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Earnings thresholds among Brazilian listed companies: a strategy to avoid earnings losses or decreases

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Abstract

Purpose – Few studies have analyzed how enterprise managers manipulate business activities to meet the earnings thresholds of Brazilian listed companies. This study investigates whether Brazilian listed companies manipulate their business activities to meet their earnings thresholds.

Theoretical framework – This study verifies whether Brazilian listed companies manipulate their business activities to meet their earnings thresholds and whether this behavior is consistent with the signaling theory.

Design/methodology/approach – We employ the Deng model (2018) and analyze how firms manipulate their earnings using gains or losses from property disposition and whether they attempt to meet their earnings thresholds by avoiding earnings losses and decreases. A regression model is then used to verify whether the manipulation affects performance in the following period (i.e., sends signals). A total of 314 samples from 49 Brazilian listed companies during 2011-2018 are examined.

Findings – Most Brazilian listed companies do not manipulate their gains or losses from property disposition to avoid earnings losses or decreases, and the manipulation does not affect performance in the following period. Therefore, the signals do not reflect future expectations, thus rejecting the signaling theory.

Practical & social implications of research – Enterprise managers could carefully control operating activities. Creditors could monitor business transactions. Accountants should pay attention to monitoring their real earnings, seeking to align the exercise of manager judgment with practices that improve the quality of accounting information. The board of directors could strengthen its control over the property disposition behavior of enterprise managers.

Originality/value – This study is the first to verify the earnings manipulation behavior of Brazilian firms by using the signaling theory. We also analyze the manipulation of the gains or losses from property disposition to address the gap in the literature.

Keywords: Earnings thresholds, Brazil, avoiding earnings below zero, avoiding earnings decreases, manipulating property disposition.

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1 Introduction

Investors and creditors value performance. Therefore, enterprise managers experience earnings pressure and may manipulate earnings through business activities (Phan et al., 2017; Jeong & Choi, 2019; Kałdoński & Jewartowski, 2020; Liu et al., 2021) to avoid earnings decreases (Byun & Roland, 2022) or to meet analysts' earnings forecasts (Gastón & Jarne, 2021), or engage in earnings management such as avoiding earnings losses (Hinkel & Hoffman, 2020).

Bartov et al. (2002) and Brown and Caylor (2005) demonstrate that managers tend to manipulate earnings to meet a specific threshold and prevent negative investor feedback from decreasing share prices, which provides a signal of future growth to outsiders. Graham et al. (2005) show that to reduce negative investor feedback, managers should provide positive expectations and manipulate earnings to meet the earnings threshold, maximize share prices, and increase stakeholders' confidence. Park and Jeon (2010) and Boone et al. (2012) mention that managers tend to manipulate earnings to avoid earnings losses or decreases when addressing accusations from external investors. Herrmann et al. (2011) show that managers manipulate earnings to meet a specific threshold and signal sufficient future cash flow. According to the signaling theory, there is information asymmetry between enterprise managers and external stakeholders. Outsiders can only infer the intentions or decisions of enterprise managers based on the information released by firms (Karaman et al., 2020). Therefore, the signaling theory may explain why earnings are manipulated to meet earnings thresholds. This can be either positive or negative for the information receivers (i.e., outsiders) (Connelly et al., 2011; Bergh et al., 2014). Enterprise managers (i.e., insiders) often send positive signals to reduce information asymmetry (Taj, 2016). Halaoua et al. (2017) suggest that when enterprise managers increase negative information, stakeholders become pessimistic about the firms. Enterprise managers manipulate earnings to meet a specific earnings threshold, increase stakeholders' confidence, and meet stakeholders' performance expectations.

Brazil is the largest country in Latin America and the fifth largest country in the world by landmass. Brazil's GDP ranks ninth globally and third among emerging economies, and its population accounts for one-third of Latin America's. Since the 1970s, the country's economy has relied heavily on metals, raw materials, and agricultural products (particularly coffee, fruit, and sucrose). Nevertheless, there is severe wealth inequality. In the early 21st century, Brazil's political system was unstable. In addition, high inflation, financial crises, high unemployment rates, corruption, and fraud all affected the country's social and economic stability. Brazil plays a critical role in the economic growth and stability of Latin America and the world. Existing research on earnings management has been conducted in the Brazilian context (Iatridis, 2012; Ferreira et al., 2012; Pelucio-Grecco et al., 2014; Silva & Nardi, 2017; Martinez & Moraes, 2017; Mellado & Saona, 2020; Souza et al., 2022). However, few studies have explored how enterprise managers manipulate business activities to meet earnings thresholds. Moreover, few studies have analyzed such behavior of Brazilian listed companies. It is also likely that the effect of earnings management in Brazilian listed firms is unclear. Therefore, this study verifies whether Brazilian listed companies manipulate business activities to meet their earnings thresholds and whether this behavior is consistent with the signaling theory.

In this study, we collect 314 samples from 49 Brazilian listed companies during 2011-2018. Based on Deng and Ong's (2018) model, we measure earnings management behavior through the gains or losses from property disposition. The earnings threshold, which is the avoidance of earnings losses or decreases, and the frequency distribution model proposed by Gunny (2010) are employed to verify whether firms manipulate the gains or losses from property disposition to avoid earnings losses or decreases. Moreover, this study analyzes the preferences of Brazilian listed companies regarding earnings manipulation. No study has discussed how the manipulation of gains or losses from property disposition affects the earnings manipulation behavior of enterprise managers. The results reveal that most Brazilian listed companies do not manipulate gains or losses from property disposition. The relationship between manipulating gains or losses from property disposition and having a higher cash flow than other firms in the same industry is not significant. The signaling theory does not affect (i.e., signal) the behavior of Brazilian listed companies of manipulating gains or losses from property disposition. In addition, some external investors do not pay attention to the effect of manipulating gains or losses from property disposition on corporate earnings. Therefore, the effect of the signaling theory is not verified.

2 Literature review and theoretical framework

2.1 Theoretical review: the signaling theory

The signaling theory states that information asymmetry exists between enterprise managers and external stakeholders (i.e., outsiders). Outsiders can only infer the managers' intentions or decisions based on the signals released by the company (Karaman et al., 2020), which can be either positive or negative (Bergh et al., 2014; Connelly et al., 2011). Enterprise managers deliver positive signals to external receivers to reduce information asymmetry (Taj, 2016). Rahimipour (2017) showed that earnings management can be mentioned as one of the practices of signaling because managers' actions can be assessed for the transfer of messages and signals related to the exchange quality of firms in the context of signaling theory.

2.2 Empirical research on earnings thresholds

The literature on earnings management indicates that most enterprise managers tend to avoid earnings losses and decreases or conform to analysts' earnings forecasts. Hansen (2010) suggests that firms with losses are likely to manipulate earnings to avoid earnings losses. Gunny (2010) states that firms manipulate earnings to avoid earnings losses and decreases through business activities. Kama and Weiss (2013) also find that enterprises manipulate earnings to avoid earnings losses and decreases, and Halaoua et al. (2017) state that losses encourage firms to manipulate earnings to avoid earnings losses. When earnings are lower than those of the previous period before manipulation, earnings manipulation is likely to be adopted to avoid earnings decreases. Lento and Yeung (2017) show that Chinese listed firms manipulate earnings around the earnings change benchmark.

Canace et al. (2018) mention that firms manipulate research and development (R&D) expenses to meet earnings thresholds. They often do not reduce R&D expenses because they expect R&D investments to generate sustainable long-term profits. Chen and Lee (2019) show that parent companies cut their costs to avoid losses in an affiliate and cut the conglomerate's costs to avoid earnings decreases in all parties. Guo et al. (2020) show that a focal firm is likely to view a rival's negative earnings surprise as an opportunity to exploit its vulnerability.

Gandhi (2020) investigates whether Indian listed companies avoid earnings losses and decreases by applying methods such as overproduction and reducing R&D or sales expenses. The results confirm that enterprise managers engage in overproduction to avoid earnings losses and decreases. Moreover, managers reduce training expenses to avoid earnings decreases, but do not reduce R&D expenses. Ogilby et al. (2020) show that sin firms do not engage in advertising, R&D, and SG&A spending just to meet earnings benchmarks and do not engage in spending on goods for sales manipulation just to meet earnings benchmarks. Suksonghong and Amran (2020) reveal that suspect firms engage in earnings manipulation through discretionary expenses, sales, and production to either avoid losses or smooth the firm's earnings and identified firms that report low earnings or low growth in earnings.

Beardsley et al. (2021) analyze whether enterprise managers manipulate earnings to meet analysts' forecasts. They find that reducing the effective tax rates during the third and fourth quarters causes earnings to exceed analysts' forecasts. Liu et al. (2021) show that ROE may act as an important determinant of certain threshold levels of Chinese listed firms. Byun and Roland (2022) show that enterprise managers manipulate quarterly earnings to avoid falling below the earnings of the previous period. Al-Shattarat et al. (2022) find that firms manipulate sales revenue, expenses, and production costs to avoid earnings losses and decreases. De La Rosa and Lambertsen (2022) suggest that loss-averse investors will move around earnings preference points such as zero earnings, last year's earnings, and analysts' forecasts. Bjornsen et al. (2023) find that firms with a more conservative analyst following have lower earnings benchmarks. Liu (2023) shows that most South African listed firms have earnings above zero or have avoided reporting declining earnings prior to R&D earnings manipulation.

2.3 The signaling theory on earnings thresholds

This view is the "signaling earnings management" argument, which claims that firms manipulate business activities to signal good future performance and to distinguish themselves from poor performance. Burgstahler and Dichev (1997) suggest that firms expect to meet earnings thresholds and enhance their external reputation by manipulating earnings, which increases confidence among their suppliers, customers, and creditors. Bartov et al. (2002) and Brown and Caylor (2005) argue that firms tend to manipulate

earnings to meet earnings thresholds and signal future growth to outsiders to avoid negative investor feedback. Graham et al. (2005) support this argument and find that firms manipulate their earnings to meet their thresholds, increase stakeholders' confidence, avoid negative investor feedback, and maximize their share price. Park and Jeon (2010) and Boone et al. (2012) mention that enterprise managers are likely to manipulate earnings to avoid earnings losses or decreases and investor condemnation. Herrmann et al. (2011) further demonstrate that firms may manipulate earnings to meet earnings thresholds and signal sufficient future cash flow. Gunny and Zhang (2014) show that when firms manipulate earnings to achieve zero earnings or the previous year's earnings, it can improve the firm's credibility and reputation with stakeholders, thus allowing for better future performance.

Carvajal et al. (2017) find that the market reacts positively to earnings manipulation to avoid earnings losses or decreases. Halaoua et al. (2017) also argue that firms manipulate earnings to maintain company performance and prevent external stakeholders from becoming pessimistic about the firm's development. Jiang et al. (2018) show that manipulating earnings to achieve zero earnings or the previous year's earnings improves the subsequent operating performance of Jordanian firms, so it can be used to achieve benefits and supports signaling earnings management. Yeung and Lento (2018) found that meeting analysts' expectations is negatively associated with stock price crash risk, but earnings level and earnings change benchmarks are not critical thresholds. Beyer et al. (2018) suggest that firms use earnings management to signal their favorable prospects, and less robust information environments are more likely to engage in earnings management to signal future performance.

Mauler (2019) demonstrates that manipulating income tax for earnings management may lead to higher costs because aligning tax rates with analysts' earnings forecasts is regarded as an unfavorable approach in the market. However, such an approach is still adopted to prevent earnings from falling below the expected thresholds and generating negative investor feedback. Hinkel and Hoffman (2020) show that firms that use the share repurchase strategy to meet earnings benchmarks lead to smaller reductions in the cost of debt. Fogel-Yaari and Ronen (2020) show that meeting or beating expectations/thresholds is good news because it signals that the firm will also meet or beat expectations in the future and explains the richness of the menu of reporting strategies ("taking a bath," "cookie-jar reserves," or marginal threshold beating). Doukas and Zhang (2020) show that managers use earnings management as a signaling device to ensure that the market quickly discovers their superior abilities, to increase acquirers' future growth prospects, and to avoid the adverse effects of information asymmetry on managers' job security and career prospects in a competitive executive labor market. Anagnostopoulou et al. (2021) argue that manipulating expenses from core to special items should be negatively associated with future operating performance because it improperly signals actual repeatable core profitability. Sun (2021) find that investors positively value low discretionary SG&A and high discretionary R&D because reduced SG&A is viewed positively by investors as evidence of cost reduction, while reduced R&D is viewed negatively by investors as such expenditures are critical signals of expected growth. Alhaddad et al. (2022) show that Jordanian firms that achieve zero or last year's earnings improve the subsequent operating performance, supporting the idea that earnings management is not entirely opportunistic. Christensen et al. (2023) show that managers engage in earnings management and results in a metric that is negatively associated with future operating performance because of an increased risk of earnings manipulation (i.e., a signal). Qiu and Zhang (2023) show that managers engage in earnings management to avoid delisting of firms and confirm positive market consequences (i.e., subsequent performance). Aljughaiman et al. (2023) show that firms were more inclined to engage in earnings management and demonstrate signaling theory frameworks to policymakers about the credibility of financial reporting information during Covid-19.

2.4 Summary of literature review

The signaling theory depicts that managers convey their inside information about firms' prospects, thus serving as a signaling mechanism. On the other hand, managers engage in earnings management to create a positive and growing earnings string over time that will enable them to send inside information and affect future performance (Gunny & Zhang, 2014; Carvajal et al., 2017; Jiang et al., 2018; Alhaddad et al., 2022). In addition, the signal is expected to provide information to investors about the company's prospects. Furthermore, firms increase their performance in the following period by manipulating business activities to avoid earnings losses and decreases in the current period (Gunny, 2010; Al-Shattarat et al., 2022). Overall, firms increase their operating performance in the following period to send a positive signal, which is

consistent with the signaling theory. We therefore propose the following hypotheses:

H1: When listed companies manipulate their business activities to avoid earnings losses, this is positively and significantly correlated with their performance in the following year.

H2: When listed companies manipulate their business activities to avoid earnings decreases, this is positively and significantly correlated with their performance in the following year.

3 Methodology

In this study, we collect 2011-2018 data on Brazilian listed companies from the S&P Capital IQ database (Supplementary Material, Supplementary Data 1 – database), excluding data on banks, securities investment companies, and insurance companies. Data not shown are regarded as missing values. The SPSS software was used for analysis. A total of 314 samples were retrieved (Table 1). The largest number of companies (24.12%) belong to the electronic services industry (SIC code 4911), while the smallest number of companies (0.32%) belong to the air transport industry (SIC code 4512).

The variables and models used are described below.

3.1 Independent variable: earnings thresholds through manipulating discretionary property disposition

(1) Manipulating discretionary property disposition

We adopt the model of Deng and Ong (2018) to measure the gains and losses from property disposition. The authors argue that the market value, revenue from fixed asset transactions, and capital expenditures (as defined by S&P Capital IQ) affect the gains and losses from property disposition. However, revenue from fixed asset transactions

Table 1
Sample distribution

SIC code	Number of firms	Sample size	Percentage of total sample (%)
1520	1	8	2.54
2000	1	8	2.54
2011	1	8	2.54
2060	1	8	2.54
2200	3	21	6.69
2300	2	16	5.09
2390	2	16	5.09
2600	2	16	5.09
2631	1	7	2.22
2834	2	12	3.82
3312	2	16	5.09
3330	1	8	2.54
3714	2	13	4.14
3842	1	3	0.95
4011	1	2	0.63
4512	1	1	0.31
4731	1	7	2.22
4911	13	76	24.2
4924	1	3	0.95
4991	1	3	0.95
5012	1	8	2.54
5172	3	22	7.00
5311	1	8	2.54
5912	1	8	2.54
5961	1	3	0.95
8071	1	2	0.63
8200	2	11	3.50

is not found in the database. In addition, the authors sample real estate investment trusts, which have a greater degree of freedom to control capital expenditures than other industries. Therefore, we modify the model as follows:

$$\frac{GAIN_{it}}{TA_{it-1}} = a_0 + a_1 \frac{1}{TA_{it-1}} + a_2 MV_{it} + \varepsilon_{it} \quad (1)$$

$GAIN_{it}$ is the gains or losses from fixed asset transactions and investments of enterprise i in period t. The value is an actual number. TA_{it-1} is the assets of enterprise i in the previous period t; MV_{it} is the market value of enterprise i in period t. ε_{it} is the magnitude of the manipulation of the gains or losses from property disposition. For accurate calculations, ε_{it} is multiplied by the assets of enterprise i in period t to determine the amount of manipulation of the gains or losses from property disposition. Therefore, earnings before manipulation gains or losses from property disposition are equal to the earnings of enterprise i in period t minus the amount of manipulation of the gains or losses from asset disposition.

(2) Earnings thresholds

1. Avoidance of earnings losses ($AEL_{i,t}$)

Based on the method of Kent and Routledge (2017), we use basic earnings per share (EPS) as the thresholds. The earnings thresholds for avoiding earnings losses are as follows: if the basic EPS of enterprise i before the manipulation of gains or losses from property disposition in period t is less than 0 and the basic EPS of enterprise i after the manipulation of gains or losses from property disposition in period t is greater than 0, the value is 1; otherwise, the value is 0.

2. Avoidance of earnings decreases ($AED_{i,t}$)

Similarly, we follow Kent and Routledge (2017) and use EPS as the threshold. The earnings thresholds for avoiding earnings decreases are as follows: if the basic EPS of enterprise i before the manipulation of gains or losses from property disposition in period t is less than that in the previous period and the basic EPS of firm i after manipulation is greater than that in the previous period, the value is 1; otherwise, the value is 0.

3.2 Dependent variable: future performance ($ACFO_{i,t+1}$)

As mentioned earlier, the signaling theory states that there is information asymmetry between enterprise managers and external stakeholders. Outsiders can only be informed about enterprise managers' intentions or decisions through signals from the enterprises (Karaman et al., 2020). Enterprise managers tend to send positive signals to reduce information asymmetry (Taj, 2016). Al-Shattarat et al. (2022) indicate that firms can announce their cash flow from operating activities in the following period to send signals to outsiders. Moreover, they use their cash flow from operating activities in relation to the cash flow of other firms in the industry to estimate future performance and identify differences in the industry. Al-Shattarat et al. (2022) define the following variable: the cash flow from operating activities of enterprise i in period $t+1$ minus the median of the cash flow of enterprises in the same industry in period $t+1$ (2-digit SIC code).

3.3 Model

For variables affecting the external information transmission of firms, Gunny (2010) sets the following control variables: (1) $SIZE_{i,t}$ is the natural logarithm of the assets of enterprise i in period t. This estimates the scale of the enterprise. (2) $MTB_{i,t}$ is the market value of enterprise i in period t minus the book value of equity. This estimates future growth. (3) $ZSCORE_{i,t}$ is the Z value of enterprise i in period t, which is equal to 3.3 × (net profit/assets in the previous period) + 1 × (sales revenue/assets in the previous period) + 1.4 × (retained earnings/assets in the previous period) + 1.2 × (operating capital/assets in the previous period). This value reflects whether the company is in financial crisis.

Equations 2-3:

$$ACFO_{i,t+1} = a_0 + a_1 \mathrm{AEL}_{i,t} + a_2 SIZE_{i,t} + a_3 MTB_{i,t} + a_4 ZSCORE_{i,t} + \varepsilon_{it} \quad (2)$$

$$ACFO_{i,t+1} = a_0 + a_1 \mathrm{AED}_{i,t} + a_2 SIZE_{i,t} + a_3 MTB_{i,t} + a_4 ZSCORE_{i,t} + \varepsilon_{it} \quad (3)$$

$ACFO_{i,t+1}$ = the cash flow from operating activities of enterprise i in period $t+1$ minus the median of the cash flow of enterprises in the same industry in period $t+1$ (2-digit SIC code). $AED_{i,t}$ = avoidance of earnings losses of enterprise i in period t; $AED_{i,t}$= avoidance of earnings decreases of enterprise i in period t. $SIZE_{i,t}$ = the natural logarithm of the assets of enterprise i in period t. $MTB_{i,t}$ = the market value of enterprise i in period t minus the book value of equity. $ZSCORE_{i,t}$ = the Z value of enterprise i in period t.

3.4 Robustness test

We also applied a robustness test to avoid extreme values and future performance (i.e., cash flow) included only the sample data between 5 and 95%.

4 Empirical results

4.1 Descriptive statistics

Table 2 presents the model of Deng and Ong (2018). Market value and the gains or losses from property disposition are non-significant and negatively correlated with each other. Firms with higher market value are less likely to manipulate operations through the gains or losses from asset transactions. Table 3 shows that the mean of manipulable gains or losses from property disposition is positive. Therefore, companies can achieve higher earnings by manipulating the gains or losses from property disposition. Moreover, the mean of MTB value is negative, so market value may be underestimated. The means of EPS before and after manipulation are both positive, and the EPS after manipulation is lower. The *Z*-score reflects the financial status of a company. The mean is 1.16, which is outside the normal range, implying that some firms may be in financial crisis.

Table 2
Property disposition model regressions (samples=314)

Dependent variable	$\frac{GAIN_{it}}{TA_{it-1}}$
Intercept	0.001
$\frac{1}{TA_{it-1}}$	-2.297***
MV_{it}	-8.254E-08
Dubin Waston	1.563
R^2	0.146
F value	27.668***

$GAIN_{it}$ is the gains or losses from fixed asset transactions and investments of enterprise *i* in period *t*. The value is an actual number. TA_{it-1} is the assets of enterprise *i* in the previous period *t - 1*; MV_{it} is the market value of enterprise i in period *t*. ***P<0.01.

4.2 Empirical test

In this study, we verify whether Brazilian listed companies manipulate their business activities (i.e., the gains or losses from property disposition) to meet specific earnings thresholds (i.e., to avoid earnings losses or decreases). We adopt Gunny's (2010) method and use histograms of the frequency distribution of earnings for an analysis. If the sample values are normally distributed and the frequency is concentrated on the right side of the earnings threshold, then the threshold is met.

Figures 1 and 2 reveal that the EPS values before and after the manipulation of gains or losses from property disposition are mostly above 0 (233 samples [74.20%] have an EPS value > 0 before manipulation, and 239 samples [76.11%] have an EPS value > 0 after manipulation). Therefore, most Brazilian listed companies tend not to manipulate their gains or losses from property disposition to avoid earnings losses. Figures 3 and 4 show that the EPS values before and after the manipulation of gains or losses from property disposition are mostly lower than those in the previous period (159 samples [50.63%] have a lower EPS

Table 3
Descriptive statistics (2011-2018, N=314; million US dollars; %)

	Max	Avg	Min
$ACFO_{i,t+1}$	16012.00	310.62	-346.87
$SIZE_{i,t}$	11.78	7.43	2.81
$MTB_{i,t}$	30246.81	-945.98	-42626.24
$ZSCORE_{i,t}$	4.95	1.16	-5.16
ε_{it} of Equation 1	1412.98	0.17	-1584.77
Earnings per share are before the manipulation of property disposition	16.59	0.30	-16.00
Earnings per share are after the manipulation of property disposition	8.58	0.269	-15.56

$ACFO_{i,t+1}$ = the cash flow from operating activities of enterprise *i* in period *t+1* minus the median of the cash flow of enterprises in the same industry in period *t+1* (2-digit SIC code). $SIZE_{i,t}$ = the natural logarithm of the assets of enterprise *i* in period *t*. $MTB_{i,t}$ = the market value of enterprise *i* in period *t* minus the book value of equity. $ZSCORE_{i,t}$ = the *Z* value of enterprise *i* in period *t*.

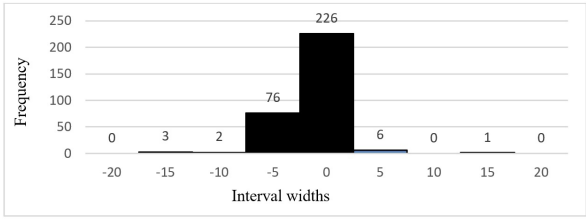


Figure 1. Histogram of earnings thresholds indicating whether earnings per share are above zero before the manipulation of property disposition (samples=314)

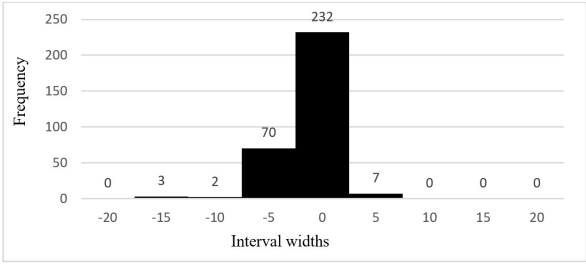


Figure 2. Histogram of earnings thresholds indicating whether earnings per share are above zero after the manipulation of property disposition (samples=314)

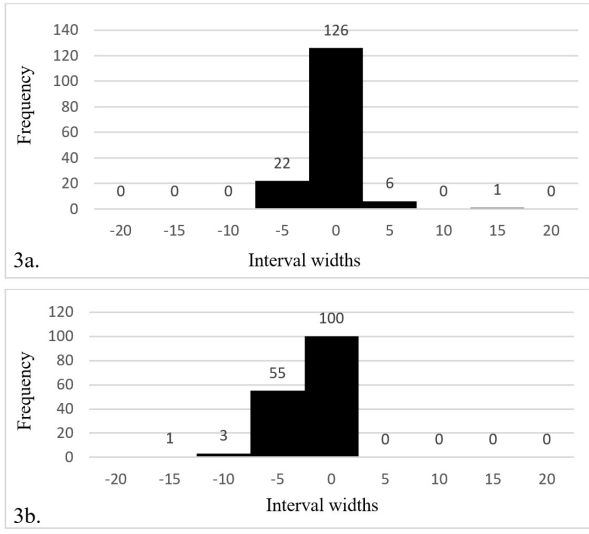


Figure 3. Histogram of earnings thresholds indicating whether earnings decreases are avoided before the manipulation of property disposition (samples=314). 3a. Histogram of earnings thresholds indicating that earnings decreases are avoided before the manipulation of property disposition (samples=155). 3b. Histogram of earnings thresholds indicating that earnings decreases are not avoided before the manipulation of property disposition (samples=159)

value than in the previous period before manipulation, and 161 samples [51.27%] have a lower EPS value than in the previous period after manipulation). Thus, most Brazilian listed companies do not manipulate their gains or losses from property disposition to avoid earnings decreases.

In order to increase outsiders' confidence in and expectations of future performance, enterprise managers send positive signals to reduce information asymmetry, manipulate earnings to meet certain thresholds, and create an image of continuous growth (Bartov et al., 2002; Brown & Caylor, 2005; Graham et al., 2005) or sufficient cash flow (Herrmann et al., 2011). To reduce negative investor feedback, earnings losses or decreases are commonly avoided (Boone et al., 2012; Park & Jeon, 2010; Halaoua et al., 2017; Carvajal et al., 2017). Graham et al. (2005), Gunny (2010), and Al-Shattarat et al. (2022) find that firms manipulate their business activities to avoid earnings losses and decreases. Firms expect performance to increase in the following period because earnings in the previous period predict future performance. Thus, investor confidence increases, which sends a positive signal. Nevertheless, the behavior of Brazilian listed companies to manipulate the gains or losses from property disposition and avoid earnings losses is positively but not significantly correlated with their performance in the following year (Table 4).

Moreover, manipulation to avoid earnings losses and to avoid earnings decreases is positively but not significantly correlated with their performance in the following year. In other words, the behavior of Brazilian listed companies to manipulate their gains or losses from property disposition to avoid earnings losses or decreases is not reflected in their future performance, thus rejecting Hypotheses 1 and 2. Our results are inconsistent with those of Graham et al. (2005), Gunny (2010), Al-Shattarat et al. (2022), Gunny and Zhang (2014), Carvajal et al. (2017), Jiang et al. (2018), and Alhaddad et al. (2022). The possible reasons are as follows: 1. Most companies do not manipulate their gains or losses from property disposition to avoid earnings losses and decreases or manipulate earnings through other approaches to meet their earnings thresholds. 2. The gains or losses from asset transactions account for 1.7% of profit, and those from the asset transactions of individual enterprises account for only 0.07% of average profit. Therefore, the gains or losses from

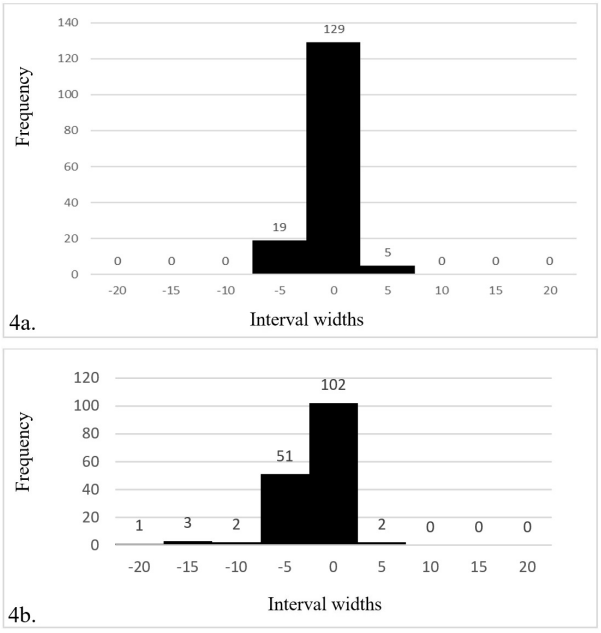


Figure 4. Histogram of earnings thresholds indicating whether earnings decreases are avoided after the manipulation of property disposition (samples=314). 4a. Histogram of earnings thresholds indicating that earnings decreases are avoided after the manipulation of property disposition (samples=153). 4b. Histogram of earnings thresholds indicating that earnings decreases are not avoided after the manipulation of property disposition (samples=161)

Table 4
Testing the motivation to manage earnings (samples=314)

Dependent variable	$ACFO_{i\ t+1}$	
Intercept	-1117.354***	-1091.328***
$AEL_{i,t}$	448.285	
$AED_{i,t}$		279.214
$SIZE_{i,t}$	171.121***	168.762***
$MTB_{i,t}$	-0.094***	-0.094***
$ZSCORE_{i,t}$	45.345	41.601
Dubin Waston	1.186	1.198
R^2	0.417	0.415
F value	57.000***	56.535***

$ACFO_{i,t+1}$ = the cash flow from operating activities of enterprise *i* in period *t+1* minus the median of the cash flow of enterprises in the same industry in period *t+1* (2-digit SIC code). $AEL_{i,t}$ = avoidance of earnings losses of enterprise *i* in period *t*; $AED_{i,t}$ = avoidance of earnings decreases of enterprise *i* in period *t*. $SIZE_{i,t}$ = the natural logarithm of the assets of enterprise *i* in period *t*. $MTB_{i,t}$ = the market value of enterprise *i* in period *t* minus the book value of equity. $ZSCORE_{i,t}$ = the *Z* value of enterprise *i* in period *t*. ***P<0.01.

property disposition of Brazilian listed companies have a small impact on their operations or profits, but are not a basis for external investors or creditors to evaluate company performance. Manipulating the gains or losses from asset transactions to meet earnings thresholds does not effectively reflect the market. 3. Most of the companies in this study are in the manufacturing industry and property disposition is not their primary business activity. Property disposition may serve only as a capital allocation strategy and is less correlated with incentives to manipulate earnings. 4. Investors or creditors may detect enterprise managers' intentions to manipulate the gains or losses from property disposition to avoid earnings losses and decreases. For example, the big-bath technique may be used by enterprise managers to influence price differences by controlling the timing of property disposition and sale of low-value fixed and financial assets to increase the surplus in the financial statements to meet the earnings threshold. Although performance improves in the following period, the technique is regarded as speculative. Therefore, cash flow cannot reflect the actual situation, which makes it difficult to estimate the future development of the company. The overall view is the "signaling earnings management" argument, which claims that firms manipulate their business activities to signal good future performance. The behavior of Brazilian listed companies to manipulate their gains or losses from property disposition to avoid earnings losses or decreases is not significantly reflected in their future performance such as cash flow. Therefore, manipulation to avoid earnings losses or decreases through gains or losses from property disposition may not be a signal, so it does not affect cash flow in the following period, thus rejecting the signaling theory.

Among the control variables, company size is significantly and positively correlated with cash flow from operating activities in the following period. The difference between the market price and the book value of equity is significantly and negatively correlated with the relative cash flow from operating activities in the following period. Therefore, large companies are more operationally stable in the following period and thus have more cash flow from operating activities compared to other companies in the same industry. However, a higher stock market

value may encourage managers to invest more money in stock speculation. Enterprise managers are likely to ignore business activities that reduce the relative cash flow from operating activities of other firms in the following period. Regarding the overall model, the *F* value is significant and the variance inflation factors of the individual variables are all less than 10. Thus, there is not a high degree of collinearity among the variables, and the model is appropriate and consistent with the assumptions of the regression model (i.e., see Appendix A). In addition, we adopt those samples that only include future performance from the 5th percentile to the 95th percentile as measures for the robustness test. The robustness test also does not support our predictions (H1 and H2). In order to shorten the tables, we omit these solutions.

5 Conclusions

Earnings affect the operations of a firm. In this study, we explore the preference of enterprise managers to manipulate gains or losses from property disposition. We collect 314 samples from 49 Brazilian listed companies from the Capital IQ database during 2011-2018. The results reveal that most Brazilian listed companies do not manipulate their gains or losses from property disposition to avoid earnings losses or decreases. Moreover, manipulating earnings to meet the two earnings thresholds does not significantly affect performance in the following period. Therefore, signaling is a speculative act for the market and stakeholders cannot reflect future expectations, thus rejecting the signaling theory.

We make the following recommendations: (1) Manipulating the gains or losses from property disposition has a weak effect on signaling to the market. Enterprise managers should not interfere with business operations and should carefully control the timing of asset transactions to reduce losses from asset sales, avoid further cash outflows, reduce distributable dividends, and control capital flow. (2) Enterprise managers should manipulate other items to send positive signals and raise investors' confidence and expectations. (3) When requiring enterprises to maintain their earnings thresholds in loan contracts, creditors should restrict the enterprises' asset transactions to protect their rights and interests, as the gains or losses from property disposition are small and manipulations can be difficult to detect. (4) When reviewing enterprises' financial statements, accountants should pay attention to their "real earnings." Moreover, accountants should verify whether enterprises control the timing of property disposition and use price differences to transfer assets or engage in tunneling. (5) The board of directors should strengthen its control over the property disposition behavior of enterprise managers, and monitor whether manipulation occurs when writing the salary contract with a specific earnings threshold. Such speculative behavior can affect the actual profit of the enterprise.

This study has some limitations. First, several data entries have missing values, and only Brazilian listed companies are included. Second, we cannot analyze the differences in culture, decision making, and systems between Brazilian listed companies and companies from other countries. Therefore, the results cannot be generalized to other countries. Finally, few studies explore models of the manipulation of the gains or losses from property disposition. In the present study, we select only one model to measure manipulation. Future studies should incorporate additional models for analysis.

REFERENCES

Alhaddad, L. M., Whittington, M., & Gerged, A. M. (2022). Abnormal real activities, meeting earnings targets and firms' future operating performance: Evidence from an emerging economy. *Journal of Accounting in Emerging Economies*, *12*(2), 213-237. http://dx.doi.org/10.1108/JAEE-07-2020-0161.

Aljughaiman, A. A., Nguyen, T. H., Trinh, V. Q., & Du, A. Q. (2023). The Covid-19 outbreak, corporate financial distress and earnings management. *International Review of Financial Analysis*, *88*, 102675. http://dx.doi.org/10.1016/j.irfa.2023.102675. PMid:37144179.

Al-Shattarat, B., Hussainey, K., & Al-Shattarat, W. (2022). The impact of abnormal real earnings management to meet earnings benchmarks on future operating performance. *International Review of Financial Analysis*, *81*, 101264. http://dx.doi.org/10.1016/j.irfa.2018.10.001.

Anagnostopoulou, S. C., Gounopoulos, D., Malikov, K., & Pham, H. (2021). Earnings management by classification shifting and IPO survival. *Journal of Corporate Finance*, *66*, 101796. http://dx.doi.org/10.1016/j.jcorpfin.2020.101796.

Bartov, E., Givoly, D., & Hayn, C. (2002). The rewards to meeting or beating earnings expectations. *Journal of*

Accounting and Economics, *33*(2), 173-204. http://dx.doi.org/10.1016/S0165-4101(02)00045-9.

Beardsley, E. L., Robinson, J. R., & Wong, P. A. (2021). What's my target? Individual analyst forecasts and last chance earnings management. *Journal of Accounting and Economics*, *72*(1), 101423. http://dx.doi.org/10.1016/j.jacceco.2021.101423.

Bergh, D. D., Connelly, B. L., Ketchen Jr., D. J., & Shannon, L. M. (2014). Signalling theory and equilibrium in strategic management research: An assessment and a research agenda. *Journal of Management Studies*, *51*(8), 1334-1360. http://dx.doi.org/10.1111/joms.12097.

Beyer, B. D., Nabar, S. M., & Rapley, E. T. (2018). Real earnings management by benchmark-beating firms: Implications for future profitability. *Accounting Horizons*, *32*(4), 59-84. http://dx.doi.org/10.2308/acch-52167.

Bjornsen, M., Brockbank, B. G., & Prentice, J. D. (2023). The effect of analyst conservatism on meeting the consensus via earnings management. *Accounting Horizons*, *37*(2), 1-17. http://dx.doi.org/10.2308/HORIZONS-2020-107.

Boone, J. P., Khurana, I. K., & Raman, K. K. (2012). Audit market concentration and auditor tolerance for earnings management. *Contemporary Accounting Research*, *29*(4), 1171-1203. http://dx.doi.org/10.1111/j.1911-3846.2011.01144.x.

Brown, L. D., & Caylor, M. K. (2005). A temporal analysis of quarterly earnings thresholds: Propensities and valuation consequences. *The Accounting Review*, *80*(2), 423-440. http://dx.doi.org/10.2308/accr.2005.80.2.423.

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*, *24*(1), 99-126. http://dx.doi.org/10.1016/S0165-4101(97)00017-7.

Byun, S. H., & Roland, K. C. (2022). Quarterly earnings thresholds: Making the case for prior quarter earnings. *Journal of Business Finance & Accounting*, *49*(5-6), 690-716. http://dx.doi.org/10.1111/jbfa.12580.

Canace, T. G., Jackson, S. B., & Ma, T. (2018). R&D investments, capital expenditures, and earnings thresholds. *Review of Accounting Studies*, *23*(1), 265-295. http://dx.doi.org/10.1007/s11142-017-9428-9.

Carvajal, M., Coulton, J. J., & Jackson, A. B. (2017). Earnings benchmark hierarchy. *Accounting and Finance*, *57*(1), 87-111. http://dx.doi.org/10.1111/acfi.12132.

Chen, C. C., & Lee, H. (2019). Rigidity of selling, general, and administrative costs and managerial incentives to meet earnings thresholds: Evidence from conglomerates. *Revue d'Economie Financiere*, *15*, 46-56.

Christensen, T. E., Huffman, A., Lewis-Western, M. F., & Valentine, K. (2023). A simple approach to better distinguish real earnings manipulation from strategy changes. *Contemporary Accounting Research*, *40*(1), 406-450. http://dx.doi.org/10.1111/1911-3846.12830.

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39-67. http://dx.doi.org/10.1177/0149206310388419.

De La Rosa, L. E., & Lambertsen, N. N. (2022). Loss aversion and financial reporting: A possible explanation for the prevalence of discontinuities in reported earnings. *Journal of Accounting and Public Policy*, *41*(6), 106992. http://dx.doi.org/10.1016/j.jaccpubpol.2022.106992.

Deng, X. Y., & Ong, S. E. (2018). Real earnings management, liquidity risk and REITs SEO dynamics. *The Journal of Real Estate Finance and Economics*, *56*(3), 410-442. http://dx.doi.org/10.1007/s11146-017-9649-5.

Doukas, J. A., & Zhang, R. Y. (2020). Corporate managerial ability, earnings smoothing, and acquisitions. *Journal of Corporate Finance*, *65*, 101756. http://dx.doi.org/10.1016/j.jcorpfin.2020.101756.

Ferreira, F. R., Martinez, A. L., Costa, F. M., & Passamani, R. R. (2012). Book-tax differences and earnings management: Evidence in the Brazilian equity market. *Revista de Administração de Empresas*, *52*(5), 488-501. http://dx.doi.org/10.1590/S0034-75902012000500002.

Fogel-Yaari, H., & Ronen, J. (2020). Earnings management strategies for meeting or beating expectations. *Journal of Accounting and Public Policy*, *39*(1), 106714. http://dx.doi.org/10.1016/j.jaccpubpol.2019.106714.

Gandhi, K. (2020). Real earnings management practices for meeting earnings benchmarks: Indian evidence. *Decision*, *47*(3), 265-291.

Gastón, S. C., & Jarne, J. I. (2021). An international comparison of incentives for earnings management in order to meet analysts' forecasts. *Spanish Accounting Review*, *24*(1), 75-89.

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, *40*(1-3), 3-73. http://dx.doi.org/10.1016/j.jacceco.2005.01.002.

Gunny, K. (2010). The relation between earnings management using real activities manipulation and future performance: Evidence from meeting earnings benchmarks. *Contemporary Accounting Research*, *27*(3), 855-888. http://dx.doi.org/10.1111/j.1911-3846.2010.01029.x.

Gunny, K., & Zhang, T. C. (2014). Do managers use meeting analyst forecasts to signal private information? Evidence from patent citations. *Journal of Business Finance & Accounting*, *41*(7-8), 950-973. http://dx.doi.org/10.1111/jbfa.12082.

Guo, W., Sengul, M., & Yu, T. Y. (2020). Rivals' negative earnings surprises language signals, and firms' competitive action. *Academy of Management Journal*, *63*(3), 637-659. http://dx.doi.org/10.5465/amj.2018.0397.

Halaoua, S., Hamdi, B., & Mejri, T. (2017). Earnings management to exceed thresholds in continental and Anglo-Saxon accounting models: The British and French cases. *Research in International Business and Finance*, *39*, 513-529. http://dx.doi.org/10.1016/j.ribaf.2016.09.019.

Hansen, J. C. (2010). The effect of alternative goals on earnings management studies: An earnings benchmark examination. *Journal of Accounting and Public Policy*, *29*(5), 459-480. http://dx.doi.org/10.1016/j.jaccpubpol.2010.06.002.

Herrmann, D., Hope, O. K., Payne, J. L., & Thomas, W. B. (2011). The market's reaction to unexpected earnings thresholds. *Journal of Business Finance & Accounting*, *38*(1-2), 34-57. http://dx.doi.org/10.1111/j.1468-5957.2010.02230.x.

Hinkel, T. P., & Hoffman, B. W. (2020). Meeting earnings benchmarks via real activities manipulation: Debt market effects. *Journal of Accounting, Auditing & Finance*, *35*(2), 349-378. http://dx.doi.org/10.1177/0148558X17742568.

Iatridis, G. E. (2012). Audit quality in common-law and code-law emerging markets: Evidence on earnings conservatism, agency costs and cost of equity. *Emerging Markets Review*, *13*(2), 101-117. http://dx.doi.org/10.1016/j.ememar.2012.01.001.

Jeong, K. H., & Choi, S. U. (2019). Does real activities management influence earnings quality and stock returns in emerging markets? Evidence from Korea. *Emerging Markets Finance & Trade*, *55*(12), 2834-2850. http://dx.doi.org/10.1080/1540496X.2018.1535970.

Jiang, H., Habib, A., & Wang, S. (2018). Real earnings management, institutional environment, and future operating performance: An international study. *The International Journal of Accounting*, *53*(1), 33-53. http://dx.doi.org/10.1016/j.intacc.2018.02.004.

Kałdoński, M., & Jewartowski, T. (2020). Do firms using real earnings management care about taxes? Evidence from a high book-tax conformity country. *Finance Research Letters*, *35*, 101351. http://dx.doi.org/10.1016/j.frl.2019.101351.

Kama, I., & Weiss, D. (2013). Do earnings targets and managerial incentives affect sticky costs? *Journal of Accounting Research*, *51*(1), 201-224. http://dx.doi.org/10.1111/j.1475-679X.2012.00471.x.

Karaman, A. S., Kilic, M., & Uyar, A. (2020). Green logistics performance and sustainability reporting practices of the logistics sector: The moderating effect of corporate governance. *Journal of Cleaner Production*, *258*, 120718. http://dx.doi.org/10.1016/j.jclepro.2020.120718.

Kent, R., & Routledge, J. (2017). Use of benchmarks in predicting earnings management. *Accounting and Finance*, *57*(1), 239-260. http://dx.doi.org/10.1111/acfi.12130.

Lento, C., & Yeung, W. H. (2017). Earnings benchmarks, earnings management and future stock performance of Chinese listed companies reporting under ASBE-IFRS. *Asian Review of Accounting*, *25*(4), 502-525. http://dx.doi.org/10.1108/ARA-10-2016-0112.

Liu, S. Q., Lin, S., Sun, Z. Y., & Yuan, L. H. (2021). Earnings management and firms' investment behavior: The threshold effect of ROE. *Emerging Markets Review*, *47*, 100797. http://dx.doi.org/10.1016/j.ememar.2021.100797.

Liu, Z. (2023). Earnings thresholds in South Africa listed enterprises: Manipulating research and developmental expenditures. *South African Journal of Economic and Management Sciences*, *26*(1), a4600. http://dx.doi.org/10.4102/sajems.v26i1.4600.

Martinez, A. L., & Moraes, A. D. (2017). Relationship between auditors' fees and earnings management. *Revista de Administração de Empresas*, *57*(2), 148-157. http://dx.doi.org/10.1590/s0034-759020170204.

Mauler, L. M. (2019). The effect of analysts' disaggregated forecasts on investors and managers: Evidence using pre-tax forecasts. *The Accounting Review*, *94*(3), 279-302. http://dx.doi.org/10.2308/accr-52268.

Mellado, C., & Saona, P. (2020). Real earnings management and corporate governance: A study of Latin America. *Economic Research-Ekonomska Istraživanja*, *33*(1), 2229-2268. http://dx.doi.org/10.1080/1331677X.2019.1691930.

Ogilby, S. M., Xie, X. I., Xiong, Y., & Zhang, J. (2020). Do sin firms engage in real activities manipulation to meet earnings benchmarks? *International Journal of Accounting & Information Management*, *28*(3), 535-551. http://dx.doi.org/10.1108/IJAIM-09-2019-0110.

Park, J. I., & Jeon, K. A. (2010). Earnings management to avoid negative earnings surprise. *Korean Journal of Accounting Information*, *28*(1), 135-174.

Pelucio-Grecco, M. C., Geron, C. M. S., Grecco, G. B., & Lima, J. P. C. (2014). The effect of IFRS on earnings management in Brazilian non-financial public companies. *Emerging Markets Review*, *21*, 42-66. http://dx.doi.org/10.1016/j.ememar.2014.07.001.

Phan, H. V., Khieu, H. D., & Golec, J. (2017). Does earnings management relieve the negative effects of mandatory pension contributions? *Financial Management*, *46*(1), 89-128. http://dx.doi.org/10.1111/fima.12139.

Qiu, Z. G., & Zhang, X. D. (2023). Consequences of earnings management triggered by delisting regulation: Evidence in China. *Journal of Accounting and Public Policy*, *42*(3), 107046. http://dx.doi.org/10.1016/j.jaccpubpol.2022.107046.

Rahimipour, A. (2017). Investigating the validity of signaling theory in the Tehran stock exchange: Using real earnings management, accrual-based earnings management and firm growth. *International Journal of Economic Perspectives*, *11*(3), 925-936.

Silva, R. L. M., & Nardi, P. C. C. (2017). Full adoption of IFRSs in Brazil: Earnings quality and the cost of equity capital. *Research in International Business and Finance*, *42*, 1057-1073. http://dx.doi.org/10.1016/j.ribaf.2017.07.041.

Souza, P. V. S., Gonçalves, R. S., & Silva, C. A. T. (2022). Impact of IFRS 15 on the quality of accruals and earnings management of Brazilian publicly held companies. *Revista Brasileira de Gestão de Negócios*, *24*(4), 675-691. http://dx.doi.org/10.7819/rbgn.v24i4.4197.

Suksonghong, K., & Amran, A. (2020). Achieving earnings target through real activities manipulation: Lesson from stock exchange of Thailand. *International Journal of Monetary Economics and Finance*, *13*(3), 260-268. http://dx.doi.org/10.1504/IJMEF.2020.108821.

Sun, E. Y. (2021). The differential role of R&D and SG&A for earnings management and stock price manipulation. *Contemporary Accounting Research*, *38*(1), 242-275. http://dx.doi.org/10.1111/1911-3846.12634.

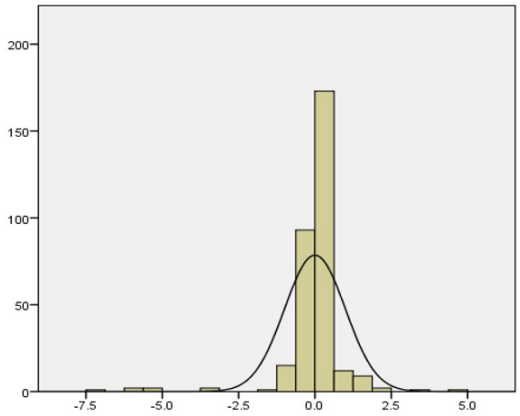
Taj, S. A. (2016). Application of Signaling Theory in management research: Addressing major gaps in theory. *European Management Journal*, *34*(4), 338-348. http://dx.doi.org/10.1016/j.emj.2016.02.001.

Yeung, W. H., & Lento, C. (2018). Stock price crash risk and unexpected earnings thresholds. *Managerial Finance*, *44*(8), 1012-1030. http://dx.doi.org/10.1108/MF-08-2017-0312.

APPENDIX A. Property disposition model regressions (diagnostic test)

(1) Histogram

Dependent variable: $GAIN_{it} / TA_{it-1}$

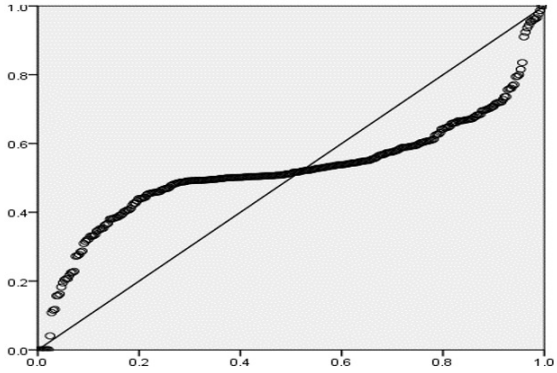


Frequency

Regression Standardized Residual

(2). Normal P-P plot of standardized residual

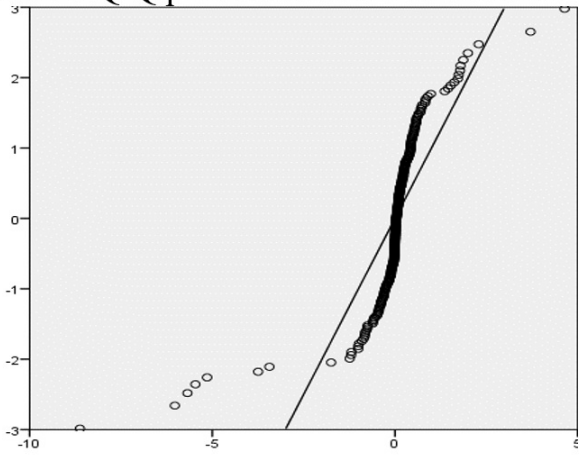
Dependent variable: $GAIN_{it} / TA_{it-1}$



Expected Cum. Prob

Observed Cum. Prob

(3) Normal Q-Q plot of standardized residual



Expected Normal value

Observed value

Supplementary Material

Supplementary material accompanies this paper.

Supplementary Data 1. Database.

Supplementary data to this article can be found online at https://doi.org/10.7910/DVN/2A8RSG

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Conflicts of interest:
The author has no conflict of interest to declare.

Plagiarism analysis:
RBGN performs plagiarism analysis on all its articles at the time of submission and after approval of the manuscript using the iThenticate tool.

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Authors' contributions:
1st author: Definition of research problem; development of hypotheses or research questions (empirical studies); development of theoretical propositions (theoretical work); definition of methodological procedures; data collection; literature review; statistical analysis; analysis and interpretation of data; critical revision of the manuscript; manuscript writing.