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## **The Role of Analysts as Gatekeepers: Enhancing Transparency and Curbing Earnings Management in Brazil**

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## Resumo

Este artigo analisa a relação entre a cobertura de analistas, erros de previsão e gerenciamento de resultados. Confirma o papel de analistas como *Gatekeepers*, ao demonstrar que os analistas estimulam a transparência e inibem o gerenciamento de resultados. Para a cobertura dos analistas utilizou-se a base de dados da I/B/E/S, onde também foram coletadas informações relativas às projeções de consenso dos analistas para companhias abertas brasileiras. Os resultados indicaram existir uma correlação negativa entre o número de analistas e a magnitude dos *accruals* discricionários em termos absolutos, indicando que a cobertura de analista inibe o gerenciamento de resultados. Verificou-se também uma correlação negativa entre a cobertura de analistas e os erros de previsão, identificando que quando uma empresa é acompanhada com um número grande de analistas, a previsão de seu consenso é mais precisa e acurada. Na análise multivariada as regressões estatisticamente satisfatórias evidenciaram resultados significativos no mesmo sentido. Os analistas do mercado, apesar das severas críticas que recebem da imprensa especializada, na realidade têm um efeito positivo sobre a governança corporativa, por monitorar a gestão e inibir o gerenciamento de resultados.

**Palavras-chave:** cobertura de analistas; gerenciamento de resultados; previsão de resultados; governança corporativa.

## Abstract

This paper examines the relationship of analysts' coverage, forecasting errors and earnings management. It corroborates the role of analysts as gatekeepers by finding that analysts enhance transparency and reduce the scope of earnings management. To identify analysts' coverage we used the I/B/E/S, from where we also obtained information on the consensus projections of analysts for listed Brazilian companies. The results indicated a negative correlation between the number of analysts covering firms and the magnitude of their discretionary accruals in absolute terms, indicating that more scrutiny inhibits earnings management. We also found a negative correlation between analysts' coverage and forecasting errors. Multivariate regressions showed statistically significant results in the same sense. Therefore, market analysts, despite the severe criticism they receive from the specialized press, actually have a beneficial effect on corporate governance by monitoring managers and inhibiting earnings management.

**Key words:** analysts' coverage; earnings management; earnings forecasts; corporate governance.

## Introduction

The increasing importance of stock markets, together with considerable participation in financial markets by small investors, has resulted in a remarkable increase in the production and consumption of financial information. Many investors rely on the recommendations of capital market analysts to choose their portfolios because of the analysts' greater market expertise and specific knowledge about the companies they follow. Analysts are arguably the eyes and ears of the market.

Whether working independently or for financial institutions or brokerage houses, market analysts pay close attention to the obligatory and voluntary information disclosed by firms. Based on this information, they make predictions about future results, employing a particular valuation model, define a target price for a stock and recommend buying, selling or holding it. For most investors who rely on analysts, this opinion is the most important function of analysts.

Market analysts act as intermediaries by following public companies and preparing earnings projections and investment recommendations. There are various reasons that justify their work, among which their role as gatekeepers stands out, a role by which they reduce the information asymmetry between investors and management. Recently analysts have come under withering fire from the specialized press. They have been accused of being unable to predict corporate governance scandals and, what is worse, of encouraging or motivating questionable earnings management practices.

Although listed firms are required to disclose information periodically to the market, these financials can be very complex and not all users are sophisticated enough to understand their implications. Based on this context, the focus of this study is to identify the association of analysts' coverage with forecasting errors and earnings management in Brazil. Does the number of analysts covering a firm influence its propensity to engage in earnings management? To what extent do analysts serve to monitor managers, discouraging them from opportunistic behavior in disclosing financial information?

Another question investigated is whether the magnitude of forecasting errors is correlated with the number of analysts covering a company. By hypothesis, we consider that as the number of analysts increases, the information asymmetry will decline, enabling better earnings projections. We focus on analysts' consensus, or street consensus, defined as the average of the earnings projections for a firm in a determined period. Analysis of the consensus projection is based on the idea that a representation of market expectations can be obtained by a measure of the central tendency of the distribution of analysts' projections.

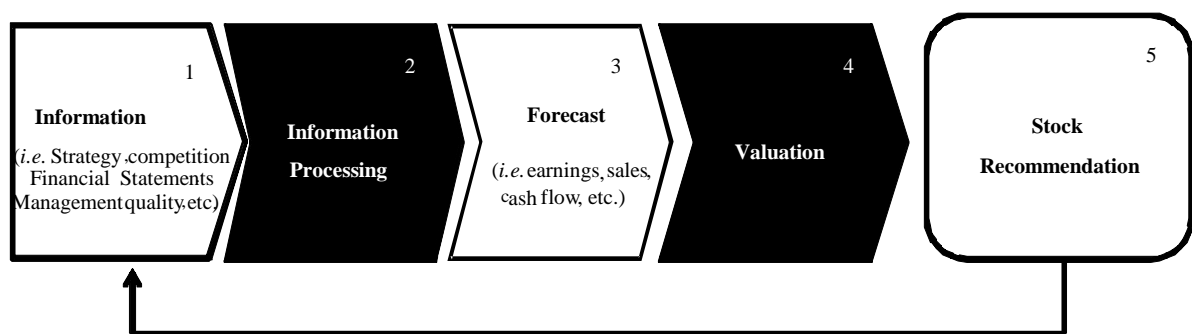
Our objective is to answer these questions in the context of Brazil, to offer additional support to clarify points not yet conclusively resolved in the international literature. Market analysts can play a valuable role in improving corporate governance while at the same time providing their projections on future earnings. These projections make it possible to estimate a key variable in stock valuation models. Identifying good projections of future earnings is a prerequisite for an adequate measurement of the fair price of a stock.

This paper is organized into five sections, including this introduction. In the next section, we present the theoretical framework; and in the third section we discuss the methodologies followed, such as the empirical proxies for analysts' coverage, earnings management and forecasting errors, along with the nature of the studies conducted. The results are analyzed in the fourth section, and our conclusions are presented in the fifth section.

## Literature Review

The study of financial analysts is a hot topic in finance, according to Ramnath, Rock and Shane (2008). Since 1992, at least 250 papers related to financial analysts have appeared in nine major research journals.

Figure 1 provides a simple schematic to capture the focus of these studies. The analyst information process begins with availability of public information such as firm strategies, the competitive landscape, financial data and other nonfinancial factors. Armed with this information, analysts employ their skills to analyze various data and derive quantifier expectations of future earnings. The analysts then use their skills to process these earnings forecasts into firm valuations which, when compared to the current stock price, result in a justifiable stock recommendation that is released to investors.



**Figure 1.** Analyst Information Processing.

Source: Adapted from Martinez, A. (2004). *Analisando os analistas: estudo empírico das projeções de lucros e das recomendações dos analistas do mercado de capitais para as empresas brasileiras de capital aberto* (p. 16). (Doctoral dissertation). Fundação Getúlio Vargas, São Paulo, SP, Brazil.

The investigation of analysts' recommendations performance is a well established line of research in Finance. Many authors have investigated whether analysts' recommendations are of value to investors. As far back as the 1930s, Cowles (1933) documented that analysts' recommendations do not produce abnormal returns. Davies and Canes (1978) investigated buy and sell recommendations published in the Wall Street Journal's *Heard on the Street* column in 1970 and 1971, detecting abnormal price movements on the day of publication and the following day. They also observed a much stronger reaction to recommendations to sell compared with recommendations to buy. Later, with the same research design, Beneish (1991) for the years 1978 and 1979, and Liu, Smith and Syed (1990) for the period 1982-85, supported Davies and Canes finding.

Barber and Loeffler (1993) investigated the effects of stock recommendations published in the monthly **Dartboard** column of the Wall Street Journal on the behavior of security prices and trading volumes from October 1988 to October 1990. The authors found positive abnormal returns of approximately four percent and an average trading volume that was double the normal for the two days following publication, concluding that the positive abnormal return was the result of naïve buying pressure (the **price pressure** hypothesis) as well as the information content of analysts' recommendations (the **information content** hypothesis).

In turn, Womack (1996), using a real-time (first-call) data on recommendations by 14 large brokerages, identified an excess return on the announcement of a buy recommendation that persisted up to one month afterward. However, the author found significantly negative returns for six months following sell recommendations and no significant abnormal returns after a buy recommendation. In contrast, Barber, Lehavy, McNichols, and Trueman (2001) investigated the performance of consensus forecasts from the Zacks database for 1985-1996. They found that a portfolio formed of the most

highly recommended shares had excess returns of 4.2%. Nevertheless, when transaction costs were considered these strategies led to non-significant abnormal returns.

In a recent paper, Mokoaleli-Mokoteli, Taffler and Agarwal (2009) tested whether sell-side analysts are prone to behavioural errors when making stock recommendations, as well as the impact of investment banking relationships on their judgments. The authors found first that new buy recommendations on average had no investment value, whereas new sell recommendations did, and take time to be assimilated by the market. They also showed that new buy recommendations are distinguished from new sells both by the level of analyst optimism and representativeness bias as well as with increased conflicts of interest.

Even though most of the research has been conducted in US Markets, similar investigations have been carried out in most developed countries. Pieper, Schierek and Weber (1993) investigated buy recommendations published in the *Effekten-Spiegel* for 1990 and 1991 in the German Stock Market, concluding that abnormal returns could only be realized by buying the stock prior to the publication of the recommendation. Schmid and Zimmermann (2003) investigated the price and volume behavior of Swiss stocks concerning buy, sell and hold recommendations, as published in the major financial newspaper in Switzerland. They found significant price reaction for the week that the recommendations were published. In a different context, Jegadeesh and Kim (2010) evaluated the value of analysts' recommendations in the G7 countries (i.e., Canada, France, Germany, Great Britain, Italy, Japan and the United States), observing a significant reaction of stock prices to recommendation revisions in all countries except Italy.

There have also been several studies in emerging stock markets, such as David (2007), examining the changes in average returns and standard deviations of stocks that people were recommended to **buy**, by analysts in the Tel-Aviv Stock Exchange, Israel. The findings show a large increase in the returns and a significant decrease in the standard deviations in the time span before the publication of the recommendation. After publication, however, there is a slight addition to the return accompanied by a large increase in the standard deviation. Likewise, Erdogan, Palmon, and Yezegel (2011) conducted a study on the Istanbul Stock Exchange. They claimed that the stocks quoted in the capital market, which are recommended by analysts, did not show superior stock return ability for both the short and long term performance of the analysts' recommendations.

Kumar, Chakrapani, Nikhil, and Bang (2009) studied the impact of buy and sell recommendations issued by analysts on the stock prices of companies listed on the National Stock Exchange (NSE) of India. The study found that buy recommendations issued by analysts on public domains helped investors to generate abnormal returns on the day of the recommendation. On the other hand, sell recommendations did not show significant negative abnormal returns. Lin and Kuo (2007) found that there are significant positive abnormal returns before and on the day of the analysts' recommendations on the Taiwanese Stock Exchange. However, when the transaction costs are accounted for, the returns become insignificant.

To sum up, the literature in general indicates that certain analysts really can outperform the market, and hence their recommendations are of value to investors. The big challenge facing investors, therefore, is to identify the analysts whose recommendations are really valid. The literature has demonstrated a serious **analyst optimistic bias** since in general buy recommendations outnumber sell recommendations. However following analysts' recommendations does not in general provide abnormal risk-adjusted returns, with the possible exception of selling recommendations. This review shows that the literature is divided in its opinions about whether analysts' recommendations have an impact on stock prices or not.

## Analysts' Coverage, Earnings Management and Forecasting Errors

Given the richness of the literature on analysts, we narrowed our discussions to the role of analysts in earnings management.

According to Elgers, Lo and Pfeiffer (2001), more coverage by analysts is generally associated with greater stock pricing efficiency from the publicly available information. In turn, according to Houston, Lev and Trucker (2008), the number of analysts that follow a given firm is negatively associated with asymmetric information between the firm and investors. Therefore, the intensity of analysts' coverage has often been used as a proxy for the quality of the information disclosed by firms (Louis & Robinson, 2005).

On the relationship of analysts with earnings management, the literature has presented conflicting conclusions. Abarbanell and Lehavy (2003) related two types of earnings management to errors in analysts' earnings projections: **taking a bath**, when the projections are not reached, and **income-increasing**, when earnings are adjusted up to analysts' forecasts. In other studies, Bradshaw, Richardson and Sloan (2001) and Ahmed, Nainar and Zhou (2005) demonstrated that analysts generally do not differentiate between discretionary and non-discretionary accruals. However, there is evidence to the contrary, indicating that analysts aggressively downgrade their opinions of firms when they perceive that managers are artificially managing earnings.

S. Brown (2004) examined the association between firms' financial statements and value and found evidence that analysts appear to be aware of the incentives for earnings management. Ke (2001) found a negative relation between the number of analysts following a given firm and the probability of that firm reporting small increases in profits. These results are consistent in indicating that analysts reduce the propensity to manage earnings. Lin and McNichols (1998) offered indirect evidence that an increase in the number of analysts following a firm is associated with reduced profits from insider trading. In turn, Lang, Karl and Miller (2004) investigated the relationship between the capital structure and analysts that follow firms, and found that in general analysts avoid following companies with precarious governance structures.

For Dyck, Morse and Zingales (2008), analysts play an active role in uncovering corporate fraud, greater than that played by regulators and auditors. For example, the involvement of analysts was responsible for the discovery of various cases of corporate fraud in the United States. Finally, Yu (2008) demonstrated that an increase in analysts' coverage reduces the propensity for earnings management.

In Brazil, Paulo, Lima and Lima (2006) tested the effect of analysts' coverage and stated that there are no statistically significant differences between firms that are covered and those that are not. According to these authors, the results can be explained by the fact that managers of Brazilian companies believe financial analysts are incapable of detecting discretionary practices.

Given the active participation of analysts in distributing information, it is reasonable to assume that managers' accounting choices do depend to some extent on the intensity of analysts' coverage. As intermediaries in the flow of private information, analysts inevitably detect some incorrect management practices. This is in line with Jensen and Meckling (1976), who in their classic article argued that analysts reduce the agency costs associated with the separation of ownership from control, so that analysts in reality are socially productive.

The international literature is almost unanimous in concluding that analysts tend to be optimistic. This optimistic bias is inferred from the finding that there is a consistently negative difference between real and projected earnings. In other words, analysts' forecasted earnings are on the whole higher than the results actually obtained. This optimism has been documented in studies using the Value Line, I/B/E/S and Zacks databases. The estimates of the degree of analysts' optimism

vary according to the study, due to the different methodologies employed, definition of the variables and period under study.

Lim (2001), using the average quarterly earnings estimates, found an optimism of 0.94% of the price. The bias was considerably higher, at 2.5%, for small cap firms, but only 0.53% of the price for large cap ones. He also observed a pervasive bias in every market and all years. Richardson, Teoh and Wysocki (1999) used individual analysts' projections and projection errors and found that although the positive bias continued to exist, there was a substantial decline, from 0.91% to 0.09% of the price, when the projection horizon was reduced from one year to one month. In turn, L. Brown (1998) observed that the bias in recent years has appeared to have shifted from optimism to pessimism, or at least to virtually no bias.

For analysts of Brazilian firms, an optimistic bias was also documented by Franco (2002) and Martinez (2004). Both authors, despite using different methods and databases and examining different problems, found the existence of optimism in the earnings projections for Brazilian firms.

According to Kothari (2001), the factors determining the optimistic bias in analysts' earnings predictions fall into two general categories: (a) economic incentives and (b) behavioral cognitive bias. Another coherent explanation was offered by Trueman (1994), who concluded that analysts tend to imitate their peers (herd behavior), seeking to follow the consensus. He demonstrated with elegant mathematical models that analysts tend to make projections similar to previous expectations, even when the information is different.

The number of analysts who follow a particular firm can vary widely. Some companies can have over 20 analysts making projections about their future earnings, while for others the number is very small. In this context, it is reasonable to expect accuracy to improve with a greater number of analysts, based on the assumption that they have a greater volume of information on the firm, and that the portfolio effect (reduced dispersion) improves the quality of the consensus estimation.

Given the richness of the literature on analysts, we narrowed our discussion to the role of analysts in earnings management. Are the analysts gatekeepers, so that they curb earnings management? Or do analysts balance different pressures and collude with management, thereby compromising their objectivity? The view that analysts succumb to pressure from management suggests that, overall, analysts are weak gatekeepers.

## **Methodology**

### **Database**

To relate the performance of analysts with earnings management, we carried out the following procedures. To study analysts' projections, we used the Institutional Brokers' Estimate System - I/B/E/S database, from which we obtained information on the consensus projections for listed Brazilian companies from 1998 to 2004. We then measured their earnings projection error in relation to the actual results. We also identified the number of analysts following each firm in order to define the variable for analysts' coverage.

The I/B/E/S is a service that assembles analysts' estimates of future earnings for thousands of publicly traded companies, detailing how many estimates are available for each company and the high, low and average estimates for each. Since the 1970s, the I/B/E/S has been the most important supplier of earnings forecasts for investment professionals around the world. In this part of the study, we used all the firms for which information was available in the database, with no type of selection.

For our first analysis, we gathered information on analysts' consensus on earnings per share (EPS) for the next year. Among the various metrics available, we found that for EPS forecasts the

greatest number of observations were for the current year. This is a key variable based on indicators of the equity/earnings type. Unlike the American market, where the majority of forecasts are of quarterly results, in Brazil annual predictions are predominant.

We collected the EPS projections for each year on a monthly basis. The I/B/E/S system contains a monthly consensus of analysts based on all forecasts until the month before publication of the results. Therefore, the system records the evolution of analysts' EPS consensus for a determined year until the month before announcement of the results. For the accounting data for capturing earnings management, we used the Economática database.

### Metric for forecasting errors

As a metric to identify analysts' performance, we computed the prediction error (*PRED\_ERR*), defined as the difference between the real earnings (observed) and the projected earnings (estimated). A negative error means a negative surprise or that the actual earnings fell short of the projections. Likewise, a positive surprise means that the actual earnings turned out to be better than projected.

For purposes of comparability, we calculated the prediction errors in terms of actual EPS. Hence, the forecast error for this study is the real minus the predicted EPS divided by the absolute value of the real EPS:

$$PRED\_ERR = \frac{EPS_{actual} - EPS_{pred}}{|EPS_{actual}|} \quad (1)$$

Where:

$EPS_{actual}$  = real earnings per share in the period

$EPS_{pred}$  = consensus (average) earnings per share forecast in the period

$PRED\_ERR$  = prediction errors

We used the absolute value (modulus) in the denominator to precisely capture the direction of the prediction error. The division by the actual EPS makes it possible to compare the errors in percentage terms.

From a methodological standpoint, there are various other measures for scaling forecasting errors. In addition to actual results (observed profit or loss), there are many studies in the international literature using errors based on percentages of price per share. However, we believe that considering price would bring distortions into our analysis because the forecasting errors would be measured in terms of a factor over which analysts have no control since the share price is determined exogenously by the market.

Likewise, we did not use total assets (or net equity) as a factor to deflate the prediction errors. First, we believe total assets could be correlated with forecasting errors in an undesirable manner. Had we worked with figures deflated by assets, we would have in essence been measuring an indicator of return on assets. Certain business segments have a higher ROA than others. This fact could impair the comparison of the forecasting errors that were calculated.

We recognize, however, that measuring the forecasting error in terms of the actual earnings per share is not problem-free. For example, for firms with earnings near zero, the errors were exaggeratedly large, and of course we had to exclude observations for which the earnings were nil because of the impossibility of dividing by zero.



### Metric for earnings management

Most research shows that discretionary accruals are the main mechanism employed by accountants and managers to manage earnings. Examples are Jones (1991); Dechow, Sloan and Sweeney (1995); Kang and Sivaramakrishnan (1995) and Martinez (2001). Irrespective of the methodological focus (discretionary accruals or descriptive-inferential statistics), all these authors have investigated the manipulation of accounting numbers through accounting choices.

For the empirical estimate of earnings management we used the model developed by Kang and Sivaramakrishnan (1995) to estimate discretionary accruals (Paulo, Lima, & Lima, 2006). The proxies for earnings management used in this study were thus discretionary accruals ( $AB\_ACC_{it}$ ) calculated by the KS model, where total accruals are calculated as follows:

$$TA_t = \frac{\Delta CA_t - \Delta CCE_t - \Delta CL_t - \Delta Debt_t - Depr_t}{A_{t-1}} \quad (2)$$

Where:

$TA_t$  = total accruals (operational) of the firm in period  $t$ ;

$\Delta CA_t$  = variation of current assets of the firm from the end of period  $t-1$  to the end of period  $t$ ;

$\Delta CL_t$  = variation of current liabilities of the firm from the end of period  $t-1$  to the end of period  $t$ ;

$\Delta CCE_t$  = variation of cash and cash equivalents of the firm from the end of period  $t-1$  to the end of period  $t$ ;

$\Delta Debt_t$  = variation of short-term loans and financings of the firm from the end of period  $t-1$  to the end of period  $t$ ;

$Depr_t$  = amount of depreciation recorded by the firm during period  $t$ ;

$A_{t-1}$  = Total assets at the end of period  $t-1$ .

The discretionary accruals of a firm in period  $t$  were calculated as follows:

$$AB\_ACC_t = TA_t - NDA_t \quad (3)$$

Where:

$AB\_ACC_t$  = discretionary accruals of the company in period  $t$ ;

$TA_t$  = total accruals of the firm in period  $t$ ;

$NDA_t$  = non-discretionary accruals of the firm in period  $t$ ;

Kang and Sivaramakrishnan (1995) proposed a model (KS model) to measure accruals and earnings management in the following form:

$$TA_{it} = \varphi_0 + \varphi_1 \delta_1 R_{it} + \varphi_2 \delta_2 OE_{it} + \varphi_3 \delta_3 PPE_{it} + \varepsilon_{it} \quad (4)$$

Where:

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

$R_{it}$  = net revenues of firm  $i$  in period  $t$ , weighted by total assets at the end of period  $t-1$ ;

$OE_{it}$  = amount of operating expenses of firm  $i$  in period  $t$ , excluding expenses for depreciation and amortization, weighted by total assets at the end of period  $t-1$ ;

$PPE_{it}$  = balance of gross property, plant and equipment of firm  $i$  at the end of period  $t$ ,

$\delta_1 = AR_{i,t-1} / R_{i,t-1}$ ;

$\delta_2 = (Inv_{i,t-1} + PrepExp_{i,t-1} + CP_{i,t-1}) / D_{i,t-1}$ ;

$\delta_3 = Depr_{i,t-1} / PPE_{i,t-1}$ ;

$AR_{i,t}$  = balance of accounts receivable from customers of firm  $i$  in period  $t-1$ ;

$R_{i,t-1}$  = net operating revenues of firm  $i$  in period  $t-1$ ;

$Inv_{i,t-1}$  = balance of inventories of firm  $i$  in period  $t-1$ ;

$PrepExp_{i,t-1}$  = balance of prepaid expenses of firm  $i$  in period  $t-1$ ;

$AP_{i,t-1}$  = balance of short-term accounts payable of firm  $i$  in period  $t-1$ ;

$Depr_{i,t-1}$  = amount of expenses for depreciation and amortization of firm  $i$  in period  $t-1$ ;

$PPE_{i,t-1}$  = balance of gross property, plant and equipment of firm  $i$  at the end of period  $t-1$ ;

$\varepsilon_{it}$  = regression error.

As above, all the variables here are weighted by the total assets at the end of period (year)  $t-1$ .

The estimated value of discretionary accruals can be calculated directly by the regression error. The KS model uses the instrumental variables method to estimate the regression parameters.

The discretionary accruals (AB\_ACC) are computed as the residual of equation 4, as follows – equation (5):

$$AB\_ACC_{it} = TA_{it} - \varphi_0 + \varphi_1 \delta_1 R_{it} + \varphi_2 \delta_2 OE_{it} + \varphi_3 \delta_3 PPE_{it} \quad (5)$$

Conceptually, a positive value of AB\_ACC means the firm is managing its earnings to increase them, while a negative value means it is doing so to reduce them.

For analysis of the results, we preferred to work with the proxies in terms of absolute value. Therefore, for the majority of the analyses we used the modulus of the forecast error (ABS\_ERR) and of the discretionary accruals (ABS\_ACC). The closer these are to zero, the smaller are the forecasting error and earnings management, while the larger they are, the greater the forecasting error and earnings management, independent of whether there was, respectively, a negative or positive surprise and upward or downward earnings management.

## Analysis of the Results

Before presenting the results, we should explain some descriptive statistics of the main empirical proxies. Table 1, Panel A, shows there were 5,554 observations. Each observation is a consensus prediction by analysts for a particular firm in a determined month.

The average number of analysts covering the firms in our sample was 9.12, with the range being from 2 to 34. Because this coverage can vary significantly among the firms, we divided the firms into classes according to the number of analysts following them.

To define the number of analysts monitoring a determined firm, we checked how many analysts participated in reaching the consensus projection. The average forecasting error (PRED\_ERR) of the

observations confirms the hypothesis widely stated in the international literature of optimistic bias. The average of the forecasting errors is -0.41. The negative result indicates a negative surprise, i.e., that the earnings projected by analysts were greater than the real result.

To measure earnings management, we used the metric *AB\_ACC*, which represents discretionary accruals (or abnormal accruals). This metric ranges from negative for companies that manage earnings less to positive for those that manage them more.

Panel B of Table 1 shows some statistics, separated into classes representing the number of analysts covering the firms in the sample. Class 1 represents firms followed by two or three analysts, while firms in Class 2 are covered by four to six analysts, those in Class 3 by seven to eleven and those in Class 4 by more than eleven analysts.

There are significant differences in terms of the average of absolute discretionary accruals and absolute forecasting errors among the classes. For example, for the firms in Class 4 there is a smaller propensity for earnings management and the consensus forecasts are more accurate in comparison with those in Class 1.

Table 1

### Descriptive Statistics

<b>Panel A: Variables</b>					
	N	Minimum	Maximum	Mean	Stand. Dev.
<b>NUM_ANAL</b>	5,554	2.00	34.00	9.12	6.29
<b>PRED_ERR</b>	5,554	-366.50	66.00	-0.41	12.94
<b>AB_ACC</b>	5,554	-0.41	0.46	0.01	0.10
<b>ABS_ERR</b>	5,554	0.00	366.50	1.86	12.81
<b>ABS_ACC</b>	5,554	0.00	0.46	0.07	0.08

<b>Panel B: Variables by Analysts Classes</b>					
	CLASSES				Total
	1	2	3	4	
NUM Observations	1,383	1,178	1,085	1,908	5,554
NUM_ANAL Mean	2.39	4.98	8.84	16.70	9.12
ABS_ACC Mean	0.07	0.07	0.07	0.06	0.07
ABS-ERR Mean	2.43	2.61	1.84	0.98	1.86

To further our research, we computed the Spearman correlation coefficient between the variables. The results are shown in Table 2. This test indicates there is a negative and significant correlation between the number of analysts and the magnitude of discretionary accruals in absolute terms (-0.119), which is in the direction expected. In other words, this confirms the hypothesis that as the number of analysts following a firm increases, the propensity for earnings management decreases.

Furthermore, there is also a negative and significant correlation between the number of analysts following a firm and the earnings forecast errors (-0.142), indicating that when more analysts follow a company, their consensus earnings predictions are more accurate.

Table 2

**Correlation Analysis**

			NUM_ANAL	PRED_ERR	AB_ACC	ABS_ERR	ABS_ACC
Spearman's rho	NUM_ANAL	Coeff. Correlation	1.0	-,096**	,044**	-,142**	-,119**
		Sig. (2-tailed)	.	.000	.001	.000	.000
	PRED_ERR	Coeff. Correlation	-,096**	1.000	-,134**	,239**	,065**
		Sig. (2-tailed)	.000	.	.000	.000	.000
	AB_ACC	Coeff. Correlation	,44**	-,134**	1.000	-,125**	,193**
		Sig. (2-tailed)	.001	.000	.	.000	.000
	ABS_ERR	Coeff. Correlation	-,142**	,239**	-,125**	1.000	,041**
		Sig. (2-tailed)	.000	.000	.000	.	.002
	ABS_ACC	Coeff. Correlation	-,119**	,065**	,193**	,041**	1.000
		Sig. (2-tailed)	.000	.000	.000	.002	.

**Note.** \*\* Correlation is significant at 0.01 level (2-tailed).

An interesting result of this analysis is the positive correlation between ABS\_ERR and ABS\_ACC, indicating that the forecasting errors accompany earnings management. In other words, earnings management might be one of the factors explaining analysts' forecasting errors. To investigate this situation further, we formulated Table 3, showing the cross-tabulation of the companies practicing earnings management, divided into income increasing and income decreasing ones, with the possible forecasting errors, respectively positive and negative surprises.

The cross-referenced results fall into four quadrants: I) ABS\_ACC<0 and PRED\_ERR<0; II) ABS\_ACC<0 and PRED\_ERR>0; III) ABS\_ACC>0 and PRED\_ERR<0 and IV) ABS\_ACC>0 and PRED\_ERR>0.

Table 3 shows several intriguing results. First, the quadrant containing the highest average ABS\_ACC (0.084) is IV, indicating that the companies in this group might be managing their earnings upward (income increasing) to meet or exceed analysts' expectations, to ensure a positive surprise. This is compatible with the argument that companies in some contexts can manage earnings to meet analysts' projections or surprise the market because of the positive effect this can have on the stock price.

In quadrant I, that with the fewest observations, the average of the prediction errors (ABS\_ERR) is the highest among all the quadrants (3.17). The firms in this quadrant practice income decreasing earnings management and negatively surprise the market. A possible explanation for this situation is that firms that realize they will not meet analysts' projections anyway may opt for "take a bath" accounting, to set a lower threshold for future comparisons.

Table 3

**Cross-Tabulated Matrix of Earnings Management and Forecasting Error by Classes**

		Analysts Forecast Errors									
		Negative Surprise PRED_ERR<0				Positive Surprise PRED_ERR>0				Total	
Earnings Management	CLASSES	N	ABS_ACC Mean	ABS_ERR Mean	N	ABS_ACC Mean	ABS_ERR Mean	N	ABS_ACC Mean	ABS_ERR Mean	
		<b>1</b>	235	0.035	4.41	519	0.072	1.71	754	0.060	2.56
<b>Income Decreasing AB_ACC&lt;0</b>	<b>2</b>	193	0.057	6.65	340	0.060	1.39	533	0.059	3.29	
	<b>3</b>	163	0.055	1.31	318	0.050	1.89	481	0.052	1.69	
	<b>4</b>	302	0.044	0.99	583	0.059	0.76	885	0.054	0.84	
<b>Partial Total</b>		893	0.046	3.17	1760	0.061	1.37	2653	0.056	1.97	
	<b>1</b>	263	0.072	4.32	366	0.099	0.82	629	0.088	2.28	
<b>Income Increasing AB_ACC&gt;0</b>	<b>2</b>	219	0.081	4.53	426	0.073	0.78	645	0.076	2.05	
	<b>3</b>	251	0.075	2.55	353	0.096	1.55	604	0.087	1.96	
	<b>4</b>	488	0.070	1.41	535	0.076	0.84	1023	0.073	1.11	
<b>Partial Total</b>		1221	0.074	2.83	1680	0.084	0.97	2901	0.080	1.75	
<b>Total</b>		2114	0.062	2.97	3440	0.073	1.17	5554	0.069	1.86	

To obtain more robust results, we carried out multivariate analysis by performing the following regressions, always with the number of analysts (analysts' coverage) as an independent variable, to explain, respectively, the forecasting errors in absolute terms and the absolute discretionary accruals. The linear regression models were:

$$ABS\_ERR = \alpha_0 + \alpha_1 NUM\_ANAL + \alpha_2 DAYS + \varepsilon_0 \quad (5)$$

Where:

ABS\_ERR : forecasting errors in absolute terms

NUM\_ANAL : number of analysts

DAYS : days before publication of the financials

$$ABS\_ACC = \beta_0 + \beta_1 NUM\_ANAL + \beta_2 SUSPECT + \varepsilon_0 \quad (6)$$

Where:

ABS\_ACC : discretionary accruals in absolute terms

NUM\_ANAL : number of analysts

SUSPECT : companies with positive and vary small forecasting errors (dummy)

When analyzing the forecasting error, besides the number of analysts we also used a variable to indicate the timing of the prediction. Our hypothesis was that the longer the forecast was made (in days) before the publication of the results, the greater the forecasting errors would tend to be. Evidence of this hypothesis would be a negative coefficient for NUM\_ANAL and a positive one for DAYS.

For the model of discretionary accruals, besides the number of analysts, we used a dummy to separate the companies suspected of engaging in earnings management from those not suspected of this practice. We classified as suspect companies those with positive and very small forecasting errors. The premise is that companies manage earnings to meet analysts' expectations, a hypothesis verified in the literature (Degeorge, Patel, & Zeckhauser, 1999).

The results are shown in Table 4. The regressions proved statistically adequate. It can be seen that the forecasting errors tend to decline as the number of analysts increases. The variable NUM\_ANAL was negative and significant (t-statistic of -3.896), indicating that the more analysts that follow a firm, the smaller the forecasting error is in absolute terms, meaning the more accurate the prediction.

For earnings management, the regression results were also statistically significant, showing that the propensity of firms to manage earnings declines with greater coverage by analysts, as shown by the negative and significant coefficient of the number of analysts (t-statistic of -3.846).

Table 4

### Regression Analysis

<b>Panel A: Dependent Variable – Absolute Forecasting Errors</b>						
$ABS\_ERR = \alpha_0 + \alpha_1 NUM\_ANAL + \alpha_2 DAYS + \varepsilon_0$						
Model		Coefficients		Standart	Sig.	
		B	Std. Error	Coefficients		
1	(Constant)	1,835	,415		4,419	0,00
	NUM_ANAL	-,106	,027	-,052	-3,896	0,00
	DAYS	,005	,001	,048	3,618	0,00
a. Dependant Variable: ABS_ERR		R	R Square	Adjusted R Square	F	Sig.
Model Statistics		,391	,153	,149	14,745	,000

<b>Panel B: Dependant Variable – Absolute Discretionary Accruals</b>						
$ABS\_ACC = \beta_0 + \beta_1 NUM\_ANAL + \beta_2 SUSPECT + \varepsilon_0$						
Model		Coefficients		Standart	Sig.	
		B	Std. Error	Coefficients		
2	(Constant)	,074	,002		39,301	,000
	NUM_ANAL	,001	,000	-,052	-3,846	,000
	SUSPECT	,008	,004	,028	2,093	,036
a. Dependant Variable: ABS_ACC		R	R Square	Adjusted R Square	F	Sig.
Model Statistics		,363	,132	,128	8,917	,000

The adjusted  $R^2$  was satisfactory in all cases, but to provide further evidence of the robustness of the statistics of the estimated models, we also carried out additional tests (not shown in the tables): (a) the Jarque-Bera normality test (JB), which indicated that the residuals were normally distributed; (b) the variance inflation factor test (VIF), which showed there was no problem of multicollinearity;

and (c) the Breusch-Godfrey test (BG), showing no autocorrelation of the residuals. Finally, we performed one more robustness test by segregating the observations between the two extreme classes of firms: Class 1, covering firms followed by two or three analysts, and Class 4, including firms covered by more than eleven analysts. In addition, we ran regressions including size and return on asset as control variables, but the results did not improve, so they are not reported in the tables.

The forecasting error is significantly higher for firms in Class 1 than in Class 4. This indicates that analysts' coverage is an important factor when it comes to explaining differences in the likelihood of committing forecasting errors. Likewise, firms in Class 1 tend to manage earnings more than those in Class 4, indicating that greater analyst coverage discourages earnings management. We submitted the differences between classes with respect to prediction errors and discretionary accruals to parametric and nonparametric tests. In all the tests, the differences between these two classes indicated that as the average number of analysts rises, the prediction errors and earnings management decline.

Table 5

### Parametric and Nonparametric Tests of the Differences between Class 1 and Class 4

<b>Panel A: Statistics for Class 1 (2 or 3 analysts) and Class 4 (more than 11 analysts)</b>										
	CLASSE	N	Mean	Stand. Dev	Stand. Error					
NUM_ANAL	1.00	1,383	2.39	.49	.01					
	4.00	1,908	16.70	3.54	.08					
ABS_ERR	1.00	1,383	2.43	17.04	.46					
	4.00	1,908	.98	2.26	.05					
ABS_ACC	1.00	1,383	.07	.07	.00					
	4.00	1,908	.06	.08	.00					

<b>Panel B: Parametric Tests of Differences of Means</b>										
		Levene's Test			t-test for equals means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Differ.	Stand. Dev. Differ.	95% Confidence Interval	
									Low	High
NUM_ANAL	Equal $\sigma^2$	1703.32	.00	-149.26	3289.00	.00	-14.31	.10	-14.50	-14.12
	Non Equal $\sigma^2$			-174.25	2006.71	.00	-14.31	.08	-14.47	-14.15
ABS_ERR	Equal $\sigma^2$	31.63	.00	3.67	3289.00	.00	1.45	.39	.67	2.22
	Non Equal $\sigma^2$			3.14	1417.30	.00	1.45	.46	.54	2.35
ABS_ACC	Equal $\sigma^2$	7.68	.01	2.98	3289.00	.00	.01	.00	.00	.01
	Non Equal $\sigma^2$			3.06	3207.95	.00	.01	.00	.00	.01

<b>Panel C: Non Parametric Tests of the Differences of Means by Classes</b>			
	NUM_ANAL	ABS_ERR	ABS_ACC
Chi-Square	5179.41	128.15	75.45
df	3.00	3.00	3.00
Asymp. Sig.	.00	.00	.00

## Conclusions

In this paper, we investigated the role of analysts' coverage as a mechanism to reduce earnings management and improve consensus earnings forecasts. The results indicated that in the Brazilian context, companies covered by more analysts are less likely to manage earnings, and that as the number of analysts increases, the consensus forecasts become more accurate.

The results can be summarized by the hypotheses investigated, as follows in Table 6:

Table 6

### Results of the Study

<b>The Role of Analysts as Gatekeepers</b>	The greater the number of analysts that follow a firm, the lower the likelihood of earnings management.
	A negative correlation was found between analysts' coverage and forecasting errors.
	The study corroborates the role of analysts as gatekeepers by finding that analysts enhance transparency and reduce the scope of discretionary accruals.

These findings were confirmed by various statistical procedures, both univariate and multivariate tests, as well as by segmenting the observations into different classes of firms according to the number of analysts that follow them and then performing parametric and nonparametric tests. All of these tests indicated the results are robust.

Intuitively, coverage by more analysts should enhance the information environment by reducing information asymmetry between management and investors. In particular, our results focus on one of the sources of reduced asymmetry: the greater the number of analysts following a firm, the less earnings management there will be.

In other words, analysts not only facilitate distribution of information, they also affect the corporate production of information. One of the negative consequences of earnings management is increased information asymmetry because this behavior masks the company's real financial situation. Users of accounting information (investors, regulators, shareholders and analysts) can make decisions based on financial statements that do not depict the real situation.

The problem of earnings management is that it changes the risk perception of investors. If a firm manages its earnings upward, investors will be led to believe the firm is doing better than it really is. Firms can also manage earnings downward to soften the volatility of returns and perhaps "save for a rainy day" so to speak, making an upwards adjustment easier in the future.

The upshot is that the earnings and other financial figures reported, while certainly having informational value, cannot be interpreted without a grain of salt. A case-by-case analysis is necessary to determine whether a firm is managing its earnings, how and in what direction.

One of the difficulties of this type of research is the lack of available data to estimate discretionary accruals. Another critical factor that influences analysis of earnings management is the heterogeneity of the sample, for instance if it is composed of commercial firms and financial institutions, which can cast doubt on the results.

Another problem that might undermine the conclusions reached here is possible errors in the data contained in the I/B/E/S system, from where we obtained the earnings forecast. If this database contains systematic errors, the results presented here could be compromised. However, the I/B/E/S



enjoys a good international reputation and data from its system are widely used in academic studies, so we believe this possibility is low.

This study contributes to the debate on the role of analysts in the capital market. Analysts are often criticized for producing imprecise forecasts and making bad investment recommendations. But our results indicate they play a positive role in corporate governance. Not only do their forecasts become more accurate as their coverage increases, the propensity of firms to manage earnings also falls, indicating that analysts play an important gatekeeper role.

While we believe the results demonstrate a statistically significant association between analysts coverage on the one hand and earnings management and earnings prediction accuracy on the other, we cannot rule out the possible endogeneity between analysts' coverage and earnings management or shortcomings of the metrics used as proxies for the number of analysts, forecasting errors and earnings management.

Still, the findings presented in this paper are important when it comes to clarifying points still not conclusively resolved in the international and Brazilian literature. Analysts play a useful role in monitoring firms and provided earnings forecasts. These predictions provide a key variable in models to evaluate fair stock prices, allowing investors to make more informed decisions.

In the final analysis, the conclusions of this paper are important for shedding light on the role of analysts in corporate governance by monitoring managers and inhibiting earnings management.

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