the production abnormal levels, a calculation is performed by using the following equation and the REM_{PROD} variable will be generated from its residues:

$$\frac{Prod_{it}}{AT_{it-1}} = \beta_0 + \beta_1 \left(\frac{1}{AT_{it-1}} \right) + \beta_2 \left(\frac{V_{it}}{AT_{it-1}} \right) + \beta_3 \left(\frac{\Delta V_{it}}{AT_{it-1}} \right) + \beta_4 \left(\frac{\Delta V_{it-1}}{AT_{it-1}} \right) + \varepsilon_{it} \quad (5)$$

In which:

$Prod_{it}$ = production cost + i entity (t-(t-1)) Δ inventory (t-(t-1)) inventory;

AT_{it-1} = total assets in the beginning of i entity i of (t-1) period;

V_{it} = i entity sales in t period;

ΔV_{it} = net revenue in t period – net revenue in t-1 period;

$\Delta V_{it} - 1$ = net revenue in t-1 period – net revenue in t-2 period;

Therefore, the calculation of the real total real earnings management calculation occurs by the residue sum in this research in this research, according to the equation as follows:

$$REM_{it} = Ab_FCO_{it} + Ab_Prod_{it} + (-1 \times Ab_Desp_{it}) \quad (6)$$

In which:

Ab_FCO_{it} = residue obtained from equation 5 of entity i in t period;

Ab_Prod_{it} = residue obtained from equation 7 of i entity in period t;

Ab_Desp_{it} = residue obtained from equation 6 of i entity in t period;

The literature on earnings management (Jones, 1991, Dechow, Sloan & Sweeney, 1995; Kothari et al., 2005) predicts that the residue estimation, that is, the earnings management has to be performed by sector and period; however, the companies present IPO in different dates, companies from the same sector do not have necessarily the same periods. Hence, the segregation by sector (7 sectors) was performed and the residues from these regressions were estimated with panel data.

Such methodology use is justified as it is presented by Barros, Bergmann, Castro and Silveira (2020), because this modelling has the main advantage of combining the transverse and longitudinal dimensions, in order to control the period factor. In the face of what was elucidated by Fávero (2013), the modelling also has three different estimations, namely: pooled, fixed and random effects. In these terms, it was also necessary to verify the most adequate estimation. For such purpose, the following tests were used: Chow F test to examine the adequation between pooled and fixed effects; BreuschPagan test to verify the adequation between pooled and random effects; Hausman test to measure the adequation

between random effects and random ones. It is worth highlighting that this methodology was applied in the residue estimation.

Then, the hypothesis test that companies that undertook IPO in Brazil, sponsored by the *Private Equity* and *Venture Capital* funds, present a lower level of earnings management (*accruals* or real ones) in comparison to the non-sponsored ones, was performed. To this end, the quantile regression model was used, by adding control variables.

The quantile regression choice, by Koenker and Bassett (1978), is justified because this linear regression model offers greater robustness to estimation, by not being grounded on the residue normality assumption. Therefore, the use of the semi-parametric model does not require the process, such as the exclusion of outliers, in order to achieve the residue normality assumption, because the exclusion in this sample could jeopardize the earnings considerably due to the sample of 39 companies. In this study, 20 replications for constructing the *bootstrap* confidence interval were used.

The used model is as follows:

$$EM_{it} = \beta_1 + \beta_2 PEVC_{it} + \beta_3 IPO_{it} + \beta_4 AUDIT_{it} + \beta_5 TAM_{it} + \beta_6 CRESC_{it} + \beta_7 ALAV_{it} + \beta_8 ROA_{it} + \beta_9 SEO_{it} + \varepsilon_{it}$$

(7)

In Figure 1, a summary of all variables of the model is shown, as well as the expected signs according to the literature.

Variable	Description	Measure	Expected Sign	References
Dependent Variable				
EM (AEM and REM)	Earnings Management	For the EM by <i>accruals</i> , it will be calculated from the residues of the Modified Jones Models with ROA (2005), and for the real EM, the residues of the Roychowdury model (2006) will be used.		Morsfield and Tan (2006); Gioielli (2008); Katz (2009); Lee and Masulis (2011); Hochberg (2012); Gioielli et al (2013); Wongsunwai (2013); Wang et al. (2018); Meij (2019); remti and Smith (2020); Carvalho et al. (2020); Melo and Lamounier (2020).
Independent Variable of Interest				

PEVC	Invested companies by <i>Private Equity</i> and <i>Venture Capital</i> funds	Dummy variable that takes the value of one if the company is invested by PE/VC funds and zero otherwise.	Negative	Morsfield and Tan (2006); Gioielli (2008); Katz (2009); Lee and Masulis (2011); Hochberg (2012); Gioielli et al (2013); Wongsunwai (2013); Wang et al. (2018); Meij (2019); Premti and Smith (2020); Carvalho et al. (2020); Melo and Lamounier (2020)
Independent Control Variables				
IPO	IPO key period	Dummy that takes value 1 for the three quarterly observations of the IPO key period, the preceding quarter, period and immediately after the IPO (quarter1, quarter 0, and quarter+1) for company i, and zero, if otherwise.	Positive	Gioielli et al. (2013) Sletten et al. (2018); Melo and Lamounier (2020).
TAM	Size	Natural logarithm of the company Total assets.	Uncertain	Lee e Masulis (2011); Hochberg (2012); Premti e Smith (2020).
CRESC	Growth	$(\text{Income}_t - \text{Income}_{t-1}) / \text{Income}_{t-1}$	Positive	Lee e Masulis (2011); Hochberg (2012).
ALAV	Leverage	$1 - (\text{Net Equity} / \text{Total Assets})$.	Uncertain	Lee e Masulis (2011);

				Hochberg (2012).
ROA	Returno on Assets	Net Profit / Total Assets.	Uncertain	Morsfield e Tan (2006); Lee e Masulis (2011); Hochberg (2012).
SEO	Secondary Offering of shares	Dummy that takes value one if the i company undertook a subsequent offering of shares, and it takes value one if f quarter is included in the interval with incentives for the new offering management (year-1, year0 and (year+1), and zero, otherwise.	Positive	Teoh et al. (1998); Lee e Masulis (2011).
AUDIT	Auditing	Dummy that takes value 1 when the company was audited by one of the auditing comapnies of the group called "Big Four", and 0, otherwise.	Negative	Morsfield e Tan (2006); Lee e Masulis (2011); Hochberg (2012).

Note: EM: Earnings Management; PEVC: Invested companies by *Private Equity* and *Venture Capital* funds; IPO: IPO Key period; AUDIT: Auditing; SZ: Size; GR: Growth; LEV: Leverage; ROA: Return on Assets; SEO: Secondary offering of shares.

Figure 1 – Variable Summary of the Model

Source: By the authors.

Additionally, the ordinary least squares regression (OLS) was performed for the findings robustness and comparison, as well as the descriptive statistical analysis of the research data. The model that was used was based mainly on the researches by Morsfield and Tan (2006), Gioielli (2008), Katz (2009), Lee and Masulis (2011), Hochberg (2012), Gioielli et al. (2013), Wongsunwai (2013), Wang et al. (2018), Meij (2019), Premti and Smith (2020), Carvalho et al. (2020) and Melo and Lamounier (2020).

The financial data collection for the model operationalization was mainly by using the Economática® databases and included quarterly information from 2010 to 2020. Moreover, the company prospectuses were verified in addition to the reports of the independent auditors. After obtaining such data, they were organized by using the Excel® software and the Stata14® one was used for the statistical calculations.

4 ANALYSIS AND RESULT DISCUSSION

4.1 Descriptive Statistics

Initially, the descriptive statistics of the quantitative variable of the proposed model in equation 7 was conducted. Thus, in Table 1 the average figures, median, standard deviation, company minimum and maximum size, sales growth, leverage and return on assets (ROA) are presented.

Table 1
Descriptive statistics – quantitative explanatory variables

Variable	Average	Median	Standard	Minimum	Maximum
			Deviation		
TAM	15,0113	14,95508	1,538042	11,16323	21,37071
CRESC	3,956996	0,4782	82,93944	-0,9997914	2209,241
ALAV	0,6217008	0,5302927	1,0421	0,0843106	20,64927
ROA	0,0107654	0,0163952	0,616618	-11,1885	14,53854

Note. In which: Size: Natural logarithm of the company total assets; Growth: $(Income_t - Income_{t-1}) / Income_{t-1}$; Leverage: $1 - (Net\ Equity / Total\ Assets)$; ROA: Net Profit / Total Assets.

Source: By the authors.

When comparing the average values to the median, a solid asymmetric distribution is verified. When specifically analysing the size, growth and leverage variables, one notices that they present a higher average than the median, allowing to infer that the values at the top of the distribution are quite distant from the center if they are compared to the values that are in the distribution lowest part, that is, smaller companies, with less sales growth and lower leverage are closer to the average than the companies with these opposing characteristics.

As to the standard deviation in size (1.538042), growth (82,9394), leverage (1,0421) and ROA (0, 616618), one observes the occurrence of high data dispersion, demonstrating heterogeneity of the companies that are included in the sample. This result was already expected because the sample includes companies from several sectors, revealing a possible sign of the presence of *outliers*. Such fact has also been formed as a strong indicative that the use of econometric models based on the average may not be the most adequate ones for the observed sample, since, by identifying the presence of *outliers*, their removal can jeopardize the results because the sample is a small one.

By aiming to analyse the earnings management behavior both by *accruals* (EMA) and by real operational decisions (REM), the average values, median, standard deviation, minimum and maximum of the total sample are presented in Table 2.

Table 2
Descriptive statistics – explained variables

Variable	Average	Median	<u>Standard</u>		
			Deviation	Minimum	Maximum
EMA	1,78E-10	0,0048108	0,3709531	-8,859201	5,9222
REM	-1,38E-09	0,0005	0,1483766	-2,373787	0,9026353

Note. In which: EMA: Management by *accruals* (EMA); REM: Earnings management by real operational decisions.

Source: By the authors.

Unlike the quantitative independent variables, the two dependent ones present themselves with lower standard deviation, and the average values closer to the medians. Another fact to be observed is that whereas REM has a negative average, the EMA presents a positive one and, by analysing the minimum and maximum values, one verifies that there was a higher dispersion in the EMA to the detriment of REM, and also by analysing the minimum and maximum values, one observes that there was higher management by EMA (5.9222) in comparison to REM (0.9026356). Such fact can be explained due to the economic effects caused by the use of REM being higher than the EMA one. Furthermore, an EMA average inferior to the result found by Sincerre et al. (2019) of 3,8% is verified when they analysed a superior sample (150 companies) and with a larger number of companies that are not supported by these funds (110), sampling behavior different from the one obtained in this study.

Afterwards, Mann-Whitney U test was applied to the REM and EMA variables segregated in companies that received the sponsorship of the *Private Equity* and *Venture Capital* funds or otherwise. This test use is justified, because, by analysing the variable normality distribution, it was found that It was not normal, a fact that leads to the use of a non-parametric test. At a 1% significance level, the null rejection hypothesis that there is equality in the *Accruals* and REM behavior for companies that are sponsored by *Private Equity* and *Venture Capital* funds was obtained. This finding is consistent with the study by Gioielli et al. (2013) that, when segregating at a 10% significance level, they also found that the earnings management behaves differently.

4.2 Quantile Regression Analysis and OLS

In Table 3, the obtained earnings of the quantile regression for the equation 7 estimation are presented, both with the dependent variable, the earnings management by real operational decisions, by using the Roychowdhury

model (2006), and the earnings management by *accruals*, by using the Modified Jones Model with ROA, proposed by Kothari et. al (2005).

The presentation and analysis of these models taken together are consistent with the literature, concerning the need for the earnings management analysis to verify both kinds of management. Subsequently, the results that were obtained by the OLS regression were added to achieve robustness and comparison of the findings, having performed *White* robust correction, because according to Favero and Belfiore (2017) this methodology is adequate by the rejection of the null hypothesis of the residue constant variance of the model (homoscedasticity), the VIF test (*Variance Inflation Factor*) and Spearman correlation tests were also applied and problems related to the multicollinearity and autocorrelation were not identified.

Table 3

Quantile Regression Earnings and OLS

Earnings Management by Real Operational Decisions (Roychowdhury Model)					
	OLS (Robust)	Quantile 0.25	Quantile 0.50	Quantile 0.75	Quantile 0.95
PE/VC	-0,0421***	-0,0632***	-0,0373***	-0,0241***	0,0340
IPO	-0,0332**	-0,0392**	-0,0103	0,0019	0,0498
TAM	-0,0045	-0,0018	-0,0050***	-0,0074***	-0,0300**
CRESC	-0,0000	-0,0000	-0,0000	-0,0000	-0,0001
ALAV	-0,0219***	-0,0273***	-0,0170***	-0,0049	0,1060***
ROA	0,0487	-0,0236***	-0,0315***	-0,0059	0,2630***
SEO	-0,0269**	-0,0313**	-0,0202***	-0,0007	0,0362
AUDIT	-0,0741***	-0,0446*	-0,0461***	-0,0756***	-0,2063**
Constant	0,1888	0,0824	0,1597	0,2441	0,7473
R ² Ajusted / Pseudo-R ²	11,92%	7,55%	3,17%	2,72%	8,07%
Observation	1007				
Earnings Management by Accruals (Jones Model Modified with ROA)					
	OLS (Robust)	Quantile 0.25	Quantile 0.50	Quantile 0.75	Quantile 0.95
PE/VC	-0,0081	-0,0009	-0,0019	-0,0210**	-0,0448**
IPO	0,0184*	0,0011	0,0069	0,0659***	0,0479*
TAM	0,0140***	0,0157***	0,0078***	0,0006	0,0107*
CRESC	-0,0000	-0,0000	-0,0000	-0,0000	-0,0000
ALAV	-0,0607***	-0,0660***	-0,0194***	-0,0030	0,0930***
ROA	0,5199***	0,4397***	0,4209***	0,4064***	0,3741***
SEO	0,0036	0,0054	0,0018	0,0110	-0,0026
AUDIT	0,0518*	0,0945***	0,0812***	-0,0013	0,0073

Constant	-0,2256	-0,3351	-0,1920	0,0412	-0,0310
R ² Ajusted / Pseudo-R ²	86,64%	31,93%	21,76%	20,74%	38,95%
Observation	1007				

Note: PE/VC: Companies invested by *Private Equity* and *Venture Capital* funds; IPO: IPO key period; SZ: Size; GR.: Growth; LEV: Leverage; ROA: Return on Assets; SEO: Secondary offering of shares; AUDIT: Auditing ***, **, *: denote a statistical significance of the 1%, 5% and 10% level estimation, respectively.

Source: By the authors.

The quantile regression was divided in 4 quantiles, representing the management lowest level (quantile 0.25), the medium level (quantile 0.50), the moderate level (quantile 0.75) and the high level (quantile 0.95) in order to make more complex analysis on the variable behavior possible, according to the management level.

In regard to the interest variable, *Private Equity* and *Venture Capital* that represents if the company is sponsored or otherwise, the obtained earnings, at a 1% significance level, demonstrate that the companies sponsored by these funds have REM significantly lower concerning the non-sponsored ones, from the low to the moderate level. Therefore, such results meet the research result by Wongsunwai (2013).

It is worth highlighting, however, that as the management increases, the fund capacity in mitigating this management decreases. For this purpose, the beta coefficient reduction is observed, which presents -0.063 at the low level, -0.037 at the medium one and -0.024 at the moderate one. This behavior can be explained by what is exposed by Cohen and Zarowin (2010), who reports difficulty in perceiving this kind of management. Thus, this factor may inhibit the monitoring action exercised by the funds when investing in their investees, so that, by verifying REM highest level, the fact that the company is sponsored by the funds does not present itself as an inhibitor factor. By having observed the earnings that were obtained by OLS, it is also confirmed, at a 1% significance level, that the sponsored companies present a significantly lower REM, considering the -0.042 coefficient.

It should be emphasized that Zang (2012) found that the managers use strategies for manipulations by real operational decisions and earnings management based on *accruals* as substitutes. It is clear when verifying Table 3 data that show that no statistical significance was found for the low and moderate levels in the AEM, different earnings from the one pointed to REM. A reverse situation was also observed regarding the earnings management highest level (quantile.95), whereas a 5% statistical significance level was obtained in the AEM, there was no impact in REM.

It should be stressed that the companies sponsored by the *Private Equity* and *Venture Capital* funds present a significantly lower AEM than the non-sponsored ones, a consistent finding with the ones found by Morsfield and Tan (2006), Gioielli (2008), Katz (2009), Lee and Masulis (2011), Hochberg (2012), Gioielli et al. (2013), Wongsunwai (2013) and Meij (2019). A point that draws attention concerns the coefficients that also present an inverse relation to the one that occurred in REM. Whereas REM reduces gradually, as the management level

increases, in AEM the coefficients increase by starting with -0.0009 (quantile .25), changing to -0.0019 (quantile .50), -0.0210 (quantile .75) and finally -0.0448 (quantile .95), possibly denoting that the monitoring effect exercised by the companies sponsored by these funds is more efficient in AEM.

This scenario does not allow to refute the hypothesis that the companies that undertook IPO in Brazil, sponsored by *Private Equity* and *Venture Capital* funds, presented a lower level of earnings management, in comparison to the non-sponsored ones. That is because both in REM and in AEM, the coefficients presented themselves with a negative signal, therefore, indicating that the companies that were sponsored by those funds tend to manage their earnings less than those that do not have them in the equity participation.

It is important to stress that although there has not been any statistical significance in all the quantiles, there was a *trade-off* in this relation, because when there is no significance in a certain quantile by REM, it presents itself in the AEM, and vice-versa. Only in the moderate level, represented by quartile .75, there was significance in both managements, with negative coefficients.

As to the IPO variable represented by quarters -1, 0 and +1, it is observed that there is a 5% significance level in REM low level (quantile.25), as it represented a -0.039 coefficient, demonstrating that in this management level, in the IPO period, a lower REM is presented. In the other quantiles, the IPO factor does not show itself as significantly different.

Concerning the AEM, the IPO variable presents a different relation to REM, considering that, whereas no relation is observed in the moderate and high quantiles in REM, AEM presents in the moderate degree, at a 1% significance level, and in the high degree management, at a 10% significance level, a positive relation. Therefore, it is indicated that in the IPO period, the companies increase the earnings managements. This relation is consistent with what is presented by Teoh et al. (1998), in which the strong pressure on the managers so that the IPO is successful, makes his moment a particularly convenient one to the earnings management increase. When verifying the earnings that are obtained by OLS, it corroborates this analysis, considering that, at a 10% significance level, a 0.0185 positive coefficient is observed.

As to the size variable, it is observed that larger companies manage less regarding REM. And as the management level increases, larger companies tend to decrease the management by REM. For such purpose, it is sufficient to observe the increasing coefficient from quantile .50 to quantile .75. This fact can be explained as it was mentioned by Premti and Smith (2020) in which larger companies receiver higher monitoring, in addition to facing higher scrutiny during the IPO process, and thus higher potential costs of litigation. Another fact, that has already been mentioned, concerns REM high marginal cost, which may inhibit larger companies with such practice.

With regard to the growth variable, although Lee and Masulis (2011) and Hochberg (2012) highlight that companies with higher growth can have more incentives and capacity to manage earnings, the findings do not corroborate this, by not showing statistical significance in any of the tested models. When

confronted with the domestic researches in the area, this result meets the findings by Gioielli et al. (2013) and Melo and Lamounier (2020).

As to the leverage variable, Lee and Masulis (2011) state that highly leveraged companies end up being more strongly monitored by the creditors, so that they can also inhibit the manager discretionary behavior, resulting in a negative relation between leverage and the earnings management. When examining the relation between leverage and REM, one notices that in the low, medium and high quantiles there is a negative relation, confirmed by OLS as well.

Concerning the performance variable, measured by ROA in this research, one observes that its relation with REM changes according to the management level. In the low and medium levels, it presents a significant relation with the negative coefficients, whereas at the high level a positive and significant relation is observed. By analysing the ROA and AEM relation, what is exposed by Kothari et al. (2005) is confirmed, that is, *accruals* correlate to the company performance, in a way that, in all the quantiles, the variable presents itself as significant and with a positive coefficient. Such fact is also confirmed by the OLS.

As to the SEO variable, which represents the subsequent offering of shares, one observes that its relation to REM is significant in the low and medium quartiles; however, with negative relation, something that meets what is exposed by Teoh et al. (1998), showing that the issuers may be interested in increasing their current shareholders' wealth to the detriment of the future shareholders, which ends up by incentivating them to increase the earnings management. The regression by OLS also confirms this significant relation, but an inverse one, that is, when the companies undertake the secondary offer, they manage REM less. In relation to SEO with AEM, although most of the coefficients are positive, none of them present statistical significance, so that it is not possible to consider that there is a relation between AEM and SEO. A similar result is seen in the studies by Melo and Lamounier (2020) and Gioielli et al. (2013).

Finally, regarding the auditing company, the findings demonstrate that the relation between the auditing company and REM confirms Lee and Masulis (2011), and according to them the auditors of large companies are more prepared to examine the financial statements of their clients rigorously. As observed, the coefficients are negative, that is, companies audited by Big4 managed less by real operational decisions. However, by analysing the relation to the AEM, it is not possible to confirm, as a significant relation did not occur in all the quantiles, with a similar result to the one found by Melo and Lamounier (2020).

5 FINAL CONSIDERATIONS

This study aimed at analysing the influence exercised by the participation of venture capital managers, *Private Equity* and *Venture Capital*, in the earnings management in Brazilian publicly held companies from 2011 to 2019 (quarterly) that undertook IPO, using the quantile regression.

The earnings demonstrated that the companies sponsored by these funds present a significantly lower REM concerning the non-sponsored ones in 3 of the 4 tested quantiles (low, medium and moderate). As to the AEM, a lower

management in the medium and high quantiles was verified. Such earnings enabled the non-refutation of the research hypothesis that the companies that undertook IPO in Brazil, sponsored by the *Private Equity* and *Venture Capital* funds, present lower level of earnings management by *accruals* and by real activities in comparison to the non-sponsored ones. This is on account of the fact that in all quantiles, in which there was statistical significance, the sponsored companies by these funds presented negative coefficients.

Additionally, the AEM and the REM relation with control variables was also tested, according to the literature. As to these variables, it is worth highlighting that the IPO period had an inverse behavior between REM and AEM. Whereas in REM there was a significant and negative relation, only in the inferior quartile, in AEM, there was a significant and positive relation in the medium and high quartiles, that is, in the IPO period, REM does not present itself as the managers' preference when using the earnings management. These findings suggest a possible *trade-off* relation between REM and AEM by the companies of the sample as it is shown by Zang (2012).

By considering the studies by Graham et al. (2005), Cohen and Zarowin (2010) and Zang (2012) who warn about the importance of performing a joint analysis of the different types of earnings management, the current research presents relevant scientific contribution to the domestic literature, by analysing the earnings management by REM and AEM of the Brazilian companies that undertook IPO, dividing them among those that are supported by the *Private Equity* and *Venture Capital* funds and those that are not. Previous studies did not perform this joint analysis (Gioielli, 2008; Gioielli et al., 2013; Meij, 2019; Melo & Lamounier, 2020).

On the market practical basis, several *stakeholders* are interested in analysing the economic-financial performance of the companies; however, when there is manipulation in the financial statements, it jeopardizes the quality of the reported report. Thus, low quality reports intensify the information asymmetry, in addition to leading to an inefficient resource allocation. For this reason, when verifying if a certain group presents less managed reports than others, it is possible to contribute with investors in the efficient resource allocation. And it is at this point that the research adds value to those that are interested in investments in companies that have interest in the participation of *Private Equity* and *Venture Capital* funds in the composition of their social capital.

It is worth highlighting that the existing literature has other models for verifying the earnings management, which can be adopted in new researches. It is worth emphasizing that the choice for this study models was due to the existing research literature, which indicated them as the most prominent ones. Furthermore, as it is shown in the study, there is no consensus on the control variables that are related to the earnings management yet. Therefore, in future researches, other control variables may be included. Another relevant factor to be highlighted was the low number of companies that undertook IPO in the period; hence, new studies with the inclusion of more countries and similar markets to Brazil, in order to compare with this study and others, may bring relevant advances to the accounting science.

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