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YÚRI VIANA DA MOTA

DISCLOSURE AND PANDEMIC RISK: ANALYSIS OF DISCLOSURE ABOUT PANDEMIC RISK BY HEALTH INSURANCE COMPANIES IN BRAZIL

Recife
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Dissertação apresentada ao Programa de Pós-Graduação em Ciências Contábeis da Universidade Federal de Pernambuco, Centro Acadêmico CCSA, como requisito para obtenção do título de mestre em Ciências Contábeis. Área de concentração: Informação Contábil.

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I dedicate this dissertation to little Daniel Moraes da Mota, who was born while his father alternated between sleepless nights due to academic activities and the blessing of fatherhood. To the small, immeasurable and wonderful gift of the Creator and Lord over all things.

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I thank the Lord and His Holy Spirit that are “my glory and the lifter up of mine head” (Psalm 3:3) and my conducer in my instabilities and weaknesses. The owner of all wisdom and enlightenment.

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RESUMO

O presente estudo versa sobre a realidade de divulgação contábil das operadoras de planos de saúde (OPS) no Brasil em virtude da ocorrência da pandemia e do crescente risco de uma nova pandemia (risco pandêmico). A dissertação fruto deste estudo teve objetivo de relacionar a realidade pandêmica com a teoria contábil da Divulgação, utilizando-se principalmente do desenvolvimento efetuado por Verrecchia (2001), na categoria “Divulgação baseada em eficiência”. O desenvolvimento desta teoria sugere a necessidade de uma maior divulgação contábil para um ponto de equilíbrio ótimo entre o ganho do empresário e o ganho do investidor, reduzindo a assimetria de informação em casos de aumento da probabilidade de ocorrência de choques de liquidez. Buscou-se identificar se a pandemia trouxe algum tipo de impacto significativo no risco ou retorno das empresas operadoras de planos de saúde situadas no Brasil.

Utilizou-se para tal uma abordagem de pesquisa exploratória com horizonte temporal longitudinal, pois examina um período de cinco anos e meio e incorpora o impacto da pandemia da COVID-19. A relação das variações com o momento pandêmico foi efetuada com base no horizonte temporal de acontecimento da pandemia no território brasileiro, a despeito dos diferentes momentos de começo da pandemia nos diferentes países do mundo. A análise revelou que as operadoras de planos de saúde no Brasil em geral tiveram sua lucratividade afetada pelo momento pandêmico e que essas variações observadas tem estreita relação como momento pandêmico. O risco aferido por meio do Capital Baseado em Risco (RBC) não teve variações explicadas pelo momento pandêmico, antes as suas variações foram explicadas pelo tamanho da empresa bem como pela modalidade empresarial dessas organizações. As variações observadas na rentabilidade por conta do momento pandêmico, fazem com que esse evento seja caracterizado como “choque de liquidez”. No entanto as variações observadas não foram suficientes para fazer com que as divulgações das OPS fossem afetadas conforme previsto na teoria contábil. Não se observou divulgação sobre o risco pandêmico, exceto na única operadora de capital aberto do segmento, todavia esta empresa não apresenta um plano de enfrentamento a esse risco. Os resultados da pesquisa mostram o uso do silêncio nas divulgações contábeis como ferramenta de legitimação por parte das empresas. O uso teórico da divulgação baseada em

eficiência aponta para a necessidade de maiores divulgações sobre o risco pandêmico nas empresas operadoras de planos de saúde no Brasil.

Palavras-chave: Risco pandêmico; Teoria da Divulgação; Choque de liquidez; Planos de saúde; Lucratividade.

ABSTRACT

This study focuses on the reality of accounting disclosure by healthcare insurance (HCI) companies in Brazil due to the occurrence of the pandemic and the growing risk of a new pandemic (pandemic risk). The dissertation resulting from this study aimed to relate the pandemic reality with the accounting theory of Disclosure, using mainly the development carried out by Verrecchia (2001), in the category “Disclosure based on efficiency”. The development of this theory suggests the need for greater accounting disclosure to achieve an optimal balance point between the entrepreneur's gain and the investor's gain, reducing information asymmetry in cases of increasing probability of liquidity shocks occurring. We sought to identify whether the pandemic had any type of significant impact on the risk or return of HCI companies located in Brazil.

An exploratory research approach with a longitudinal time horizon was used for this, examining a period of five and a half years that incorporated the impact of the COVID-19 pandemic. The relationship between variations and the pandemic moment was made based on the time horizon of the pandemic occurring in the Brazilian territory, in view of the different pandemic start times in different countries of the world. The analysis revealed that healthcare insurance companies in Brazil in general had their profitability affected by the pandemic and that these observed variations were closely related to the pandemic. The risk measured through Risk-Based Capital (RBC) had no variations explained by the pandemic, rather its variations were explained by the size of the company as well as the business type of these organizations. The variations observed in profitability due to the pandemic moment, cause this event to be characterized as a “liquidity shock”. But these variations were not sufficient to cause HCI companies’ disclosures to be affected, as predicted in accounting theory. No disclosure was observed about the pandemic risk by the companies, except in the only publicly traded company in the segment. However this company did not present a plan to face this risk. The findings show the use of silence in disclosures as a tool to improve the legitimacy of companies, despite the increase of risks for companies. The theoretical use of efficiency-based disclosure shows the necessity of improving disclosures about pandemic risk by healthcare insurance companies in Brazil.

Keywords: Pandemic risk; Disclosure theory; Liquidity shock; Healthcare Insurance; Profitability.

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LISTA DE ABREVIATURAS E SIGLAS

ANS	Suplementary Health National Agency (Agência Nacional de Saúde Suplementar)
RBC	Risk Based Capital
COVID	*Corona Virus Disease*
ERM	Enterprise Risk Management (Gestão de risco empresarial)
HCI	Healthcare Insurance
ROI	Return on Investment
ROE	Return on Equity

Summary

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1. INTRODUCTION

Companies are increasingly sensitive to risks that need to be well managed, otherwise companies and the entire market will suffer from anomalies generated by management that is inattentive to these emerging demands. The COVID-19 pandemic affected the entire global society and had its effects on companies, with a drop in global economic activity in 2020 based on data published by the International Monetary Fund (IMF, 2021). Some companies experienced a positive impact that led to high profits and company appreciation even for the post-pandemic period, while some companies were seriously harmed, leading to the closure of activities or economic damage of such magnitude that it will take a long time to recover (Hayes and Jung, 2022; Ribeiro, Silva, Pires and Souza, 2023; Rosa, Meneses and Carvalho, 2022).

The general objective of the present study is to verify how healthcare insurance companies and their accounting disclosures were affected by the pandemic panorama, observing the changes in profitability of these companies before and during the pandemic (2018 - 2020) and after the pandemic (2021 – 3st Quarter of 2023). To achieve this general objective, the study will focus on the following specific objectives: 1) Identify the occurrence of variations (positive or negative) in the profitability and risk of these companies; 2) Check the existence of a relationship between these variations and the pandemic event; 3) Indicate whether these variations affected the disclosure of accounting information about the pandemic and understand the observed relationship with disclosure theory.

The present study maintains its social relevance in the discussion about the health plan business sector, which in Brazil covers approximately a quarter of its population (50.8 million people according to ANS data from 09/2023, available at the website of the regulatory agency (24/01/2024): https://www.ans.gov.br/images/stories/Materiais_para_pesquisa/Perfil_setor/sala-de-situacao.html) and which in the world has proved to be a good market alternative to guarantee access to healthcare. This branch of business is studied in the context of a recent global event that affected the entire world economy, showing itself as a current and emerging theme of social dynamics with direct implications for business activity.

The theoretical relevance of this study is found in the application of Disclosure Theory (Verrecchia, 2001) to the specific context of healthcare insurance. In particular, it aims to investigate the relationship between disclosure about pandemic risk and the developments of voluntary disclosure theory (Dye, 1985) in light of the third category (Verrecchia, 2001, p. 99) of research on disclosure in accounting, which Verrecchia labels “efficiency-based disclosure”, where the author examines the conditions for “choosing unconditional disclosure” (Verrecchia, 2001, p. 100). The study brings into discussion the “disclosure paradox” (Marshall, 1974, p. 382) and highlights its specific observations in the pandemic context of the business sector studied.

The practical relevance of this study is found in its investigation of the practice of corporate disclosure about the emerging pandemic risk and purposing specific treatment for this information in entities of healthcare insurance with consequences for the profitability of these entities.

2. DEVELOPMENT

2.1. Risk Management

2.1.1. Enterprise Risk Management (ERM)

The lack of risk management in business has been identified as a harmful factor for companies, especially insurance companies, as is evident in the theoretical framework presented by Nguyen and Vo (2020). As presented by the authors, the “financial strength of companies” is directly linked to “corporate governance and financial difficulties” (p. 4), as seen in previous studies. Figueira-de-Lemos and Hadjikhani (2014; apud Sharma *et al*, 2020), warn that “managing uncertainty involves reducing the probability of undesirable results and their impact on business at the various stages of the value chain” (p. 4).

Additionally, business risk management needs to be considered from the perspective of disclosing information and contributing to the growth of company value. Oniovosa and Godsday (2023) study this relationship in banking institutions in the sub-Saharan context and identify a significant and positive correlation between the disclosure of ERM information and the growth in company value.

The synthesis of perspectives presented by the authors suggests that Enterprise Risk Management (ERM) and its disclosure have a direct effect on the company’s value. The impact of the absence of ERM and good disclosure about ERM

has also been strongly observed in companies, for example, in underestimated environmental risk events such as Deepwater Horizon (2010) and Brumadinho (2019), loss of value due to case identification of corruption at Petrobras (2017) and Wirecard (2020), market strategy misaligned with emerging risks at Kodak and Blockbuster and, finally, concealment of information to manipulate the company's risk calculations at AIG (2005).

All of these cases had a high impact on the value of these companies and great losses for the global economic society. This makes clear the need for research involving risk management and company value, not only to identify past impacts, but to identify possible ways to mitigate risks prospectively, reducing the asymmetry of information about real and potential risks. According to the Global Risk Management Survey (Caldwell, 2021), companies have woken up to the need for risk management, which can be observed through practices such as:

- Adherence to hiring professionals for the position of CRO (Chief Risk Officer): 100% of the institutions participating in the research had the position or its equivalent;
- 82% of respondents reported that their boards were spending more time on risk management compared to two years previously;
- 58% of institutions participating in the survey delegated primary responsibility for risk management oversight to a board risk committee.

In this survey, companies also expressed their concerns about non-financial risks. The top three macrotrends cited that were expected to increase in importance for respondents' institutions over the next two years were: *the global financial crisis* (48%), *global pandemics* (42%), and *deteriorating credit quality* (39%), with the pandemic risk being the most cited (27%) as number one (Appendix A).

2.1.2. Risk management in health insurers

The Supplementary Health Agency (ANS) has always worked with the aim of guaranteeing medical assistance to customers, so that the market is not affected by the segment's lack of credibility. To achieve this objective, the agency has regulated management practices – paying attention to risk management by health insurers. For this risk control, the regulatory body adopted the best international practices with regards to risk management. The theoretical-conceptual bases of the ANS Risk

Management Manual are the ISO 31000, ISO 31010 and COSO3 standards, based on the principles and methodologies established in the Basel Accords.

According to Lima (2018, p.12), one of the three main contributions of the first Basel Agreement was the calculation of Regulatory Capital, which, in the health insurance segment, is called Risk-Based Capital (RBC). This indicator was incorporated into companies operating in the financial market and, recently, into health insurers.

RBC measures the company's overall risk by evaluating specific risks: market risk, credit risk, underwriting risk and operational risk. All of these parts of the risks are affected, directly or indirectly, by the effects of a pandemic. Therefore, it is necessary to assess how much the pandemic has affected companies' risk levels.

The research question we intend to investigate is whether the fluctuation in risk levels is correlated with the fluctuation in the value of companies. The calculation of RBC in health insurers is defined by Normative Resolution No. 569 (12/19/2022) and the annexes to this normative resolution are found in Appendix B.

2.1.3. Pandemic Risk

As previously seen in the Global Risk Management Survey, pandemic risk is a growing concern in companies, especially in entity risk management (Jonas, 2014). The low frequency of the event has meant that the occurrence of these events is disregarded in the publications of the entities' financial statements. However, the high financial impact of this event should justify the publication of this risk mitigation plan in cases of new pandemics.

Roberts et al (2023, p. 1745) present new perspectives on the frequency of pandemics:

> "Actuarial reports from organizations such as the European Actuarial Advisory Group have sought to provide information about the risk of a pandemic outbreak. One such report states that the probability of no pandemics in the next ten years is less than 20 percent (European Actuarial Advisory Group, 2006)".

This study aims to give voice to the criticisms of Roberts et al (2023) by investigating the disclosure of pandemic risk, applying the study to the companies that operate health plans in Brazil, under the perspective of continuity by the value of profitability of these companies. According to that author, "a closer examination of

insurance company disclosures showed that their focus was less on how pandemics could affect business continuity and more on the potential losses that could arise from insurance claims" (p. 15). This common perspective among insurance companies does not meet society's desire for business continuity to provide services to users.

Rizwan et al (2020), in their analysis of eight major global economies greatly affected by the pandemic (China, Canada, France, United States, Germany, Spain, Italy and United Kingdom), drew attention to how the pandemic has generally increased systemic risk for organizations due to increased liquidity and default risks, as well as reduced revenue.

2.2. Disclosure Theory

The Disclosure Theory, as summarized and developed by Verrecchia (2001) has historically focused on:

- Association-Based Disclosure: "how exogenous disclosure is associated with, or related to, the change or disruption in the activities of investors who compete in capital market settings as individual, welfare-maximizing agents" (Verrecchia, 2001, p. 99). These changes are typically associated with stock prices and trading volumes;
- Disclosure based on discretion: This investigates "how managers and/or firms exercise discretion with regard to the disclosure of information about which they may have knowledge" (Verrecchia, 2001, p. 99). Therefore, it considers information under the endogenous environment of disclosure;
- Efficiency-Based Disclosure: This category "discusses which disclosure arrangements are preferred in the absence of prior knowledge of the information, that is, ex ante" (Verrecchia, 2001, p. 99). In other words, this examines the "unconditional" or preferable "disclosure choices" in a market context where welfare-maximizing actions are taken by individuals.

Verrecchia's (2001) third category seeks to address the type of disclosure desirable for healthcare insurance companies in a pandemic context and analyze the disclosure observed from this perspective.

Given the importance of the search for efficiency in economic and management sciences, as is evident in accounting research over time (Verrecchia,

2001; Hughes & Pae, 2004; Fields, Lys and Vincent, 2001; Watts & Zimmerman, 1986; Ng, 1977) it is necessary to verify the efficient accounting information of healthcare insurance in light of good theory and the perspective of desirable information to generate efficiency.

The concept of efficiency has been worked economically in order to generate a market configuration that improves the conditions of all individuals in a pure exchange market, as developed by Pareto according to Ng (1977). However, given the complexity of the reality and diversity of the market, it is practically impossible for disclosure to generate such efficiency in the market that all participants benefit, as highlighted by Verrecchia (2001). Thus, the aforementioned author continues working on the idea of efficiency in accounting disclosure from the perspective of imperfect competition as a component of the cost of capital, to face the “disclosure paradox”. This paradox consists of the observation that increased disclosure brings few benefits in a pure exchange market context, as individuals have the necessary information to make decisions, and furthermore, it was realized that more information left market participants risk averse – inhibiting them from making decisions and transactions, and consequently reducing the volume of transactions in the market. This is evident in the business preference to publish “good news” regarding results and transactions and to suppress “bad news”, as evidenced in studies by Hughes and Pae, 2004; Hutton *et al*, 2003; Brown and Kim, 1993; Skinner, 1994; Bamber and Cheon, 1998.

Verrecchia (2001) connects the idea of efficiency with information asymmetry, translating it as a component of the cost of capital, since when individuals do not receive information about the entity, they discount the perception of a lack of information when carrying out transactions in the market. This discount is not interesting for companies that seek greater security for investors to invest their capital in the company. Therefore, companies should commit to a higher level of disclosure, reducing information asymmetry and, consequently, the cost of capital. However, there is a desirable limit to increasing disclosure, as this has costs for the company.

To identify the extent to which increased disclosure brings benefits to the entrepreneur and investor, Verrecchia (2001) proposes the following equation that is worth highlighting:

$$Q(q) = \frac{C + \left[\frac{(k-q)}{2k}\right] t\lambda(q)}{R(q)}$$

$$R(q) = (1/9k)(\alpha^2 k + \beta^2 \left(\frac{3}{4}k^3 - \frac{5}{12}q^3\right))$$

Where:
$Q(q)$ =Investor expected return
C = Investor capital
k = Total (or maximum) information
q = Available information
α = Constant
β = Constant
t = Probability of a liquidity shock occurring
$\lambda(q)$= Variation in information "q"
R(q) = Entrepreneur's expected revenue

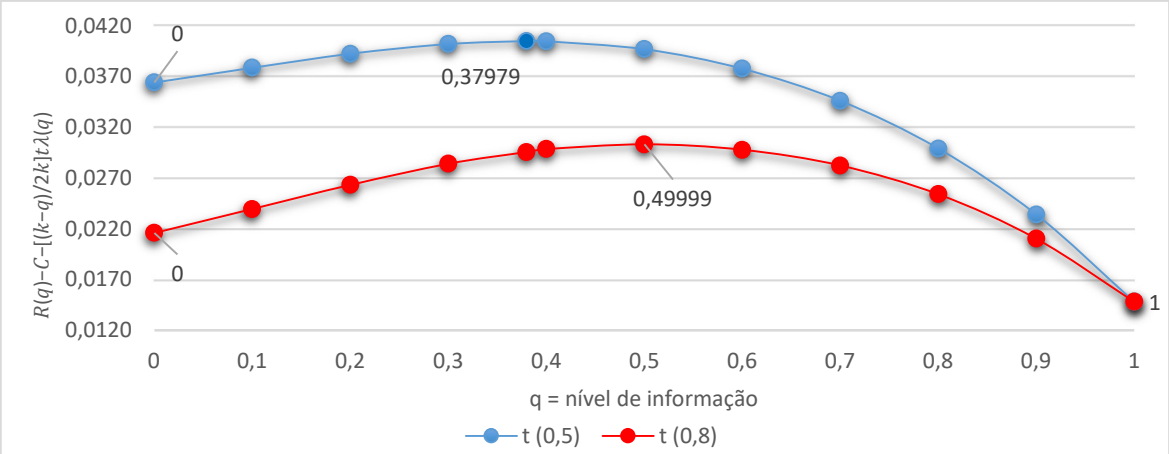
If we observe carefully, the closer the available information (q) is to the maximum possible information (k), the lower the probability of generating impacts from the occurrence of an event that causes a liquidity shock (t), since in theory, market participants have good information available that mitigates risks or that aligns market participants with the same vulnerability. Consequently, the further away from maximum (or ideal) information, the greater the effect of liquidity shocks on the investor's revenue expectation (Q(q)).

From a business perspective, the entrepreneur's revenue expectation (R(q)) is not a function that encompasses the probability of a liquidity shock occurring (t). However, it is affected to a certain extent by the level of disclosure (q), which is inversely proportional to the probability of liquidity shocks occurring (t). Therefore, the entrepreneur's revenue expectation is to some extent affected by the probability of liquidity shocks occurring. Thus, there is an incentive for the company to disclose some information about events that have a high impact on the company's liquidity, under penalty of suffering from the increase in the cost of capital resulting from information asymmetry.

As can be seen in graph 1, as Verrecchia uses the function $R(q) - C - [(k-q)/2k]t\lambda(q)$ to identify the maximization of the result for the entrepreneur with the reduction of the cost related to information asymmetry, the maximization of the result for the entrepreneur happens at the point where *q* causes the graph to reach its maximum point.

In Verrecchia's calculation, where the probability of a liquidity shock (*t*) is equal to 50%, this happens at the point *q*=0,37979. However, with the change in the probability of a liquidity shock to 80% (predicted probability of a new pandemic occurring in the next 10 years), the optimal information point is shifted to the point *q*=0,49999. In other words, the increase in the probability of a liquidity shock causes the ideal use resulting from the reduction in costs related to information asymmetry to be displaced towards a greater need for information disclosure.

Graphic 1 – Relation between maximization of entrepreneurs' returns and the disclosure level (*q*)



Source: Author (2024)

It is observed too in graph 1 that the entrepreneur's approach tends to be the same in the case of full disclosure ($q = k = 1$) independent of risk of liquidity shock level, but in any other case ($q < 1$), at the greater probability of liquidity shock, the general approach tends to be smaller, once the market is risk adverse and tends to apply the discount related to information asymmetry.

In this work, the purpose is to investigate whether healthcare insurance companies suffered a strong impact on their liquidity, measuring liquidity using the profitability indicators since the pandemic period.

The disclosure theory works mainly with observations of market behavior primarily with publicly traded companies. Between the companies observed in this study just one company is a traded company. Despite this, the theory has applicability because of the strong presence of companies such as cooperatives that dominate the market (45% of all companies of study, most representative modality) and that are not

“completely closed” (to a specific group that can be part of these cooperatives: the doctors, in this case).

The cooperatives have some similarities with the traded companies. First, the interest to be a partner (cooperative) based on profit performance and profit capacity of the company is similar to the market interest, as evidenced by the research of Cabaleiro-Casal et al (2019). This characteristic is observable in the definition of a cooperative according to the International Cooperative Alliance (ICA): “*autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise*” (ICA, 2023, p. 100). It is notable the expression “economic needs and aspirations”. Because the cooperatives have intentions of economic growth, assuming the stance of being a capitalist company with differentiated values to achieve these objectives.

Second, the similarities with traded companies are reinforced with the adoption by cooperatives of disclosure components that are usual at capitalist firms as observed by Bollas-Araya et al (2016).

The philanthropic companies were not included in this analysis because it was perceived that the characteristics of organizational purposes and of disclosure are not compatible with the theoretical relation in use.

According to disclosure theory, as developed by Verrecchia (2001), if the pandemic event caused an impact on the value perception of the company, and consequently on the benefit expectation of investment, it would be possible to classify the pandemic event as a “liquidity shock” event, which would justify the need to include some information about pandemic risk in the company’s disclosures. Otherwise, if the pandemic moment was a moment that did not affect the liquidity and profitability of this business segment, the possibility of an event representing a “liquidity shock” would be ruled out, which would completely justify the non-disclosure of information about pandemic risks, as this would only be considered as “bad new” about the healthcare insurance sector, which could create adverse selection among investors without this posing a real risk to their expectations of future profitability.

Thus, the efficient accounting information for the companies in the study would be information that maximizes earnings prospects without leaving a gap regarding a

liquidity shock arising from an event with a high probability of occurring: the risk of a new pandemic. Or information that would bring peace of mind to the market regarding the measures adopted to mitigate possible difficulties, based on the experience gained and the main impacts suffered.

In view of the above, the present study examined the way in which the pandemic affected the profitability and the level of risk (measured by RBC) of health care insurance companies, in order to verify whether the pandemic event represented an event consisting of a “liquidity shock”, bringing concerns to the market about the liquidity of these entities' assets.

Profitability is expected to fall, with a negative and significant relationship between the profitability indexes of these entities with the occurrence of the pandemic. This expectation is due to the increase in healthcare costs and expenses caused by all the critical aspects experienced during the pandemic, among which we can mention the increase in prices of medical and pharmacological materials, the logistical difficulties faced and the use by consumers of services with high-cost value.

It is also expected that the risk measure captured by the RBC will have a positive and significant relationship with the pandemic event, as a direct impact on credit risk is expected (due to the scarcity of credit expected in the pandemic moment), an increase in operational risks and direct impact on pricing (which is a component of subscription risk).

If the pandemic event is framed as a liquidity shock for companies in the market segment under study, then it would be theoretically expected that there would be greater disclosure by entities, especially about the risk of a new pandemic. Because this risk, as seen in graph 1, would shift the optimal point of the return relationship for businesspeople and investors downwards, requiring greater informational efforts from companies to restore confidence to the market.

2.3. Profit and “Liquidity Shock”

Central to the objectives of companies is the management of profitability of the company. This idea of value was examined based on the seminal perspective of the International Federation of Accountants (IFAC), which uses the business perspective of sustainability as “creating value for current shareholders while simultaneously

protecting the rights of future shareholders and stakeholders" (Brocket & Rezaee, 2012, p. 4).

Companies have taken on a larger role perspective, since the development of stakeholder theory (Freeman, 1984). This theory is a development of disclosure theory and contributes to the notion of creating value for the company in all the relationships it maintains in society. This value is associated with multiple aspects of a company (including profits) and their disclosure. This perspective goes beyond that to consider the prospect of continuity (perpetuity) of a company's operations, preserving good relations with the business environment, efficiency of a company's contracts and the respective disclosure.

All of these actions are carried out to raise the prestige, image and intangible aspects of reliability of a company, helping to consolidate its action and status in global business and contributing directly to a company's results. Jensen (2002, p. 243) concludes that:

> *Stakeholder theory plays into the hands of special interests who wish to use resources of firm for their own ends. (...) undermine the foundations that have enabled markets and capitalism to generate wealth and high standards of living worldwide.*

This new understanding is translated into accounting practices and Corporate Social Responsibility Communication (CSRC) reports and requires companies to adopt a new approach to proximity to these audiences so that the company's purposes remain aligned with the constant changes in the purposes of stakeholders (Morsing & Schultz, 2006). According to Nyiama (2014), this involves understanding the types of influences from stakeholders and responding appropriately to these influences to strategically generate value.

Stakeholder theory brings to light the reflection on what would be a good way to measure business performance to meet the different interests of the public, with such diverse purposes. Regarding value, the management theories developed tend to closely prioritize a value perspective from the shareholder's point of view. Jensen (2002) defends this perspective for two reasons: voluntary transactions and measurement simplicity. Voluntary transactions presuppose the gain of value throughout the entire chain and the simplicity of measurement presupposes that

managers will make rational decisions by understanding the effects of the decision made.

For Assaf (2021, p. 9) “the value of a company is measured by its ability to generate economic cash benefits in the future, by the expected returns from its financial decisions, and not by its past performance or the size of invested capital”. This perspective is in line with research by Copeland et al (2000), Rappaport (2001) and Young and O'Byrne (2003), which reinforces the shareholder-focused value perspective, rather than the market value perspective. Copeland and Dolgoff (2009, p. 36) clarifies the understanding of value:

> *Shareholder value is created when investors recognize the potential for risk-adjusted returns from excess cash flows. Shareholder value, therefore, is created when investor expectations change. The economic value is effectively confirmed when these cash flows are realized. In the long term, shareholder value must be related to the creation of economic value – but only because, in the long term, investors will adjust their expectations to the reality of the level of realized cash flows.*

This does not imply disrespect for other stakeholders, but rather the understanding that all stakeholders tend to gain from shareholder-focused value creation from a perspective of operational continuity, with strategies developed to increase future cash flows. From this idea arises the concept of value-based management (VBM), where the entity will seek to increase the future cash flows projected for itself, based on expectations for the component parts of this projection. These components are called “value drivers”, which Copeland et al. (2000, p. 96) define as “any variable that influences the value of a company”. Among these drivers, the most important ones are identified so that goals can be established, and their development can be monitored.

To measure the value of the company, considering the scope of the information regarding the drivers of the company's value, we will use the Return on Investment (ROI) to measure the profitability of the total capital used to finance the operations of these entities and the Return on Equity (ROE) to identify the investor’s operational benefit.

The aforementioned indicators will be used because in the event of a loss of return value for both the Financial Capital used to finance the company, and the investor’s specific capital, this fact highlights the shock in the investor’s liquidity expectation, leading to the previously mentioned inferences.

The low perception in capacity of these companies to face moments of crisis in health affect directly the revenues, by the loss of credibility for the consumers and affect the perception of gain by entrepreneurs. This has a direct impact on the profitability of these companies.

The value perception of companies is directly affected by the quality of accounting information and its perception by users of this information (accountee). The perception of low quality in accounting information or the perception of a lack of information on the part of the "accountee" tends to cause adverse selection (Eisenhardt, 1989). This is an application of Game Theory (Neuman & Morgenstern, 1944) to Disclosure Theory that highlights the relationship between the quality of accounting information and the ability to make decisions about good investments.

2.4. Methodology

This study is characterized as exploratory research with a longitudinal time horizon (Saunders, 2019), as it examines a period of five and a half years (between the 1st quarter of 2018 and the 2nd quarter of 2023), including the pandemic of COVID-19 period. The relationship between variations and the pandemic moment was made based on the time horizon of the pandemic occurring in the Brazilian territory. Despite the occurrence of other events in the period that may have a direct impact on the indicators to be analyzed, the pandemic event certainly has prominence as few of these events are expected to have a significant impact on the care or administrative demands of healthcare insurance companies. The pandemic took hold in Brazil in 2020.

This research used quantitative methodology with a deductive approach, based on observations found in the indicators of Medical Assistance Insurance Companies in Brazil from 2018 to 2023 (second quarter). As the current methodology for calculating the RBC requires the use of previous data (two years before the year being calculated), data from 2016 to 2023 (second quarter) was used. The data was taken from the ANS website as open data: https://dadosabertos.ans.gov.br/FTP/PDA/demonstracoes_contabeis/ .

After data collection, the sample universe was selected, since not all entities that are regulated by the ANS are the object of interest in this study, as their peculiarities could distort the analysis depending on the specificities of these business types.

From the universe of companies regulated by the ANS, the following companies were excluded:

- Benefit Administrators: Health plan intermediary companies;
- Philanthropic Entities: because of their charitable nature, with different management purposes than other companies that aim to make a profit to partners or benefit their cooperative members;
- Dental Entities: Cooperatives and non-cooperative companies because they are limited to a specific area of healthcare with different service characteristics and dynamics in relation to RBC standards.

Information on company measures is restricted to the 631 HCI that make up the table below:

Table 1 – General characterization of analyzed companies

Market Region*	BUSINESS MODALITIES				Total
	Self-management	Medical Cooperative	Group Medicine	Specialized Health Insurance	
1	9	3	9	5	26
2	5	1	4		10
3	30	6	7		43
4	30	6	79	3	118
5	28	240	81		349
6	15	16	54		85
Total	**117**	**272**	**234**	**8**	**631**

* Marketing region as defined by the Normative Resolution nº 569/2022, attachment I.

Source: Author

The entities that make up the universe of medical assistance companies subject to this study are present in 24 states in Brazil (except Roraima and Amapá) and the Federal District.

After collecting the entities' accounting data, they were processed to calculate the Value Based Management (VBM) drivers through the use of Return on Investment (ROI) and Return on Equity (ROE) for the period between 1st quarter of 2018 and 2nd quarter of 2023. The formula for these two indicators are:

- $ROI = \frac{LOL_{Aj}}{Inv} \times 100$
- Where:
  - LOL_{Aj}: Adjusted Net Operating Profit
  - Inv: Investment (Amount raised to finance the business, not arising from the operation)
- $ROE = \frac{Profit}{Equity_{(Med.)}} \times 100$
- Where:
  - $Profit$: Net profit
  - $Equity_{(Med)}$: Average between equity at the beginning of the year and the equity at the end of year

At the same time, the Risk-Based Capital (RBC) was calculated using the government methodology, described in annexes IV, V, VI and VII of Normative Resolution 569/2022, developed by the National Supplementary Health Agency (ANS) and all companies during the analysis period.

The period of analysis was delimited with a focus on the pandemic and, understanding that the pandemic event has multiple impacts on the most diverse risk factors, we understand that the assessment of the general risk indicator of the entities under study would be sufficient to eliminate interpretative biases.

The return and risk characteristics were observed in the periods to conclude about the influence of the moment of the COVID-19 pandemic on the variations that occurred in these characteristics in order to verify whether there is evidence of the need for information about the pandemic risk in the insurers' disclosures of health.

It is expected that the pandemic would have a negative impact on the profitability of these companies, thus their risk measured through the RBC would also increase and, in this case, it would be justifiable to present additional accounting information that should include the pandemic risk due to this moment representing a “liquidity shock” for these companies.

Thus, the dependent variables of the analysis are primarily ROI and ROE, with RBC as an independent variable. To verify the pandemic moment, the dummy variable “Pandemic” was included, which takes the value 0 for periods before and after the pandemic (before the pandemic – 1st quarter of 2018 to 1st quarter of 2020 – and after

the pandemic – 2nd quarter of 2021 to 2nd quarter of 2023) and value 1 for the pandemic period (2nd quarter of 2020 to 1st quarter of 2021).

The sinistrality rate was also used as an independent variable to compose the regression formula, which is the proportion between the care cost and the companies healthcare insurance revenue, given its importance both for the composition of the profitability and the risk of these companies.

Control variables relating to the size of the companies were also included, according to the ANS classification of the number of beneficiaries of these companies, being Large Size (T_1 – Above 100 thousand beneficiaries), Medium Size (T_2 – Between 20 thousand and 100 thousand beneficiaries) and Small Size (less than 20 thousand). The latter does not have a specific variable, being captured by the difference between the variables previously presented. Control variables relating to the business modality of these companies were also included, namely Self-Management (M_1), Group Medicine (M_2), Cooperatives (M_3) and Specialized Health Insurance Companies (captured by the difference between the other modalities).

The regression equations of the study under analysis are:

$$ROI = \beta_0 + \beta_1 S_t + \beta_2 T_{1t} + \beta_3 T_{2t} + \beta_4 D_{1t} + \beta_5 M_{1t} + \beta_6 M_{2t} + \beta_7 M_{3t} + \beta_8 RBC_t$$

$$ROE = \beta_0 + \beta_1 S_t + \beta_2 T_{1t} + \beta_3 T_{2t} + \beta_4 D_{1t} + \beta_5 M_{1t} + \beta_6 M_{2t} + \beta_7 M_{3t} + \beta_8 RBC_t$$

Where:

S_t = sinistrality (ratio between the Cost of healthcare and the Revenue related to the Health Plan)

$$T_1 = \begin{cases} 1, if\ Large\ size \\ 0, otherwise \end{cases}$$

$$T_2 = \begin{cases} 1, if\ Medium\ size \\ 0, otherwise \end{cases}$$

$$D_1 = \begin{cases} 1, if\ during\ pandemic \\ 0, otherwise \end{cases}$$

$$M_1 = \begin{cases} 1, if\ self management \\ 0, otherwise \end{cases}$$

$$M_2 = \begin{cases} 1, if\ group\ medicine \\ 0, otherwise \end{cases}$$

$$M_3 = \begin{cases} 1, if\ cooperative \\ 0, otherwise \end{cases}$$

$RBC_t = Risk\ Based\ Capital$ in each moment

Through this analysis, we seek to identify the relationship between Sinistrality and RBC with ROI/ROE, verifying the influence of those on the profitability of entities, as well as the influence of the factors pandemic event, type of healthcare insurance companies and the size of company as Dummy variables in the model.

On the other hand, we used the same variables to check fluctuations in the risk measure captured by the RBC, depending on the aforementioned variables using the following regression formula. Thus, in this configuration the dependent variable is the RBC and ROI/ROE become independent variables:

$$RBC = \beta_0 + \beta_1 S_t + \beta_2 T_{1t} + \beta_3 T_{2t} + \beta_4 D_{1t} + \beta_5 M_{1t} + \beta_6 M_{2t} + \beta_7 M_{3t} + \beta_8 ROI$$

$$RBC = \beta_0 + \beta_1 S_t + \beta_2 T_{1t} + \beta_3 T_{2t} + \beta_4 D_{1t} + \beta_5 M_{1t} + \beta_6 M_{2t} + \beta_7 M_{3t} + \beta_8 ROE$$

2.5. Results

2.5.1. Analysis and comments on the results

Below we have table 2 with the statistical summary of the data used in the analysis.

Table 2 – Statistical Summary

	ROE	***ROI***	***Sinistralidade***	***RBC_MILHÕES***
Average	0,03	-0,00455	0,79	37,31
Standard Error	0,01	0,006299	0,06	2,33
Median	0,03	0,014146	0,73	4,71
Standard Deviation	1,47	0,718491	6,47	265,42
Variance	2,17	0,516229	41,83	70.445,57
Minimum	-81,50	-33,317	-54,23	0,02
Maximum	116,56	21,37141	550,19	6.929,50

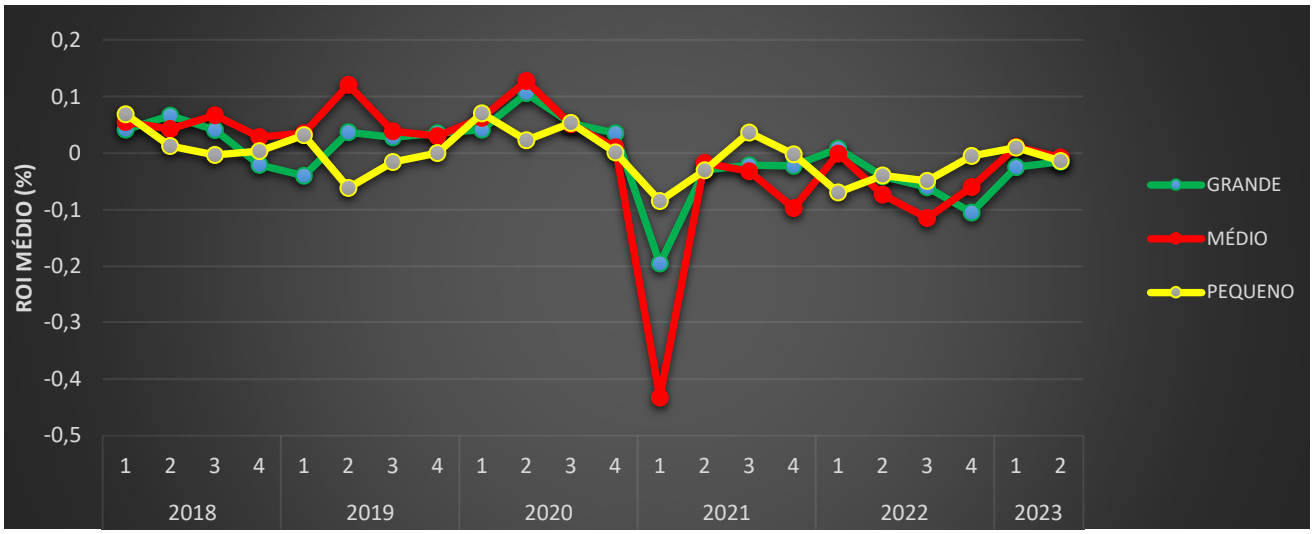
Source: Author

Of the total observations on average in each quarter, the total composition of observations included 54% small size companies, 34% medium-sized companies and 12% large size companies.

So, identifying the occurrence of variations (positive or negative) in the profitability and risk of these companies there is Graphs 2 and 3 respectively showing

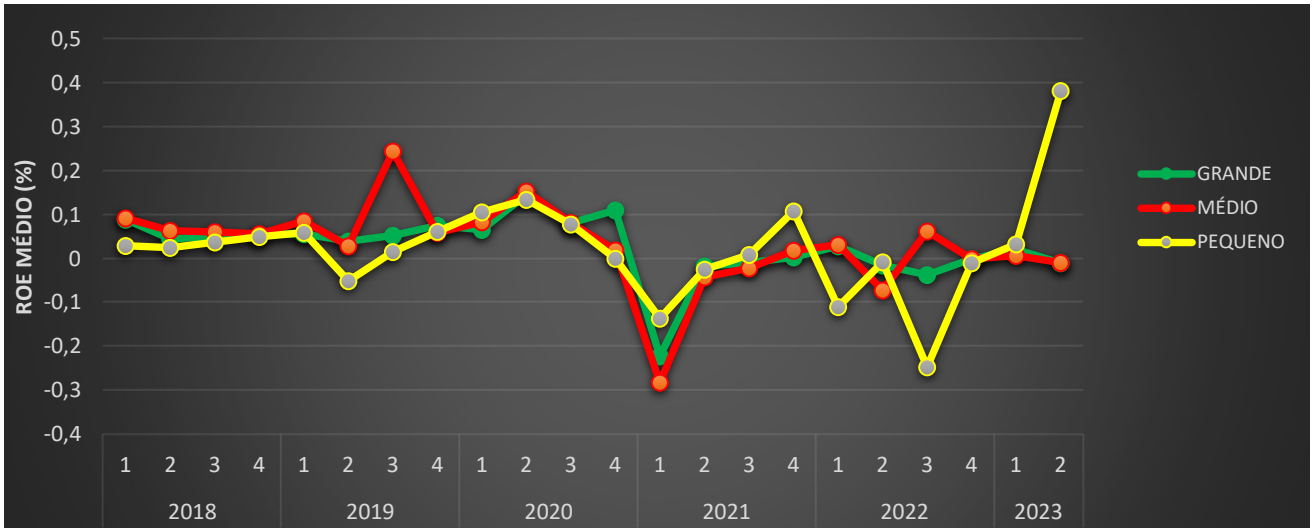
the fluctuation in ROI and average ROE depending on the size of the companies over the analyzed period. A similar movement is noticeable in both graphs, regardless of the size of companies, of a drop in indicators that starts in 2020 and reaches its lowest level at the beginning of 2021, with a recovery from the 2nd quarter of 2021 to the levels observed before.

Graphic 2 – AVERAGE ROI by size of healthcare insurance companies



Source: Author (2024)

Graphic 3 – AVERAGE ROE by size of healthcare insurance companies



Source: Autor (2024)

Checking the existence of a relationship between these variations and the pandemic event and indicating whether these variations affected the disclosure of

accounting information about the pandemic and understanding the observed relationship with disclosure theory, the regression model that has ROI/ROE is insufficient to significantly explain the variations in these indicators, since R^2 presents a very low value (0.0010 for ROE and 0.0035 for ROI), among all the variables included in the analysis. Only the variable referring to the pandemic moment (D_1) showed a significant relationship with the variations of the two indicators (ROE and ROI) and with a negative coefficient as seen in the regression analysis data below, with a 95% confidence level, as can be seen in table 3.

Table 3 – Regression results: ROE and ROI as dependents variables

	ROE				ROI			
	Coefficients	**Standard Error**	**Stat t**	**valor-P**	**Coefficients**	**Standard Error**	**Stat t**	**valor-P**
Intersection	0,0314	0,1256	0,2503	0,8023	0,0199	0,0612	0,3247	0,7454
Sinistrality	-0,0003	0,0020	-0,1475	0,8828	-0,0006	0,0010	-0,6152	0,5384
D_1	-0,0759	0,0259	-2,9345	**0,0033**	-0,0788	0,0126	-6,2439	**0,0000**
M_1	0,0401	0,1272	0,3152	0,7526	0,0270	0,0620	0,4350	0,6636
M_2	-0,0035	0,1256	-0,0280	0,9776	-0,0061	0,0613	-0,0992	0,9209
M_3	0,0538	0,1252	0,4299	0,6673	0,0263	0,0610	0,4315	0,6661
T_1	-0,0023	0,0444	-0,0523	0,9583	-0,0025	0,0217	-0,1166	0,9071
T_2	0,0015	0,0286	0,0536	0,9572	-0,0070	0,0139	-0,5047	0,6138
RBC (Millions)	0,0000	0,0001	0,1921	0,8477	0,0000	0,0000	0,2399	0,8104

Source: Author (2024)

Thus, it can be inferred that the occurrence of the pandemic moment negatively and significantly affected the profitability of companies operating health insurance plans, which is enough to classify the pandemic moment as characteristic of a “liquidity shock” for the health sector. In this way, it can be deduced, based on the construction of Verrecchia (2001), that the market will demand from these companies a greater level of information involving the risk about the pandemic, under penalty of attributing to these companies a greater discount on the cost of capital invested resulting from information asymmetry.

It was found that, in the market segment under study (health insurance), the disclosure of information about pandemic risk has been scarce in the entities' financial statements. This fact is in line with what is predicted by disclosure theory, since the presentation of pandemic risk in accounting information tends to reduce expectations

of value creation on the part of these entities (Dye, 2017), as exposure to risk would tend to reduce the expected value of companies. It is completely understandable from the perspective of Legitimacy Theory (Deegan, 2002), if we consider that companies disclose with the intention of "appearing as if they are doing the right thing" (p. 9), in Deegan's words. And disclosure on this topic would imply the need for effective management of pandemic risk so that the company's perception of value is not affected.

However, the profitability of these companies may be harmed by the non-disclosure of the pandemic risk and investors fear investing in these entities due to the lack of adequate information and management of this risk.

Only one company in Brazil within the healthcare insurance segment has open capital presented in its disclosure, with the information that "it cannot guarantee that it will be able to adapt its business to the emergence of new diseases, epidemics, pandemics, viruses and bacteria", which leaves the investor in complete uncertainty regarding the company's coping with a new pandemic.

It was observed that the risk, as captured by the RBC, was not affected by the variable referring to the pandemic moment (D_1), however, it had its variations with a strong relationship with other variables, such as the type of HCI company and size of the HCI company, as can be observed in the regression analysis below:

Table 4 – Regression results: RBC as the dependent variable

	ROI				***ROE***			
	Coefficients	***Erro padrão***	***Stat t***	***valor-P***	**Coefficients**	***Erro padrão***	***Stat t***	***valor-P***
Intersection	903,22	18,1889	49,6581	-	903,2238	18,18816	49,65997	-
Sinistrality	-0,73	0,3157	-2,3197	0,0204	-0,73268	0,315715	-2,32069	0,0203
D_1	5,24	4,0946	1,2789	0,2009	5,215512	4,089538	1,27533	0,2022
M_2	-890,18	18,5206	-48,0644	-	-890,178	18,51996	-48,0659	-
M_3	-904,84	18,1916	-49,7394	-	-904,846	18,19095	-49,7416	-
M_3	-915,77	18,0709	-50,6765	-	-915,761	18,0703	-50,6776	-
T_1	193,31	6,8075	28,3971	0,0000	193,3095	6,807228	28,39769	0,0007
T_2	15,21	4,5132	3,3694	0,0008	15,21589	4,512744	3,37176	0,0000
ROI/ROE	0,68	2,8416	0,2399	0,8104	0,266112	1,385439	0,192078	0,8477

Source: Author (2024)

Such observations are consistent with the RBC calculation methodology that considers the size of the HCI companies for some calculation factors and with the

fact that the RBC calculation in HCI companies considers information from several previous months, which softens the immediate effects on the calculation of the risk.

2.5.2. Research limitations

One limitation of this study is the use of a risk factor (RBC) that captures variations in risk arising from several factors (operational, market, credit, legal, underwriting), as well as the fact that the RBC calculation method presents some difficulties in calculating only with open data from HCI companies due to changes in the ANS standard chart of accounts in the period and the recent creation of this methodology by the Brazilian agency (this calculation was not done previously).

It also presents as a limitation that only a small number of pandemic events have occurred, with data available to compare similarities or differences in the behavior of these companies.

2.5.3. Research Contributions

This research contributes to accounting science in the sense of expanding the analysis of disclosure theory according to Verrecchia's (2001) categories with application to a situation experienced worldwide and with great possibilities of new occurrence in order to strengthen the governance and management instruments of entities to confront a pandemic risk.

Dye (2001) criticizes Verrecchia’s work and mathematical models in general, believing that they are not developed to capture reality, but to emphasize their builder's perspective on reality. However, despite Dye's perspective, Verrecchia's model is useful in the analysis developed in this study to show that there is a noticeable efficiency gap in the financial statements of the segment under analysis. This gap is neither apparent nor illusory and impacts on the conduct of entities being decisive to their continuity, given the relevance of the pandemic event. An absence in disclosing the risk of a liquidity shock and the uncertainties generated by this absence have a direct impact on the quality of the information presented and, consequently, on the efficient allocation of the Brazilian healthcare market.

The lack of information about the pandemic risk and about management of this risk in the study entities tends to maintain silence on an aspect that is difficult to measure and manage. Such silence seems to use the management of ignorance as a

tool for publicizing the pandemic risk. A purposeful silence that seeks social legitimacy, resulting in what Roberts (2017, p. 59) calls “knowingly eclipsed” realities as part of the process known as “decoupling”. In the decoupling process, the external pressure for transparency ends up not generating in the company a commitment to adopting, in its processes and disclosures, the expected level of transparency.

These companies appear to comply with the information requirements, aware of the lack of pandemic risk and aware of the possible impacts on the entities. At the same time, they are willing to run the risk of being “caught” in their absence, either by users of accounting information who are more attentive, or by the impact of the occurrence of the undisclosed risk. In the latter case, the excuse in front of the cameras would already be ready: “unpredictability”. In this regard, Davies and McGoey (2012) warn about how social sciences have failed to recognize that “the only thing more perfect than the illusion of full knowledge is the ability to profess perfect ignorance” (p. 81). This warning from the aforementioned authors rests on the repeated observation of the use of “appropriate ignorance” as a justification for omissions of actions and information that were previously known and that generated profound losses and crises, such as the subprime crisis in 2007.

The information gap exposes companies to risks that could be better managed through insurance and reinsurance contracts. The presentation of high pandemic risk management and disclosure about it could give credibility to the market and lead to a more intense resumption of growth and economic stabilization of the segment by attracting new investors. Such findings are in line with the conclusions of Albitar, Al-Saher and Elmarzouky (2021), who emphasize the ethics involved in disclosing this relevant information.

The research mainly contributed to identifying that companies in the business sector studied are below the level of information desired by the market in the light of accounting theory, due to the imminent liquidity shock that is foreseen ahead and the impact it could have on the profitability of these companies, based on what was seen in the last pandemic event, with serious consequences for the market and customers - including new demands and social risks that involve these organizations, as highlighted by Choi, Kühner and Shi (2022).

As possibilities for future research, we point to the need to verify with the market whether the absence of this information has actually caused adverse selection in investors and scared off the market to the point of avoiding or reducing the amount of intended investments in these companies.

It is understood that this research could still be deepened through interviews with the managers of these organizations to identify the main reasons for not disclosing information about the pandemic risk for these organizations, as well as the mechanisms for mitigating these risks, which can range from the lack of information about the main impacts and precautions to be taken, to the intention of not highlighting the vulnerabilities of these organizations.

It is envisaged that this research can shed light on the formulation of insurance and reinsurance services aimed at providing guarantees and support to these organizations to face pandemic moments through insurance companies.

3. CONCLUSIONS

Regarding the general objective, it was found that health plan operating companies were affected by a reduction in their profitability during the pandemic. However, accounting disclosures practically did not change due to the pandemic risk.

Variations in profitability were significantly related to the pandemic moment, in contrast to the risk measured through the RBC, which practically did not change, and the changes suffered were not statistically related to the pandemic moment.

According to disclosure theory, companies' financial information should be closely related to observed variations, causing these companies to increase the level of disclosure, especially regarding the pandemic event, which ended up not being observed in practice.

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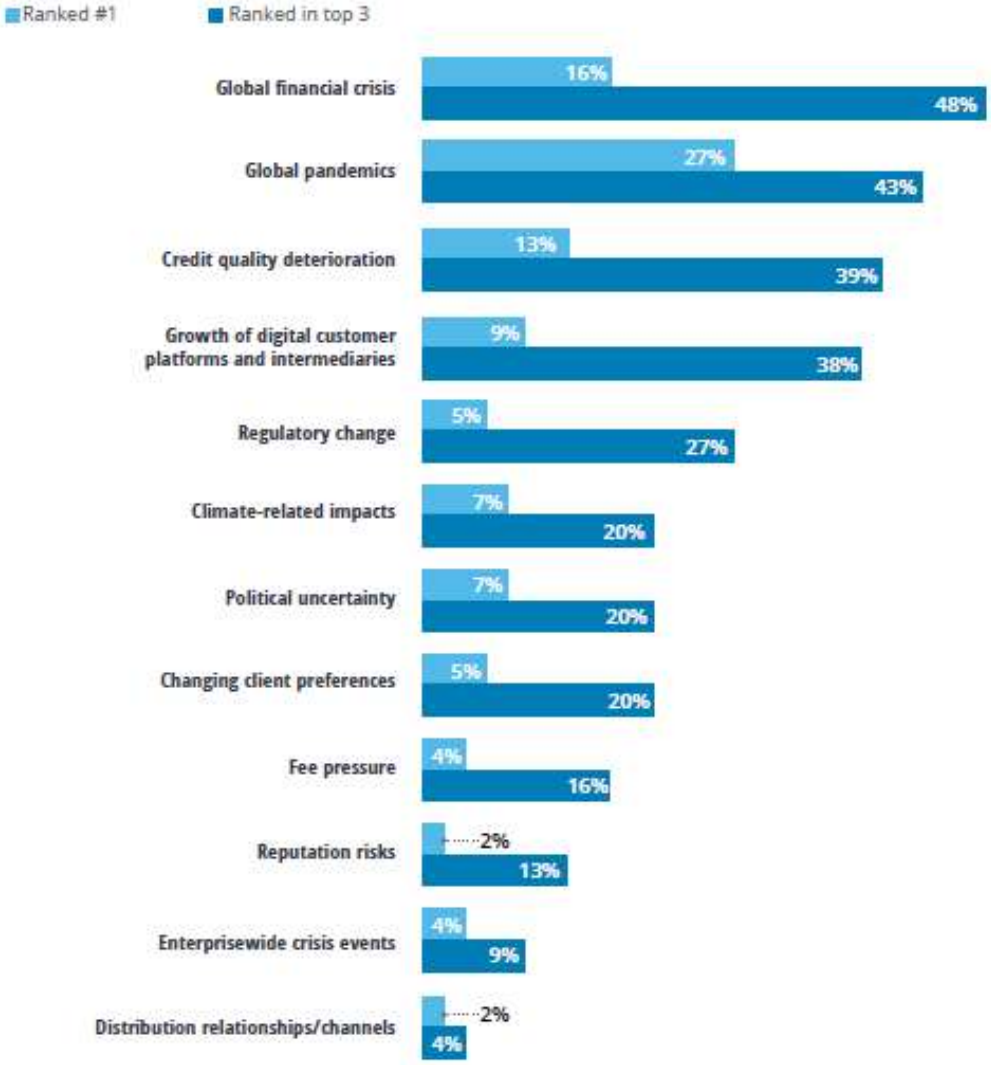
APPENDIX A – RESEARCH OF DELOITTE ABOUT EMERGING RISKS

FIGURE 13

Over the next two years, which three of the following emerging macrotrends do you think will increase the most in their importance for your organization?



Source: Deloitte Global Risk Management Survey, 12th ed.

APPENDIX B – RISK BASED CAPITAL CALCULATION

ANEXO III

Apuração do Capital Baseado em Risco

1. O capital de risco para as operadoras referente aos riscos de subscrição, de crédito, legal e operacional e mercado será constituído de acordo com a fórmula a seguir:

$$CBR = \sqrt{CRS^2 + CRC^2 + CRM^2 + 2 \times (0{,}5 \times CRS \times CRC + 0{,}25 \times CRS \times CRM + 0{,}25 \times CRC \times CRM} + CRO$$

Na qual:

- RBC: é o capital baseado nos riscos de subscrição, de crédito, mercado, legal e operacional;

- CRS: é o capital baseado no risco de subscrição, calculado conforme o Anexo IV; e

- CRC: é o capital baseado no risco de crédito, calculado conforme o Anexo V; e

- CRO: é o capital baseado no risco operacional, incluindo o risco legal, calculado conforme o Anexo VI;

- CRM: é o capital baseado no risco de mercado calculado conforme o Anexo VII.