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DO VARIABLE COMPENSATION FROM CEOs HAMPER ADJUSTMENT IN COST BEHAVIOR?

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ABSTRACT

This research investigated whether the variable remuneration of CEOs impairs the adaptation in the cost behavior of 206 Brazilian companies. Descriptive, documentary and quantitative research using regression. The period of analysis comprised 2011 to 2015. The results revealed that, in general, there is no asymmetry in costs behavior, as the increase in revenue is not reflected in a drastic increase in costs. On the other hand, companies achieve an adaptation in costs by reducing them when sales revenue decreases, resulting in cost symmetry. However, when analyzing the effect of variable remuneration on the relationship between increase/decrease in sales revenue and cost behavior, the results indicated an asymmetrical behavior of costs, that is, the variable remuneration impairs the adjustment in the behavior of costs, since that there was an asymmetry in costs when including the remuneration variable for CEOs. These findings provide evidence for managers to establish parameters on the behavior of costs, especially when there is an increase in company revenues, since this is usually linked to the variable remuneration of CEOs. Efficient control over the behavior of costs can reduce agency conflicts between managers with contracts linked to variable remuneration, shareholders and investors. This research contributes by analyzing perspectives of managerial accounting (cost behavior) and financial accounting (variable remuneration of CEOs), an incipient relationship in the international and national context. It contributes to organizations by revealing that variable compensation impacts the behavior of costs and helps managers to make accurate decisions based on cost analysis and compensation based on profit and shares.

Keywords: Remuneration of CEOs. Costs behavior. Brazilian companies.

RESUMO

Esta pesquisa investigou se a remuneração variável dos CEOs prejudica a adaptação no comportamento de custos de 206 empresas brasileiras. Pesquisa descritiva, documental e quantitativa com a utilização de regressão. O período de análise compreendeu 2011 a 2015. Os resultados revelaram que, no geral, não há assimetria no comportamento de custos, pois o aumento na receita não se reflete em um aumento drástico nos custos. Por outro lado, as empresas conseguem uma adaptação nos custos pela sua redução quando da diminuição na receita de vendas, ocorrendo simetria de custos. Contudo, quando analisado o efeito da remuneração variável sobre a relação entre aumento/diminuição na receita de vendas e o comportamento de custos, os resultados indicaram um comportamento assimétrico dos custos, ou seja, a remuneração variável prejudica a adaptação no comportamento de custos, visto que houve assimetria nos custos quando da inclusão da variável de remuneração dos CEOs. Estes achados oferecem evidências para que os gestores estabeleçam parâmetros sobre o comportamento dos custos, principalmente, quando há aumento das receitas nas empresas, visto que esta, geralmente atrela-se a remuneração variável dos CEOs. Um controle eficiente sobre o comportamento dos custos pode reduzir os conflitos de agência entre os gestores com contratos atrelados a remuneração variável, acionistas e investidores. Esta pesquisa contribui ao analisar perspectivas da contabilidade gerencial (comportamento dos custos) e financeira (remuneração variável dos CEOs), relação incipiente no contexto internacional e nacional. Para as organizações contribui ao revelar que a remuneração variável impacta no comportamento dos custos e auxilia os gestores a tomar decisões precisas com base em análises de custos e remuneração com base no lucro e ações.

Palavras-chave: Remuneração dos CEOs. Comportamento de Custos. Empresas brasileiras.

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1 INTRODUCTION

Cost is considered crucial for companies and is the sum of sacrifices made for goods and services needed to perform activities. The realization of accurate cost estimates and analysis is relevant for companies, as they help managerial actions. Therefore, understanding the behavior of costs is a significant factor for its management (ATASEL; SEKER; YILDIRIM, 2021) and vital for managers, accountants and financial analysts (IBRAHIM, 2018). In addition, understanding the behavior of cost is a fundamental element of cost and management accounting (GOLDEN; MASHRUWALA; PEVZNER, 2020; ATASEL; SEKER; YILDIRIM, 2021) and the asymmetric behavior of costs occupies a valuable place in this literature because it is the asymmetry in economic activity (FOURATI; GHORBEL; JARBOUI, 2020). In this sense, the behavior of costs refers to the way costs respond as a result of changes in management activities and decisions (IBRAHIM; EZAT, 2017).

The traditional view assumes that the behavior of costs is proportional to the level of activity (NOREEN; SODERSTROM, 1997; ANDERSON et al., 2003; BANKER; CIFTCI; MASHRUWALA, 2008; ATASEL; SEKER; YILDIRIM, 2021) and costs are considered fixed or variable (ATASEL; SEKER; YILDIRIM, 2021). This traditional model assumes that costs behave symmetrically, which means that variable costs can change proportionally to changes and fixed costs remain constant regardless of changes in activities (IBRAHIM; EZAT, 2017).

Studies reveal that costs can behave asymmetrically, that is, costs can respond differently to upward or downward changes in activities (ANDERSON; BANKER; JANAKIRAMAN, 2003; IBRAHIM; EZAT, 2017). The costs are considered asymmetric, since the managers begin to adjust the resources committed to the activities, because in the case of a decline in the demand, these can retain resources (CALLEJA; STELIAROS; THOMAS, 2006). According to Anderson, Banker, Huang and Janakiraman (2007) the asymmetric costs represent the deliberate retention of selling, general and administrative expenses, based on managers' expectations that revenue will increase in the future.

Due to the importance of observing the existence of asymmetry in the costs of the companies, the topic began to be studied in different contexts and countries with a focus on the area of management accounting (ANDERSON, BANKER; JANAKIRAMAN, 2003), such as the studies developed by Kama and Weiss (2011), Chen, Lu and Sougiannis (2012), Banker, Byzalov and Chen (2013), Kama and Weiss (2013), Balakrishnan, Labro and Soderstrom (2014), Dalla Via and Perego (2014), Banker et al. (2014), Richartz and Borgert (2014), Richartz, Borget and Lunkes (2014), Marques et al. (2014), Xue and Hong (2016), Pamplona et al. (2016), Lopes and Beuren (2017), Ibrahim and Ezat (2017), Ibrahim (2018), Zagita and Rossieta (2019), Lee, Park and Hyeon (2019), Fourati, Ghorbel and Jarbouï (2020), Özkaya (2021) and Atasel, Seker and Yildirim (2021). However, in view of these studies, there are incipient results in the accounting literature that indicate that executives remuneration impacts the cost behavior of companies (CAYLOR; LOPES, 2013; ZAGITA; ROSSIETA, 2019). Thus, the present study introduces a variable not explored in this literature on the behavior of costs, that is, the variable remuneration of the CEOs.

We highlight the gap for the development of this study, since the studies in general, observed the existence of asymmetric behavior of costs in companies and in different countries, adding: deliberate decision of the managers (KAMA; WEISS, 2011; KAMA; WEISS, 2013; BANKER et al., 2014); management incentives (CHEN et al., 2012); employment protection act (BANKER et al., 2013); legal structure and competitiveness (DALLA VIA; PEREGO, 2014); results management and corporate governance (XUE; HONG, 2016); corporate governance (IBRAHIM, 2018; IBRAHIM; EZAT, 2017; LEE; PARK; HYEON, 2019); institutional factors within the country (PAMPLONA et al., 2016); operational efficiency (LOPES; BEUREN, 2017); characteristics of companies and country (GDP) (ATASEL; SEKER; YILDIRIM, 2021), economic growth (ZONATTO et al., 2018), accounting conservatism (FOURATI; GHORBEL; JARBOUI, 2020) and labor adjustment costs (GOLDEN; MASHRUWALA; PEVZNER, 2020), to explain the behavior of costs. In this context, the gap emerges that the variable remuneration of CEOs can stimulate organizations to conduct their decisions to adapt costs to asymmetric behavior.

Caylor and Lopez (2013) have found evidence that there is a relationship between executive compensation and cost behavior. These authors evidenced a weak relationship between executive compensation and company performance, ignoring the possibility that remuneration is related to performance, but rather is considered a function of the behavior of company costs. Zagita and Rossieta (2019) also showed a relationship between the compensation of incentives per earnings target on the rigidity behavior (asymmetry) of costs, which reveals that there is an effect of the incentives directed by the agency in this relationship. According to Watts and Zimmerman (1986), executive directors who receive variable compensation (based on profit and shares of companies) may use methods that increase the result in the short term, in order to increase their income, which would affect the cost behavior.

It can be inferred that CEOs that receive variable remuneration can stimulate revenue growth through the incorporation of costs and, therefore, behavior becomes asymmetric, where costs increase more than the increase in revenues itself stimulated. In this context, in order to help understand the impacts of CEO

remuneration on the behavior of Brazilian companies' costs, the following research question was elaborated: does the variable remuneration of CEOs affect adaptation to cost behavior? In order to answer the presented question, the objective of this research is to investigate whether the variable remuneration of CEOs impairs the adaptation in the behavior of costs of the companies listed in B3.

This research advances in relation to the studies developed by Kama and Weiss (2011), Chen et al. (2012), Banker et al. (2013), Kama and Weiss (2013), Dalla Via and Perego (2014), Banker et al. (2014), Xue and Hong (2016), Pamplona et al. (2016), Lopes and Beuren (2017), Ibrahim and Ezat (2017), Ibrahim (2018), Zagita and Rossieta (2019), Lee, Park and Hyeon (2019), Fourati, Ghorbel and Jarboui (2020), Özkaya (2021) and Atasel, Seker and Yildirim (2021), by adding the variable compensation of CEOs to the discussion, along with cost behavior. Thus, we seek to contribute to the literature by addressing the influence that the variable remuneration of executives determined in this research, as an independent variable, exerts on the behavior of the costs of Brazilian companies.

The issue is relevant, since executive compensation is of great interest to managers and investors. In addition, the analysis of cost behavior together with executive remuneration is based on the assumption that executives can use cost behavior to obtain their own benefits and therefore do not seek to directly meet stakeholder objectives. Therefore, "we investigate the asymmetric cost behavior because this concept is considered as an important area of research in the accounting management, as well as in the economic research, and is also prominent for corporate insiders and outsiders" (FOURATI; GHORBEL; JARBOUI, 2020, p. 169).

It is justified the development of this research, because understanding how managers' decisions can shape the cost structures of companies, as well as cost behavior, is of fundamental interest to the accounting researchers (KAMA; WEISS, 2011). Guenther, Riehl and Röbler (2014) developed a re-reading of the research scenario carried out on cost behavior and revealed the need for research to better analyze the causes and consequences of cost asymmetry in companies, in the case of this research, the remuneration of executive officers. In addition, the authors observed that the phenomenon of cost asymmetry is not only a natural occurrence in companies, because it presents characteristics that can be managed by managers. Therefore, the variable remuneration of the executives may affect the adaptation of the cost behavior. In addition, Xue and Hong (2016) highlighted the importance of the relationship between accounting and economics in research on cost behavior. According to Zagita and Rossieta (2019), more studies should be developed to identify the gains of executive directors considering the behavior of costs, which motivates them to practice cost-efficiency policies.

This study is justified because the results have important implications for managers and decision makers, since an understanding of the impact of executive officers' remuneration on cost behavior can result in a better and more robust planning and controlling their actions in companies. The relevance of the study is seen in the arguments of Balakrishnan et al. (2014), because according to the authors, the topic is of considerable interest, as it examines a central issue in accounting management and helps managers to make the best decisions.

The period of analysis comprised the years 2011 to 2015, as Brazilian companies listed on the Brazilian Stock Exchange (B3) underwent some essential changes that make this period of analysis important to be analyzed. A relevant change is that as of 2010, Brazilian companies were required, pursuant to CVM Instruction 480/09, to disclose the reference form containing information on the compensation paid to executive officers, both fixed and variable (based on profit and company shares). Another justification for analyzing the period from 2011 to 2015 is the intention to select a period of time after the global financial crisis that lasted from 2007 to 2009 and also to eliminate the potential effects of this crisis for analytical purposes of the results (ATASEL; SEKER; YILDIRIM, 2021). In this sense, understanding the behavior of costs is crucial for budgeting, control and performance evaluation activities (ÖZKAYA, 2021). Therefore, the analysis of the period between 2011 and 2015 is justified, since this is the period of beginning of mandatory disclosure of information on the remuneration of executive officers in Brazil. Period that precedes the economic recession experienced in the country. Thus, the data of this period allow a more adequate comparability of the behavior of the variables used in the research (without any bias).

This study offers important contributions. First, we add to the accounting literature, more precisely to managerial accounting of cost behavior, the impacts of variable compensation of executives in this behavior, showing that the asymmetry of costs occurs in Brazilian companies that pay their executives variable remuneration, or in other words, the variable remuneration of CEOs impairs the adjustment in cost behavior. Secondly, we add to the debate about the variable remuneration of executives, as this one presents itself with the behavior of the costs of Brazilian companies, thematic not yet explored in the Brazilian scenario, but in the international context by Caylor and Lopez (2013) and in contemporary times by Zagita and Rossieta (2019). Third, the present study adds evidence to the incipient literature that examines the relationship between executive compensation and corporate cost behavior. It is also noteworthy that a greater awareness of the behavior of costs, more precisely the asymmetric behavior, is important for emerging markets, to protect the interests of shareholders and satisfy their informational needs (IBRAHIM; EZAT, 2017).

2 THEORETICAL FOUNDATION AND RESEARCH HYPOTHESES

2.1 Cost Behavior

The cost behavior is considered the main focus of the Sticky Costs Theory (LOPES; BEUREN, 2017), and is considered in the literature as asymmetric (Sticky Cost) and symmetrical (Anti-Sticky). The denomination of costs with the type of behavior of Sticky Costs was instituted by Anderson et al. (2003). The translation would be "rigid costs", but an adaptation was made to be denominated "costs with asymmetric variation" or "costs with asymmetric elasticity" or "asymmetric costs" (RICHARTZ; BORGERT, 2015).

Asymmetric costs are a proposition that managers consider the adjustment costs by changing resource levels, since optimal resource decisions are generally asymmetric. Thus, behavior of costs implies a symmetrical relation between changes in activities and costs (BANKER et al., 2013). Therefore, it is essential to consider asymmetric behavior when classifying costs to maintain companies' competitive advantage, as the literature assumes that this behavior may be due to deliberate decision-making taken by company management when activity declines (IBRAHIM; EZAT, 2017). On the other hand, when the increase in demand equals the decrease in demand, the cost response is symmetrical. However, the literature finds that the response of managers to the same change in demand is different and thus, the response to cost also differs, which contradicts the traditional cost model (IBRAHIM, 2018).

According to Weiss (2010), the results of the classification of costs in asymmetric costs and symmetric costs show that absolute profit forecasts for analysts analyzing companies with asymmetric cost behavior are on average 25% less accurate when compared to companies with the behavior of symmetrical costs. Richartz et al. (2014) point out that symmetrical cost behavior is more rigid, that is, costs vary less in relation to changes in revenues. In this way, the total cost reduces more than increases for variations in revenue of the same level. Weiss (2010) points out that symmetric costs assume an overcapacity for the activity level, and this level is interpreted as a reduction in demand. Thus, it is assumed that an excess of capacity, in the face of a reduction of costs in the level of activity, exceeds the cost for a similar increase in activity level, resulting in cost symmetry.

Anderson et al. (2003) consider that sales, general and administrative expenses respond differently to changes in company activity. In this way, when revenue increases costs increase proportionally more than they fall when a revenue fall occurs. From this new perspective, authors analyzed this theme, in order to verify if the costs of the companies are asymmetric and what changes in the level of activity that causes the costs to be asymmetric. Anderson et al. (2003) compared the traditional model of cost behavior with an alternative model. In this model, costs increase more when activity increases than falls when activity decreases. The findings were consistent with the approach proposed by the authors in the theory of the "alternative" model, which was called Sticky Costs.

Subramaniam and Weidenmier (2003) also aimed to verify the asymmetry of costs. The results showed that total costs rose 0.93% for every 1% growth in revenue, while decreasing 0.85% for each 1% decrease in revenue, confirming what the Sticky Costs theory advocates. According to Calleja et al. (2006), the behavior of costs asymmetrically occurs when revenue declines. The analysis by Anderson et al. (2007) recognized that the costs of products sold do not necessarily move in proportion to revenues. In addition, selling, general and administrative expenses change differently for periods of revenue reduction. The findings also show that an increase in these expenses in relation to cost occurs when revenue declines are positively associated with future earnings, while the increase in selling, general and administrative expenses occurs when revenue increases are negative and associated with future earnings.

Banker et al. (2013) used the Employment Protection Act as a determinant of costs, that is, as a proxy for the adjustment of labor-related costs. The findings of the study revealed that managerial decisions regarding salary adjustment are reflected in the behavior of costs. The study developed by Kama and Weiss (2013) examined how managerial choices can influence cost behavior. The results showed that managers' motivations are important for understanding the determinants of the cost structure of companies.

Marques et al. (2014) suggest that the behavior of sales, general and administrative expenses is asymmetrical in relation to the evolution of sales revenue. This survey shows that, on average, when sales revenue increases by 1%, selling, general and administrative expenses increase by 0.56%, but when revenue decreases by 1%, these expenses decrease by only 0.45%. The results also indicated that the asymmetry seems to decrease when considering the analysis of more than one year. Dalla Via and Perego (2014) found that cost asymmetry occurs only for total cost and not for selling, general and administrative expenses, for cost of goods sold and for operating costs of companies belonging to Italy.

Xue and Hong (2016), aimed at analyzing the behavior of costs and their consequences in the management of results and corporate governance of companies in China. The results allowed to identify that corporate governance can minimize the asymmetry of costs, however, its effect is not as strong as that of results management. These results reveal that the behavior of costs can be affected by the management of results developed by the managers and minimized by practices of corporate governance.

Other evidence located in the accounting literature on cost behavior refers to the study of Lopes and Beuren (2017), which identified cost behavior and its relationship with operational efficiency measures in Brazilian airlines. The findings of the study revealed the existence of asymmetry in the behavior of costs in the companies surveyed. The authors concluded that there is asymmetry in cost behavior and that the number of employees and aircraft influence in a non-proportional way the cost behavior of the companies analyzed.

Ibrahim and Ezat (2017) analyzed the cost behavior of listed companies in Egypt and the results indicated that asymmetric cost behavior is common among the analyzed companies, as the selling, general and administrative costs, the costs of goods sold and the total costs were considered rigid. Lee, Park and Hyeon (2019) also showed asymmetry in the cost behavior of Korean companies.

Zonatto et al. (2018) investigated the effects of economic growth on the behavior of rigid costs of companies belonging to BRICS countries, observing periods of prosperity and recession. The results revealed that costs have asymmetric behavior in certain accounts and vary in relation to different economic environments related to companies located in the countries of the BRICS group. This evidence indicates that the behavior of asymmetric costs occurs differently across the BRICS, as the level of asymmetry costs can vary systematically across cost accounts, companies, different industries and countries. The research developed by Fourati, Ghorbel and Jarboui (2020) also analyzed several countries and the results showed the existence of cost rigidity and conditional conservatism in the international context. However, the association between cost rigidity and accounting conservatism is different across country groups and across sectors.

Another study that sought to determine the rigid (asymmetric) cost behavior of publicly traded companies in Brazil, Russia, India, China, South Africa and Turkey (BRICS+T) was carried out by Atasel, Seker and Yildirim (2021), and revealed that BRICS+T companies have a rigid cost behavior.

Finally, Özkaya (2021) analyzed the cost behavior of small and medium-sized enterprises in Turkey. The results show that Turkish SMEs' costs are rigid to varying degrees (4.9% for total costs, 3.7% for cost of goods sold (COGS), 17.3% for selling, general and administrative costs). In addition, there is a partial reversal of the rigidity of total costs and selling, general and administrative costs after a period of falling revenue. The degree of cost rigidity for total costs and COGS is greater when revenue reductions are below 10% than when revenue reductions are between 25% and 50%. Another important result is that the degree of cost rigidity varies between the different sectors analyzed.

Given the evidence found in the literature, the first hypothesis of the study was developed:

H₁: The behavior of the costs of Brazilian companies is asymmetric and the increase in costs through the increase in net sales revenue is higher when compared to the reduction of costs due to a proportional reduction in net sales revenue.

2.2 Remuneration of Executive Officers and Cost Behavior

The asymmetric behavior of costs can be attributed to the deliberate intervention of opportunistic managers, as this behavior of costs results mainly from the deliberate and opportunistic intervention of managers when demand changes, as they seek to bring costs closer to an optimal cost response level. In this context, corporate governance mechanisms can be important to mitigate this behavior of managers and can affect several managerial decisions and consequently the behavior of costs (IBRAHIM, 2018). In this way, cost behavior reflects managers' decision-making about resources, which can be influenced by several factors (LEE; PARK; HYEON, 2019).

In addition to corporate governance (IBRAHIM, 2018), another factor is the construction of empires through the remuneration received, as the decision of a manager to inefficiently reallocate the resources of his company when sales fall is in search of his incentives for the empire building. These inefficient resource allocations can result in asymmetric cost behavior and be detrimental to a company's sustainability (LEE; PARK; HYEON, 2019). Therefore, the variable compensation paid to executive directors can influence the behavior of costs (ZAGITA; ROSSIETA, 2019).

The executive compensation system according to Mazur and Salganik-Shoshan (2017) has a significant impact on the creation of shareholder wealth and may lead to the pursuit of objectives other than the maximization of wealth. Caylor and Lopez (2013) emphasize that the study of cost behavior becomes relevant when analyzed against the remuneration of executive officers. In this sense, considering the asymmetry of costs in the planning and control phase, a provision is made so that this asymmetry does not impede a better performance and results for the company, as well as increase shareholder wealth (CALLEJA et al., 2006).

According to Weiss (2010), managerial accounting has focused on cost behavior as an important aspect for the analysis of profit for managers, estimating the future costs of companies in the process of forecasting profits. In this way, predicting the behavior of costs is considered a key part of forecasting results. Weiss (2010) indicated that cost behavior and its asymmetry influence the priorities of analysts and investors who use this information to observe the value of the company. Therefore, the remuneration of executive officers

may affect the behavior of costs, since, once they receive variable compensation, they may use procedures that increase their remuneration in the short term, such as changes in cost behavior.

Kama and Weiss (2011) focused on the deliberate decisions made by managers with their own interests and the behavior of costs. They investigated how resource adjustments made intentionally to achieve the profit targets affect the degree of cost asymmetry. The results showed that the intentional adjustments made to the profitability decrease the symmetry of costs. Such evidence indicates that, in the face of incentives to avoid losses and reductions in profits, managers speed up resource depletion adjustments when sales fall, which reduces the degree of cost symmetry (KAMA; WEISS, 2011).

Chen et al. (2012) suggest that the agency problem provides an important explanation for the asymmetric behavior of costs, particularly among companies with poor corporate governance. The authors argue that variable remuneration may lead to a greater alignment of incentives and, lower incentives for cost behavior. On the other hand, variable remuneration may have significant impacts on costs, leading to greater asymmetry in costs (CHEN et al., 2012).

Caylor and Lopez (2013) examined the relationship between cost behavior and executive board remuneration. The results showed that compensation committees may react differently to a decline in asset returns, depending on how management responds to cost behavior. This finding suggests that the compensation of executive officers is associated with the behavior of costs. The authors also found that the behavior of firms' costs provides an explanation for inefficiency in executive compensation contracts (CAYLOR; LOPEZ, 2013) since they can act for their own benefit (WATTS; ZIMMERMAN, 1986).

The results of Banker et al. (2011) indicated that new variable remuneration incentives lead to increases in total costs. In addition, executive officers make rational spending decisions when receiving new variable compensation concessions. Firms offer long-term incentives, anticipating behavior with executive directors' spending (BANKER et al., 2011). However, inducing directors to act in the long-term interests of companies requires the alignment of incentives among the various directors. This action has higher costs and favors short-term behavior. Thus, maximizing the value of the company in the long run is more difficult (POGACH, 2018).

Zagita and Rossieta (2019) investigated whether companies listed in the Indonesian bolda practice cost rigidity behavior. Specific circumstances that prevent managers from adopting such behavior and exercising an economic policy aimed at their remuneration were also examined. This study hypothesizes that managers generally practice cost sticking behavior to enjoy a double benefit. The results revealed that when a level of gain is critical next to losses, managers choose to practice traditional cost-efficient behavior and fail to build a business empire through a policy of cost rigidity. On the other hand, the results also indicated the effect of incentives driven by agency theory, including compensation of incentives per earnings target, on cost rigidity behavior.

Research by Ibrahim (2018) provided evidence on the impact of corporate governance on the asymmetric cost behavior of Egyptian firms. The findings evidenced an asymmetric behavior of COGS, as COGS increased by 1.05%, but decreased by 0.85% for an equivalent activity change of 1%, which contradicts the assumption of the traditional cost model that costs behave linearly. In the context of corporate governance, larger boards, dual roles, and more independent board members increase the level of rigid cost behavior, while greater corporate ownership and economic growth reduce the level of rigid cost behavior.

Lee, Park and Hyeon (2019) analyzed Korean companies and the results revealed that cost rigidity is lower in the co-CEO structure than in the single-CEO structure. This study contributes to the literature by showing that the co-CEO structure works as an internal corporate governance tool to mitigate the agency problem related to rigid cost behavior. Finally, Golden, Mashruwala and Pevzner (2020) investigated the impact of dependence on skilled labor on cost rigidity of US firms. The findings indicated that a greater dependence on skilled labor is associated with a more asymmetrical cost behavior. This result corroborates the arguments of previous studies (ZAGITA; ROSSIETA, 2019) that the remuneration paid to executive directors tends to impact the behavior of costs.

Thus, an important factor for the behavior of costs (asymmetric or symmetrical) are the incentives that the executive directors receive in relation to their variable remuneration (BANKER; HANGANG; NATARAJAN, 2011). In order to achieve this, agency issues may decrease and even reinforce the asymmetry of costs in companies, according to the circumstances (KAMA; WEISS, 2013; ZAGITA; ROSSIETA, 2019). Zagita and Rossieta (2019) state that under the earnings target incentive (remuneration) system, an annual bonus is provided to managers of companies that can make a profit, not a loss. Thus, companies with a low level of profit or a small loss would strive to improve the level of profit by practicing an efficient decision and avoiding the policy of cost asymmetry. Based on the context the second hypothesis is presented:

H₂: The variable remuneration of the CEOs causes asymmetry in the behavior of the costs of the companies listed in B3.

3 METHODOLOGICAL PROCEDURES

This research is characterized as descriptive, documentary and quantitative. The research population comprised the Brazilian companies listed in B3. In order to determine the sample, financial firms were excluded because they had particular characteristics (IBRAHIM; EZAT, 2017; IBRAHIM, 2018; ZONATTO et al., 2018; LEE; PARK; HYEON, 2019). The sample was defined from the companies that presented the disclosure of the data related to the remuneration of the executive directors in the reference form. The companies that had information in the period 2011 to 2015 were selected. The sample consisted of 206 companies listed in B3, which represented 1.030 observations during the analyzed period.

Contemporary studies on the behavior of costs also analyzed a more remote period, which justifies the analysis of the period from 2011 to 2015, such as, for example, Ibrahim and Ezat (2017) who analyzed the period from 2004 to 2011 of companies in Egypt, Ibrahim (2018) analyzed the period from 2008 to 2013 also in companies from Egypt and Zagita and Rossieta (2019) analyzed the period from 2009 to 2015 in companies in Indonesia.

Data on the remuneration of executive officers were collected on the reference form available on the B3 website and information on cost behavior was extracted from the Economática® database. The period of analysis comprised 2011 to 2015. The variables analyzed are presented in Table 1.

Table 1 – Variables used in the study

Variable	Definition	Collect	Authors
Cost Behavior	Total Costs	Economática®	Anderson et al. (2007); Weiss (2010); Kama and Weiss (2011); Chen et al. (2012); Banker et al. (2013); Caylor and Lopez (2013); Dalla Via and Perego (2014); Balakrishnan et al. (2014); Richartz and Borgert (2014); Marques et al. (2014); Lopes and Beuren (2017); Ibrahim and Ezat (2017); Ibrahim (2018); Zonatto et al. (2018); Zagita and Rossieta (2019); Lee, Park and Hyeon (2019); Atasel, Seker and Yildirim (2021); Özkaya (2021).
	Liquid Revenue of Sales		Anderson et al. (2007); Chen et al. (2012); Balakrishnan et al. (2014); Dalla Via and Perego (2014); Richartz and Borgert (2014); Richartz et al. (2014); Marques et al. (2014); Lopes and Beuren (2017); Ibrahim and Ezat (2017); Ibrahim (2018); Zonatto et al. (2018); Zagita and Rossieta (2019); Lee, Park and Hyeon (2019); Atasel, Seker and Yildirim (2021); Özkaya (2021).
Remuneration	Variable Remuneration	Reference Form – Item 13.2	Chen et al. (2012); Caylor and Lopez (2013); Zagita and Rossieta (2019);

Source: Research data.

In the data analysis stage, the results for the subsequent acceptance or rejection of the research hypotheses are presented through the statistical method of multiple linear regression. Initially, a general analysis of cost behavior was carried out, that is the ratio of total costs to net sales revenue, since the behavior of costs is the relationship between costs and company activities (ATASEL; SEKER; YILDIRIM, 2021). The empirical model to verify this relationship is composed as follows:

$$\log \left[\frac{\text{Total Costs}_{i,t}}{\text{Total Costs}_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{\text{Revenue}_{i,t}}{\text{Revenue}_{i,t-1}} \right] + \varepsilon_{it} \quad (1)$$

Following, in order to identify the impact of executive officers' remuneration on cost behavior, the second model of analysis was developed, as follows:

$$\log \left[\frac{\text{Total Costs}_{i,t}}{\text{Total Costs}_{i,t-1}} \right] = \beta_0 + \beta_1 \log \left[\frac{\text{Revenue}_{i,t}}{\text{Revenue}_{i,t-1}} \right] + \beta_2 \text{Var.Rem.} + \varepsilon_{it} \quad (2)$$

In order to obtain a better understanding of the cost behavior model, it is worth noting that there are two main variables: Net Sales Revenue and total company costs, which sum to the sum of the accounting costs Cost of Goods Sold (CGS) and Sales, General and Administrative Expenses (SG&A). This model is adapted from the studies developed by Anderson et al. (2003), Subramaniam and Weidenmier (2003) and Richartz et al. (2014). The international research of Subramaniam and Weidenmier (2003) is the main basis for the operationalization of the total costs as compared to the sum of the CGS with Sales, General and Administrative Expenses. In Brazil, the study by Richartz et al. (2014) stands out, since they also used the variable total cost, operating it in a similar way to this research.

In the models, the equations consider the change in the index for the dependent variable "total costs" and the independent variable "net sales revenue", considering the numerator of period t and the denominator of period t-1. In this way, it is possible to verify the positive and negative changes in revenues of period t in relation to period t-1. The calculation that shows the increase in net sales revenue and the decrease of this, was also adopted in the study of Richartz et al. (2014).

The model data were standardized in logarithm, as recommended by Anderson et al. (2003), because this step provides improvements in the comparability of the variables. For the acceptance of the H₁ Research Hypothesis, it is believed that when revenue increases by 1% costs rise proportionally more than they fall when revenue declines by 1%. Thus, for the positive changes in net sales revenue (referred to as the increase) and following the negative changes (called reduction), the asymmetric cost variation should present the following result: $\beta_1 \text{ increase} > \beta_1 \text{ reduction}$. The analysis of the results is presented below.

4 ANALYSIS OF RESULTS

Initially, the asymmetric behavior of costs is presented as the variable of the proportion of the variable remuneration under the total remuneration, according to Table 2.

Table 2 – Asymmetric behavior of costs in the increase and decrease of revenue

Panel A - Sample with increase in Sales Revenue		
Explanatory Variables	Dependent Variable	
	Model 1 VCT Coef./Sig.	Model 2 VCT Coef./Sig.
(Constant)	0.058*	0.100*
Inc.Rev.	0.613*	
Inc.Rev.*Var.Rem. Var.Rem.		1.500*
Significance of the model	0.000*	0.000*
Durbin-Watson	1.917	1.821
R squared	0.541	0.354
Number of observations	725	725
Panel B - Sample with decrease in Sales Revenue		
Explanatory Variables	Dependent Variable	
	VCT Coef./Sig.	VCT Coef./Sig.
(Constant)	0.015*	-0.116*
Dec.Rev.	0.760*	
Dec.Rev.*Var.Rem. Var.Rem.		0.874*
Significance of the model	0.000*	0.000*
Durbin-Watson	1.927	1.924
R squared	0.821	0.372
Number of observations	305	305

* Significance at 5%.

VCT – variation in total costs; Inc.Rev. – increase in sales revenue; Inc.Rev.*Var.Rem. – increase in sales revenue moderated by the ratio of variable remuneration to total remuneration; Var.Rem. – proportion of variable remuneration in relation to total remuneration; Dec.Rev. – decrease in sales revenue; Dec.Rev.*Var.Rem. – decrease in sales revenue moderated by the ratio of variable remuneration to total remuneration.

Source: Research data.

Panel A of Table 2 demonstrates the results of three multiple linear regression models, the first one related to the asymmetric behavior of costs according to the increase/decrease in sales revenue. In addition,

the second model shows the behavior of costs explained by the increase/decrease in sales revenue with variable remuneration effect. Finally, the third model complements the analysis of the effect of variable remuneration on the association between cost behavior and variation (increase/decrease) in sales revenue.

The results indicate, through model 1, that for every 1% increase in sales revenue the total cost tends to increase by 0.613% and, on the other hand, every 1% decrease in sales revenue the total cost reduces in 0.760%. In general, it can be inferred that there is no asymmetry in cost behavior since the increase in revenue is not reflected in a drastic increase in costs and, on the other hand, companies are able to adapt in costs by reducing it when the decrease in sales revenue. Thus, we can observe from these results an behavior of the costs symmetrical (Anti-Sticky), which allows to reject the hypothesis H_1 of the study.

The researches developed by Richartz et al. (2014), Dalla Via and Perego (2014), Marques et al. (2014), Lopes and Beuren (2017), Ibrahim and Ezat (2017), Ibrahim (2018), Zonatto et al. (2018), Zagita and Rossieta (2019) and Özkaya (2021), do not corroborate with the findings of the present research, since they verified the existence of the asymmetric phenomenon of costs. However, Dalla Via and Perego (2014), refer in their research particularities about the legal structure of the country, issues related to competitiveness, which influence the behavior of costs. Richartz and Borgert (2014) identified the existence of cost asymmetry in Brazilian companies, but the Sticky Costs Theory was partially applicable to these companies, due to the rigid structure of labor laws, tax aspects, and other specific factors in Brazil. A justification for this result can be identified in the findings of Özkaya (2021, p. 367), since "although results reveal that the degree of cost stickiness varies across different industries, sticky cost behavior in industries does not show a clear pattern". These results reveal that there are several factors that can influence the behavior of the companies' costs, such as the executive compensation.

In the analysis of model 2 that reflects the effect of variable remuneration on the relationship between increase/decrease in sales revenue and cost behavior, the findings reveal that every 1% increase in sales revenue, associated with companies with higher variable remuneration, the total cost increases by 1.50%. At the time of the reduction of sales revenue by 1% the total cost also has a reduction of 0.874%. This result makes it possible to accept the H_2 hypothesis of the research and suggests that the variable remuneration of the executive officers impacts the behavior of the costs, since these are asymmetric (Sticky-Cost) when considering the variable remuneration in the model. The contribution of the study is to show that cost asymmetry occurs in Brazilian companies that pay their executives variable compensation (based on the company's profits and shares). Opens the way to new research, encouraging the understanding of costs in companies that have the variable remuneration as an incentive for executives to reach their goals at work, as well as in macroeconomic environments such as Brazil.

This result confirms one of the approaches to agency theory, since this theory addresses that executive directors may not behave in a manner aligned with the interests of shareholders (PICHETKUN, 2012). Therefore, this result suggests that managers of companies with a sufficient level of profit tend to practice a policy of rigidity (asymmetry) of costs, so that managers enjoy the benefits of a business empire and bonuses related to variable compensation (ZAGITA; ROSSIETA, 2019). Thus, asymmetric behavior of costs can occur due to the role of executive directors, in the adjustment of resources in response to a change in activities (PICHETKUN, 2012).

This finding converges with the Mazur and Salganik-Shoshan (2017) discussion, because the authors argue that because of the agency problem arising from the separation of ownership and control, directors can pursue other goals than maximize shareholder wealth. As for example, in the case of this research, to improve the variable remuneration obtained from the organization in which they act through adjustments in the behavior of the costs. In view of this result, Kama and Weiss (2011) point out that when facing profit targets, the degree of cost symmetry is diminished as directors speed up cost cutting when sales fall. This managerial behavior expresses agency costs, which occur because managers have their own interests, and are motivated to achieve the profit goals, make decisions to maximize their personal utility, not the value of the company, which also converges with the findings of the present research.

Therefore, corporate governance, in the form of executive compensation, can affect managers' decisions regarding the adjustment of resources when the company's activity changes (IBRAHIM, 2018). The findings of Chen et al. (2012) also corroborate with the results of this research, because they found evidence that the asymmetry of costs increases the incentives of the executive directors due to the problem of agency in the companies. In addition, the authors found that the behavior of asymmetric costs decreases in years of change in the CEO or immediately prior to a change of the CEO, and also, the asymmetry of costs increases with the remuneration of the executive directors. This evidence provides support for the argument that the agency problem (managers who promote their own interests) explains the cost variations (cost asymmetry) (CHEN et al., 2012).

According to Caylor and Lopez (2013), it is also possible that the behavior of costs is more salient in a compensation scenario for executive directors. In order to do so, this evidence supports the findings of an impact of the executive directors' remuneration on the behavior of corporate costs, with the variable

remuneration of CEOs being detrimental to the adjustment in cost behavior. On the other hand, the research developed by Kama and Weiss (2011) also converges to the findings found in this study, as they found results that suggest that the incentives to achieve the managers' profit goals lead to deliberate resource adjustments, the symmetry of costs. Thus, costs become more asymmetric when managers are faced with an increase in future sales.

In this sense, an opportunistic behavior of CEOs is to build a business empire, adjusting the company's resources beyond the ideal level, thus creating idle resources, cost inefficiency and a low level of earnings. In addition, under these conditions, managers enjoy status, power, perceived competence and business prestige (ZAGITA; ROSSIETA, 2019). So when sales revenue is on the decline, managers face two options. The first is to adjust the cost proportionally to reach a certain level of earnings (efficient motive) and the second option is to keep the cost stable to maintain the business empire (asymmetrical cost behavior) (ZAGITA; ROSSIETA, 2019). In view of the results found, the second view according to Zagita and Rossieta (2019) was found in this research.

An important implication of this result (H2) is for regulators of issues related to corporate governance, as they must consider how the intervention of managers can make costs behave asymmetrically and how corporate governance can minimize this intervention by managers in the costs (IBRAHIM, 2018). Thus, the behavior of costs needs to be controlled and managed, in order to maintain organizational competitiveness (ZONATTO et al., 2018).

Table 3 shows the summary of the existence of asymmetric cost behavior by comparing the coefficients of variation of the increase in sales revenue and the decrease in sales revenue.

Table 3 – Asymmetric cost behavior

Model 1	Model 2
No effect of Variable Remuneration	With effect of Variable Remuneration
Revenue increases 1% and total cost increases 0.61%	Revenue associated with Variable Remuneration Increases 1% and cost increases 1.5%
Revenue decreases 1% and total cost decreases 0.76%	Revenue associated with Variable Remuneration Decreases 1% and cost decreases 0.87%
Symmetry -0.15%	Asymmetry 0.63%

Source: Research data.

In the model that does not consider the effect of variable remuneration, the evidence shows that the behavior of costs is symmetrical (-0.15%), suggesting that, in general, companies can adapt their costs to increase earnings in the event of increase or decrease in sales revenue. However, variable remuneration makes the behavior of costs asymmetric, that is, the cost can be reduced in a very representative proportion in the eventual fall in sales revenue, but when there is revenue growth, costs increase in greater proportion.

From these results, it can be verified that in documenting the effects of agency factors (executive directors' remuneration) on cost behavior, this research sheds light on the role these executives play in adjusting costs in response to their remuneration, as evidenced in the studies of Caylor and Lopez (2013), Zagita e Rossieta (2019), Chen et al. (2012) and Pichetkun (2012). In this way, this study confirms the hypothesis that asymmetric cost behavior is practiced by managers of Brazilian companies, although this practice can compromise companies' profit levels, which is the main interest of shareholders (ZAGITA; ROSSIETA, 2019). However, according to Zagita and Rossieta (2019), when the private interest of executive directors is threatened (when sales decrease and the level of earnings is critical to consider a bonus from the executive compensation system), they tend to leave the practice of asymmetry of costs to ensure their adequacy to earnings (variable remuneration).

According to Pichetkun (2012), the management of large companies (CEOs) may prefer to manage their remuneration by keeping unused resources, rather than adjusting costs when sales revenue decreases. On the other hand, management also has the potential to affect the compensation of executive officers, both fixed and variable, which causes them to adjust costs when sales revenue falls, in order to improve their compensation (PICHETKUN, 2012). Thus, it is noted that the variable remuneration has significant impacts on the cost behavior of the Brazilian companies analyzed.

Then, the cluster technique was used to establish a group formed by the companies with the highest proportion of variable remuneration in relation to the total proportion and another group with the companies with the lowest proportion of variable remuneration. For this purpose, the k-average cluster analysis was elaborated both for the sample of companies with an increase in sales revenue and for companies with a decrease in sales revenue.

The formation of the clusters was used to elaborate a new variable that categorizes the companies of

the cluster that represent those companies with higher variable remuneration. A dummy variable was established for the companies with the highest variable remuneration and, otherwise, the variable was associated with the increase and/or decrease of sales revenue in the determination of two regression models, as shown in Table 4.

Table 4 – Asymmetric Behavior of Costs due to variable remuneration effect

Explanatory Variables	Dependent Variable		
	VCT Coef./Sig.	VCT Coef./Sig.	Asymmetric Behavior of Costs
(Constant)	0.111*	-0.111*	
Inc.Rev.*DummyRV	0.637*		0.045
Dec.Rev.*DummyRV		0.592*	
Significance of the model	0.000*	0.000*	
Durbin-Watson	1.895	1.883	
R squared	0.372	0.342	
Number of observations	725	305	

Source: Research data.

It can be seen from Table 4 that with each increase of 1% in the sales revenue of the companies with the highest variable remuneration, the cost increases by 0.637%. In contrast, with each decrease of 1% in sales revenue of the companies with the highest variable remuneration, the cost reduced by only 0.592%. It is suggested that there is an asymmetric behavior of costs of 0.045 in companies that tend to make variable compensation to executives, in a greater proportion than the others. These findings corroborate with the studies developed by Banker et al. (2011), Chen et al. (2012), Caylor and Lopez (2013), Kama and Weiss (2013) and Zagita and Rossieta (2019), as they also found evidence of an asymmetric behavior of costs when analyzing the impact of the variable remuneration of executive officers on cost behavior.

Table 5 shows the asymmetric behavior of costs by segregation of the sample of increase in sales revenue in companies with lower and higher variable remuneration, in order to prove the findings previously presented.

Table 5 – Cost asymmetry in the variable compensation clusters due to the increase in sales revenue

Explanatory Variables	Cluster 1 =	Cluster 2 =
	Lower Variable Remuneration	Higher Variable Remuneration
	VCT	VCT
(Constant)	0.087*	0.024*
Increase Revenue	0.410*	0.851*
Sig. of the model	0.000*	0.000*
Durbin-Watson	1.977	1.817
R squared	0.356	0.761
N. of observations	358	367

Source: Research data.

In the group of companies with the highest variable remuneration, the findings determine that every 1% increase in sales the total cost increases by 0.41%, however, among the group of companies with the highest evidence of variable remuneration, it is concluded that each 1% increase in sales revenue total cost increases by 0.85%. It is concluded that companies with lower variable remuneration make the asymmetric behavior of costs more evident in the increase in sales revenue. Therefore, companies with lower variable remuneration tend to gain more, resulting from the greater difference between the increase in sales revenue and the increase in costs.

Table 6 shows the asymmetric behavior of costs by the segregation of the sample of a decrease in sales revenue in companies with lower and higher variable remuneration, in order to prove the findings previously presented.

Table 6 – Costs asymmetry in the variable remuneration clusters due to the decrease in sales revenue

Explanatory Variables	Cluster 1 =	Cluster 2 =
	Lower Variable Remuneration	Higher Variable Remuneration
	VCT	VCT
(Constant)	0.051*	0.006*
Decrease Revenue	0.951*	0.651*
Sig. Of the model	0.000*	0.000*
Durbin-Watson	1.952	1.917
R squared	0.880	0.818
N. of observations	175	130

Source: Research data.

The results showed that for every 1% decrease in sales revenue, the cost reduced by 0.95%, showing that the costs are quite symmetrical among the group of companies with a lower level of the proportion of the variable remuneration in relation to the total remuneration. On the other hand, in the group with the highest level of variable remuneration, the findings indicate that with every 1% decrease in sales revenue the cost reduces by 0.65%. It is concluded that in companies with a higher proportion of variable remuneration in relation to total remuneration, the behavior of costs becomes more asymmetric, and the costs of the company can't decrease in an equivalent proportion to the reduction in sales revenue. In order to do so, companies with higher variable remuneration, in the event of a reduction in sales revenue, tend to present lower gains, since they can't adapt costs as it occurs in companies with lower variable remuneration.

Thus, the findings of the research are exactly the reverse, that is, companies with variable remuneration can even increase revenues, but when this occurs they are not able to adapt their costs correctly, making the performance proportional to the increase in revenues is not the more rentable. Given this result, it is noted that an understanding of cost behavior is critical for executive officers since they can predict future costs and make changes that are self-benefiting relative to compensation. In addition, this evidence about cost behavior makes accounting careful when carrying out cost analyzes, as this may impact on the compensation of executive officers (PICHETKUN, 2012). Table 7 presents a summary of the behavior of costs.

Table 7 – Summary of the asymmetric behavior of costs by the effect of samples segregated by clusters of higher and/or lower variable remuneration

Cluster 1 – Lower Variable Remuneration	Cluster 2 – Higher Variable Remuneration
Revenue increases 1% and total cost increases 0.40%	Revenue increases 1% and total cost increase 0.85%
Revenue decreases 1% and total cost decreases 0.95%	Revenue decreases 1% and total cost decreases 0.65%
Asymmetry -0.55%	Asymmetry 0.20%

Source: Research data.

It can be seen in Table 7 that in cluster 1 companies (with a lower proportion of variable remuneration over total compensation) the behavior of costs is less asymmetrical, offering support to infer a considerable financial efficiency. However, in cluster 2 companies (with a higher proportion of variable remuneration over total remuneration), the behavior of costs becomes asymmetric, offering less financial efficiency for the organization, in which, in the increase of revenue, the costs follow a very close follow-up and yet in the fall of revenue companies can't exert such a drastic cut in costs. These results corroborate the statements of Lee, Park and Hyeon (2019), as they address that inefficient resource allocations can result in asymmetric cost behavior and consequently cause damage to the sustainability of companies.

The results contribute to the management of companies understand that the analysis of cost behavior is fundamental for managers to carry out planning, control, as well as cost reduction. The findings contribute to investors and financial analysts seeking to understand the relationship between executive officers' remuneration and cost behavior, which is useful information for investment decision-making (PICHETKUN, 2012).

Another contribution of this research is that when corporate profits are critical, executive managers can enjoy a double benefit: taking advantage of being CEO and practicing asymmetric cost behavior and receiving incentives associated with a suboptimal level of earnings (ZAGITA; ROSSIETA, 2019). This dual benefit translates into excessive agency costs for all stakeholders. "Therefore, companies' oversight functions should monitor and control cost stickiness behaviour and encourage managers to practice cost-efficient behaviour consistently, and not only when they face the threat of losing incentives due to a critical earnings level" (ZAGITA; ROSSIETA, 2019, p. 178).

In addition, the results found in this research reinforce the approach of the Sticky Costs Theory and reveal research gaps that encourage research on the behavior of costs in the Brazilian context.

5 DISCUSSIONS AND CONCLUSIONS

Understanding the relationship between sales and costs is relevant for companies and therefore it is vital to verify the behavior of costs. In addition, cost behavior is one of the main themes of cost and management accounting (ATASEL; SEKER; YILDIRIM, 2021). Therefore, this research aimed to investigate whether the variable remuneration of CEOs impairs the adaptation in the behavior of costs of Brazilian companies listed in B3. The discussions and conclusions of this study show the behavior of the costs of these companies and present the relationships of the variable compensation of the CEOs and the behavior of the costs.

The findings found in the study revealed that, as a whole, there was no asymmetry in the cost behavior of the companies analyzed, since the increase in sales revenue did not reflect an increase in costs and, on the other hand, companies are able to adapt to costs when they occur a decrease in sales revenue. This result shows that costs are more rigid, since they vary less in relation to changes in revenues. This result reinforces the analysis of the behavior of costs in Brazilian companies, since initially the Sticky Costs Theory was not verified.

Based on this result, the results of international research are consistent with the phenomenon of asymmetric cost behavior, such as Dalla Via and Perego (2014), Banker et al. (2014), Richartz and Borgert (2014), Richartz et al. (2014), Marques et al. (2014), Xue and Hong (2016) and Pamplona et al. (2016), for example. However, according to Lopes and Beuren (2017), who also analyzed Brazilian companies, it is perceived that in Brazil the acceptance of cost asymmetry is partial, once the research is applied in a context that differs from the international environment, which may justify the results obtained in the present research for Brazilian companies.

However, when analyzing the effect of variable remuneration on the ratio between increase/decrease in sales revenue, the results showed an asymmetrical behavior of costs, which reveals that the remuneration of the executive directors presents significant impacts on the behavior of the costs, thus not allowing, its balance, as this will have an impact on executive compensation. Therefore, these results made it possible to reject the H_1 hypothesis and to accept the H_2 hypothesis. Such information is relevant to professionals working in business management, since CEOs variable compensation plans may impact on cost behavior. In this sense, the compensation plans deserve attention of the managers in the management of the cost management strategy, since the significance of the relationship between the executives' remuneration and the cost behavior in this research culminates in this direction. From these results it can be inferred that the adoption in some cases of a variable can result in significant contributions, such as the variable remuneration variable of the CEOs in this research.

From these results, we can support the traditional model of cost behavior (Anti-Sticky), since this model assumes that costs behave in a symmetrical way for increases and decreases in activity. A fact found in this study, the new approach elaborated from the traditional model, but with the inclusion of the variable remuneration of the executive directors, because with the inclusion of this variable, the costs presented an asymmetric behavior (Sticky Cost). That is, the total costs respond in a different way to the changes in company activity. Thus, when revenue increases costs increase proportionately more than they fall when a revenue fall occurs.

From the research gap identified in the literature, from the inclusion of variable variable remuneration of executives in the cost behavior model, it is noted that Weiss (2010) initiated a chain of multidisciplinary approach in financial and managerial accounting, as they investigated the influence of analysts on the behavior of costs, more precisely on the asymmetry of costs. This study opened a new path for the literature on cost behavior and the present research sought answers that add to these areas significant contributions, since they confirm that the fact that the executive receives a variable remuneration affects the asymmetric behavior of the costs of Brazilian companies.

Given the findings, it can be seen that when sales revenue increases, the asymmetric behavior of costs increases in a significant proportion and this fact occurs in companies with a higher level of variable remuneration of executive directors. In this sense, it can be inferred that the variable remuneration is usually tied to the increase in sales of the companies and, with this fact, less is the emphasis given to the expenses that refer to the cost efforts to reach the desired revenue, since when decreases in sales revenue occur, costs are reduced in good proportion. Thus, it is noted that when there are significant increases in sales revenue, the costs of the analyzed companies increase significantly, which causes asymmetry in the behavior of costs. As variable remuneration is linked to the profits and the actions of the companies, this may not be tied to the costs involved in the efforts to achieve the goals, so there is an asymmetry in the behavior of the costs when the variable remuneration of the executives is analyzed. These findings are similar to the findings of Banker et al. (2011), Chen et al. (2012), Caylor and Lopez (2013) and Kama and Weiss (2013).

From this result, Guenther et al. (2014) confirm that the behavior of costs is not considered a purely natural phenomenon, but rather is the result of managerial decisions involved in a scope related to the understanding of the motivations, incentives and deliberate choices of executives (KAMA; WEISS, 2013). These incentives highlighted by Guenther et al. (2014), in the case of this research refer to the variable remuneration of executives. Reflections on this perception of the aforementioned authors are identified in the

researches developed by Xue and Hong (2016), since they dealt with the management of results and practices of corporate governance and cost behavior. In addition, the findings of the effects of variable remuneration on the asymmetric behavior of costs of Brazilian companies reveal that the cost rigidity derived from the agency problem can consequently be harmful to the long-term value of companies and to their sustainability (LEE; PARK; HYEON, 2019).

Therefore, this result of the impact of executives' variable remuneration on cost behavior can be explained through the agency theory view, since, according to Chen et al. (2012), Caylor and Lopez (2013) and e Zagita and Rossieta (2019) the agency problem provides an explanation for cost behavior, since variable remuneration can cause cost impacts, thus causing asymmetric behavior. Evidence from Banker et al. (2011) may also explain this result, as they have found results to suggest that the incentives received by executives are related to cost behavior. According to Kama and Weiss (2013), agency issues (compensation of executive directors) can decrease and even reinforce the asymmetry of costs in companies. In the case of this research, the compensation of the executives presented impacts on the costs, causing asymmetry. Another justification for this result is that "managers have a tendency to grow the firm to a size that is greater than the optimal one since they benefit from the large size of the firm: greater monetary compensation and perquisites, greater reputation and higher visibility to the public" (LEE; PARK; HYEON, 2019, p. 12). Therefore, due to these incentives, "CEOs are less likely to reduce resources for a given sales drop, which results in asymmetric cost behavior" (LEE; PARK; HYEON, 2019, p. 12).

The results of this study have important implications for professionals who evaluate changes in costs in relation to sales revenue. In this sense, the study provides evidence that managers, investors and shareholders need to establish control parameters on the behavior of costs, especially when there is an increase in sales revenues in companies and link the results to the variable remuneration of CEOs. More efficient control over cost behavior may lead to a possible reduction in agency conflicts between managers hired through variable compensation and shareholders and investors. Therefore, investors and market analysts must take into account that the behavior of costs is not always linear as assumed by the traditional cost model (IBRAHIM; EZAT, 2017). The findings of this research also contribute to the users of accounting (stakeholders, government among others) when examining their financial statements, as well as cost behavior. The results provide evidence that contribute to the understanding of knowledge about the asymmetry and symmetry of costs in a context of companies not yet investigated according to the configuration proposed in this study.

According to Calleja et al. (2006), the results have important implications for managers and decision makers of companies, since decisions based on the traditional cost behavior model (Anti-Sticky) overestimate the responsiveness of costs to changes occurring at the activity level. In this sense, cost asymmetry can be interpreted as a managerial exuberance during periods of growth, since managers tend to compromise the company with resources that are consistent with consecutive growth, so this may have a positive impact on the compensation of executive officers.

It can be concluded that results-based compensation can have an inverse effect than expected, since the results suggest that these companies take a relaxed attitude toward the readjustment of costs in the face of the growth in organizational revenues. In this sense, this research contributes to the literature, since previous studies on asymmetric behavior of costs have ignored the impact of managerial incentives, such as the remuneration of executive officers. This gap was filled in the Brazilian scenario regarding executive compensation and cost asymmetry, showing that the agency factors (compensation of executive officers) motivate cost adjustment decisions and thus help explain cost behavior. In addition, it contributes to the fact that the evidence revealed that the agency problem causes costs to shift (asymmetry of costs), thus moving away from their ideal level (symmetry).

The theoretical-empirical implications of this research are highlighted in the influence of the variable remuneration of CEOs, on the behavior of costs. To that end, the contribution to the Theory of Sticky Costs is to indicate a new dimension for the expansion of the studies, seeking to understand the influence of executive compensation plans on cost behavior. In this study, the two types of variable remuneration were used, based on the profit and shares of the companies together, but the separate analysis of this type of remuneration (variable) can also influence differently on the behavior of costs, which analysis can be considered by future studies. According to Lopes and Beuren (2017, p. 44), "studying more approaches that may influence cost behavior tends to enrich the literature nationally and internationally". In addition, for researchers, this study provides evidence on cost rigidity in an emerging market (IBRAHIM; EZAT, 2017) and assesses the effect of variable compensation paid to executive directors on cost behavior and adds new evidence for the Brazilian context.

In view of the facts evidenced in the present research, some limitations are presented, such as the impossibility of generalization of the results, since only the companies that disclosed in the reference form the values related to the variable compensation paid to the executive directors, listed in B3 in the period from 2011 to 2015. Overall, the results obtained provide useful insights for the financial accounting literature and encourage the development of new studies to improve understanding of the role of the motivations underlying

the decisions of the executive directors in defining the cost structures of the companies in which they operate. To that end, the models used in the research provide evidence for additional research into the causes and consequences of cost behavior. Thus, the recommendations for future work are related to the amplification and even alteration of the research sample, since a new sample will make it possible to use this study for comparative results.

In addition, we analyze the context of this research in other countries and the inclusion of other variables that may have an impact on the behavior of costs, such as financial difficulties and factors related to the economic-financial performance of companies. The evidence found about the asymmetric behavior of costs is consistent with the decision-making of executive directors weighing the economic consequences of their actions. Therefore, understanding the decision-making process of managers and the forces that drive them to impact the behavior of costs for their own benefit are important steps for improving the analysis of business costs. These issues should be considered for the development of new studies, so that the discussion of cost behavior presents an evolution in the accounting literature, more precisely in the management area.

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