

Determinants of voluntary executive stock option disclosure in Brazil

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Abstract This study investigates whether the governance attributes of Brazilian companies are associated with voluntary executive stock option (ESO) disclosure. Results show that Brazilian companies voluntarily disclose very little about their ESO plans, and that board size, presence of a compensation committee, and auditing by a Big 4 firm are significantly related to the degree of voluntary ESO disclosure. We also show that family-controlled companies in Brazil are associated with low voluntary ESO disclosure. Results are robust to a number of specification tests, dependent and explanatory variable measurements, and sample composition. This study has professional and regulatory implications for Brazil and other emerging capital markets. The results underscore the need for stricter rules for executive compensation reporting in Brazil, and they invite policy makers and regulators in emerging markets to consider the effects of company-level governance factors on disclosure incentives.

Keywords Executive compensation · Stock options · Voluntary disclosure · Emerging markets · Brazil

JEL Classification G34 · M41 · F39

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1 Introduction

One of the most widely accepted principles of corporate governance is that executive compensation should be tied to company performance. This principle has influenced practice, as evidenced by the tremendous growth in the use of executive stock option (henceforth ESO) plans as incentive compensation in the last two decades (Bebchuck and Fried 2005; Brenner and Schwalbach 2009) as well as increasing pressure from investors worldwide to improve executive and director compensation disclosure practices (Canyon and Sadler 2001; Towers Watson Report 2009; Nelson et al. 2010).

Greater transparency in executive compensation practices better enables shareholders to monitor the relationship between compensation and company performance and to verify whether senior management is in fact accountable to the board of directors (Canyon and Murphy 2000; Craighead et al. 2004; Laksmana 2008). Public disclosure can be particularly informative on complex compensation arrangements such as stock options, where the potential for wealth transfer to senior management is great (Canyon and Sadler 2001; Nelson et al. 2010). Moreover, when compensation appears excessive (Core et al. 1999) or when it shrinks a company's competitive advantage (Laksmana 2008), senior management are more inclined to provide opaque disclosures or to withhold sensitive information about their compensation arrangements. Hence, from a governance perspective, ESO disclosure is a topic of both academic and professional relevance.

Consistent with the above motivations, this study investigates whether voluntary disclosure of ESO plans is associated with the company's governance structure in a comprehensive sample of Brazilian companies listed on the São Paulo Stock Exchange (Bovespa). We take the perspective that ESO plans are an efficient incentive mechanism to align management and shareholder interests, and consequently to stimulate value creation (Byrd et al. 1998). However, depending on how they are designed and awarded, ESO plans can become vehicles to divert wealth from shareholders toward management in the absence of corresponding company performance (Andjelkovic et al. 2002). An alternative way to effectively mitigate this agency problem would be to provide full public disclosure on compensation arrangements (Bebchuck and Fried 2005). The degree of disclosure is ultimately determined by the members of the board of directors. This in turn gives them greater responsibility to justify their compensation policies and perform their monitoring duties (Laksmana 2008; Canyon and Sadler 2010; Canyon et al. 2011).

As an emerging market that abounds in information asymmetry, ownership concentration, ineffective market surveillance, and poor investor protection (Lameira and Ness 2007; Black et al. 2009), Brazil offers a unique setting to investigate this issue. Historically, the private benefits of control in Brazilian companies have been high and the minimum legal rules and company-level governance weak (Dyck and Zingales 2004). In addition, because developing countries present greater variation in their use of corporate governance mechanisms than most mature markets (Judge 2009), there is more room for company-level governance to explain variations in the voluntary disclosure of compensation practices. This research setting also offers the conditions for a natural experiment on

the determinants of voluntary ESO disclosure. In 2009, Brazil's Security and Exchange Commission (*Comissao de Valores Mobiliarios*, hereinafter CVM) attempted to impose stricter mandatory executive compensation disclosure standards (CVM 2009), but the released regulation was openly opposed by the association of Brazilian publicly traded companies (ABRASCA¹) and was legally contested by the Brazilian institute of financial executives (IBEF²). Despite the regulatory guidelines and tremendous pressure from investors, this court litigation meant that, up to December 2010, Brazilian companies were able to decide what type of ESO information they wanted to disclose.

In fact, our results indicate that Brazilian listed companies that use ESO plans as a long-term incentive compensation mechanism disclose relatively little about these plans. We also show that board size, presence of a compensation committee, and using a Big 4 auditing firm are positive and statistically significant in explaining the variation in the degree of voluntary ESO disclosure. We also demonstrate that the presence of family-controlled firms in Brazil is associated with low voluntary ESO disclosure. Other findings cast doubt on the effectiveness of some governance corporate governance mechanisms to promote voluntary disclosure in Brazil. Note that these results were submitted to a variety of specification tests, on both dependent and independent variables, to ensure robust findings as far as possible.

This study contributes to the extant literature in a number of ways. First, in order to examine voluntary disclosure, it is preferable to obtain data from a regime that allows discretionary disclosure. Second, we document the use extent of ESO plans by Brazilian companies. Third, we develop and validate an index to measure the degree of voluntary ESO disclosure by Brazilian companies based on the recommended practices released in 2007 by the Brazilian Stock Exchange Commission (CVM) and the Institute of Corporate Governance (IBGC). Fourth, we document the voluntary ESO disclosure practices of Brazilian companies and identify their governance-related determinants. Finally, to our knowledge, this is the first study of its kind to examine the Brazilian capital market, and one of only a few empirical studies on voluntary compensation disclosure in an emerging market. As such, our study has academic, professional, and regulatory implications for Brazil and other emerging capital markets. Taken together, our findings invite policy makers and regulators in emerging markets to consider the effects of company-level governance factors on disclosure incentives.

The remainder of the document is structured as follows. We first provide some background on ESO disclosure practices in Brazil. This is followed by the theoretical framework and the development of our research hypotheses. We then describe the data sources, data collection procedures, disclosure index construction, independent variables, and the model used in our empirical investigation. The results and main implications are discussed, and a summary and conclusions are presented.

¹ *Associação Brasileira das Empresas de Capital Aberto* (ABRASCA).

² *Instituto Brasileiro dos Executivos Financeiros* (IBEF).

2 ESO disclosure in Brazil

In Brazil, attempts to impose stricter rules for the public disclosure of executive compensation are recent and have been openly opposed by companies.³ Currently, the mandatory rules require Brazilian listed companies to disclose only the aggregate amount paid to board members and top management, with no details about fixed, short-term, or long-term performance-contingent compensation. Moreover, the data on total compensation are unstructured, and what little information is disclosed is dispersed throughout the various voluntary and mandatory reports (Nunes 2008; Victor et al. 2010). A recent Towers Watson study on executive pay (Towers Watson Report 2009) in 12 countries reveals that although the absolute number of Brazilian firms using ESO is low, Brazil is ranked as second—just after the U.S.—in terms of the relative importance of long-term incentive compensation paid to executives. This is confirmed by Sigollo (2010), who reports that a stock option plan is the favored method among Brazilian publicly traded companies that provide long-term incentive compensation to top management. Furthermore, Sigollo (2010) reveals that stock options account for an average of 80% of the total incentive compensation paid. However, the Towers Watson study also indicates that U.S. executive pay disclosure is by far the most detailed in the world, whereas Brazilian public companies still have full discretion over what information to disclose.

In 2007, the Brazilian Securities Exchange Commission (henceforth CVM) released a memorandum (Ofício-Circular CVM/SNC/SEP No. 01/2007, hereinafter the Memorandum) recommending that executive compensation be disclosed individually, or at least separately, for the board of directors and top executives. During CVM's public consultation on the disclosure regulation reform, market participants recognized the importance of providing a detailed description of compensation policies and metrics, but recommended that individual reporting of executive compensation was unnecessary (Torres 2009). On December 7, 2009 CVM issued Regulation 480 (CVM 2009), making several aspects of executive compensation disclosure mandatory. This Regulation reinforced Statement CPC-10 of the *Comite de Pronunciamentos Contabeis* (Brazil's equivalent of the Financial Accounting Statements Board), which defined the accounting treatment for ESO disclosure by Brazilian public companies (CPC 2008). These rules were due to become mandatory for the calendar year 2009, for which reporting was due in 2010. Faced with strong opposition by both public companies and executives, the courts imposed a moratorium on March 2, 2010 (Abrantes et al. 2010). CVM appealed this decision and Regulation 480 was finally upheld by the federal courts on September 28, 2010 (Ennes 2010). As a result, despite the new Regulation and the relatively large overall executive compensations in Brazilian companies (Ernest and Young Brazil 2008; Brenner and Schwalbach 2009; Sigollo 2010), public disclosure of ESO plans remained largely voluntary up to the end of 2010.

³ The president of the Brazilian Association of Public Companies (ABRASCA) declared that, "It [the proposed mandatory executive compensation disclosure] seems to us more a matter of curiosity than an effective need of the investors" (Feltrin 2009).

3 Theoretical background and research hypotheses

Long-term incentive compensation is considered an essential governance mechanism. It encourages managers to make decisions that meet shareholder expectations, and at the lowest possible cost (Murphy 1996; Byrd et al. 1998). This belief has led to the international proliferation of ESO plans (Brenner and Schwalbach 2009).⁴ Nevertheless, the apparently excessive compensation awards and their ostensibly weak relationships to company performance (Andjelkovic et al. 2002; Weisbach 2007) have raised the question of whether ESO plans can really maximize shareholder value and whether ESO disclosure⁵ really enhances the effectiveness of incentive contracting with the chief executive officer (henceforth CEO). Advocates of mandatory disclosure of compensation practices argue that transparency reduces the costs of both shareholder monitoring and agency compensation (Bahar 2006). Disclosure is also widely recognized as the backbone of effective regulation of incentive compensation, as well as good governance practice (Hill 1997; Conyon and Sadler 2001). For instance, Swan and Zhou (2006) and Andjelkovic et al. (2002) show that greater transparency in executive compensation reduces information asymmetry, which they attribute to improved monitoring of executive compensation and its relationship to company performance.

Consistent with the literature, we focus on ESO plan disclosure for three main reasons. First, as mentioned above, detailed data on the other components of top management compensation in Brazilian listed companies are not publicly available. Second, the design and disclosure of ESO plans are part of the overall fiduciary responsibilities of the board of directors. The board is mandated to set performance goals and establish the amount of incentive compensation for each senior executive, while the compensation committee has the responsibility to assess executive performance, decide on whether the incentive compensation should be awarded, and adjust the amount of compensation as necessary (Conyon and Peck 1998; Epstein and Roy 2005; Silva and Tosi 2004; Conyon et al. 2011). Given these fiduciary responsibilities, ESO disclosure is intended to provide shareholders with the information they need to assess how well directors represent their interests and how accountable executives are to the board of directors. With greater ESO disclosure, directors also signal to the market how they are fulfilling their responsibilities, ensure their reputation, and make their value-adding actions transparent to other stakeholders. Third, given that ESO plans can result in potentially large wealth transfers to managers, executives would be inclined to provide opaque disclosures or to withhold sensitive compensation information. Greater disclosure of compensation practices increases investors' ability to monitor and sanction managers for

⁴ The ESO plan is a contract that gives management individuals the right, but not the obligation, to underwrite a company's shares at a fixed price within a fixed period of time. Conceptually, the main objective is to align executive and shareholder interests such that executives are concerned with the expected cash flow during their time with the company (Agrawal and Knoeber 1996). The ESO plan is also a way to retain talent (Silva et al. 2007).

⁵ Executive compensation disclosure has been mandatory in the United States since 1934. However, only in recent years have a few other countries such as Canada, the United Kingdom, Australia, and France required the disclosure of executive compensation data.

underperformance. It could also lessen management's ability to negotiate advantageous contract terms in future (Conyon and Sadler 2001; Laksmana 2008; Nelson et al. 2010).

Although ESO plan disclosure is a controversial issue, the literature contains only a few studies in this area, and the findings are inconclusive. For instance, Conyon et al. (2002) found an association between ESO disclosure and certain board characteristics in U.K. listed companies, but they did not examine other governance attributes or the extent of ESO disclosure compliance. Nelson and Percy (2005) and Nelson et al. (2010) examined the association between ESO disclosure and several governance mechanisms in a sample of Australian listed companies. However, they specifically looked at the disclosure of ESO-sensitive information and compliance with statutory disclosure rules in a mature market. Hence, an investigation of voluntary ESO disclosure in Brazilian listed companies could provide new insight into how boards of directors perform their fiduciary reporting duties in a climate of weak regulatory enforcement and corporate governance. In the next paragraphs we present our research hypotheses on the associations between governance attributes and voluntary ESO disclosure in Brazilian companies. We group our hypotheses into three broad categories: board structure and composition, audit quality, and ownership structure.

3.1 Board structure and composition

The research on governance views the board of directors as the keystone of a company's corporate governance quality (Fama and Jensen 1983). One of the most frequently examined characteristics to assess governance effectiveness is board size. The general rule is that the board should be small enough to deliberate expeditiously, yet large enough to fully employ all its expertise and embrace all its responsibilities (Andjelkovic et al. 2002). Yermack (1996) suggests that small boards are more likely to provide CEOs with stronger compensation incentives and to dismiss CEOs for poor performance. However, more recent studies suggest that larger boards have a greater knowledge base from which to fulfill their advisory role (Coles et al. 2005). Similarly, Laksmana (2008) contends that board size is positively related to executive compensation disclosure in the U.S., arguably because larger boards have more resources available to perform their functions and would more closely monitor compensation policies and disclosure.

In Brazil, two major weaknesses in governance quality are board structure and board composition. According to Black et al. (2010: 22), most Brazilian companies have boards that are too small to be effective, with limited formal executive compensation procedures to work with. Moreover, compensation committees are rare, and the equivalent committee in Brazil, called the supervisory board, is not required to be composed exclusively of independent directors (De Carvalho and Pennacchi 2009; Black et al. 2009). We therefore propose that the small boards in Brazil are less responsive to investors' demands for greater disclosure of compensation practices. This leads to the following hypothesis:

H1 Board size is positively associated with voluntary ESO disclosure.

A second argument is that effective monitoring by the board necessitates a majority of outside independent directors who are not affiliated with management (Fama and Jensen 1983). Independent directors are assumed to make more objective decisions and to better monitor shareholder interests than inside directors, whose careers tend to be tied to the CEO's (Core et al. 1999; Epstein and Roy 2005). The research supports this argument, showing that boards dominated by inside directors increase the likelihood of earnings manipulation and fraudulent financial statements (Dechow et al. 1996) and decrease the likelihood of auditors' issuing going-concern opinions (Carcello and Neal 2000). Moreover, Chen and Jaggi (2000) and Huafang and Jianguo (2007) found a positive relationship between the proportion of independent directors and overall voluntary disclosure. Laksmana (2008) reported a similar association specifically for the disclosure of executive compensation practices by U.S. companies. In addition, Nelson et al. (2010) found a positive association between factors related to board independence and compliance with ESO statutory disclosure laws in Australian companies. These findings suggest that independent directors have more incentive to improve the company's compensation disclosure practices in order to maintain their reputation and demonstrate high quality board governance.

Unlike in the U.S., the U.K., and Australia, where most of the studies on ESO disclosure have been conducted, Brazil has no legal requirements for board independence. One-third of board members are usually company officers, and some or all of the non-executive directors represent the controlling shareholder (Black et al. 2010: 26). Moreover, in less regulated markets, voluntary disclosure is generally acknowledged as a remedy for the agency problems resulting from greater information asymmetry. Thus, disclosure can provide a window into both the board and the overall quality of the company's governance. Companies with a strong board are therefore more likely to show higher transparency in their compensation practices (Murphy 1996; Vassallo and Wells 2006; Laksmana 2008; Bellavance and Schiehl 2009; Machuga and Teitel 2009). Given Brazil's greater ownership concentration and restricted voting rights structures (i.e., dual class share companies), most directors are appointed by the controlling shareholder. Hence, both their independence and their concern for minority shareholder interests are in question (Aguilera and Cuervo-Cazurra 2009). We therefore contend that Brazilian companies with independent boards of directors are more likely to respond to investor demands for greater disclosure of compensation practices. This leads to the following hypothesis:

H2 The proportion of independent directors is positively associated with voluntary ESO disclosure.

Another board attribute that is said to promote board independence from management is separation between the CEO and board chair functions. The combination of these two functions, called CEO duality, is assumed to increase CEO power and consequently hinder the three most important functions of the board: monitoring, disciplining, and reporting to shareholders (Fama and Jensen 1983). The empirical research generally supports these claims, showing that CEO duality is negatively associated with the quality of financial disclosure (Forker 1992;

Huafang and Jianguo 2007) and the disclosure of compensation practices (Conyon et al. 2002; Laksmana 2008). Accordingly, we contend that Brazilian companies in which the CEO chairs the board are likely to be less responsive to investors' demands for greater compensation disclosure. This leads to the following hypothesis:

H3 CEO duality is negatively associated with voluntary ESO disclosure.

3.2 Audit quality

The governance literature views the choice of independent auditors as an indicator of the company's governance quality. By hiring a large audit firm such as a Big 4,⁶ the company signals to the market that it accepts the auditor's demands for higher quality disclosure. This is also consistent with the argument that large auditors have stronger incentives to maintain their independence and to impose more stringent and extensive disclosure standards, because they have more to lose if their reputation is damaged (Carcello and Neal 2000; O'Sullivan et al. 2008).⁷ Accordingly, larger audit firms would invest more than smaller audit firms in maintaining their reputation as a provider of quality audits. Moreover, because they have more clients, they are less dependent on any one of them. As a result, larger audit firms are assumed to exert greater influence over a company's disclosure practices than smaller audit firms (DeAngelo 1981; Ahmed and Nicholls 1994; Nelson et al. 2010). Consistent with these arguments, Carcello and Neal (2000) and O'Sullivan et al. (2008) found a positive association between audit quality, as measured by a Big 4 dichotomous variable, and the quality of companies' voluntary disclosure. Clarkson et al. (2006) and Nelson et al. (2010) also found that audit quality contributes to improved compliance to compensation disclosure rules.

Brazilian listed companies must have their financial statements audited by an independent auditor. They must also rotate the external auditor every 5 years, and they cannot rehire a former auditor for at least 3 years.⁸ Moreover, according to the Memorandum, independent auditors are responsible for monitoring corporate disclosure practices. We therefore expect Brazilian listed companies with a Big 4 external auditor to be more responsive to investors' demands for greater compensation disclosure. This leads to the following hypothesis:

H4 Auditing by a Big 4 auditor is positively associated with voluntary ESO disclosure.

⁶ The biggest auditing companies, known as the Big 4, are PricewaterhouseCoopers, Deloitte Touche Tohmatsu, Ernst & Young, and KPMG.

⁷ This reasoning is similar to Conyon, Peck, and Sadler's (2011) argument concerning the role of compensation consultants. We are thankful to an anonymous referee for pointing this out.

⁸ This is a stricter rule than in the U.S., where firms can keep the same auditor indefinitely but the auditor must rotate the lead partner on the audit after 5 years (Black et al. 2010).

3.3 Ownership structure

The research on the effects of ownership structure on internal governance mechanisms suggests that investors who monitor managers absorb all the monitoring costs but receive benefits that are only proportional to their shareholdings (e.g., Fama and Jensen 1983; Byrd et al. 1998). This discourages minority shareholders from closely monitoring management decision making, leaving the task to another, larger shareholder. The presence of large shareholders in the ownership structure is therefore expected to increase monitoring efforts, reduce agency costs, and increase company value (Byrd et al. 1998). However, controlling shareholders have strong incentives to use inadequate disclosure practices, as certain information could reveal the individual benefits awarded to management and/or controlling shareholders to outsiders, who in turn might take disciplinary action against them (Zingales 1995; Tinaikar 2009; Nelson et al. 2010). Limited disclosure of compensation practices is also assumed to be a relatively inexpensive and attractive way for insiders to conceal excess compensation, compared to directly manipulating compensation contracts (Tinaikar 2009). In other words, improving compensation disclosure increases the cost to management and controlling shareholders of expropriating the company's assets through excess compensation. The empirical evidence supports these claims. For example, Machuga and Teitel (2009), in a study of Mexican companies, found that the presence of large institutional shareholders in the absence of controlling shareholders significantly increases the quality of companies' disclosures on governance issues. Moreover, Tinaikar (2009) showed that institutional shareholdings mitigate insiders' incentives to mask their private control benefits and non-value-maximizing decisions through limited executive compensation disclosure. Similarly, Nelson et al. (2010) demonstrated that greater shareholder activism and a stronger regulatory environment encourage greater ESO disclosure compliance by Australian companies.

As in other emerging economies, companies in Brazil show high ownership concentration and family control (Black et al. 2010), resulting in a dominance of family membership on boards and scant representation by minority shareholders (Lameira and Ness 2007; Brenner and Schwalbach 2009; Black et al. 2009, 2010).⁹ In addition, most Brazilian companies issue preferred (non-voting) shares (Black et al. 2010: 32), a practice that allows controlling shareholders to escape the wealth consequences of their own decisions. Accordingly, we expect Brazilian listed companies with ownership concentration to use less transparent executive compensation practices. This leads to the following hypothesis:

H5 Ownership concentration (measured by the disparity between voting and cash flow rights) is negatively associated with voluntary ESO disclosure.

⁹ Valadares and Leal (2000) and Leal et al. (2000) found high concentrations of voting power in Brazilian firms, largely due to the practice of issuing preferred shares. Similarly, Black et al. (2009) showed that most Brazilian firms use dual-class structures, with insiders retaining common voting shares and outsiders holding primarily preferred shares, thus creating a wedge between the voting and economic rights of controllers.

4 Research methods

4.1 Sample and data

Empirical testing is performed on data from companies listed on the São Paulo Stock Exchange (Bovespa). To be included in the sample, companies must have had active ESO plans in the calendar year 2007. Data on ESO plans were retrieved from the companies' annual reports, websites, and official CVM filings. We identify 125 companies that reported active ESO plans in 2007. From these, 26 companies are excluded because the inception date of their ESO plan was after December 31, 2007. Another 26 companies are excluded because, although they had an active plan, no options were granted until the end of 2007. Five further companies are excluded because they had not filed their 2007 annual financial reports by the end of 2008. This yields a final group of 68 companies. Given our meticulous data collection procedures, we are confident that these companies well represent all Brazilian companies with active ESO plans in 2007.¹⁰

The companies operated in nine industries: Basic Materials, Cyclical Consumer Goods, Financial Intermediation and Other, Industrial Goods, Information Technology, Non-Cyclical Consumer Goods, Public Utilities, Telecommunications, and Transportation and Construction. Table 1 presents the distribution of companies by industry. The companies are fairly well distributed among nine different industries, with many operating in Cyclical Consumption Goods, Non-Cyclical Consumption Goods, and Transportation and Construction (11 companies each, about 16% of the total), and the fewest operating in the Public Utilities sector (6%). Table 1 presents a comparison of our sample industry composition with companies listed on Bovespa in 2007.¹¹ At the usual 5% significance level, only the Financial Intermediation and Basic Materials industries are significantly underrepresented in our final sample. For a broader interpretation of the results, we also examine our sample representativeness in terms of the average Brazilian listed company. Thus, Table 1 also presents a comparative analysis between the characteristics of our sampled companies and all Bovespa companies. We focus on six aspects: size, market capitalization, stock market liquidity, profitability, listing in Bovespa's premium segments (Level 2 and *Novo Mercado*), and issuance of American Depositary Receipt (ADR) levels II and III. For the majority of the criteria used, companies in our sample are statistically indistinguishable from the average Bovespa listed company, at the usual significant levels. As expected, our sample companies with active ESO plans have more liquid stocks and are slightly more profitable than the average Brazilian listed company. From the comparisons presented in Table 1, we may therefore assume that our sample is representative of the Brazilian stock market.¹²

¹⁰ In fact, we identified a few companies whose board of directors had approved ESO plans but that had not awarded any stock options as of December 31, 2007. These firms were not suitable for our study because they had nothing to disclose concerning an ESO plan, and were therefore excluded.

¹¹ Active firms: firms whose stock exchange registrations were not cancelled before 2007 and whose stocks were traded at least once in that year.

¹² Although not reported here due to space constraints, the comparison between our sampled companies and companies listed on the Bovespa market index (IBovespa) shows no significant differences.

Table 1 Descriptive statistics of ESO companies

Industry	ESO companies		Bovespa		ESO versus Bovespa	
	Number	%	Number	%	Z test	p-Value
Cyclical consumption goods	11	16.2	63	20.1	-0.735	0.231
Non-cyclical consumption goods	11	16.2	20	6.4	2.685	0.996
Transportation and construction	11	16.2	26	8.3	1.996	0.977
Financial intermediation and other	9	13.2	78	24.8	-2.069	0.019
Industrial goods	6	8.8	4	1.3	3.535	1.000
Basic materials	6	8.8	63	20.1	-2.184	0.014
Information technology	5	7.4	3	1.0	3.340	1.000
Telecommunications	5	7.4	15	4.8	0.865	0.806
Public utilities	4	5.9	35	11.1	-1.300	0.097
Oil and gas	0	0.0	7	2.2	-1.243	0.107
Total	68	100.0	314	100.0		

Proxy or variable ^a	ESO companies		Bovespa		ESO versus Bovespa	
	Mean	Standard deviation	Mean	Standard deviation	t Test	p-Value
Company size	10.564	39.933	9.317	40.664	0.231	0.817
Market capitalization	6.888	16.29	6.782	31.217	0.032	0.975
Stock liquidity	1.525	1.110	0.247	0.892	14.524	0.000
Return on assets	4.31%	6.45%	1.43%	16.31%	1.736	0.083

Proxy or variable ^a	ESO companies		Bovespa		ESO versus Bovespa	
	N	Prop.	N	Prop.	Z test	p-Value
Listing in Bovespa's premium segments	51	0.750	119	0.379	5.582	1.000
ADR levels II and III	14	0.206	36	0.115	2.022	0.978
N	68		314			

^a For proxy or variable measurement details, see Table 4

4.2 Voluntary ESO disclosure index

As discussed above, the Brazilian regulation for ESO disclosure was not yet official at the time of this study and was primarily voluntary. However, since 2004 there has been a trend towards harmonization with international disclosure standards, resulting in the release by the CVM of several official recommendations for the disclosure of detailed information about the components of executive performance-contingent compensation (CVM 2004). Specifically, the above-mentioned Memorandum of February 14, 2007 (CVM 2007) provided the basis for the criteria we use to build our voluntary ESO disclosure index. The Memorandum makes recommendations for the disclosure of different executive compensation items, including stock-based compensation, which should be included in the footnotes of audited

Table 2 Voluntary executive stock option (ESO) disclosure index

Items in the memorandum CVM (2007)	Number of sub-items
I—Presence of option plans, with a description of their nature and conditions (including eligibility conditions for beneficiaries)	7
II—Quantity, description of the nature, and conditions (including, as applicable, rights to dividends, votes, conversion, dates of exercise, and expiration) and amount of authorized, exercised, and expired options, as applicable, held by each group of beneficiaries, including their exercise price, or, as applicable, the calculation method. The measure of the beneficiaries' eligibility to exercise the rights should be indicated (for example, the time elapsed since the authorization date of the option with respect to the total length of time over which the beneficiary can exercise the option)	11
III—Percentage of ownership dilution to which the current shareholders will be submitted in case all authorized options are exercised	1
IV—Regarding the exercised options, a description of the shares delivered, in terms of quantity, class, and type, and the total and unit price of the exercise for each class and type, and the retrospective market price on the respective dates	N/A
V—The dates or periods when the options can be exercised by the beneficiaries, and any expiry dates	2
VI—A description of any negotiations involving shares held in treasury to meet the options exercised, showing the quantity of shares, by class and type, as well as the value received by the company	N/A
VII—The effect on the earnings statement and book equity, in case these write-offs have been realized	2

Source: Developed by the authors, based on the memorandum (CVM 2007)

financial statements. Note that because this regulation merely suggests the nature of the disclosed information, ESO disclosure was completely voluntary during the period of this investigation. Table 2 summarizes the content of the seven items in the Memorandum, including the total number of sub-items.

Most indices measuring the disclosure level of executive compensation practices are based on mandatory disclosure regulation (Coulton et al. 2001; Clarkson et al. 2006; Tinaikar 2006). These indices take into account the relationship between the quantity and quality of the disclosed information. Given the voluntary aspect of ESO disclosure in Brazil, we do not rate the quality of the disclosed information. This would have introduced considerable subjectivity into our index.¹³ Accordingly, we construct our index by attributing a value of 1 to each ESO disclosure item recommended by the Memorandum.

Using the criteria presented in Table 2 and the content analysis method (Bardin 1977), the information retrieved from the companies' annual reports, explanatory notes to audited financial statements, and websites are coded. The obtained scores are then combined to obtain an overall ESO disclosure index for each company.

¹³ Note that some ESO disclosure items are not scored in our index. Specifically, item IV would apply only to companies whose plans would already allow their exercise during 2007. Because the majority of ESO plans in Brazil were approved between 2005 and 2007, the option exercise rights had not yet been acquired by December 31, 2007. The same holds for Item VI, as its occurrence is also linked to the exercise of options.

Given that some aspects of the Memorandum might be considered more important to disclose than others, different weighting methods are explored. The result is six different measures of voluntary ESO disclosure for each company:

- I. A simple equally weighted index based on financial reports only. The number of sub-items reported by the company in its official financial reports are counted and normalized by the total number of sub-items (23) to produce an index from 0 to 1.
- II. Identical to (I) above, but based on information disclosed on the company's website.
- III. The sum of I and II above normalized by twice the number of sub-items (46) to produce an index from 0 and 1.
- IV. An index that is equally weighted across the five items in the Memorandum, with items scored according to the number of sub-items concerning financial reports and websites. For instance, because item V in the Memorandum includes two sub-items, each sub-item accounts for one-half of the item (1/10 of the total index), whereas for item II (11 sub-items), each sub-item accounts for only one-eleventh of this item (1/55 of the total index). This weighting scheme aims to balance the importance of items that include fewer sub-items (III, V, and VII). This index is also normalized between 0 and 1.
- V. An index weighted according to expert opinions obtained via the Delphi method (see Appendix for details). Weights are then applied to the sum of counts obtained from financial reports and websites.
- VI. Identical to (V) above, but the expert opinions are then equally weighted by the number of sub-items in each item, as in (IV) above. Weights are also applied to the sum of the counts from financial reports and websites.

More details on index construction and validity are given in Appendix. Descriptive statistics of these indices are presented in Table 3. Most indices are normally distributed (according to the Jarque–Bera test), except for indices IV and VI. This indicates that assigning equal weights to each item in the Memorandum skews the index distribution to the right. More importantly, the indices are highly correlated. Pearson's correlation coefficients range from 0.776 to 0.999, and without exception, they are significant at the 1% level or less. This indicates that our results should be robust to different index sub-item weighting. We further support the robustness of our measures at the end of the results section.

4.3 Empirical model

In order to test our research hypotheses, the dependent variable of this study (the voluntary ESO disclosure index) is regressed on the explanatory variables representing the companies' corporate governance framework (described in our research hypotheses) and selected control variables, using the following model:

$$DISCL_i = \beta_0 + \sum_{i=1}^7 \beta_i X_i + \sum_{i=8}^{19} \beta_i Z_i + u_i \quad (1)$$

Table 3 Descriptive statistics for the ESO disclosure index

	Disclosure index					
	I	II	III	IV	V	VI
<i>Statistic</i>						
Observations	68	68	68	68	68	68
Mean	0.375	0.457	0.416	0.319	0.430	0.326
Standard deviation	0.204	0.199	0.190	0.217	0.186	0.216
Minimum	0.000	0.087	0.087	0.052	0.100	0.056
1st Quartile	0.217	0.304	0.261	0.156	0.295	0.164
Median	0.370	0.435	0.402	0.257	0.415	0.262
3rd Quartile	0.522	0.609	0.554	0.472	0.559	0.477
Maximum	0.826	0.957	0.891	0.929	0.889	0.931
Jarque–Bera statistic	1.241	1.393	2.158	10.387	1.792	9.442
<i>p</i> -Value	0.538	0.498	0.340	0.006	0.408	0.009
<i>Correlations</i>						
I	1.000					
II	0.776	1.000				
III	0.944	0.941	1.000			
IV	0.844	0.834	0.890	1.000		
V	0.946	0.930	0.996	0.876	1.000	
VI	0.848	0.833	0.892	0.999	0.880	1.000

Disclosure indices: I—equally weighted by number of sub-items based on financial reports; II—equally weighted by number of sub-items based on the company’s website; III—equally weighted by number of sub-items based on both financial reports and websites; IV—equally weighted by number of items based on both financial reports and websites; V—sub-items weighted according to expert opinion based on both financial reports and websites; VI—weighted by number of items according to expert opinion based on both financial reports and websites. All correlations are significant at the 1% level or less. *Maximum correlation:* 0.999; *minimum correlation:* 0.776

where $DISCL_i$ is a continuous dependent variable reflecting the degree of ESO disclosure, X_i are the corporate governance variables, Z_i are other company-level control variables, β_0 and β_i are the coefficients to be estimated, and u_i is a random error term.

4.4 Explanatory and control variables

Data on companies’ governance attributes were obtained from their annual reports, websites, and official CVM filings. Board structure is measured using the following variables: board size, proportion of independent directors,¹⁴ CEO/board

¹⁴ The rules for board disclosure in Brazil require companies to identify “executive or non-executive directors” only. Consequently, the independent and unrelated attributes are not automatically contained in the disclosed information. We hand-collected data on boards of directors to identify whether non-executive directors (1) were appointed by or (2) had family ties with the controlling shareholder. Our variable board independence is measured by the number of non-executive directors without ties or appointed by the controlling shareholder divided by the total number of directors on the board.

chair duality, and the presence of a compensation committee. Audit quality is measured by a dummy variable indicating whether the company's independent auditor was a Big 4 firm. Ownership structure is measured by the imbalance between ownership and control, that is, the percentage of voting power held by controlling shareholders in relation to their percentage of cash flow rights. This variable "*indicates the propensity of controllers to extract private benefits from the control of the company*" (Lima and Terra 2005:8). A dummy variable for family-controlled companies is also included, because the presence of family members in executive positions and/or on the board may influence the company's tendency to disclose.

Consistent with the literature on compensation disclosure (e.g., Conyon and Sadler 2001; Tinaikar 2009; Nelson et al. 2010), the company-level control variables included in the regressions are company size, financial leverage, profitability, listing on Bovespa's premium segments, and industry sector. Accounting and stock market data for the computation of these variables were obtained mostly from the Economática© database, but are also complemented and/or validated with data manually collected from official CVM and Bovespa filings. Detailed descriptions of explanatory and control variables are provided in Table 4.

Summary statistics for the independent and control variables are presented in Table 5. The boards of companies that use stock option plans to compensate their executives contain an average of seven to eight members. These companies have a minimum of four members on the board and a maximum of 15. The proportion of independent members is 32% on average, with a minimum of 0% and a maximum of 100%. The percentage of companies in which the same individual serves as the CEO and board chair is low, at only 19%, and only 37% of the companies have a formal compensation committee on the board. Regarding audit quality, the vast majority of companies (86%) are audited by a Big 4 auditing firm.

With respect to ownership structure, the average vote-to-capital ratio is 1.28. This means that the percentage of voting shares held by majority shareholders is greater than their share in the company's total equity. As expected, this confirms that voting power is concentrated in Brazilian publicly traded companies. Family-controlled companies account for 34% of the companies in our study, a relatively high proportion, considering that these are listed companies, albeit consistent with the Brazilian context (Brenner and Schwalbach 2009, Black et al. 2009).

Table 5 also presents the descriptive statistics for the control variables representing the general characteristics of the companies in our study. Average company size, represented by total assets, is about R\$10.5 billion (about US\$6 billion). The average financial leverage shows that debt capital financing accounts for around 52% of the total assets. Average profitability, based on return on assets

Table 4 Measurement of the explanatory variables

Explanatory variable	Description of the proxy
<i>Corporate governance</i>	
Board size	Number of members on the board of directors
Board independence	Number of outside (non-executive) directors not appointed by the controlling shareholder divided by the number of members on the board of directors
CEO/chair duality	Dummy variable corresponding to 1 if the CEO is also the board chair and 0 otherwise
Compensation committee	Dummy variable corresponding to 1 if there is a compensation committee and 0 otherwise
External auditing	Dummy variable corresponding to 1 if the company's accounting reports were audited by one of the 4 largest auditing firms (PriceWaterhouseCoopers, Deloitte Touche Tohmatsu, Ernest & Young, or KPMG) and 0 otherwise
Concentration of voting power	Share (%) of votes held by the largest stockholder divided by the share (%) of capital held by the largest stockholder
Family company	Dummy variable corresponding to 1 if the company is controlled by a family and 0 otherwise
<i>Control variables</i>	
Company size	Natural logarithm of the company's total assets
Financial leverage	Total debt divided by total assets
Profitability (<i>Return on Assets</i>)	Earnings before interest and taxes divided by total assets
Bovespa's premium segment	Dummy variable corresponding to 1 if the company is listed in Bovespa's levels 1 or 2 or the <i>Novo Mercado</i> and 0 otherwise
<i>Industry</i>	
Industrial goods	Dummy variables corresponding to 1 if the company belongs to the industry and 0 otherwise.; financial intermediation and other is chosen as the base-case
Cyclical consumer goods	
Transportation and construction	
Non-cyclical consumer goods	
Basic materials	
Telecommunications	
Information technology	
Public utilities	

(ROA), is 4.5%. Finally, as expected, a substantial percentage (66%) of companies is listed in Bovespa's top premium segments, i.e., Level 2 and *Novo Mercado*.¹⁵

The correlation matrix presented in Table 6 shows that the independent variables are weakly correlated. The highest correlation is only 0.47 (between company size and board size) and the lowest is -0.36 (between Bovespa premium segment and compensation committee). Most correlations are insignificant at the usual significance levels, and none is significant at the 1% level.

¹⁵ Level 1 requires softer corporate governance commitments from the company in order to be listed. We therefore focus our analyses on the stricter segments Level 2 and *Novo Mercado*.

Table 5 Descriptive statistics of explanatory variables

Statistic	Mean	Standard deviation	Minimum	Median	Maximum
Board size	7.412	2.261	4.000	7.000	15.000
Board independence	0.320	0.346	0.000	0.200	1.000
CEO/Chair duality	0.191	0.396	0.000	0.000	1.000
Compensation committee	0.368	0.486	0.000	0.000	1.000
Big 4 auditing	0.868	0.341	0.000	1.000	1.000
Concentration of voting power	1.284	0.651	0.000	1.000	3.846
Family-controlled-company	0.338	0.477	0.000	0.000	1.000
Company size (million reais—R\$)	10,564	39,933	297	1,701	294,876
Company size (million dollars—US\$) ^a	5,968	22,561	168	961	166,597
Financial leverage	0.521	0.212	0.006	0.499	0.957
Profitability	0.045	0.065	-0.142	0.038	0.236
Bovespa's premium segment	0.662	0.477	0.000	1.000	1.000

^a Based on the official exchange rate on December 31, 2007

5 Results

5.1 Executive stock option (ESO) disclosure practices in Brazilian companies

Due to the lack of statutory obligation to meet the aforementioned CVM disclosure recommendations, ESO disclosure practices differ widely across the sampled companies. Besides differences in the amount of information made available, a lack of standardization can be seen. The greatest variation is in the number of companies that disclosed information by sub-item. For example, only three of the 68 companies disclosed whether or not they imposed stock option transfer conditions, whereas 47 reported the amount of authorized and exercised options for the period.

On average, the companies provided information in their audited financial statements on about nine of the 23 sub-items. On the websites, the average number of disclosed sub-items is 10.51. In other words, the companies reported on average 10 of the 23 sub-items, either in financial statements or on websites. This can be explained by the fact that many of the websites contained not only standard financial statements, but also links to additional information on corporate governance practices, including information on stock option plans.

Regarding Item I, the most frequently reported information concerns the eligible beneficiaries, reported by 74% of companies; grace period conditions, reported by 66%; and the maximum number of shares to be awarded, reported by 63%. The conditions for transferring granted stock options, accounting treatment, and the alienation of options were reported by only 15, 26, and 37% of companies, respectively, while maturity conditions were reported by exactly half.

For Item II, the most reported information concerns the option exercise price and the number of options granted and exercised in the period, disclosed by 75, 74%,

Table 6 Correlation matrix of explanatory variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Board size	1.000									
(2) Board independence	-0.178	1.000								
(3) CEO/chair duality	-0.106	0.053	1.000							
(4) Compensation committee	0.173	0.086	-0.293**	1.000						
(5) Big 4 auditing	-0.083	0.080	0.190	0.208	1.000					
(6) Concentration of voting power	0.120	-0.189	-0.202	0.277**	0.129	1.000				
(7) Family company	0.063	-0.159	-0.031	0.293**	0.004	0.215	1.000			
(8) Company size	0.472*	-0.149	-0.110	0.239**	0.055	0.142	0.237	1.000		
(9) Financial leverage	0.196	0.094	-0.039	0.245**	0.010	0.238	0.158	0.338*	1.000	
(10) Profitability	0.028	-0.181	-0.021	0.164	0.074	0.098	0.096	-0.026	0.014	1.000
(11) Bovespa's premium segment	-0.187	0.133	0.031	-0.357*	-0.096	-0.305**	-0.014	-0.269**	-0.273**	-0.075

Maximum: 0.472; *Minimum:* -0.357

* Significant at the 10% level

** Significant at the 5% level

*** Significant at the 1% level

and 74% of companies. The least reported information concerns the kinds of rights granted by the underlying shares (voting rights, special dividend rights, mandatory bid rule rights, liquidation rights, etc.) (only 29% of companies) and the options cancelled in the period (37% of companies).

Items III, V, and VII represent the information least reported by the companies. Importantly, only 25% reported the dilution of ownership to which current shareholders would be submitted in case the granted stock options were exercised by the beneficiaries. Only 21% reported the dates or periods when the beneficiaries would acquire the right to exercise the options and when those rights would expire. A slightly higher percentage (32%) reported the effect on earnings of the expensing of compensation within the fiscal year, although a much smaller percentage (19%) reported the effects on liquid assets.

The descriptive statistics for the various weighted indices are presented in Table 3, showing that the average voluntary ESO disclosure index ranges from 0.32 to 0.46 (median 0.26 and 0.44). The fact that the median is below the mean and the considerable distance between the 3rd quartile and the maximum score highlight the low average disclosure among the companies.

5.2 Determinants of voluntary executive stock option (ESO) disclosure

Table 7 presents the results of the multiple linear regressions on the determinants of voluntary ESO disclosure estimated by ordinary least squares (OLS). We estimate the regressions for each disclosure index in order to draw general conclusions that are robust to the measurement of the dependent variable.

Although it explains 30% on average of the variation in the degree of voluntary ESO disclosure, the adjusted R^2 can be considered reasonable when compared to other studies on this issue, and given the focus of our study. Recall that our main objective is to highlight the role played by certain governance attributes in the decision to voluntarily disclose information about ESO plans. The adequacy of the standard linear regression model assumptions is verified by a number of specification tests (heteroskedasticity, autocorrelation, nonlinearity, normality, and multicollinearity), and all regressions pass all tests, with the exception of disclosure Index IV for the Lagrange Multiplier heteroskedasticity test (homoskedasticity rejected at the 5% level). We may therefore conclude that our regressions are well specified.

Table 7 presents the main findings of our study: board size, the presence of a compensation committee, and auditing by a Big 4 firm are consistently significant across the six disclosure indices. Moreover, the signs for these variables are consistent with our theoretical predictions, suggesting that voluntary ESO disclosure practices in Brazilian companies are positively associated with larger boards, a formal compensation committee, and a Big 4 auditor. These results support hypotheses H1 and H4.

The remaining explanatory variables fail to reach the usual significance levels. Therefore, hypotheses H2, H3, and H5 are not supported, casting some doubt on the effectiveness of these corporate governance mechanisms to promote voluntary ESO disclosure in Brazil.

Table 7 Determinants of voluntary executive stock option (ESO) disclosure

	Expected sign	Dependent variables: disclosure indices						VIF
		I	II	III	IV	V	VI	
<i>(a) Explanatory variable</i>								
Constant		-0.102 (-0.244)	-0.097 (-0.221)	-0.099 (-0.245)	-1.176 (-0.275)	-0.004 (-0.010)	-0.072 (-0.168)	
Board size	+	0.041*** (4.577)	0.036*** (3.285)	0.039*** (4.573)	0.373*** (3.250)	0.039*** (4.427)	0.037*** (3.221)	1.613
Board independence	+	-0.063 (-0.896)	-0.004 (-0.053)	-0.033 (-0.467)	-1.310 (-1.781)	-0.032 (-0.445)	-0.132 (-1.781)	1.473
CEO/chair duality	-	-0.029 (-0.378)	0.000 (-0.005)	-0.015 (-0.212)	0.127 (0.171)	-0.023 (-0.342)	0.008 (0.106)	1.513
Compensation committee	+	0.111** (1.949)	0.081* (1.331)	0.096** (1.746)	1.794*** (3.060)	0.092** (1.682)	0.176* (3.002)	1.811
Big 4 auditing	+	0.268*** (4.241)	0.117** (1.745)	0.192*** (3.637)	1.950*** (3.726)	0.194*** (3.656)	0.199* (3.791)	1.480
Concentration of voting power	-	0.009 (0.189)	0.065* (1.368)	0.037 (0.856)	0.375 (0.885)	0.030 (0.709)	0.035 (0.817)	1.656
Family company	-	-0.058 (-0.883)	-0.025 (-0.395)	-0.042 (-0.682)	-0.014 (-0.022)	-0.051 (-0.846)	-0.003 (-0.047)	1.523
Company size	+	-0.010 (-0.383)	0.005 (0.176)	-0.002 (-0.094)	-0.052 (-0.198)	-0.007 (-0.289)	-0.008 (-0.296)	2.564
Financial leverage	+	0.000 (0.111)	0.000 (-0.150)	0.000 (-0.025)	-0.006 (-0.398)	0.000 (0.003)	-0.001 (-0.389)	1.632
Profitability	+	0.001 (0.443)	0.000 (-0.137)	0.000 (0.150)	-0.016 (-0.453)	0.001 (0.300)	-0.001 (-0.382)	1.232
Bovespa's premium segment	+	-0.003 (-0.039)	-0.011 (-0.139)	-0.007 (-0.096)	0.190 (0.256)	-0.003 (-0.051)	0.020* (0.265)	1.779
Industry dummies		Yes	Yes	Yes	Yes	Yes	Yes	1.717– 2.424
		Dependent variables: disclosure indices						
		I	II	III	IV	V	VI	
<i>(b) Specification statistic</i>								
N		68	68	68	68	68	68	
Adjusted R-squared		0.275	0.131	0.235	0.305	0.213	0.296	
F-statistic (21;45)		2.336***	1.530	2.082**	2.548***	1.955***	2.483***	
p-Value		[0.009]	[0.115]	[0.020]	[0.004]	[0.030]	[0.005]	
LM heteroscedasticity test		1.290	0.133	0.185	3.908**	0.082	4.205	
p-Value		[0.256]	[0.716]	[0.667]	[0.048]	[0.774]	[0.040]	
Durbin–Watson autocorrelation test		1.957	2.157	2.082	2.276	2.089	2.288	
p-Value		[0.429]	[0.748]	[0.636]	[0.880]	[0.647]	[0.890]	

Table 7 continued

	Dependent variables: disclosure indices					
	I	II	III	IV	V	VI
Breusch–Godfrey autocorrelation test	0.020	0.599	0.165	1.218	0.213	1.328
<i>p</i> -Value	[0.886]	[0.439]	[0.685]	[0.270]	[0.644]	[0.249]
Ljung–Box Q-statistic	0.024	0.667	0.185	1.379	0.240	1.514
<i>p</i> -Value	[0.877]	[0.414]	[0.667]	[0.240]	[0.624]	[0.219]
Wald nonlinearity test	6.699	7.495	6.118	10.904	6.084	10.666
<i>p</i> -Value	[0.996]	[0.991]	[0.998]	[0.927]	[0.998]	[0.935]
Jarque–Bera normality test	1.558	0.268	0.413	0.028	0.409	0.053
<i>p</i> -Value	[0.459]	[0.875]	[0.813]	[0.986]	[0.815]	[0.974]

Notes: *Dependent variables* (disclosure indices): I—equally-weighted by number of sub-items based on financial reports; II—equally-weighted by number of sub-items based on the company’s website; III—equally-weighted by number of sub-items based on both financial reports and websites; IV—equally-weighted by number of items based on both financial reports and websites; V—sub-items weighted according to experts’ opinion based on both financial reports and websites; VI—weighted by number of items according to experts’ opinion based on both financial reports and websites. *Explanatory variables:* Board size = No. of members on the board of directors; board independence = No. of outside (non-executive) directors not appointed by the controlling shareholder ÷ No. of members on the board of directors; duality CEO/chairman of the board = 1 if the CEO is also the board chair and 0 otherwise; compensation committee = 1 if there is a compensation committee and 0 if not; Big-4 auditing = 1 if the accounting reports are audited by one of the 4 largest auditing firms and 0 otherwise; concentration of voting power = % votes of the largest stockholder ÷ % capital of the largest stockholder; family company = 1 if the company is controlled by a family and 0 otherwise; company size = value of total assets; financial leverage = debt-equity ratio; profitability = return on assets; Bovespa premium segment = 1 if the company is listed in levels 1 or 2 and the *Novo Mercado* of Bovespa and 0 otherwise. *VIF:* variance inflation factor. *t*-Statistics in round brackets. *p*-Values in square brackets

* Significant at the 10% level (one-tailed)

** Significant at the 5% level (one-tailed)

*** Significant at the 1% level (one-tailed)

Although most of the control variables representing the companies’ general characteristics show the hypothesized signs, none appear significant to explain the degree of voluntary ESO disclosure. The industry dummies reveal that the Transportation and Construction, Telecommunications, and to a lesser extent, Information Technology industries stand out in terms of voluntary ESO disclosure.¹⁶

5.3 Robustness checks

Given the small absolute number of Brazilian firms with active ESO plans, a potential concern in this study is that our results could be influenced by the limited number of companies in the sample. We again stress that, based on our meticulous data collection procedures, we are confident that the companies included in this

¹⁶ These results are not reported in Table 7 for the sake of concision, but are available on request to the authors.

study are representative of all the companies that had active ESO plans in Brazil in 2007. Nevertheless, the robustness of our findings would be in question if they were not robust to the composition of the companies sampled.

In order to address this issue, a Leamer's (1985) global sensitivity analysis is performed. Thus, each regression is run repeatedly, eliminating one company each time. If our findings were contingent on the composition of each sub-sample, then large variations in coefficients, t-statistics, and the significance of explanatory variables should be identified. The sensitivity analysis results are presented in Table 8. For brevity, we report only the results on disclosure index III (equally weighted by the number of sub-items based on both financial reports and websites). Results for the other five indices are similar and are available on request.

The sensitivity analysis confirms the above-reported results: board size, the presence of a formal compensation committee, and auditing by a Big 4 firm show significant and positive coefficients in all regressions (Table 8, Panel A). Moreover, these variables are significant at the 5% level, respectively, for 100, 72, and 96% of the regressions. This strongly supports the robustness of our findings. Similarly, non-significant variables are rarely significant, further supporting our results and the stability of our model.

A number of further robustness checks are run to verify the consistency of our results. First, we more closely examine the effect of other ownership structure characteristics. Given the higher disclosure standards that certain shareholders usually demand, we consider the presence of large institutional and foreign shareholdings in the company as well as the issuance of ADR levels II and III. These variables are insignificant and their inclusion leaves the results basically unchanged with respect to our baseline model. Second, we include the board independence measure squared to investigate whether the effect of independence is nonlinear. This variable is also insignificant, and does not change the previous results. Finally, we estimate the model for a sub-sample of 55 companies that voluntarily disclosed other aspects of executive compensation. It is arguable that these companies were more likely to disclose details of their ESO plans as well, and are therefore unrepresentative of regular companies. Again, the main results are unchanged. However, the dummy variable measuring family-controlled companies is negative and significant, supporting Hypothesis H5, which predicts that ownership concentration lessens voluntary ESO disclosure.

Based on the robustness results, we conclude that our baseline results are robust to measurement differences in both the dependent and independent variables. Together with the results presented in Table 7, these results appear to reflect the underlying factors that determine voluntary ESO disclosure in Brazilian publicly traded companies.

6 Summary and concluding remarks

This study examines the determinants of voluntary ESO disclosure in 68 Brazilian publicly traded companies that used and granted executive stock option (ESO) plans in 2007. Five research hypotheses concerning the governance determinants of

Table 8 Global sensitivity analysis of the determinants of voluntary executive stock option (ESO) disclosure

Variable	Original estimate	Mean	Median	Std. Dev.	Max.	Min.	% > 0	N
<i>Panel A—Regression coefficients</i>								
Board size	0.039	0.094	0.039	0.125	0.427	0.029	100.0	408
Independence	-0.033	-0.263	-0.053	0.473	0.029	-1.742	4.4	408
CEO/chair duality	-0.015	0.011	-0.007	0.072	0.487	-0.380	39.7	408
Compensation committee	0.096	0.391	0.105	0.629	2.008	0.060	100.0	408
Big 4 auditing	0.192	0.486	0.198	0.657	2.157	0.088	100.0	408
Concentration of voting power	0.037	0.092	0.037	0.130	0.657	-0.025	99.0	408
Family company	-0.042	-0.033	-0.038	0.045	0.277	-0.398	11.8	408
Company size	-0.002	-0.012	-0.007	0.025	0.058	-0.197	21.3	408
Financial leverage	0.000	-0.001	0.000	0.002	0.005	-0.012	34.6	408
Profitability	0.000	-0.003	0.000	0.007	0.003	-0.043	49.5	408
Bovespa's premium segment	-0.007	0.031	-0.001	0.086	0.607	-0.277	46.6	408
Variable	Original estimate	Mean	Median	Std. Dev.	Max.	Min.	% > 1.669	N
<i>Panel B—t-statistics</i>								
Board size	4.573	3.842	3.765	0.655	5.351	2.620	100.0	408
Independence	-0.467	-0.895	-0.706	0.675	0.381	-2.364	0.0	408
CEO/chair duality	-0.212	-0.113	-0.092	0.267	0.609	-1.247	0.0	408
Compensation committee	1.746	2.107	1.842	0.675	3.443	0.993	71.8	408
Big 4 auditing	3.637	3.418	3.651	0.811	4.832	1.202	95.6	408
Concentration of voting power	0.856	0.800	0.827	0.385	2.103	-0.492	1.2	408
Family company	-0.682	-0.479	-0.539	0.383	0.461	-1.780	0.0	408
Company size	-0.094	-0.177	-0.217	0.236	0.725	-0.837	0.0	408
Financial leverage	-0.025	-0.140	-0.101	0.253	1.016	-1.315	0.0	408
Profitability	0.150	-0.012	-0.022	0.365	1.026	-1.084	0.0	408
Bovespa's premium segment	-0.096	0.035	-0.016	0.226	0.880	-0.659	0.0	408
Variable	Original estimate	Mean	Median	Std. Dev.	Max.	Min.	% < 0.05	N
<i>Panel C—p-Values</i>								
Board size	0.000	0.001	0.000	0.001	0.005	0.000	100.0	408
Independence	0.679	0.765	0.759	0.165	0.989	0.352	0.0	408
CEO/chair duality	0.584	0.543	0.536	0.101	0.892	0.272	0.0	408
Compensation committee	0.043	0.039	0.035	0.036	0.162	0.001	71.8	408
Big 4 auditing	0.000	0.008	0.000	0.019	0.117	0.000	95.6	408
Concentration of voting power	0.197	0.229	0.206	0.110	0.688	0.020	1.2	408
Family company	0.751	0.672	0.704	0.132	0.960	0.323	0.0	408
Company size	0.537	0.568	0.586	0.090	0.797	0.236	0.0	408
Financial leverage	0.510	0.553	0.540	0.095	0.903	0.157	0.0	408

Table 8 continued

	Original estimate	Mean	Median	Std. Dev.	Max.	Min.	% < 0.05	N
Profitability	0.441	0.504	0.509	0.139	0.859	0.154	0.0	408
Bovespa's premium segment	0.538	0.487	0.506	0.087	0.744	0.191	0.0	408

voluntary ESO disclosure are tested, based on extensive data collected manually from the companies' annual reports, explanatory notes to audited financial statements, and websites. Our disclosure index is based on the Memorandum released by the Brazilian Securities and Exchange Commission (CVM).

On average, Brazilian companies appear to disclose very little about their ESO plans. Board size and the presence of a compensation committee are significantly and positively related to the degree of voluntary ESO disclosure. From an external governance perspective, we also show that auditing by a Big 4 firm is positively related to the degree of voluntary ESO disclosure. Moreover, we show that family-controlled firms in Brazil are associated with low voluntary ESO disclosure. Other hypothesized determinants of disclosure are insignificant, casting doubt on the effectiveness of some corporate governance mechanisms to foster voluntary compensation disclosure in Brazil. The results pass a number of specification tests and are robust to the measurement of both the dependent and explanatory variables. Our findings are of particular relevance to corporate regulators and policy makers in emerging markets, given the characteristics of the Brazilian capital market and the expectation that governance structures will promote disclosure integrity and transparency, which are essential to boost investor confidence.

This study has some limitations. The sample size is small compared to similar studies. However, given the nature of corporate structures in Brazil and the fact that we focus on voluntary disclosure, we are confident that our sample is representative of all companies in the Bovespa stock exchange with an active ESO plan in 2007. In our voluntary ESO disclosure index, equal weighting is assigned to the different disclosure criteria. This assumes that each criterion is equally important within the index and across the companies. However, the robustness tests performed on the indices reveal that different weighting systems would not noticeably affect the results. Therefore, despite the limitations, our results make a relevant contribution to the literature on the relationships between company-level governance factors and voluntary disclosure, and more specifically, to empirical governance research in less mature markets and low-disclosure regimes like Brazil.

The main implications of our results are that (1) because Brazilian companies that use ESO plans disclose little about their executive compensation arrangements, stricter and mandatory compensation disclosure rules by the surveillance authorities would be a substantial improvement from the viewpoint of investors; (2) because board size is significant to explain disclosure practices, corporate governance abiding companies should attempt to have larger boards; (3) because the presence of a compensation committee increases the amount of information disclosed, regulatory authorities should put forward stronger recommendations for the adoption of compensation and auditing board committees by listed companies;

and (4) because the type of auditing firm also has a significant impact on ESO disclosure, both companies and authorities should take steps to ensure adequate auditor independence.

In sum, our findings support the adoption of internationally accepted good practices and standards of compensation disclosure, and invite investors and policy makers in emerging markets to consider the effects of company-level governance factors on disclosure incentives. Our results show that Brazilian firms with a stronger governance structure are more likely to voluntarily provide information on executive compensation. Therefore, strengthening the requirements for board independence and overall governance mechanisms could make companies more willing to provide voluntary disclosure, including companies with large controlling shareholders. Finally, our results suggest that it would be advantageous for countries with low-disclosure thresholds, such as Brazil, to establish formal rules to improve compensation disclosure practices. This would also raise investor confidence. Regarding the U.K.'s recently introduced "say on pay" initiatives—which have generated intense debate in the U.S. and Canada—we believe that emerging markets like Brazil need first to implement and enforce mandatory compensation disclosure requirements. Given Brazil's greater ownership concentration and restricted voting rights structures, these requirements could counterbalance the power of large controlling shareholders. Only then could "say on pay" mechanisms be effective.

Future research could further explore this issue by investigating the disclosure of other components of executive compensation in Brazilian listed companies. The disclosure, either voluntary or mandatory, of sensitive information for the valuation of ESO grants is also a potential avenue for future research. Once detailed compensation disclosure becomes mandatory in Brazil, the costs and benefits of disclosing such information could be examined. Most listed companies in emerging markets have a concentrated ownership structure, with large family and non-family shareholders, including domestic financial institutions, foreign investors, and the state. Therefore, future research could also investigate the potential effects of different types of large shareholders on information disclosure in emerging economies.

In conclusion, this study underscores the need for stricter reporting rules for executive compensation disclosure in Brazil, as well as the importance of achieving greater convergence with the International Accounting Standards. We believe that the single most important regulatory initiative would be to make the disclosure of all components of the executive compensation plan mandatory. For instance, the Summary Compensation Table of the US-SEC's 10-K form, which breaks down the different types of compensation granted to individual executives, could be a starting point for the standardization of compensation disclosure in Brazil and other emerging markets.

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Appendix

Disclosure index construction and validity

Index construction

Our voluntary disclosure index is based on the 23 sub-items in Memorandum CVM/SNC/SEP No. 01/2007 of February 14, 2007 (CVM 2007). As a first step, a value of 1 is attributed to sub-items for which the company disclosed information and zero otherwise. The quality, usefulness, or thoroughness of the disclosed information is not rated, but its occurrence is reported. The final equally weighted index is the simple sum of a company's score divided by 23 in order to express the index as a range from 0 to 1.

This simple index is computed from two basic information sources: the company's annual report and financial statements filed with CVM and/or the company's website. The former generates our equally weighted Index I and the latter our Index II. The two information sources are then aggregated to obtain Index III. Accordingly, this index is normalized by 46, i.e., twice the total number of sub-items.¹⁷

Given the possibility that different sub-items are more important than others, we decided to experiment with different weighting schemes. First, equal weights are assigned to each *item* in the Memorandum instead of each piece of information disclosed. For instance, item I comprises seven different pieces of information, whereas item III comprises only one piece of information. Therefore, in our above-presented baseline models, item I is potentially seven times more important to measure ESO disclosure than item III. Assigning equal weights to each item is therefore a way to even out the importance of each disclosure class by assigning more weight in the final index to pieces of information under items with fewer sub-items (i.e., items III, V, and VII in the Memorandum).

Finally, each sub-item is assigned a different weight according to expert opinion. Following the Delphi method proposed by Dalkey and Helmer (1963),¹⁸ four finance and accounting professors from the most respected universities in Brazil offer their opinions. Among these are two leading experts on Brazilian corporate governance, and at least three have published extensively in high-profile

¹⁷ In this index, each sub-item is counted twice in case it is reported in both the company's financial reports and the company website. This approach is suitable for our study because it obtains higher scores for companies that have taken the trouble to release their information in different media.

¹⁸ More details on the Delphi method can be found in Linstone and Turoff (2002).

international journals such as *Corporate Governance*, *Emerging Markets Review*, and *Financial Management*. They were asked to rate the 23 sub-items in the Memorandum on a five-point Likert scale in terms of how they perceived them. Their scores were averaged by sub-item and the results were submitted to the experts for a second round. They could change (or not) their original rating based on the average ratings of the other experts. The second-round results are averaged by sub-item and normalized by the sum of the ratings to obtain the weights. The final disclosure, Index V, is obtained by multiplying each weight by the original score for each company in Index III (the sum of financial reports and websites). Disclosure Index VI applies the expert weights to the sub-items and normalizes them to obtain the same total weight for each item in the Memorandum, as in Index IV. The final weighting is then applied to the sum of the financial reports and website scores.

Index validity

A series of procedures are used to validate our index. First, as mentioned above, the correlations among the six indices are tested. The results in Table 3 reveal that they are highly positively correlated and that all correlations are significant at the 1% level.

Second, according to Laksmana's (2008) method, the validity of our measures is assessed by their correlation to stock volatility. According to Laksmana (2008), bid-ask spreads and stock return volatility are well known proxies for information asymmetry. As greater disclosure should reduce investor uncertainty, valid disclosure indices should present negative correlations with information asymmetry proxies. Bid-ask spread data for Brazil is unavailable, but we do have data on stock return volatility.¹⁹ Hence, our six indices were submitted to the Laksmana (2008) test. Table 9, Panel A presents the results. All six indices are negatively correlated with stock return volatility. Moreover, our estimates are close to those of Laksmana (2008).²⁰ Correlations between logarithmic transformations of the variables are also computed, as Laksmana (2008) suggests that the relationship between these variables may be nonlinear. Again, our indices correlate negatively with the proxy for information asymmetry, and our estimates are close to those of Laksmana (2008).

Finally, to test whether our expert opinions using the Delphi method are robust to the composition of the expert panel, the same evaluation form was submitted to five Ph.D. candidates in finance and accounting at Brazil's top universities. Results are presented in Table 9, Panel B. The expert and Ph.D. candidate assessments are very similar. Results of an F-test of equality of variances cannot reject the null hypothesis that both scores are drawn from the same distribution. Moreover, the scores display strong positive correlation, significant at the 1% level. We therefore conclude that

¹⁹ Computed as the standard deviation of daily stock returns from January 1 to December 31, 2007.

²⁰ Note that Laksmana's (2008) index is a measure of overall compensation disclosure, whereas ours is a measure of the disclosure of a particular type of compensation. Hence, the slightly smaller estimates we obtain are perfectly understandable.

Table 9 Validity of executive stock option (ESO) disclosure indices

	I	II	III	IV	V	VI	Laksmana (2008)	
<i>Panel A—Pearson correlation coefficients</i>								
Disclosure indices								
Stock return volatility	-0.157	-0.187	-0.183	-0.088	-0.168	-0.081	-0.180	-0.210
LN disclosure indices								
LN stock volatility	-0.149	-0.159	-0.199	-0.105	-0.185	-0.098	-0.230	-0.200
	Mean score						Standard deviation	
<i>Panel B—Delphi method validity</i>								
Experts				4.207				0.900
Ph.D. Candidates				4.122				0.762
	Mean score						<i>p</i> -Value	
F-statistic				0.617				0.441
Correlation coefficient				0.598				0.003

the experts' weights are consistent. Based on these procedures, we conclude that our ESO disclosure measures are valid.

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