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The relationship between executive compensation and research and development spending: an analysis of medium and high-tech companies listed on the brazilian stock exchange

La relación entre la remuneración de ejecutivos y los gastos en investigación y desarrollo: un análisis de empresas de mediana y alta tecnología que cotizan en la bolsa de valores brasileña

Relação da remuneração executiva com os gastos em pesquisa e desenvolvimento: uma análise das empresas de média e alta tecnologia listadas na bolsa de valores brasileira

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Abstract

Purpose: This study analyzes the relationship between executive compensation (fixed and variable) and research and development (R&D) spending—used as a *proxy* for innovation effort—in companies listed on the Brazilian stock exchange. The study examines how the incentive structure mitigates managerial risk aversion in sectors where innovation is strategic. The research guides the analysis of the relationship between executive compensation and the intensity of R&D investments in Brazilian medium-high and high-technology companies.

Methodology: This research uses a quantitative, descriptive, and documentary approach, analyzing data from 53 publicly traded Brazilian companies between 2010 and 2022. The focus is on companies with medium-high and high levels of technological development, according to the classification of the Organisation for Economic Co-operation and Development (OECD), adapted by the Industrial Innovation Survey (PINTEC/IBGE). The data were analyzed using

linear regression with panel data, controlling for variables such as size, indebtedness, profitability, and Covid-19.

Results: The results demonstrate that the compensation structure influences managers' willingness to allocate resources to innovation. The findings indicate that, although there is a positive correlation between variable executive compensation incentives and R&D, this relationship is moderated by risk aversion and sectoral characteristics. This suggests that variable compensation acts as a partial mechanism to mitigate agency conflict, but its effectiveness depends on balancing it with short-term goals.

Contributions of the Study: This research contributes to the literature by demonstrating how Agency Theory operates in an emerging market, where factors such as institutional instability influence managers' accounting choices. The study shows that, for high-tech companies in Brazil, aligning interests through executive compensation is crucial for sustaining long-term projects over immediate results.

Keywords: Executive Compensation, Research and Development, B3 and Innovation.

Resumen

Objetivo: Este estudio analiza la relación entre la remuneración ejecutiva (fija y variable) y el gasto en investigación y desarrollo (I+D), utilizado como indicador del esfuerzo innovador, en empresas que cotizan en la bolsa brasileña. El estudio examina cómo la estructura de incentivos mitiga la aversión al riesgo gerencial en sectores donde la innovación es estratégica. La investigación orienta el análisis de la relación entre la remuneración ejecutiva y la intensidad de las inversiones en I+D en empresas brasileñas de tecnología media-alta y alta.

Metodología: Esta investigación utiliza un enfoque cuantitativo, descriptivo y documental, analizando datos de 53 empresas brasileñas que cotizan en bolsa entre 2010 y 2022. El enfoque se centra en empresas con niveles de desarrollo tecnológico medio-alto y alto, según la clasificación de la Organización para la Cooperación y el Desarrollo Económicos (OCDE), adaptada por la Encuesta de Innovación Industrial (PINTEC/IBGE). Los datos se analizaron mediante regresión lineal con datos de panel, controlando variables como tamaño, endeudamiento, rentabilidad y COVID-19.

Resultados: Los resultados demuestran que la estructura de compensación influye en la disposición de los directivos a asignar recursos a la innovación. Los hallazgos indican que, si bien existe una correlación positiva entre los incentivos variables de compensación ejecutiva y la I+D, esta relación se ve moderada por la aversión al riesgo y las características sectoriales. Esto sugiere que la compensación variable actúa como un mecanismo parcial para mitigar el conflicto de agencia, pero su eficacia depende de su equilibrio con los objetivos a corto plazo.

Contribuciones del Estudio: Esta investigación contribuye a la literatura al demostrar cómo funciona la Teoría de la Agencia en un mercado emergente, donde factores como la inestabilidad institucional influyen en las decisiones contables de los gerentes. El estudio muestra que, para las empresas de alta tecnología en Brasil, alinear los intereses mediante la compensación ejecutiva es crucial para sustentar proyectos a largo plazo en lugar de resultados inmediatos.

Palabras clave: Compensación Ejecutiva, Investigación y Desarrollo, B3 e Innovación.

Resumo

Objetivo: Analisar a relação entre a remuneração executiva (fixa e variável) e os gastos em Pesquisa e Desenvolvimento (P&D) — utilizados como *proxy* de esforço de inovação — em empresas listadas na bolsa de valores brasileira. O estudo verifica como a estrutura de incentivos mitiga a aversão ao risco gerencial em setores nos quais a inovação é estratégica. A pesquisa norteia a relação entre a remuneração dos executivos e a intensidade dos investimentos em P&D nas empresas brasileiras de média-alta e alta tecnologia.

Metodologia: A pesquisa utiliza uma abordagem quantitativa, descritiva e documental, analisando dados de 53 empresas brasileiras de capital aberto entre 2010 e 2022. O foco recai sobre empresas de níveis médio-alto e alto de desenvolvimento tecnológico, conforme a classificação da Organização para a Cooperação e Desenvolvimento Econômico (OCDE), adaptada pela Pesquisa Industrial de Inovação (PINTEC/IBGE). Os dados foram analisados por meio de regressão linear com dados em painel, controlando variáveis como tamanho, endividamento, rentabilidade e Covid-19.

Resultados: Os resultados demonstram que a estrutura de remuneração influencia a disposição dos gestores em alocar recursos para inovação. Os achados indicam que, embora exista uma correlação positiva entre incentivos de remuneração executiva variáveis e P&D, essa relação é moderada pela aversão ao risco e pelas características setoriais. Isso sugere que a remuneração variável atua como um mecanismo parcial para mitigar o conflito de agência, mas sua eficácia depende do equilíbrio com metas de curto prazo.

Contribuições do Estudo: A pesquisa contribui para a literatura ao demonstrar como a Teoria da Agência opera em um mercado emergente, no qual fatores como instabilidade institucional influenciam as escolhas contábeis dos gestores. O estudo evidencia que, para empresas de alta tecnologia no Brasil, o alinhamento de interesses via remuneração executiva é decisivo para sustentar projetos de longo prazo em detrimento de resultados imediatistas.

Palavras-chave: Remuneração Executiva, Pesquisa e Desenvolvimento, B3 e Inovação.

1 Introduction

Innovation is recognized as one of the sources of sustainable competitive advantage in a constantly changing environment. This is due to the ability of business innovation to drive improvements in products and processes, promote continuous advancements that help companies survive, enable accelerated growth, increase efficiency, and ultimately lead to greater profitability compared to those that do not invest in innovation (Beuren et al., 2020). In this sense, spending on Research and Development (R&D) serves as the primary proxy for measuring corporate innovation efforts. Given companies' focus on activities related to the improvement of products and services, the resources allocated to these initiatives can be viewed as an investment with the prospect of future economic benefits (Gonçalves, 2017).

When considering success in developing innovations and successfully launching products on the market, companies have the potential to generate gains or profits (Zhou et al., 2021). However, according to Seybert (2010), most R&D projects take more than a year to complete and require evaluations at multiple stages in order to obtain a realistic view of concrete results. Furthermore, the author argues that capitalizing or recognizing these expenditures as expenses can influence the perception of the project's success and, consequently, the manager's decision-making. It is worth noting that, from the perspective of International Financial

Reporting Standards (IFRS), the distinction between the research phase (expense) and the development phase (asset) is required (Accounting Pronouncements Committee - CPC, 2010). It is observed that capitalizing these costs mitigates the immediate impact on profit, reducing pressure on the executive's variable compensation. In this sense, innovative initiatives are characterized by requiring substantial investments, entailing significant risks, and demanding a longer period for organizations to achieve meaningful returns (Zhou et al., 2021).

In this context, a process must emerge to align executives' objectives with corporate objectives so that they can make decisions in the organization's best interest, balancing risk-taking and risk aversion while expanding their investment horizon to the long term (Jensen & Meckling, 1976). It must be considered that in the absence of adequate control and incentive mechanisms, as highlighted by Jensen and Meckling (1976), managers (agents) tend to allocate resources in a way that maximizes their own utility, which can result in underinvestment in risky projects. According to Tong and Zhang (2015), short-term incentives in executive compensation divert managers' attention and promote myopic behavior. These implications suggest that, without long-term contracts, managers may sacrifice the firm's future value to secure immediate bonuses. Furthermore, resource allocation to R&D generally occurs before financial returns are generated, resulting in a reduction in executive compensation in the current period (Beuren et al., 2020).

When companies establish financial incentive contracts tied to short-term annual accounting metrics, these agreements tend to encourage managers to seek to maximize those metrics (Tong & Zhang, 2015). In addition to risk aversion, other biases are generated in this process, such as self-protection bias and resistance to projects that may generate visible accounting losses in the short term, even if they are profitable in the long term (Dechow & Sloan, 1991; Tversky & Kahneman, 1981). This fact encourages short-sighted behavior, prioritizing investments with quick returns at the expense of others that require a longer period to yield results, as is the case with R&D (Dechow & Sloan, 1991). In this sense, such short-term metrics can encourage opportunistic behavior on the part of the agent (Ittner et al., 1997; Oyadomari et al., 2009). Thus, the alignment between metrics and objectives is one of the key aspects in the drafting of contracts (Jensen & Meckling, 1976).

Since recognizing R&D expenses as a cost has an adverse impact on the company's earnings, the manager's compensation would also be negatively affected if his compensation package were tied to the company's performance. In this context, it can be anticipated that an increase in executive compensation, especially in the form of variable pay linked to short-term metrics (which significantly impact overall earnings), could lead to a reduced inclination toward investments in fixed assets and R&D (Gonçalves, 2017). This study focuses specifically on medium- and high-tech companies listed on the Brazilian stock exchange because, in these organizations, investment in R&D is not optional but a strategic necessity for maintaining competitiveness. The literature on developed markets suggests that, in these sectors, the sensitivity between compensation and R&D is more pronounced, making it the ideal setting to test agency conflicts.

Furthermore, the decision to invest in R&D may be related to the "horizon problem" discussed by Dechow and Sloan (1991) and Cheng (2004), whereby executives who do not expect to remain in their positions (due to retirement or the end of their term) believe they do not have enough time to reap the benefits of long-term investments. Therefore, to a certain extent, the form of compensation may be more relevant than the absolute amount in encouraging managers to seek to increase the company's value. From this perspective, executive compensation based on shares or long-term incentives serves as a mechanism to mitigate this opportunistic behavior. Effective corporate governance has the potential to align

the interests of managers and shareholders, thereby mitigating the adverse effects of agency conflict (Al Farooque et al., 2019).

Angarita and Donaggio (2018) argue that, in companies with strong corporate governance, compensation committees composed of independent members play a key role in determining executive compensation by evaluating individual and organizational performance. Empirical research supports the importance of corporate governance in the context of business growth (Bloom & Van Reenen, 2007; Claessens, 2012). Although R&D activities are perceived as investments that generate real economic benefits in the long term, they may involve high-risk strategies with uncertain future benefits (Abrahams & Sidhu, 1998). Due to this high level of risk, managers may choose to reduce it (Merkley, 2014), as the agent exhibits risk aversion and seeks to increase their wealth, while the principal is risk-indifferent and expects maximum effort from the agent (Jensen & Murphy, 1990). This divergence in attitudes toward risk lies at the heart of the agency conflict in innovation-intensive firms. Thus, the challenge related to executive compensation and R&D investment is, essentially, a matter of optimizing the allocation of scarce resources (Zhou et al., 2021).

Given that research on the influence of executive compensation on corporate innovation (Hall & Liebman, 1998; Jensen & Murphy, 1990) still yield inconclusive results and are scarce in emerging markets, the following research question arises: **what is the relationship between executive compensation and corporate innovation (via R&D) among medium- and high-tech companies listed on B3 from 2010 to 2022?**

To address this issue, the study focuses on sectors where R&D intensity is mandatory, thereby minimizing sectoral noise. In short, this study seeks to fill a gap in the national literature by synthesizing discussions on short-term incentives and long-term investments, testing whether the structure of fixed and variable compensation in Brazil follows the conflict-mitigation patterns observed in developed economies. Thus, this research is justified by the need to understand how incentive mechanisms operate in a capital market environment still in the process of consolidation, such as Brazil's, where investor protection and governance practices may differ from the Anglo-Saxon standards predominant in the classical literature.

The study is limited to an analysis of publicly traded companies listed on B3 that operate in medium-to-high and high-technology-intensity sectors, according to the criteria of the Organization for Economic Cooperation and Development (OECD). The time horizon covers the period from 2010 to 2022, a timeframe that allows for observing the evolution of innovation investments following Brazil's convergence with International Financial Reporting Standards (IFRS). The scope of the analysis is limited to consolidated data from the Notes to the Financial Statements and Reference Forms, focusing exclusively on compensation for the statutory board of directors and reported R&D expenditures.

2 Literature Review

Several studies have examined the influence of executive compensation on corporate innovation, analyzing the relationship between financial incentives and managers' willingness to take strategic risks (Abrahams & Sidhu, 1998; Hall & Liebman, 1998; Jensen & Murphy, 1990). However, there is no consensus on whether performance-based incentives encourage risky decisions and attract innovative managers (Jensen & Murphy, 1990). From the perspective of Agency Theory (Jensen & Meckling, 1976), this lack of consensus stems from the classic conflict of interests: while the principal (shareholder) seeks to maximize long-term value, the agent (manager) tends to be risk-averse and prioritize immediate results. In this study, the compensation package was divided into two categories: fixed compensation and short-term variable compensation. The impacts of these two types of incentives on R&D investments were

analyzed (Abrahams & Sidhu, 1998). This segmentation allows us to identify how the reward structure can mitigate or accentuate the manager's opportunistic behavior regarding R&D investments. In emerging markets, this relationship is even more complex due to institutional factors (Barros et al., 2021; Islam et al., 2021).

Although most international studies focus on developed markets (the United States and Europe), research in Brazil remains limited. However, the factor of internationalization emerges as a distinguishing element in this study: Brazilian companies exposed to the foreign market face greater pressure from global competition, tending to adopt more sophisticated governance practices and compensation packages (Aghion et al., 2018; Xu et al., 2024). Thus, there is a gap in the literature regarding the influence of different types of compensation in emerging economies, where economic and political instability can distort traditional incentives.

2.1 Innovation, Agency Theory, and Incentive Design

Unlike production activities in general, innovation is a complex, long-term process that requires the joint collaboration of senior executives and employees (Holmstrom, 1989). According to Schumpeter's (1934) classical theory, economic development is driven by creative destruction, whereby innovation represents a bet on the firm's future growth and survival. However, information asymmetry makes it difficult for shareholders to monitor the manager's actual effort in these long-term projects, since the agent possesses greater technical knowledge regarding the feasibility of innovations (Eisenhardt, 1989; Holmstrom, 1979). To mitigate this agency problem, Holmstrom (1989) argues that incentive design must take into account that innovation is a multi-stage task that is difficult to measure. If the contract focuses excessively on short-term metrics, the manager will be discouraged from innovating. In the Brazilian context, this dynamic is influenced by the government environment.

Although R&D investments are limited compared to those in developed nations, the Brazilian government implements incentive measures, such as financial support and easier access to credit (Silva & Reis, 2012). However, these public policies and the complexity of the tax system create noise in performance measurement. Until 2008, accounting practices allowed for the deferral of expenses, but harmonization with international standards (IFRS) and the tax provisions of the Lei do Bem have altered how profit—and consequently variable compensation—is calculated. Therefore, in Brazil, the relationship between managerial effort and compensation depends not only on the executive's will but also on how political and tax issues impact the company's bottom line (Gonçalves, 2017). Figure 1 presents the dynamics of innovation from a management perspective, highlighting the continuous flow between idea generation and the market.

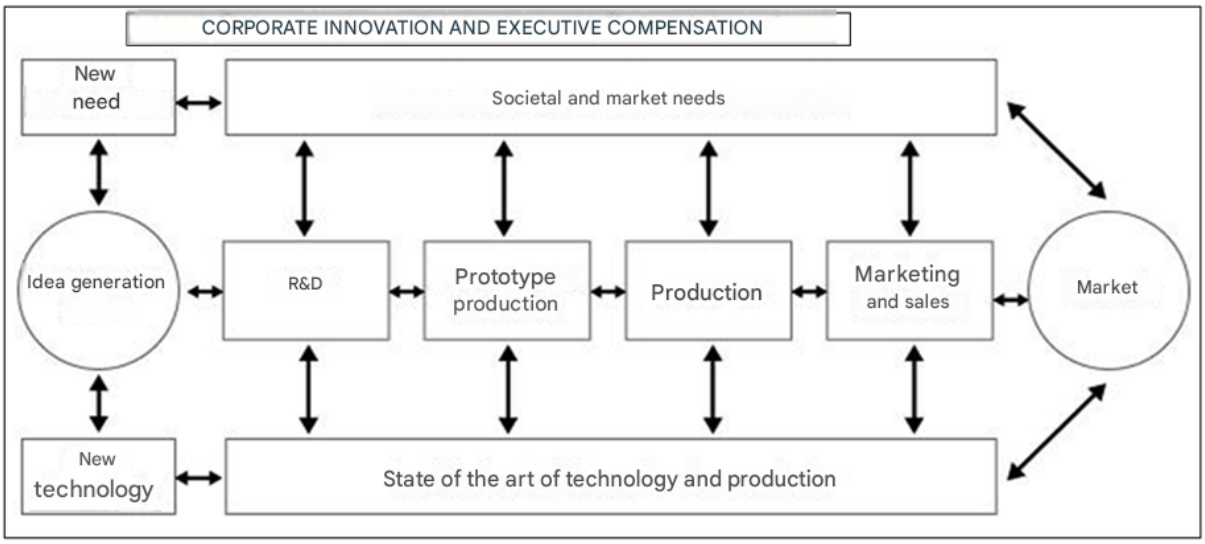

Figure 1: *Innovation Dynamics from the Perspective of Management and Tax Incentives*
Source: *Adapted from Rothwell (1994, p. 10).*

The structure illustrated in Figure 1 demonstrates that innovation is not an isolated process, but rather an interactive flow in which R&D activities and prototype production depend both on the state of the art in technology and on the needs of society. In the presented model, it is observed that tax incentives and promotion laws act as external elements that permeate these stages, reducing the transition costs between the idea and sales marketing. Consequently, by mitigating financial risk in the R&D and production phases, such institutional mechanisms directly influence the agent's perception of risk, potentially aligning executive compensation with the firm's long-term objectives. Brazilian legislation, through Laws No. 10,973 of 2004 (Brazil, 2004) and No. 11,196 of 2005 (Brazil, 2005), has stimulated innovation and scientific research in the productive sector in Brazil (Silva & Reis, 2012).

These political and tax issues are critical, as tax benefits (such as reductions in Corporate Income Tax (IRPJ) and Social Contribution on Net Income (CSLL) on R&D expenditures) lower the net risk of the project for the firm and may mitigate executive risk aversion if variable compensation is tied to post-tax profit metrics. Such laws offer tax incentives, including reductions in income tax and social contribution on net income for R&D expenditures, reductions in the tax on industrialized products (IPI) on equipment purchases, accelerated depreciation of tangible assets, and amortization of intangible assets (Flammer & Bansal, 2017).

Furthermore, encouraging innovation among firms—especially in the face of increasingly competitive domestic and global markets—underscores the importance of internationalization as a driver of technological efficiency (Aghion et al., 2018). However, innovative initiatives are often risky and long-term in nature (Zhou et al., 2021). Although shareholders generally demand that companies engage in innovative activities to maximize long-term value, managers often operate with short-term decision horizons and tend to avoid future-oriented investments (Flammer & Bansal, 2017; Holmstrom, 1989; Narayanan, 1985). This temporal disconnect lies at the heart of the agency problem in compensation: if an executive's bonus is strictly annual, he will have little incentive to approve projects whose benefits will only materialize in future terms.

Often linked to the context of innovation, investments in R&D play an essential role in organizational progress, driving the development of new products, production methods, and market expansion (Landry & Callimaci, 2003). These investments are fundamental elements, closely linked to the company's subsequent growth and improved productivity (Flammer & Bansal, 2017). The number of technology patents held by a company is directly related to the

competitive advantages it can achieve, enabling stable profit growth (Atalay et al., 2014). In this sense, compensation should act as a control mechanism to prevent executives from choosing conservative strategies in order to protect their personal income (Zhou et al., 2021). Without this alignment, the scenario favors behaviors detrimental to innovation, such as fragmentation or negative cooperation in decision-making (Larkin et al., 2012), making the implementation of innovative strategies more challenging.

The integration of corporate governance and internationalization incentives thus becomes the key to mitigating these problems. Agency Theory, as postulated by Holmstrom (1989), Jensen and Meckling (1976), and Narayanan (1985), clarifies the tensions inherent in resource allocation. These tensions arise from the misalignment of interests caused by information asymmetry, which allows the agent to prioritize personal objectives. While shareholders demand strategic investments in R&D to maximize value (Flammer & Bansal, 2017), managers under short-term pressure prioritize profit predictability (Hsu et al., 2023; Zhou et al., 2021). In this scenario, internationalization acts as a disciplinary mechanism: companies seeking global expansion face scrutiny from foreign investors and increased competition, which requires a tighter alignment between compensation and innovation to mitigate agency costs (Aghion et al., 2018; Ferreira et al., 2023).

Dynamic tensions, including risk, exert a strong influence on innovation management. In situations where the external environment is challenging, there is a greater need to balance growth with risk mitigation (Frezatti et al., 2017). The assessment of corporate risk is based on an analysis of the likelihood and probability of its occurrence (Aqlan & Ali, 2014). In Brazil, this uncertainty is exacerbated by political and tax variables, which make long-term planning more costly and risky for managers (Barros et al., 2021; Lazzarini et al., 2015). Such institutional factors raise the required risk premium and may discourage investments in late-maturing innovations. The sources of risk stem from the specific context of each organization and its interactions with the value environment, according to the Committee of Sponsoring Organizations of the Treadway Commission (COSO, 2013; Oliva, 2015).

Therefore, the implementation of innovations must be carried out with caution. In short, given that innovation is inherently risky, it is reasonable to expect managers to carefully evaluate the costs and benefits (Hsu et al., 2023). However, the use of tax incentives (Lei do Bem) can act as a risk mitigator for managers, facilitating the acceptance of R&D projects that, without the tax benefit, would be rejected. According to Porter's (1980) logic, investors will not accept returns below the risk-free rate, and firms unable to sustain their profitability tend to cease operations. For the author, the inability to innovate leads to obsolescence; under agency theory, the executive may prioritize personal survival over the firm's competitiveness. Thus, innovation is a high-risk management activity, the final decision regarding which is strongly influenced by the design of compensation and the institutional environment.

Figure 2 illustrates how risk management is not an isolated process, but rather depends on the efficiency of external variables, such as the level of the tax burden, which impacts the cash flow available for R&D. Innovation is a high-risk management activity, in which the final decision is strongly influenced by the compensation structure and the institutional environment. In this context, Figure 2 illustrates how risk management and innovation are not isolated processes, but rather depend on the efficiency of external variables and the organizational structure.

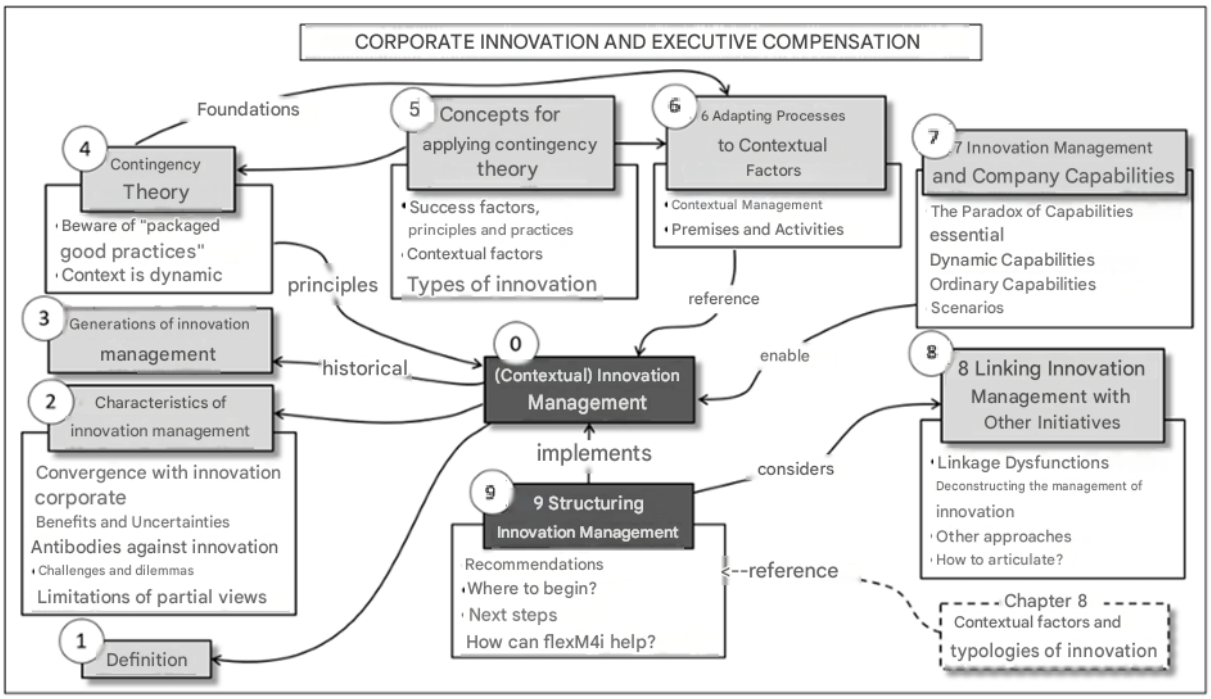

Figure 2 *Relationship Between Risk Allocation, Tax Incentives, and Executive Governance*
Source: *Adapted from FlexMethod (2024).*

As shown in Figure 2, contextual innovation management (item 0) implements a framework that takes into account both theoretical foundations (item 4) and the adaptation of processes to external factors (item 6). The articulation of this management approach enables the company to address dysfunctions and challenges (item 2), using incentives—such as tax burden adjustments—to enable dynamic capabilities (item 7). It is the executive's responsibility to identify, through this framework, the most effective way to deal with uncertainties (Frezatti et al., 2017), converting adversities into strategic opportunities (Hammond et al., 2017). Thus, as shown in Figure 2, it is the executive's responsibility to identify the most effective way to deal with uncertainties during management, aiming to safely achieve objectives through efficient alternatives (Frezatti et al., 2017). According to Hammond et al. (2017), companies must have the ability to convert adversities into opportunities, developing competitive strategies to deal with market dynamics. In this regard, internationalization emerges as a strategy for mitigating systemic risk, allowing the firm to diversify its revenue sources and absorb global technologies, which requires more robust governance (Aghion et al., 2018; Xu et al., 2024).

According to Zhou et al. (2021), innovation involves risks and uncertainties at two levels: the individual and the systemic. At the individual level, decision-makers are entrepreneurs and managers; at the systemic level, agents include investors and the market (Fredrickson et al., 2010). The allocation of resources to R&D can yield future benefits; however, the level of risk is a key factor that often restricts this investment (Gurd & Helliar, 2017). From the perspective of Agency Theory (Jensen & Meckling, 1976), this constraint occurs because the agent (executive) tends to avoid risk if it jeopardizes their short-term financial stability. Madrid-Guijarro et al. (2009) conclude that innovation activities decline as debt increases, as risk aversion intensifies. Regarding executives, Desterro et al. (2018) note that increased monitoring results in a demand for higher compensation (risk premium) in exchange for the uncertainties assumed.

This demand for higher compensation, however, may be distorted. The occurrence of corporate scandals has sparked debates about the transparency of executive compensation

practices (Bebchuk & Fried, 2003). Initially, compensation levels should be based on the complexity and skills required (Yarram & Adapa, 2021). However, Managerial Power Theory argues that compensation may be driven by the executive's political influence over the board (Bebchuk & Fried, 2003). This view suggests that powerful Chief Executive Officers (CEOs) exercise control over the process of setting their own compensation, creating an entrenchment effect (Bloom & Van Reenen, 2007). In this scenario, the manager becomes immune to pressures for innovation, securing high bonuses regardless of long-term results, which undermines the firm's competitiveness (Bebchuk & Fried, 2003).

To address this gap and align interests, compensation design is vital. Performance-based pay incentives are most effective when accompanied by robust monitoring mechanisms (Brandão et al., 2019; Elsayed & Elbardan, 2018; Liu et al., 2022). The compensation package may include a fixed salary, bonuses, and stock options (Machado & Beuren, 2015). Since base salaries constitute the fixed (secure) portion, risk-averse executives prefer increases in the fixed portion rather than aggressive innovation targets (Murphy, 1999). However, stock options align the manager's time horizon with that of the shareholder. This alignment is especially critical in internationalized companies, where market value metrics reflect the firm's global competitive capacity relative to foreign competitors.

With regard to the bonus plan, it is often linked to accounting metrics (Jensen & Murphy, 1990). Watts and Zimmerman (1986) explain that variable compensation contracts seek to mitigate agency conflicts. However, a critical point addressed in this study arises here: if these performance indicators do not account for tax deductions and policy issues related to innovation promotion (Lei do Bem), the manager may be financially penalized for investing in R&D. Thus, R&D spending reduces immediate accounting profit, thereby decreasing the executive's bonus. This tension creates a misalignment that can result in underinvestment in innovation and a loss of value for shareholders (Celik & Tian, 2022). Therefore, Machado and Beuren (2015) categorize compensation into short-term (salary and bonuses) and long-term (stock options), arguing that sustainable innovation depends on the predominance of the latter in the CEO's total compensation structure. This tension creates a misalignment that can result in underinvestment in innovation and a loss of value for shareholders (Celik & Tian, 2022). To mitigate such conflicts, Machado and Beuren (2015) argue that technological sustainability depends on a compensation structure dominated by long-term incentives, as summarized in Figure 3.

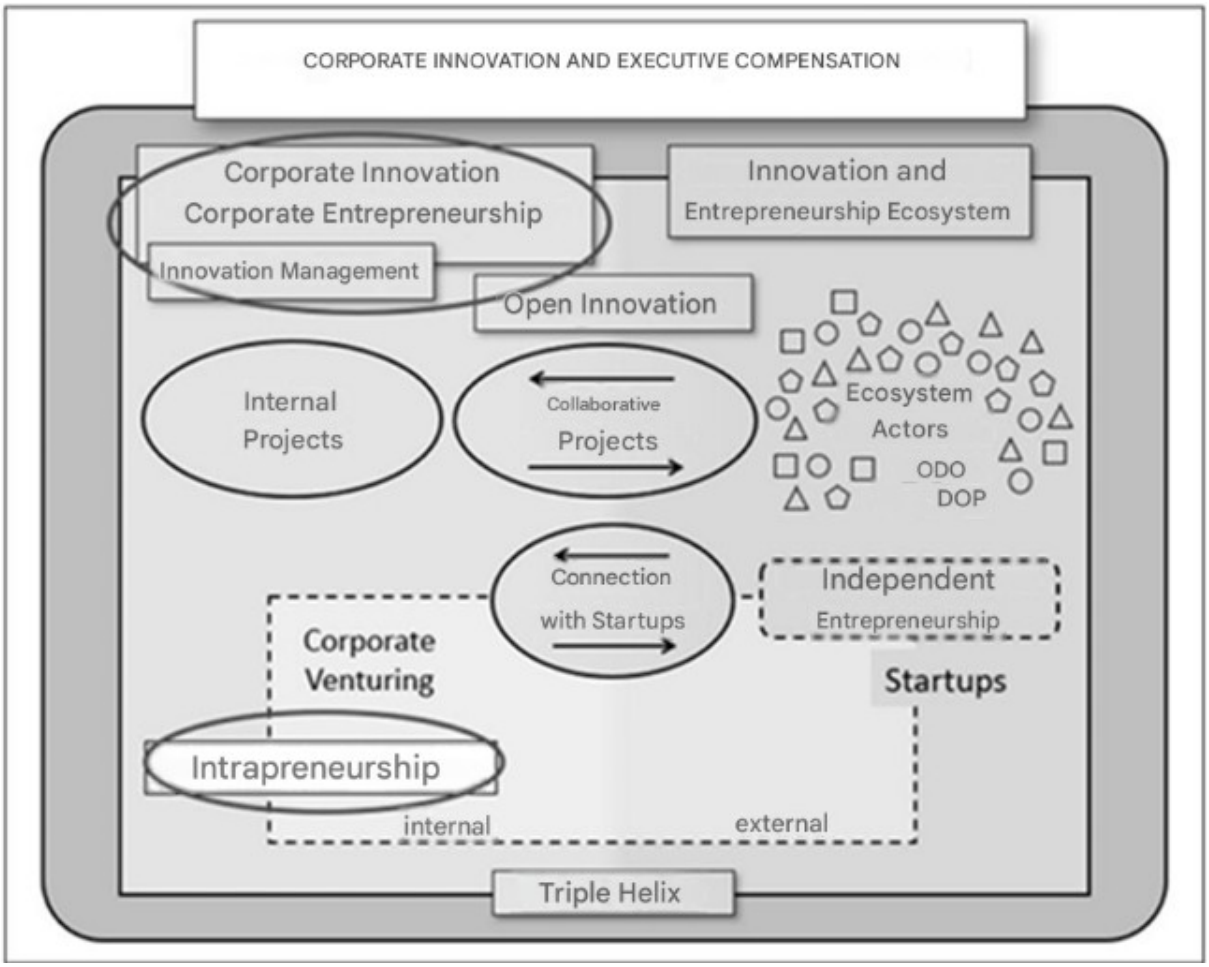

Figure 3 *Matrix Showing the Alignment Between Long-Term Incentives and Innovation Capacity*
Source: *Adapted from FlexMethod (2024).*

Figure 3 summarizes how different compensation approaches converge to mitigate agency conflicts, highlighting that the effectiveness of governance depends on the balance between immediate bonuses and equity compensation. In this context, Al Farooque et al. (2019) argue that executive equity ownership should be more strongly linked to investment in innovation than short-term compensation. Furthermore, based on the theoretical framework of Jensen and Meckling (1976) and Watts and Zimmerman (1986), it is concluded that substantial long-term incentives are necessary to align the agent's time horizon with that of the principal, with controlled risk-taking serving as the explanatory channel for the subsequent increase in innovation. The presented framework shows that the effectiveness of governance is not static but depends on the balance between immediate bonuses and equity ownership. Based on the theoretical framework of Jensen and Meckling (1976) and Watts and Zimmerman (1986), it is observed that this structure is essential for aligning the agent's time horizon with that of the principal.

Thus, the matrix demonstrates that controlled risk-taking serves as the explanatory channel for business sustainability, especially in internationalized companies that seek to meet global ESG standards and remain competitive (Xu et al., 2024). Consequently, companies use executive compensation as one of the most effective mechanisms to mitigate the agency problem (Jensen & Murphy, 1990), given the manager's role in overseeing R&D efforts (Celik & Tian, 2022). However, in internationalized Brazilian companies, this role is expanded: the

need to meet global Environmental, Social, and Governance (ESG) standards and technological competitiveness reinforces the adoption of long-term metrics to ensure business sustainability (Xu et al., 2024).

According to Terry (2023), short-term pressure on CEOs to meet profit targets can result in a drastic reduction in R&D investments. In addition to the previous discussions on the institutional environment, it is observed that, in the Brazilian context, this scenario is exacerbated by fluctuating political and tax issues. As argued by Barros et al. (2021) and Lazzarini et al. (2015), such uncertainties increase agency costs and may lead managers to sacrifice long-term innovation investments in favor of securing immediate accounting bonuses, as a defensive strategy to mitigate the risk of underperformance in a highly unstable environment.

In contrast, Beuren et al. (2020) and Manso (2011) emphasize that long-term compensation is the most effective strategy for shielding innovation from these fluctuations. Empirical evidence (Baranchuk et al., 2014; Shleifer & Vishny, 1997; Welker, 2015) demonstrates that long-term contracts act as a buffer against volatility, encouraging innovative projects. These findings corroborate studies suggesting that restricted stock and stock options have the potential to foster innovation (Flammer & Bansal, 2017; Lerner & Wulf, 2007). It can therefore be concluded that the balance between fixed and variable components, under the oversight of a management team attentive to internationalization and local tax specifics, is the key factor for success in high-risk environments. It can therefore be concluded that the balance between fixed and variable components, under the oversight of a governance structure attentive to internationalization and local tax particularities, is the determining factor for success in high-risk environments. The Integrated Framework presented in Figure 4 synthesizes this complexity by articulating the approaches and practices necessary to sustain corporate entrepreneurship.

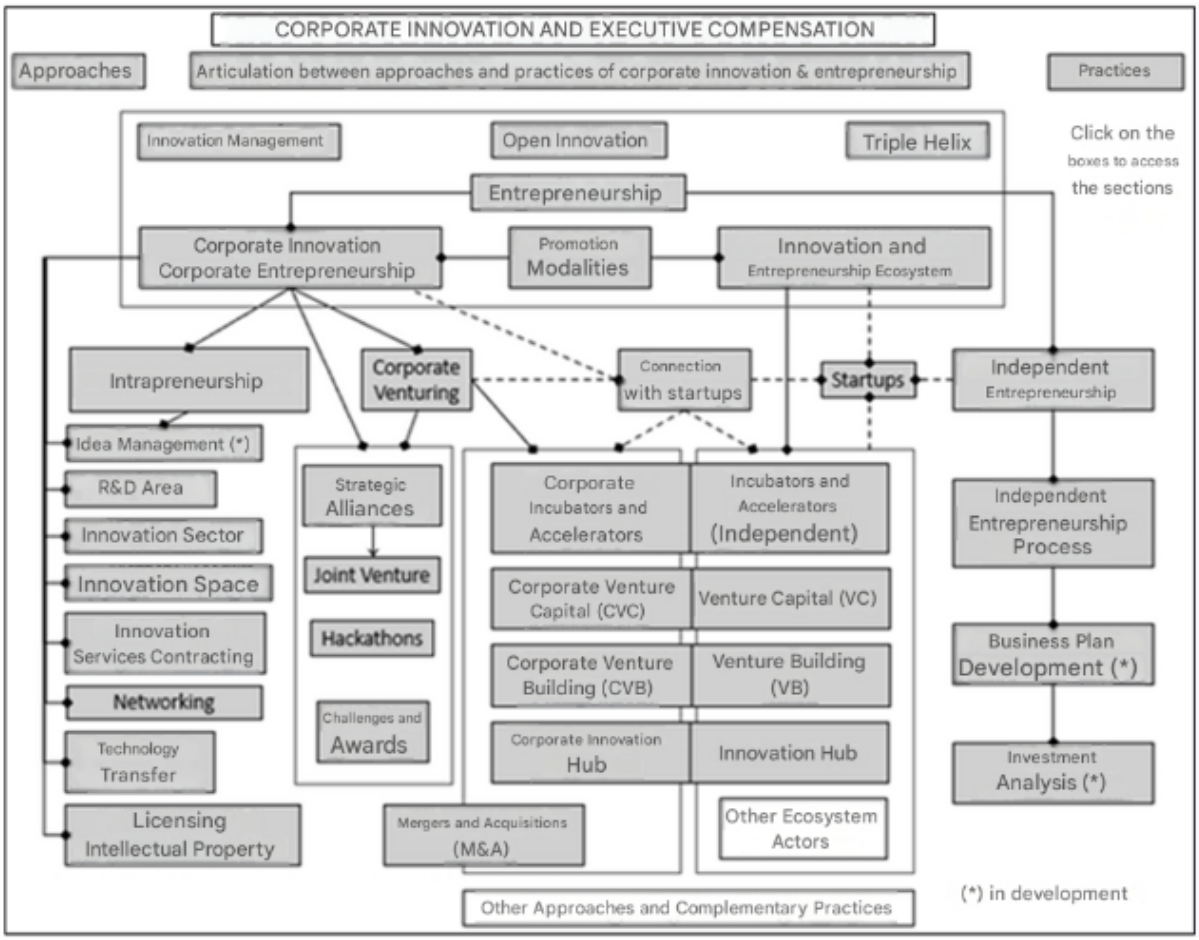

Figure 4: *Integrated Framework for Governance, Managerial Entrepreneurship, and Innovation*
Source: *Adapted from FlexMethod (2024).*

The framework illustrated in Figure 4 demonstrates that the effectiveness of governance depends on the connection between idea management and funding mechanisms, such as corporate venturing and strategic alliances. It is observed that the incentive system should act as a mechanism to foster entrepreneurship (Jensen & Murphy, 1990), integrating everything from intrapreneurship to partnerships with startups. This coordination aims to protect the interests of capital providers (Shleifer & Vishny, 1997), ensuring that technology transfer and investment analysis occur in a coordinated manner to mitigate agency costs and prevent emotional dysfunctions in the organizational environment (Grabner & Martin, 2021).

Figure 4 illustrates how governance must balance managerial entrepreneurship with the control of agency costs, especially in environments where internationalization requires rapid and innovative responses. In the context of corporate governance, the fundamental objectives of compensation packages are to protect the interests of capital providers and maximize shareholder wealth (Shleifer & Vishny, 1997). Therefore, the Ideal Contract Theory proposes that an efficient incentive system serves as a mechanism to foster entrepreneurship while limiting management's self-interest (Jensen & Murphy, 1990). However, the effectiveness of this contract is not automatic; one must consider that injustices in salary distribution can trigger negative emotions (Grabner & Martin, 2021), undermining the organizational climate necessary for creativity.

Thus, the financial incentive aims to encourage executives to place a greater emphasis on sustainable development. However, Han et al. (2017) found no evidence that variable

compensation, on its own, increases the amount invested in R&D. This finding suggests that moderating variables, such as political instability and local tax incentives (Lei do Bem), are key determinants for the bonus to actually result in innovation. According to Nguyen et al. (2018), the effectiveness of promoting innovation is intrinsically linked to the level of risk assumed. The allocation of resources to patents (Atalay et al., 2014; Landry & Callimaci, 2003) can be impacted by agency conflicts, in which managers adopt strategies for immediate financial stability at the expense of disruptive innovation. This risk aversion can lead to organizational fragmentation and negative cooperation (Fredrickson et al., 2010; Larkin et al., 2012), discouraging long-term investments. However, in internationalized firms, this fragmentation tends to be countered by global governance systems that reward technological efficiency over mere cost reduction. Exposure to the foreign market acts as a disciplining force, requiring that compensation be aligned with global competitiveness practices.

To summarize from the perspective of Agency Theory (Jensen & Meckling, 1976), managerial incentives directly influence strategic decisions. Executives with fixed compensation or compensation tied to short-term goals tend to prioritize immediate returns, reducing investments in R&D that have long and uncertain payback periods (Hall & Liebman, 1998). On the other hand, long-term incentive packages align managers' interests with strategic objectives, stimulating investment in innovation (Shleifer & Vishny, 1997). Thus, the relationship between compensation and innovation depends on the structure of incentives and the time horizon. Considering the literature reviewed and the need to align the agent's time horizon with that of the principal in an emerging market, the following hypotheses are formulated:

H1: Executives' fixed compensation is negatively correlated with R&D spending.

H2: Variable executive compensation is positively correlated with R&D spending.

3 Methodological Procedures

This study is classified as quantitative, descriptive, and documentary (Raupp & Beuren, 2006). In order to determine whether executive compensation affects R&D expenditures, we selected Brazilian medium-high and high-tech companies that reported R&D expenditures. To mitigate the risk of obsolescence in static classifications (based on 2002/2003 OECD data), this study adopted a dynamic validation criterion: the sample was confirmed by the actual and recurring presence of R&D expenditures reported in the Notes to the Financial Statements during the analyzed period (2010–2022). The choice of the sample is justified by the strategic engagement in innovation activities, where dependence on technology makes the investment decision a matter of survival (Gonçalves, 2017).

The time frame from 2010 to 2022 is justified by Brazil's adoption of IFRS, which ensures the comparability of accounting metrics, and also covers different economic cycles, including the period of the COVID-19 pandemic, which was controlled for in the model to isolate exogenous shocks in the investment decision. The final sample comprises 53 companies that met the criteria for data availability and technological relevance (Table 1).

Table 1
Sample filtration and selection process

Criterion	
Population: Companies listed on Brasil, Bolsa, Balcão (B3) for which compensation data was available on Refinitiv®	**286**

(-) Companies in the Financial Sector and Others	(42)
(-) Companies that do not fall under the classification of the Annual Industrial Survey (PIA)	(107)
(-) Companies for which data is not available in the Notes to the Financial Statements	(84)
= Study sample	**53**

Note: B3 = Brasil, Bolsa, Balcão; PIA = Annual Industrial Survey.
Source: *Survey data (2024).*

The innovation metric (Inov) focuses on R&D expenditures reported in the Notes to the Financial Statements for the fiscal year, rather than on the accumulated balance of intangible assets. This distinction is fundamental: the aim was to capture management's deliberate effort (investment flow) in the current year, reflecting the managerial decision to allocate cash to innovation, regardless of whether the final accounting treatment was capitalization or expense. This approach allows us to observe the direct impact of compensation policy on short-term decisions. The financial data were extracted from the Refinitiv® database, while compensation information was manually collected from the Reference Forms (FR). After collection, the variables were measured (Table 2).

Table 2
Study variables

	Dimension	Variable	Measurement	Authors
Dependent Variable	Innovation	R&D Investment (*Inov*)	Amount as stated in the notes (NE)	Chen et al. (2017); Kim et al. (2008); Tsao et al. (2015)
Independent variable	Executive Compensation	Fixed Compensation (RemF)	Fixed value on the Reference Form (FR)	Hallock et al. (2010)
		Variable Compensation (RemV)		
Control Variables	Control variables (*Control*)	Company Size (Tam)	Total Assets	Coelho (2016); Manzaneque et al. (2016)
		Return on Equity (ROE)	Net Income / Shareholders' Equity	Coelho (2016); Manzaneque et al. (2016)
		Capital Structure (EC)	Current Liabilities + Non-Current Liabilities / Total Assets	Cheng (2004); Subekti and Sumargo (2015)
		Return on Assets (ROA)	(Net Income / Total Assets) * 100	Coelho (2016); Manzaneque et al. (2016)
		Tobin's Q (QTOBIN)	Market Value of Capital / Replacement Cost of Capital	Zhou et al. (2021)
		Market to Book (MTB)	Market Value/Net Asset Value	Chen and Zhao (2006)

Note. Control = Control variables; EC = Capital Structure; FR = Reference Form; Inov = Investment in Research and Development (Innovation); MTB = *Market-to-Book;* NE = Notes to the Financial Statements; R&D = Research and Development; QTOBIN = Tobin's Q; RemF = Fixed Compensation; RemV = Variable Compensation; ROA = Return on Assets; ROE = Return on Equity; Tam = Firm Size.
Source: *Survey data (2024).*

As shown in Table 2, to measure the dependent variable, we chose to examine the innovation construct using the proxy of R&D expenditures reported in the notes to the financial statements (NFS). It should be noted that the variable captures expenditures recorded as expenses during the period and/or the flow of new investments, reflecting management's decision regarding resource allocation for the fiscal year, regardless of their subsequent capitalization. Compensation was segregated to test differentiated impacts. Regarding the explanatory variables of interest, fixed compensation (RemF) is associated with risk aversion and stability (security), while variable compensation (RemV) seeks to align interests (Jensen & Meckling, 1976; Murphy, 1999). The hypotheses are not redundant, as they test distinct mechanisms: H1 examines whether the comfort zone of fixed pay discourages innovation (managerial inertia), while H2 tests whether short-term financial incentives (bonuses) are sufficient to overcome the risk aversion inherent in R&D.

The inclusion of control variables aims to isolate the effect of compensation and mitigate the bias from omitted variables, which, according to the literature, influence technological intensity. Firm size (TAM) is controlled because larger organizations tend to have greater fundraising capacity and economies of scale, facilitating substantial investments in innovation (Zhou et al., 2021). Profitability (ROE and ROA) is included since the availability of internal resources (financial leeway) reduces dependence on external capital, which is generally more expensive for risky projects (Coelho, 2016). The capital structure (EC) controls the impact of indebtedness; high levels of debt can restrict R&D spending due to pressure from interest payments and creditor monitoring. Finally, growth opportunities and market value, measured by Market-to-Book (MTB) and Tobin's Q, are essential for aligning the analysis with the profile of medium- and high-tech companies, as classified by the OECD and the Industrial Innovation Survey (PINTEC), since they capture expectations of future profits derived from intangible assets.

The data were initially analyzed using descriptive statistics, which are essential for understanding the distribution, particularly the presence of outliers and negative values in compensation components (Fávero, 2015). The relationship was investigated using linear regression of panel data estimated by Generalized Least Squares (GLS). This method was chosen because it is robust in handling the heteroscedasticity and autocorrelation present in financial data, ensuring greater reliability of the estimators than the Ordinary Least Squares (OLS) method (Fávero & Belfiore, 2017)

To address the research question and control for the effects of intervening variables identified in the literature—such as capital structure and exogenous shocks (COVID-19)—the econometric models were defined as Model 1 (Test of H1) and Model 2 (Test of H2), represented by Equations 1 and 2, respectively.

$$Inov_{it} = \alpha_{it} + RemF_{it} + \sum \beta i * Control + \varepsilon_{it} \quad (1)$$

$$Inov_{it} = \alpha_{it} + RemV_{it} + \sum \beta i * Control + \varepsilon_{it} \quad (2)$$

Where: $Inovit$ refers to the corporate innovation variable, $RemFit$ – Represents the fixed compensation variable, $\sum \beta iit * Control$ – Represents the coefficient of the control variables and εit – Represents the regression error term and $RemVit$ refers to the coefficient of the independent variable related to variable compensation (short term).

$$Inov_{it} = \alpha_{it} + RemV_{it} + \sum \beta i * Control + \varepsilon_{it} \quad (2)$$

In order to present and analyze the linear relationship between the variables, a normality test (Skewness-Kurtosis) was conducted. Since the variables do not follow a normal distribution, we opted for Spearman's correlation coefficient, a nonparametric method that is more robust to asymmetric distributions and the presence of outliers (Fávero & Belfiore, 2017). Additionally, specification tests (Hausman) were conducted to choose between fixed-effects and random-effects estimation, and multicollinearity tests (VIF) were performed to ensure the adequacy of the econometric model (Fávero, 2015).

Before selecting the best regression model, econometric tests were conducted to ensure the robustness of the estimators. Table 3 lists the tests and their results:

Table 3
Results of the validation tests for the estimation models

Tests	Test Statistics Values	Selected Model
Chow's Test	Prob>F = 0.0000	Fixed effects
Breusch-Pagan Test (LM)	Prob> χ^2 = 0.000	Random Effects
Hausman test	Prob> χ^2 = 0,8955	Random Effects

Note: LM = Lagrange multiplier (*Lagrange Multiplier*); Prob = Probability value (*p-value*); χ^2 = Chi-square statistic.
Source: *survey data (2024).*

After conducting the tests, the Hausman test indicated that the null hypothesis cannot be rejected, leading to the conclusion that the most appropriate method is the Panel Data model with Random Effects (GLS).

4 Results and Analysis

4.1 Descriptive analysis

Since descriptive statistics provide a detailed overview of the variables analyzed, Table 4 lists the metrics for the continuous variables on a logarithmic scale (ln), a technique used to reduce skewness and mitigate the impact of outliers that could influence the econometric modeling.

Table 4
Descriptive statistics for the main continuous variables

Variables	Average	Standard Deviation	Minimum	Maximum
***ln* Inov**	18.89	1.15	14.56	20.71
***ln* RemF**	15.56	0.98	9.07	16.65
***ln* RemV**	14.62	1.04	0.00	15.99
***ln* TAM**	22.97	1.28	19.01	24.73
ROE	0.17	1.25	-54.52	20.80
EC	0.62	0.17	-0.42	1.57
ROA	0.04	0.07	-0.42	0.41
QTOBIN	1.86	2.83	0.44	46.27
MTB	2.30	6.59	-2.43	113.60

Note. ln Inov = Logarithm of R&D Expenditures; *ln* RemF = Logarithm of Fixed Compensation; ln RemV = Logarithm of Variable Compensation; ln TAM = Logarithm of Total Assets; ROE = Return on Equity; EC = Capital Structure; ROA = Return on Assets; QTOBIN = Tobin's Q; *MTB = Market-to-Book.*

Source: *survey data (2024).*

As shown in Table 4, the variable ln Inov has a mean of 18.89. The range between the minimum (14.56) and the maximum (20.71) indicates disparities not only in company size but also in R&D accounting treatment. While some firms choose to capitalize these expenses (preserving the net income for the period), others record them as immediate expenses, altering the calculation basis for executive compensation. Regarding ln RemF (Fixed Compensation), the average of 15.56 indicates the maintenance of a stable contractual basis. From the perspective of Behavioral Agency Theory (Wiseman & Gomez-Mejia, 1998), this portion aims to mitigate the executive's loss aversion in the face of innovation risks. For ln RemV (Variable Compensation), the minimum value of 0.00 reflects the absence of unpaid bonuses or bonus adjustments in certain fiscal years, suggesting that incentives are contingent on performance net of accounting adjustments, which may impact the perception of short-term alignment.

In addition, Table 5 presents the distribution of the sample's categorical variables, focusing on the frequency during the pandemic period.

Table 5
Descriptive statistics for categorical variables

Categorical Variables	Frequency	Percentage (%)
Covid-19		
Pre-Pandemic Period (2010–2019)	468	75,0%
Pandemic Period (2020–2022)	156	25,0%

Source: *survey data (2024).*

The data reveal significant heterogeneity in the sample. Interpreting these results in light of Jensen and Meckling (1976) calls for caution: if R&D is capitalized, it does not reduce immediate profits, allowing the CEO to invest without sacrificing his short-term compensation. However, if treated as an expense, the agency conflict intensifies. As for market metrics, the average QTOBIN (1.86) indicates that, even considering the systemic shock of Covid-19 (representing 25% of the sample in Table 5), the market continued to value these companies above book value, aggressively pricing in future growth opportunities linked to intangible assets.

4.2 Correlation coefficient matrix

Table 5 presents the Spearman correlation matrix.

Table 5
Correlation coefficient matrix

	inov	**remf**	**remv**	**TAM**	**ROE**	**EC**	**ROA**	**Qtobin**	**MTB**
inov	1								
remf	0.505	1							
remv	0.408	0.346	1						
TAM	0.828	0.582	0.391	1					
ROE	0.081	-0.006	0.005	0.000	1				
EC	0.134	0.100	0.103	0.163	0.078	1			
ROA	0.0431	-0.018	-0.002	-0.025	0.756	-0.303	1		
Qtobin	-0.069	0.048	0.120*	-0.173	0.322**	0.055	0.278	1	

MTB	0.081	0.174	0.265	0.014	0.294**	0.077	0.302	0.669	1

**The correlation is significant at the 0.01 level. *The correlation is significant at the 0.05 level.
Note: inov = Research and Development Expenditures (Innovation); remf = Fixed Executive Compensation; remv = Variable Executive Compensation; TAM = Company Size; ROE = Return on Equity (*Return on Equity*); CS = Capital Structure; ROA = Return on Assets (*Return on Assets*); Qtobin = Tobin's Q; MTB = *Market-to-Book*. * The correlation is significant at the 0.05 level. ** The correlation is significant at the 0.01 level.
Source: *survey data (2024).*

Based on Table 5, we first observe a strong positive correlation between Inov (R&D expenditures) and TAM (size), with a coefficient of 0.828. This supports the Schumpeterian view that larger firms have more resources and organizational flexibility to bear the costs and risks of innovation. When analyzing the incentive variables, it is noted that innovation shows moderate correlations with both Fixed Compensation (RemF) and Variable Compensation (RemV). However, the coefficient for Fixed Compensation (0.505) is higher than that for Variable Compensation (0.408). From the perspective of Behavioral Agency Theory, this suggests that the security provided by a fixed salary may be a more stable motivator for innovation than bonuses, as it mitigates the executive's risk aversion, allowing them to invest in long-term projects without fearing an immediate loss of income.

On the other hand, the Inov variable has a very low correlation with ROE (0.081) and a negative correlation with Tobin's Q (-0.069). This result, which may seem counterintuitive for high-tech companies, can be explained by the accounting treatment of R&D: when recorded as an expense, investment in innovation reduces immediate accounting profit, negatively impacting profitability indicators in the short term. Furthermore, the negative correlation with Tobin's Q may reflect market uncertainty (especially in the post-pandemic scenario) regarding the realization of returns on these intangible investments. As for financial control variables, CS (Capital Structure) shows a low correlation with innovation (0.134), indicating that, in this univariate analysis, the level of indebtedness does not appear to be the main determinant of R&D spending.

These preliminary results point to the complexity of aligning compensation practices with innovation. The simple correlation suggests that salary size and security (fixed pay) go hand in hand with R&D. However, to isolate the actual effect of incentives and control for factors such as capital structure and the Covid-19 shock, the multivariate analysis presented in the regression section below is necessary.

4.3 Regression Results

Table 6 shows the results of the regressions for Models 1 and 2.

Table 6
Results of the Regression Models

Variable	**Dependent variable:** *Inov (Random Effects)*	
	(1)	**(2)**
RemF	0.10	
	(0.04)	
RemV		0.17
		(0.03)
TAM	0.72	0.71
	(0.02)	(0.02)
ROE	-0.00	-0.03
	(0.01)	(0.04)
EC	0.16	0.57

	(0.10)	(0.29
ROA	0.53	1.39
	(0.39)	(0.78)
TOBINQ	-0.003	0.003
	(0.01)	(0.04)
MTB	0.01	0.001
	(0.00)	(0.016)
Covid-19	0.08	-0.08
	(0.12)	(0.13)
R^2 *Overall*	0.6507	0.6765
Significance of the model	0.000	0.000
Number of observations	624	582

Note. Standard errors are shown in parentheses. EC = Capital Structure; Inov = Innovation; MTB = *Market-to-Book;* RemF = Fixed Compensation; RemV = Variable Compensation; ROA = Return on Assets; ROE = Return on Equity; TAM = Firm Size; TOBINQ = Tobin's Q. * Significant at the 0.10 level. ** Significant at the 0.05 level. *** Significant at the 0.01 level.
Source: *Survey data (2024).*

Analysis of Model 1: Fixed Compensation and Managerial Security The coefficient for fixed compensation (RemF) was positive (0.10) and significant. This finding is directly consistent with Behavioral Agency Theory (Wiseman & Gomez-Mejia, 1998). Contrary to the classical view that fixed pay leads to inertia, in high-tech and uncertain environments, fixed pay acts as a safety net. By ensuring the agent's financial stability, the firm reduces their loss aversion, encouraging commitment to long-term innovation policies. The control variables CS (Capital Structure) and Covid-19 were not statistically significant. As detailed in the methodology, the inclusion of these variables aimed to control for financial constraints and exogenous shocks. The lack of significance suggests that the decision to innovate in this sector is resilient: it is driven predominantly by Size (TAM)—confirming the Schumpeterian hypothesis that large firms possess the necessary resources—and is independent of momentary fluctuations in debt or health crises.

In Model 2, Variable Compensation (VC) showed a positive (0.17) and significant relationship with innovation, a result that at first glance contradicts the managerial myopia hypothesis (H2). To interpret this finding, it is necessary to consider the accounting treatment of R&D. The classical view of Jensen and Meckling (1976) assumes that R&D expenditures reduce immediate profits, thereby harming the manager's bonus. However, the positive result suggests that the companies in the sample may be using the prerogative of CPC 04 (IAS 38) to capitalize development expenses. When R&D is capitalized, it does not appear in the income statement as an expense but is recorded as an Intangible Asset. This accounting choice shields the executive's bonus: he can invest in innovation (increasing the company's value and his future compensation) without suffering the penalty of reduced short-term profit. Therefore, the positive relationship indicates that variable incentives work, provided they are mediated by accounting choices that align the agent's horizon with that of the principal. The significant Market-to-Book (MTB) variable reinforces that the market prices these growth opportunities. Thus, the compensation structure of Brazilian technology companies appears to have found a balance where both security (fixed) and incentive (variable/adjusted for capitalization) converge to foster innovation.

5 Concluding Remarks

The objective of this study was to analyze the influence of executive compensation on innovation investments by medium- and high-tech companies listed on the Brazilian stock

exchange. By comparing the premises of classical Agency Theory with the reality of Brazilian companies, the results revealed a complex scenario in which both fixed and variable compensation act as drivers of innovation, refuting the hypothesis of managerial myopia associated with short-term incentives. The findings indicate that fixed compensation plays a role in providing psychological security for the agent. In line with Behavioral Agency Theory, it is concluded that ensuring a robust base salary mitigates executives' risk aversion, encouraging them to invest in long-term projects.

At the same time, the positive relationship found between variable compensation and innovation suggests that agency conflict is moderated by accounting geography: the regulatory flexibility that allows for the capitalization of R&D expenses (as intangible assets) offsets the negative impact on short-term profits, enabling managers to invest in innovation without sacrificing their annual bonuses. However, this study is not without methodological limitations. The main constraint relates to the nature of the secondary data extracted from financial statements. The presence of negative values in variable compensation indicates that public data capture ex-post adjustments (such as clawbacks and reversals), which do not necessarily reflect the original design of incentive contracts. Furthermore, the econometric model did not explicitly distinguish between companies that capitalize R&D and those that expense it, inferring this behavior through aggregate results. The sample, restricted to companies listed on the Brazilian stock exchange, also limits the generalizability of the findings to the universe of privately held companies or early-stage startups.

For future research, we recommend conducting a more in-depth analysis from the perspective of Accounting Geography, segmenting the sample into companies that capitalize R&D expenses versus those that recognize them as expenses, in order to test whether the sensitivity of variable compensation varies depending on the accounting treatment chosen. It is also suggested that qualitative studies be conducted to assess the conditional clauses (triggers) in compensation contracts, investigating whether there are non-financial targets—such as the achievement of critical project milestones—that explain the positive correlation observed between short-term bonuses and innovation. Finally, the inclusion of corporate governance metrics and a comparison with other Latin American markets could offer a broader perspective on how the institutional environment moderates this relationship.

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