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The moderating effect of the concentration of institutional investors in the relation between earnings surprise and abnormal returns

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Abstract

Purpose: The study analyzes the moderating effect of the concentration of institutional investors in the relation earnings surprise and abnormal returns in publicly traded Brazilian companies.
Method: Data was collected from the Thomson Reuters® database. The institutional investor is treated in this research as a shareholder who holds common shares and operates with Assets Under Management. The earnings surprise was computed as the difference between the earnings report by the company and the estimated by the consensus of the analysts while the abnormal returns were calculated using the Event Study method. Altogether, 118 companies listed on B3 were investigated during the period from 2010 to 2018, totaling 2,264 observations.
Results: The results confirmed the positive earnings surprise can generate positive abnormal returns following the announcement of quarterly financial results. However, the moderating effect of the concentration of institutional investors on the surprise-return relationship was inconclusive because no statistical evidence was found that the concentration of institutional investors could change the direction or strength that the positive earnings surprise caused in abnormal returns.
Contributions: The study contributes to the understanding of the role of institutional investors in the capital market, seeking to understand whether the financial sophistication attributed to these investors is sufficient to reduce the anomalies in the share price caused by the surprises in profits.

Keywords: Earnings Surprise. Abnormal Returns. Institutional Investors.

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1 Introduction

The national and international capital market is sensitive to profit surprises (Bernard & Thomas, 1989; Foster et al., 1984; Skinner & Sloan, 2002), but little is known whether the type of investor that makes up the ownership structure of the company interferes with stock returns in the face of a profit surprise. Martinez (2006), Pimentel (2015) and Galdi and Lima (2016) inferred that the Brazilian market has paid a premium for companies that manage to accurately achieve analysts' estimates of future earnings. However, it is believed that institutional investors, as they are considered sophisticated participants in the capital market, tend to make better quality projections based on the earnings reported by companies and, consequently, are not surprised to cause an exaggerated reaction in the return of the actions.

Profit alone may not be able to bring about changes in investor perspectives, because under the logic of the efficient market there is no chance for abnormal returns arising from public information. This is because prices have already reflected all available information, that is, profit/loss announcements should not have an impact on prices, unless the announcement appears differently than expected by the market.

Martinez (2006) mentions that a common proxy for market expectations is the forecast of analysts, with real results above expectations being considered positive surprises. On the other hand, when companies do not meet analysts' forecasts, they are called negative surprises and are immediately reflected in the value of the shares. It would be as if the market punished companies that do not perform according to analysts' expectations.

Thus, managers can take advantage of investors' inefficiencies to achieve the expected earnings estimated by analysts, using the earnings management device. According to Graham et al. (2005), the Chief Financial Officers (CFO's) will do their best to achieve the analysts' profit targets, as there is fear that missed profit targets or irregular profits could affect investor confidence and the company's financial stability. However, it can be intuited that institutional investors are less sensitive to earnings surprises due to their sophistication in analyzing the data disclosed by companies.

Jiang et al. (2008) express that companies with high concentrations of institutional ownership mitigate the opportunistic behavior of managers, as they exercise a kind of external corporate governance, which discourages managers from using accounting profit manipulation practices. In addition, Boehmer and Kelley (2009) studied the behavior of intraday common stocks over twenty-two years at the NYSE and concluded that stocks with greater institutional ownership are priced more efficiently. The results showed that the role of institutional shareholders mitigates anomalies in stock prices and returns, in addition to accelerating price adjustment to new information.

Thus, considering the need to deepen the discussion on the impact that institutional investors can have on the Brazilian stock market, this research aims to answer the following concern: what is the moderating effect of institutional investor concentration on the relationship between surprise in earnings and abnormal returns in publicly traded Brazilian companies?

Although international research has studied the profit-return relationship for over forty years, studies in Brazil are still incipient. One of the contributions of this study is to deepen the theme to better understand the investors' reaction to the relation of the accounting numbers announcements on the capital market. It is noteworthy that no studies were found that verified the impact of institutional investors on abnormal returns in face of earnings surprises. Therefore, research gains importance for emerging markets.

The database used to collect institutional investors has a quarterly historical series of common shares per investor and not just the main shareholders, as is commonly reported in the Reference Forms (FR) published by the CVM. This data is more complete, as, in addition to information on the ownership structure of less than 5%, it compiles data released by the investors themselves, which allows for more complete analyses, including the shares of institutional investors with low shareholdings.

It should be noted that in Brazil there are high rates of shares held by few companies. In addition, there is low liquidity and high volatility of shares, due to speculative movements, as well as the concentration of investments in a single majority shareholder (Pimentel, 2015). Such characteristics interfere with market efficiency, which makes comparisons with the international market difficult.

2 Empirical Rationale and Hypothesis

Under the logic of the Efficient Market Hypothesis (EMH), changes in accounting earnings would only present informational content to the extent that they could signal

the occurrence of unexpected cash flows. Therefore, for the market to react significantly to reported earnings, they need an unexpected factor. Beaver et al. (1979) showed that the greater the surprise in profits, the greater the market response. This is because investors, at the time of earnings disclosure, adjust the companies' performance expectations.

The idea is that the unexpected profit interferes in the generation of future financial resources, and therefore, attracts the attention of investors. According to Alwathnani et al. (2017), investors, when projecting future perspectives of companies, attribute greater weight to the unexpected accounting profit, therefore, the stocks present a strong response, that is, they lead to exaggerated stock returns.
In HME's semi-strong form, stock prices respond instantly and impartially to incoming public information. The studies by Ball and Brown (1968), Belo and Brazil (2006), Chudek et al. (2011), Foster et al. (1984) and Sarlo Neto et al. (2005) found consistent delays in stock price responses to earnings information, which contradicts the semi-strong hypothesis. For Brown (1997), the proof of the violation of the HME in its semi-strong form occurred through the research of Latané and Jones (1977), Jones et al. (1984) and Jones et al. (1985) who studied the effect of unexpected earnings on stock prices.

The concept of Standardized Unexpected Profit (SUE), developed by Latané and Jones (1977), is based on the principle that surprises in earnings are understood as information that can justify the revision of beliefs, by investors, about probability of future earnings. The rationale is that earnings surprise information and the accompanying revision of probability beliefs have measurable impacts on stock prices at some point after earnings announcements.
Previous studies have shown that the market reacts and rewards companies that meet or exceed analysts' forecasts positively. However, it is possible to believe that not all investors trust that reported results are free from biased measurement aiming at positive surprises. Bartov et al. (2002) explain that the premiums paid to shares with positive profit surprises are justified by economic reasons, but the possibility that managers use accrual management techniques to achieve expected profit targets is not ruled out, as a way of intentionally causing premiums higher for these actions.

According to Hirshleifer et al. (2012) one of the assumptions about accrual anomalies (delay in stock price review given information on the magnitude of accruals included in earnings) is that the market can be affected by the low financial sophistication of investors. That is, investors are limited in interpreting and pricing accounting information. Martins et al. (2019) reinforce that investors are not qualified enough, or are still not concerned about the intentional interference in the procedures for calculating profits and determining future cash flows, which causes mispricing of assets.

However, it is believed that the poor pricing of assets, as well as the improvement in the interpretation of accounting procedures, is mitigated by the presence of institutional investors. The fact that institutional investors are considered more sophisticated allows for deeper and more efficient analysis of financial information, which in turn helps to mitigate anomalies caused by earnings surprises. Green et al. (2011) found that the presence of institutional investors in the US market reduced accrual anomalies. Therefore, the same effect is expected to occur with earnings surprises.
For Botelho (2019), one of the main variations in the price of assets in variable income markets occurs due to the purchase and sale carried out by institutional investors, often accompanied by other investors who seek to act jointly. Thus, large appreciation and devaluation movements can be the result of the decision-making process of this type of investor. The movement of a person on the stock exchange cannot change the market, but a pension fund that decides to change its strategy and buy shares in a certain company at once has enough strength to cause changes in the price of an asset.

Vasconcelos and Martins (2020) argue that the role of institutional investors in incorporating information into prices is an expanding field, not only in the Brazilian market, but internationally, as there is no defined position on whether institutional investors actually incorporate information to share prices, or whether the presence of institutional investors increases market efficiency with the rapid incorporation of company-specific information.

Theoretically, much of the information contained in earnings is already priced before its release (Ball & Brown, 1968), with the surprise in earnings being responsible for providing new information to the market and for driving stock prices. However, a little-investigated exogenous element, the participation of sophisticated investors in the corporate structure of companies, can make a difference in the way that information about earnings surprises is processed by the market.

Empirical evidence supports the idea that individual investors generate abnormal return patterns before earnings announcements, while institutional investors are more likely to detect information related to earnings

quality (Liu, 2018). Therefore, the study hypothesis predicts that: **the concentration of institutional investors negatively moderates the relationship between positive earnings surprise and abnormal returns**.

3 Methodology

This study uses publicly traded companies as a target population, except for those in the financial sector, which had shares traded on B3 (Brazil, Stock Exchange, OTC) between the quarters of 2010 to 2018. For the definition of the study period, it was taken taking into account the adoption of IFRS (International Financial Reporting Standards) which for Brazilian companies took place in 2010. In addition, the use of periods prior to 2010 could cause damage that is difficult to control in the calculation of accounting income, in view of the regulatory changes with the convergence of IFRS (Martins et al., 2019).

The composition of the sample is based on the perspective of a panel with unbalanced quarterly data. The study period is 33 quarters, and the collection was carried out in January 2019. Financial and ownership structure data were collected in the Thomson Reuters® database. The population cut for the definition of the sample came from 312 non-financial companies listed in B3. Subsequently, companies that did not provide complete data were excluded, resulting in 118 companies and 2264 observations as the final sample.

3.1 Dependent Variable

The abnormal return was used to capture the market reaction to earnings surprises and the Event Study method was used to verify the impact of earnings announcements on stock valuation. For the operationalization of the Event Study, the recommendations of (Barros et al., 2019; Champbell et al., 1997; Lima et al., 2008; Martinez, 2006; Paulo et al., 2013; Schimmer et al., 2015) were followed. To calculate the Abnormal Return, the Application Eventstudytools was used, which refers to a WEB APIs for automating the extraction of information disclosed to the market and the combination of data.

For the definition of the Event and Selection of Assets, the starting point was the disclosure of profits/losses in each quarter. Thus, the date each company released the Financial Statements at the Brazilian Securities and Exchange Commission (CVM) was "Date Zero". The Event Window was 3 days before and 3 days after the profit/loss disclosure. Although there is a subjective component in defining the number of days of the Event Window, Benninga and Czaczkes (2008) argue that a significant part of recent studies consider Windows of 3, 5 and 10 days around date zero.

The examinations of observed daily returns, daily expected returns and abnormal daily returns took place from the daily price quotes. It is noteworthy that the criteria for selecting the companies was based on the availability of data, using only the series of prices of common shares (ON).

To determine the daily returns, we first established the Estimation Window, comprising 493 observations. The beginning of this window being in the 504th observation prior to date zero and the last observation of the estimation window in the 11th observation prior to date zero. The calculation of the estimation window was constructed based on the determination of observed daily returns, namely: (i) daily stock return (Ri), in the form of continuous capitalization; and (ii) daily market return, represented by Ibovespa (Rmt), also in continuous capitalization. The daily returns observed were determined as follows:

$$R_i = ln(P_t/P_{t-1}) \quad (1)$$
$$Rmt = ln(C_t/C_{t-1}) \quad (2)$$

where,
P_t - is the share price at time t;
P_{t-1} - is the share price at time t-1;
C_t - is the Market Portfolio quotation at time t (Ibovespa);
C_{t-1} - is the Market Portfolio quotation at time t-1 (Ibovespa);
ln - represents the logarithmic form used to determine daily returns.

The estimation took place through the application of Ordinary Least Squares (MQO) in the form of a simple linear regression commonly called the Market Model, which has the following configuration:

$$R_i = a_i + \beta_i R_{mt} + \varepsilon_i \quad (3)$$

a and β parameters were used to determine expected daily returns and abnormal daily returns. Thus, the expected daily returns consisted of the returns that would be produced by the asset in question, based on the estimated a and β parameters and the daily market returns observed within the Event Window. The expected returns were operationalized as follows:

$$E(R_i \mid R_m) = a_i + \beta_i R_{mt} \quad (4)$$

Abnormal daily returns represent the difference between the observed daily returns given by Ri and the expected daily

returns determined by E (Ri I Rm). Thus, abnormal daily returns (ARi) were operationalized according to the equation below. Therefore, the abnormal daily return (ARi) represents a positive or negative surplus.

$$AR_i = ln(P_t/P_{t-1}) - (a_i + \beta_i R_{mt}) \quad (5)$$

Regarding the estimation of abnormal daily return and accumulated abnormal return, the following procedures were used: The abnormal daily return was determined by the difference between the observed daily return and the expected daily return (Equation 6). Cumulative abnormal returns were represented by the sum of daily abnormal returns in continuous periods contained in the Event Window (Equation 7).

$$AR_i = R_i - E(R_i \, I \, R_m) \quad (6)$$
$$CAR_{i\,(t1,\,t2)} = \sum^{t2}_{t=t1} AR_i \quad (7)$$

$CAR_{i\,(t1,\,t2)}$ represents the accumulated abnormal return of the asset under analysis, taking into account the extension of days from the first (t_1) to the last day (t_2) analyzed. Finally, the estimation values of *ARi e* $CAR_{i\,(t1,\,t2)}$ are what determine the dependent variable of this research, as the market reaction to surprise in the earnings will be verified based on the abnormal returns.

It is noteworthy that among the numerous compositions of abnormal returns accumulated around the event, four metrics were chosen for the purpose of operationalizing the research: i) AR[0] corresponds to the abnormal return on the day of earnings release; ii) CAR[0;+3] corresponds to the abnormal return accumulated after earnings disclosure; iii) CAR[-3;+3] corresponds to the accumulated abnormal return of the three days prior to the disclosure of earnings, as well as the three days after; vi) CAR[-3;-1] corresponds to the accumulated abnormal returns for the three days prior to the earnings release.

3.2 Independent variable

The earnings surprise was computed by the difference between actual earnings per share (reported by the company) and forecast earnings per share (last analyst consensus at earnings release date). From the results it was possible to classify the positive and negative surprises. Positive surprise occurs when the result has a positive value, that is, when the company's accounting result is higher than expected by analysts. On the other hand, when the result for the quarter is lower than expected by analysts, the surprise is negative. For the purpose of analysis, the dichotomous variable SURP_D was created, in which the companies that presented a positive surprise in the quarter were classified with 1, and negative, with 0.

3.3 Moderating variable

Regarding the moderating variable, an investor is considered institutional when it is a shareholder that operates with assets under management (Assets Under Management - AUM). On the Thomson Reuters® platform, this classification is called Investment Managers, which are institutional investors (buy side) who are on the buying side, with discretionary power over the assets under management in both purchase and sale decisions. In this group of investors are: Bank and Trust; Foundation; Hedge Fund; Investment Advisor; Insurance Company; Pension Fund; Private Equity; Venture Capital; Investment Advisor/Hedge Fund and Sovereign Wealth Fund.

The representation of the concentration of institutional investors is made through the variable "INST", which corresponds to the ratio of the share of common shares that institutional investors hold over the company's common shares. It is a continuous variable from 0 to 1, the closer to 0, the lower the concentration of institutional investors, on the other hand, values close to 1 indicate a high concentration of institutional investors holding the company's common shares.

A variable has a moderating effect if the relationship between two or more variables, X and Y, varies depending on the levels of moderation (Vieira, 2009; Whisman & McClelland, 2005). Thus, there is moderation when the new variable arising from the multiplication between the independent variable (SURP_D) and the moderating variable (INST) is significant in the regression equation.

3.4 Control Variables

The control variables were included in the regression in order to look for actors of the abnormal return (as a way of isolating the influence that other independent variables could exert on the dependent variable). In Table 1 the variables, calculation methods and references of such metrics are identified.

Table 1. Definition of control variables

Variable	Notation	Calculation Method	References
Financial distress	ZALT	$3,3x_1+0,999x_2+0,6x_3+1,2x_4+1,4x_4$	(Altman, 1968; Coelho et al., 2017; Howe & Houston, 2016; Li et al., 2017; Rosner, 2003; Shahwan, 2015)
Leverage leve	ALAV	Total liabilities divided by equity	(Barth et al., 2008; Klann & Beuren, 2015; Ribeiro & Colauto, 2016; Rodrigues et al., 2019)
Size	LNAT	Natural logarithm of total assets	(Klann & Beuren, 2015; Ribeiro & Colauto, 2016; Rodrigues et al., 2019)
Return on assets	ROA	Net income divided by total assets	(Gao & Zhang, 2015; González & García-Meca, 2014; Ribeiro & Colauto, 2016; Rodrigues et al., 2019)

Market-to-Book	MTB	Market value of shared divided by book value of equity	(Cho et al., 2019; Gao & Zhang, 2015; Lento et al., 2016; Potin et al., 2016)
Age	IDA	Founding years	(Bradshaw et al., 2012; Cho et al., 2019; Dickinson, 2011; Lima et al., 2015)

Note. x_1 = EBIT ÷ Total Assets; x_2= Net Revenue ÷ Total Assets; x_3= Market Value of Equity ÷ Total Liabilities; x_4 = Working Capital ÷ Total Assets; x_5= Retained Equity ÷ Total Assets

3.5 Procedures for Inferential Analysis

The announced research hypothesis is that the concentration of institutional investors negatively moderates the positive surprise relationship of earnings and abnormal returns. Equation 8 refers to the regression model with the panel structure:

$$AR_{it} = \beta_0+\beta_1\ SURP\_D_{it} + \beta_2\ INST_{it} + \beta_3\ SURP\_D_{it}*INST_{it} + \beta 4ZALT_{it} + \beta_5\ ALAV_{it} + \beta_6\ LNAT_{it} + \beta_7\ ROA_{it} + \beta_8\ MTB_{it} + \beta_9\ IDA_{it} + Setor_i + Trim_i + \varepsilon_{it}\ (8)$$

where:

AR_{it} - corresponds to the abnormal returns metrics AR[0], CAR[0;+3], AR[0] - corresponds to abnormal returns on the day of earnings release; CAR[0;+3] - corresponds to abnormal returns accumulated after earnings disclosure; CAR[-3;+3] corresponds to the abnormal returns accumulated in the three days before the earnings release, as well as in the three days after;

CAR[-3;-1] - corresponds to the abnormal returns accumulated only for the three days prior to the earnings release;

β_0 equation intercept;

$SURP\_D_{it}$ - dummy variable of company i in period t that assumes the value "1" for the positive surprise of earnings and "0" for the negative surprise of earnings;

$INST_{it}$ – corresponds to the concentration of institutional investors in company i in period t;

$ZALT_{it}$ - level of financial distress of company i in period t;

$ALAV_{it}$ - degree of financial leverage of company i in period t;

$LNAT_{it}$ - logarithm of total assets of company i in period t;

ROA_{it} - return on total assets of company i in period t;

MTB_{it} - market-to-book index of company i in period t;

IDA_{it} - age of company i in period t;

$Setor_i$ - dummy variables for sectoral control (2010 to 2018);

$Trim_i$ - dummy variable for quarter control (2010 to 2018) and

ε_{it} - error of the proposed model.

The operationalization of equation 8 was based on the four Abnormal Returns metrics: AR[0], CAR[0;+3], CAR[-3;+3] and CAR[-3;-1]. Furthermore, two analyzes are essential for understanding the results. The first is parameter 1 that investigates the relationship of positive earnings surprise to predicting abnormal returns, and for the hypothesis test it is expected that $\beta_1>0$, that is, a positive earnings surprise should increase abnormal returns, as evidenced by the literature (Alwathnani et al., 2017; Ball & Brown, 1968; Galdi & Lima, 2016; Martinez, 2006; Skinner & Sloan, 2002).

The second and main analysis referred to parameter β_3 resulting from the interaction between the dummy variable positive surprise of earnings (SURP_D) and the concentration of institutional investors (INST). The coefficient of this parameter is expected to be negative, ie $\beta_3<0$. The expectation is that the concentration of institutional investors will mitigate the effect of the positive surprise of earnings on abnormal returns. As these are sophisticated stocks due to the characteristics of investors, pricing can occur more efficiently, reducing the chances of an overreaction in the stock's return when reported earnings are higher than estimated by analysts (positive surprise).

The empirical analyzes of the study were performed using the SPSS 22 and STATA 13 statistical software. A maximum significance level of 5% was considered in all hypothesis tests. Outliers were detected by the winsorization process, at 1% at the top and at the base of the data (Alwathnani et al., 2017; Chiachio & Martinez, 2019; Cho et al., 2018; Gao & Zhang, 2015; Lorencini & Costa, 2012).

4 Description and Analysis of Results

4.1 Descriptive Data Analysis

Table 2 presents the descriptive analysis of the research variables:

Table 2. Descriptive statistics of research variables

Panel (a)					
Quantitative Variables	Minimum	Maximum	Average	Median	Standard deviation
AR[0]	-0.7040	0.2152	-0.0006	-0.0007	0.0317
CAR[0;+3]	-0.3903	0.3624	-0.0030	-0.0010	0.0598
CAR[-3;+3]	-0.4010	0.3850	-0.0027	-0.0024	0.0690
CAR[-3;-1]	-0.2597	0.2236	0.0003	-0.0003	0.0373
INST	0.0017	0.8522	0.3169	0.2570	0.2241
SURP	-17.8667	6.7333	-0.4606	-0.0643	2.6313
ZALT	-0.3112	9.3760	2.4580	1.8888	1.8505
ALAV	0.0267	9.1984	1.2135	0.7560	1.4915
LNAT	20.4957	27.0415	22.8229	22.6864	1.3003
ROA	-0.0508	0.0626	0.0109	0.0104	0.0181
MTB	0.1683	15.9040	2.4258	1.5661	2.5850
IDA	4.0000	99.0000	35.1201	33.00	23.0710
Panel (b)					
Surprise in Profits Dummy	Observations		SURP		
	Distribution	%	Average	Median	Mann-Whitney U Statistic

Positive Surprise "1"	927	41%	0.6824	0.2254	0,000***
Negative Surprise "0"	1337	59%	-1.2531	-0.3089	

Note: AR[0] abnormal returns on earnings release day; CAR[0;+3] abnormal returns accumulated after earnings disclosure; CAR[-3;+3] abnormal returns accumulated in the three days prior to the earnings release, as well as in the three days after; CAR[-3;-1] abnormal returns accumulated in the three days prior to earnings release; INST concentration of institutional investors; Surprise SURP in profits; LNAT log of total assets; ROA return on total assets; ALAV degree of financial leverage; ZALT level of financial difficulty; MTB Market-to-Book Index; IDA age of the company; ***, ** and * indicates significance of 1%, 5% and 10%.

First impressions reveal that the dependent variables (abnormal returns) present themselves in a negative way. This means that, on average, the market's response to the disclosure of quarterly earnings was poor, with the biggest loss in the three days after the accounting result disclosure date CAR[0;+3], in which accumulated abnormal returns reached the value of -0.30 percentage points. It is noteworthy that the variable CAR[-3;-1] was the only one that did not show a negative mean. Although the average of abnormal returns for this variable is slightly positive and its median negative, the estimation window only covered the three days prior to the disclosure of the accounting result, which in turn tends to demonstrate that the market did not anticipate the disclosure of profit.

A possible explanation for the market's negative perception about the disclosure of accounting results is the analysis of the SURP variable. It is noticed that the average of the earnings surprise was computed as negative, that is, the result realized in the quarter was lower than the result expected by the analysts. On average, the accounting result turned out to be 46% lower than the estimate of market analysts. In this context, there is an indication of the strength that the variable surprise in earnings has on the abnormal return.

Panel (b) of Table 2 used the SURP variable in a dichotomous way, that is, it represents the profit surprise as positive and negative. The data showed that less than half (41%) of the observations were composed of positive surprises, with accounting results above those predicted by analysts. When analyzing the averages of each of the surprises (positive and negative), it can be seen that the positive ones exceed the analysts' forecast by 68.24%, while the negative surprises fall short of the forecasts by 125%, this denotes that the positive surprises are less exacerbated than the negatives. Given that it will not be possible to achieve the expected results, managers may be increasing expenses or reducing revenues in order to create reserves to be reversed and improve future results (Healy, 1996). The Mann-Whitney test (U=000; p<0.01) showed significant differences between these two groups of surprise.

About the moderating variable INST, it was possible to identify that, on average, institutional investors represent around 31.69% of the companies' ownership structure. This data reinforces the growing participation of institutional investors in Brazil. According to González and García-Meca (2014) and Sousa (2017), institutional investors in Brazilian companies appear with around 28 and 24 percentage points. In this sense, it is worth emphasizing the representativeness of institutional investors in the Brazilian market, because, in comparison with the study by Lel (2019), at a global level, institutional investors did not go beyond the 10% mark of equity interest.

4.2 Inferential Analysis

The multivariate analysis aimed to test whether the concentration of institutional investors negatively moderates the positive surprise relationship of earnings and abnormal returns. For that, the parameters of equation 8 were followed, which predicts as the main point of analysis the behavior of the interaction between the variables SURP_D and INST.

Table 3 shows the results of the regressions having as dependent variable the four abnormal returns metrics: AR[0], CAR[0;+3], CAR[-3;+3] and CAR[-3;-1].

As shown in Table 3, the interaction variable SURP_D* INST was not significant, denoting that the concentration of institutional investors cannot change the direction or strength that the positive surprise of earnings causes on abnormal returns.

It was believed that this interaction could be negative, that is, institutional investors would be able to more quickly review the difference between reported earnings and their expectations, and therefore, the positive surprise factor would not be as impactful for companies with greater concentration of institutional investors, but the statistical significance did not provide confirmation of the research hypothesis.

Thus, the violation of the HME in its semi-strong form was evident. It was noted that the prices of the shares traded do not fully and instantly reflect all relevant and available information regarding these shares, given that the surprise of profits generated abnormal returns.

On the other hand, it was expected that a greater weight of sophisticated investors in the ownership structure of companies could improve or even correct stock pricing at the time of the earnings surprise. According to Green et al. (2011)

Table 3. Results of panel regressions

Explanatory	Dependent	AR[0]	AR[0]	CAR[0;+3]	CAR[0;+3]	CAR[-3;+3]	CAR[-3;+3]	CAR[-3;-1]	CAR[-3;-1]
SURP_D	Coef.	0,0037**	0,0029	0,0188***	0,0203***	0,0176***	0,0184***	-0,0014	-0,0024
	Std.Err.	0,0016	0,0031	0,0031	0,0055	0,0034	0,0057	0,0017	0,0028
INST	Coef.	0,0090	0,0081	0,0117	0,0136	0,0132	0,0143	-0,0048	-0,0061
	Std.Err.	0,0074	0,0079	0,0166	0,0169	0,0183	0,0192	0,0040	0,0050
SURP_D * INST	Coef.	-	0,0025	-	-0,0051	-	-0,0027	-	0,0030
	Std.Err.	-	0,0070	-	0,0129	-	0,0150	-	0,0071
ZALT	Coef.	-0,0025*	-0,0025*	-0,0080***	-0,0079***	-0,0094***	-0,0094***	-0,0015**	-0,0016**
	Std.Err.	0,0014	0,0014	0,0018	0,0018	0,0024	0,0024	0,0007	0,0007
ALAV	Coef.	-0,0001	-0,0001	0,0053***	0,0052***	0,0074***	0,0074***	0,0009	0,0009
	Std.Err.	0,0014	0,0012	0,0017	0,0017	0,0026	0,0026	0,0007	0,0007
LNAT	Coef.	-0,0067**	-0,0067**	-0,0072	-0,0071	-0,0100	-0,0100	-0,0007	0,0007
	Std.Err.	0,0033	0,0033	0,0056	0,0056	0,0062	0,0062	0,0009	0,0009
ROA	Coef.	0,1554	0,1557*	0,4749***	0,4743***	0,7011***	0,7008***	0,1594***	0,1603***
	Std.Err.	0,09358	0,0937	0,1360	0,1359	0,1525	0,1526	0,0618	0,0619
MTB	Coef.	-0,0005	-0,0005	-0,0037***	-0,0037***	-0,0059***	-0,0059***	-0,0009**	-0,0009**
	Std.Err.	0,0009	0,0009	0,0019	0,0011	0,0012	0,0013	0,0005	0,0005
IDA	Coef.	-0,0049***	-0,0048***	-0,0124***	-0,0124***	-0,0167***	-0,0167***	0,0000	0,0000
	Std.Err.	0,0013	0,0013	0,0043	0,0042	0,0043	0,0042	0,0000	0,0000
Constante	Coef.	0,3456***	0,3459***	0,6524***	0,6517***	0,8963***	0,8960***	0,0349*	0,0355*
	Std.Err.	0,0932	0,0929	0,2137	0,2117	0,2172	0,2160	0,0206	0,0206
Observations		2264	2264	2264	2264	2264	2264	2264	2264
Set and Trim		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chow Panel Test		1,290***	1,290***	1,550***	1,550***	1,450***	1,440***	1,200	1,190
Breusch Pagan Panel Test		0,000	0,000	1,970	2,020	0,000	0,000	0,00	0,00
Hausman Panel Test		165,97***	218,26***	84,440***	77,90***	79,570***	80,34***	51,26	51,24
Panel Type		Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Pooled	Pooled
Average VIF		2,47	2,55	2,47	2,55	2,47	2,55	2,47	2,55
Jarque-Bera Normality		1.2e+06 ***	1.2e+06 ***	1594***	1605***	911,6***	916,5***	1612***	1607***
Heteroc. Wald/Breusch-Pagan		11369,85***	11112,10***	7.5e+29***	3.0e+30***	12044,83***	12156,84***	0,3313	0,3567
Wooldridge Autocorrelation		0,441	0,351	0,082	0,075	0,691	0,690	0,329	0,304
Teste F		3,45***	3,50***	5,81***	5,64***	8,59***	8,45***	1,42**	1,39**
R2 within		0,0327	0,0328	0,0733	0,0734	0,0743	0,0743	-	-
R2 between		0,0014	0,0014	0,0011	0,0011	0,0021	0,0021	-	-
R2 overall		0,0001	0,0001	0,0000	0,0000	0,0000	0,0000	0,0090	0,0086

Note: AR[0] abnormal returns on earnings release day; CAR[0;+3] abnormal returns accumulated after earnings disclosure; CAR[-3;+3] abnormal returns accumulated in the three days prior to the earnings release, as well as in the three days after; CAR[-3;-1] abnormal returns accumulated in the three days prior to earnings release; SUR_D dummy variable that takes the value "1" for positive profit surprise and "0" for negative profit surprise; INST concentration of institutional investors; LNAT log of total assets; ROA return on total assets; ALAV degree of financial leverage; ZALT level of financial distress; MTB Market-to-book index; IDA age of the company; Data did not show multicollinearity: VIF<5; The Jarque-Bera test confirmed the non-normality of the residues, however, given the size of the analyzed sample, asymptotic normality is assumed, supported by the central limit theorem (Wooldridge, 2006); The Wooldridge test pointed out the non-existence of autocorrelation between the regression residuals, considering that the p-value was greater than 0.05; The Wald test diagnosed heteroscedasticity in the panel with fixed effects, so the computation of the estimators occurred considering robust heteroscedasticity estimators; ***, ** and * indicates significance of 1%, 5% and 10%.

the institutional investor figure was able to reduce accrual anomalies in the American market. According to Liu (2018), institutional investors may have skills to identify information related to earnings quality.

The assumption that institutional investors would be sufficiently sophisticated to analyze the entire flow of accounting information disclosed by companies, with regard to the aspects of profit surprise, and that they performed economic and financial analyzes to correct the overreaction in stock prices, at the time of the quarterly earnings release, was not observed.

The results for the sample under analysis show that the concentration of institutional investors in the company's shareholder structure was not enough to mitigate the abnormal returns that occurred in view of the positive profit surprise. The lack of statistical significance was also shared in Sen (2009), when they concluded that the profit surprise was not priced correctly by the Indian market and that institutional investors were also unable to mitigate this anomaly.

Some conjectures can help understand the results obtained; one of them is that investors in Brazil have a short-term investment orientation. In the literature review carried out by Ferri and Soares (2009), the probability of executives having a short-sighted behavior when there are certain institutional investor profiles, that is, adopting a portfolio manager rather than an owner's posture, is not discarded. Thus, a change in the company's future expectation caused by the disclosure of an unexpected profit may be able to change the position of investors, including institutional ones, which in turn will be reflected in the share price.

It should be noted that the profit surprise was a significant determinant for three abnormal returns metrics. The results attested that the positive profit surprise generates positive effects on the market values of the companies' securities, that is, the disclosure of a profit above analysts' expectations increases abnormal returns on the day of the AR[0] profit disclosure, in subsequent days CAR[0;+3], as well as abnormal returns accumulated around the earnings release CAR[-3;+3].

These findings follow the line of avant-garde studies such as that by Latané and Jones (1977), Jones et al. (1984) and Jones et al. (1985), who proved that the Brazilian market also reacts in a delayed manner when revising stock prices in the face of profit surprises. Non-significance was found only for the dependent variable CAR[-3;-1]. The idea of this last variable was to test whether the market was aware of earnings in advance, that is, whether the market could react to earnings surprises before the information became public. However, as expressed in Table 3, the positive profit surprise coefficient was not significant, ruling out this possibility.

In addition to the earnings surprise, the market also reacted to other variables at the time of disclosure of the financial statements. The ZALT control variable demonstrated that the more critical the company's financial situation, the lower the abnormal rates of return. On the other hand, when analyzing the effect of the ALAV variable on abnormal returns in the metrics CAR[0;+3] and CAR[-3;+3], it was noticed that the market did not repress the riskiest companies in terms of indebtedness.

On the contrary, companies with higher levels of dependence on third-party resources showed positive and statistically significant abnormal returns. Comparing the effects of ZALT and ALAV on abnormal returns, it was possible to see that the market is able to discern that indebtedness may not be the main cause of the company's financial problems. Furthermore, the possibility that the market is validating the benefits of the cost of debt with third parties for profit is not ruled out.

Still concerning the control variables, the positive and statistically significant influence of the ROA on the abnormal return is highlighted. In practically all the regressions shown in Table 3, it can be seen that the better return on the asset was reflected in the increase in abnormal returns. These results reaffirm the importance of the company generating positive results, as it demonstrates that actions with potential to generate profits cause exaggerated reactions both at the time of the disclosure of the accounting results and in the three days prior to the disclosure of the profit CAR[-3;-1].

Regarding the IDA variable, the data indicated that the company's age was another determinant that interfered with the abnormal return on the shares. The market reacted negatively to companies with more years of foundation, that is, when the accounting results are released, there is a bonus paid to newer companies. Consequently, the result indicates that investors in the Brazilian market may be more interested in stocks that present faster growth.

Finally, the behavior of the MTB and LNAT variables was evaluated. The data revealed that the stocks most valued by the market in relation to the company's equity value, that is, the stocks with the highest MTB score, are the ones with the lowest abnormal returns. Except in the AR[0] model, in which the MTB variable was not statistically significant. Regarding company size, represented by the LNAT variable, the inferences from the results are imprecise, despite its negative relationship with abnormal returns, that is, the larger the company, the lower the return. However, the results are inconclusive, as in

only one of the abnormal returns metrics the log of assets was significant, even so, above 5%.

5 Conclusions

The results of the study show that the Brazilian market fails to price the information about the surprise in profits instantly, causing an excess of return. Based on panel data regressions, surprise earnings were found to be a significant predictor of abnormal returns. Thus, accounting results above those predicted by analysts (positive surprise) are capable of generating positive abnormal returns. The opposite is also valid, results below analysts' expectations (negative surprise) interfere negatively in short-term abnormal returns.

The results showed that the Brazilian market did not anticipate the effect of surprise on earnings before the disclosure of the financial statements, given the lack of statistical significance between SURP_D and CAR[-3;-1]. It is noticed that the surprise in earnings only influenced the abnormal returns after the public disclosure of the financial statements.

It was also sought to understand whether the delay in stock pricing was related to the presence of sophistication of investors in the company's ownership structure. The hypothesis of this research was based on the premise that the asset pricing anomaly would be mitigated by the presence of institutional investors. It was believed that the greater concentration of institutional investors could negatively moderate the positive surprise relationship of earnings and abnormal returns. However, the lack of significance of the SURP_D*INST interaction coefficient did not allow us to confirm the hypothesis that a high concentration of institutional investors attenuates the effect of the positive surprise of earnings on abnormal returns. Finally, in the Brazilian market, surprise profits are responsible for part of the stock price anomalies. Although the excess return is justified by economic reasons, that is, the surprise in earnings has informational content in relation to future earnings, the possibility of investors forming asset portfolios to exploit this relative bad pricing is not ruled out. Furthermore, the financial sophistication characteristics of the institutional investor seem not to be sufficient to contain delays or biases in the interpretation of disclosed earnings information, which, in turn, allows room for abnormal gains in the face of a positive earnings surprise.

As for the limitations of the research, it is necessary to recognize that the results are limited to the variables used in the study and to the companies that constituted the sample. It is suggested for future research to explore such limitations, as well as to increase the number of control variables as a way to neutralize other environmental influences on the results. The internal classifications of institutional investors could be investigated, such as: pension funds, banks and insurance companies, hedge funds, among others, in an attempt to identify whether a certain type of investor moderates the surprise-return relationship. Another possibility of a study that would add greater knowledge and allow to ratify these results is the use of a portfolio/portfolio methodology, as well as the increase in the event window of abnormal returns in order to verify the behavior of stocks in the long run.

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