The Effect of Financial Analysts' Coverage on the Relationship of Stock Liquidity to Stock Price Crash Risk

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المستخلص:

اختبرت الدراسة تأثير سيولة الأسهم على خطر انهيار أسعار الأسهم، وأيضا اختبرت أثر تغطية المحللين الماليين كمتغير منظم على العلاقة بين سيولة الأسهم وخطر انهيار أسعار الأسهم في الشركات المساهمة المسجلة في البورصة المصرية، والتي تمثلت في ٦٣ شركة مساهمة في الفترة من ٢٠١٨ – ٢٠٢٢ بواقع ١٥٤٢٢ مشاهدة يومية، وأسفرت نتائج الدراسة عن وجود تأثير طردي معنوي لسيولة الأسهم على خطر انهيار أسعار الأسهم، إلا أنه نتيجة لدخول تغطية المحللين الماليين كمتغير منظم للعلاقة انعدمت العلاقة بين سيولة الأسهم وخطر انهيار أسعار الأسهم، وأصبح للتفاعل بين تغطية المحللين الماليين وسيولة الأسهم تأثير طردي معنوي على خطر انهيار أسعار الأسهم.

Synopsis

The research problem:

This paper examined the effect of stock liquidity on stock price crash risk, and the impact of financial analysts' coverage as a Moderator variable on the relationship between them.

Motivation:

Both the liquidity of stocks and stock price crash risk are considered important factors affecting investors and companies. Stock liquidity may be an incentive for the company to have effective governance mechanisms. These mechanisms limit the reasons for stock price crash risk. In addition, more transparent information environments lead to reducing bad news coverage. This is done by the financial analysts to reduce the risk of stock price crash. Thus, the aim is to provide the evidence of the effect of stock liquidity on stock price crash risk, and the effect of the modified role of financial analysts' coverage.

The test hypotheses:

Our first hypothesis considered whether stock liquidity has affected stock price crash risk of companies. The second tested whether coverage of the financial analysts has an impact on the relationship of stock liquidity to stock price crash risk of companies.

Target population:

The study focused on the Egypt companies listed in AGX 70 index in the period from 2018 to 2022.

Adopted methodology:

We used the multiple linear regression analysis and the Hierarchical Moderated Regression Analysis with modified variables.

Analyses:

The researchers used the financial statements of the companies registered on the EGX 70 index in the period from 2018 to 2022. The data for regression are obtained from Mubasher website, and the Egyptian Stock Exchange website of the sample companies.

Findings:

We found a significant positive effect of stock liquidity on stock price crash risk, since the increase in stock liquidity may be caused by the management that hid the negative and bad news and showed only good news to improve liquidity. The results of the study indicated that there is a positive effect of financial analysts' coverage on the stock price crash risk as the optimism of financial analysts may hinder the flow of information from the company to the market at the right time and may not limit the management's ability to withhold the bad news. However, as a result of introducing the financial analysts' coverage as a Modified variable, the relationship between stock liquidity and stock price crash risk disappeared.

Keywords:

Financial analysts' coverage, Stock liquidity, Stock price crash risk, EGX 70 index, Moderator variables.

1- Introduction:

The literature of accounting and finance shed light on the importance of liquidity in financial markets, as stock liquidity is essential for their efficiency. It also has a significant impact on investors, companies, and financial markets. For investors, stock liquidity is an important factor that must be taken into account when making investment decisions in the stock market. Its importance in asset pricing becomes obvious, as the lower the liquidity of the asset, the higher the cost of trading it. Thus, the investors prefer to invest in liquid stocks (Chebbi et al., 2022).

At the corporate level, companies whose stocks are characterized by higher liquidity have lower cost of equity, and higher market value. They also reduce risk of debt default, and lessen reliance on short-term debt (Nadarajah et al., 2021). Liquidity has an impact on the functional operational efficiency of stock market. It represents the lifeline of financial markets (Alhassan and Naka, 2020). It is also considered one of the most important indicators of the efficiency of the financial markets, the very thing that makes it more attractive to investors. It is one of the reasons for the integration of stock markets, as investors tend to move their capital when they expect a large return on their investments. In addition, it enables investors to deal in buying and selling stocks easily, quickly, and at the lowest cost, the very thing that activates trading volume and is reflected on the efficiency of stock markets. On the other hand, low liquidity in the market hinders the discovery of stock price, which leads, in turn, to stock price volatility, instability, and increased risk in the market.

Crash risk in the stock price of the companies is considered a major hazard for the investors and companies alike because of its impact on the investor's decision-making and on the company's management of its risks. It also explains an important part of the amount of change in the company's ownership rights. At the market level, crash risk in the stock price of the company is considered a fundamental determinant for the amount of the expected returns in the sector in which the company operates (DeFond et al., 2015). Withholding the bad news by the management is one of the Explanations for the risk of stock price crash (He et al., 2022). It is based on the idea that managers withhold bad or negative news or unfavorable information from investors in particular and from the financial community in general for as long as possible in response to certain motives and to achieve certain advantages as well. Seeing that the ability of managers to cover the bad news is limited, this process of blocking out will not continue. So, when the process of covering the bad news continues, it accumulates over time until it reaches, at a certain moment, a point that exceeds the management's ability to withhold it. This is called the turning point at which the accumulated news is announced all at once. On reaching the market, this news causes a collapse in the stock price of the company.

The liquidity of stocks has an impact on the risk of a crash in stock price. This effect may be positive, as high stock liquidity prompts speculative investors to sell stocks to take advantage of the high price, which may result in an increase in the supply volume and, consequently, a decrease in the price (Alp et al., 2022). Therefore, hiding the bad news in order to improve liquidity has an impact on crash risk due to the accumulation of negative news that is revealed all at once. On the other hand, other studies have found that there is a negative effect of stock liquidity on stock price crash risk. Also, when the liquidity of stocks rises, it indicates an increase in the volume of demand and thus an increase in stock price and in the control over the management, the very thing that helps to limit its manipulation and concealment of bad news and consequently reduces crash risk in the future (An et al., 2018).

Financial analysts work as information intermediaries between the management of the company and market participants by obtaining information from various sources, processing it, and disseminating it in the market. This is reflected in improving the transparency of information and reducing its asymmetry, the very thing that increases the informational efficiency of stock markets and is reflected in the performance of companies, in addition to the supervisory role of financial analysts over the management performance. This contributes to restricting management's freedom to manipulate financial reports and limit covering the bad news, which is one of the most important determinants of a crash in the stock price of the company (Zhao et al., 2023).

According to the aforementioned, and under the transient investor theory, which states that for fear of the potential short-term sales by investors and a decline in stock prices in response to the disclosure of negative news, managers tend to withhold the bad news of the companies instead of publishing it in the right time. When the accumulated bad news is finally published to the public, the financial markets will suffer a sharp negative reaction causing stock price crash. Therefore, stock liquidity may be an incentive for the company to have effective governance mechanisms to maintain the current and prospective investors. Consequently, these mechanisms will limit the reasons for stock price crash risk especially the conflict of interests between the management and shareholders according to the theory of agency. In addition, more transparent information environments lead to reducing bad news coverage. This is done by the financial analysts to reduce the risk of stock price crash.

In light of the above, this study attempts to search for an answer to the following questions:

- What is the effect of stock liquidity on stock price crash risk?

- What is the effect of financial analysts' coverage on the relationship of stock liquidity to stock price crash risk?

2. Literature of the study and the development of hypotheses:

2.1. Stock liquidity

Stock liquidity is a complex and multidimensional concept. Stock liquidity has been defined in many ways in previous studies based on the dimensions that were addressed in defining liquidity. Some researchers focused on the cost dimension, and from this perspective (Panayides et al., 2013) defined liquidity as the cost of trading a particular asset in relation to its fair value. Another team of researchers focused on the dimensions of quantity and speed of trading. From this perspective, they (Naik and Reddy, 2021) defined liquidity as the presence of buyers and sellers who are willing and able to exchange a certain quantity of securities at a specified price without delay. From a comprehensive perspective, (Le and Gregoriou, 2020) explained that stock liquidity refers to the ability to trade large amounts of stocks without any delay and at low cost with little impact on the stock price.

(Bedowska-Sojka, 2021; Helgheim and Yue, 2021) explained that liquid stocks have certain characteristics. **Immediateness** means the speed at which investors deal with stocks. **Narrowness** refers to low trading costs and thus a low range between the selling price and the buying price. **Depth** refers to the availability of a large amount of buy and sell orders in the market in a way that maintains balance in the price of securities. **Flexibility** means the speed at which the stock price returns to its normal levels after an adverse shock. Moreover, **widening** refers to the presence of various buy and sell orders in large quantities, which are traded smoothly in a way that confirms price stability.

Previous studies have dealt with a variety of issues related to liquidity, including the determinants of liquidity, such as disclosing future information. It is one of the most important determinants of stock liquidity since it allows investors to evaluate the current plans and future expectations of the financial performance of the company. Therefore, disclosing future information achieves more transparency and reduces information asymmetry. This affects the sentiment of the investors and trading volume, which leads to an increase in stock liquidity (Li et al., 2023). (Cho and Kim, 2021) concluded that there is an increase in stock liquidity after the voluntary disclosure of good news.

(Boubaker et al., 2019) also tested the effect of the financial reports complexity on the liquidity of stocks. The researchers concluded

that annual reports which are difficult to read hinder the investors' ability to process and analyze the information contained in financial reports of the companies. So, the investors' desire to trade weakens and consequently stock liquidity decreases. Companies with high environmental, social and governance standards also enjoy high stock liquidity, which is reflected in the low cost of capital (Luo, 2022). Other studies have tended to investigate liquidity determinants. They are represented in the size and adequacy of the capital, profitability, financial leverage, and the age of the company as internal determinants. In addition, the inflation rate, the exchange and interest prices are as external determinants.

The study of (Al-Homaidi et al., 2020) found a significant effect between the size of the company, the financial leverage, the ratio of return on assets, company age, and stock liquidity. Utami, Wahyuni and Nugroho (2010) also tested the factors affecting stock liquidity. They are represented in the disclosure of future information, institutional ownership, foreign ownership, and information asymmetry as a mediating variable on stock liquidity. The study found that there is an effect of information asymmetry and foreign ownership on stock liquidity, the information asymmetry mediates the relationship between the disclosure of future information and stock liquidity, and that the foreign ownership also has a negative impact on stock liquidity through information asymmetry,

The study of (Juwita and Pratama, 2022) concluded that a positive impact occurs for the profitability of the companies on the liquidity of stocks. The more profitable the company is; the more investors will be interested in purchasing the stocks of these companies. Thus, the liquidity of the stock increases. On the other side, there is a negative effect of stock price on its liquidity as when the stock price rises, the purchasing power of investors decreases and consequently the liquidity of the stock declines. Therefore, (Lee and Ryu, 2019) studied the relationship between the ownership structure and the liquidity of the stocks. They concluded that the foreign investors tend to improve the liquidity of the stocks when they determine their holdings of stocks. Also, the liquidity of the stocks increases along with the foreign ownership and the decline of the foreign exchange liquidity.

In the same context, (Ding and Suardi, 2019) tested the association of state ownership with high stock liquidity, which is consistent with the investors' perception of a decrease in the risks facing the governmental companies due to the guarantees and benefits provided to

them by the government. Thus, state ownership enhances the value of companies, which increases their willingness to trade in such stocks. Accordingly, the government ownership affects the liquidity of stocks by contributing to increasing trading activity and reducing transaction costs in the stock market.

Other studies have tended to examine the different impacts of stock liquidity. It has an influence on the company's propensity to retain cash. (Nyborg and Wang, 2021) concluded that stock liquidity increases the company's tendency to keep cash because stock liquidity reduces financial constraints and that companies keep cash because they are motived to buy back undervalued stocks or to stabilize their stock prices. Thus, this motive is enhanced by the liquidity of stocks.

In the same context, Hu, Li and Zeng (2019) found a negative relationship between stock liquidity and cash retention, as liquidity reduces the cost of stock issuance and debt financing. Liquidity can also enhance corporate governance by increasing stakeholder intervention, the very thing that limits the opportunism of the managers. Thus, companies that have more liquid stocks hold less cash. In addition, stock liquidity is an important factor in determining the cost of ownership rights. (Alhassan and Naka, 2020) tested the relationship between stock liquidity and future investment decisions. The two researchers concluded that investment growth is affected by the potential decline in the cost of equity as a result of the increase in stock liquidity. It is also concluded that this effect is stronger in companies that have financial constraints that limit their ability to obtain external financing.

Stock liquidity has an impact on dividend policy. (Nguyen, 2020) tested the effect of stock liquidity on dividend policy. It is concluded that stock liquidity enhances dividend distributions by reducing cash flow fluctuations. Companies that enjoy higher stock liquidity show a lower level of uncertainty in cash flows. It is also concluded that there is a negative impact of stock liquidity on dividends in the case of high (advanced) markets and companies that have good governance, and that there is a positive impact on dividend policy in developing markets. This discrepancy in results is due to the different degree of market development.

However, the study of (Sari et al., 2022) found that there is no effect of stock liquidity on dividend distributions, and stock liquidity has an effect on tax non-compliance (Kim et al., 2022), and this effect increases when controlling shareholders own more shares, and that this effect occurs at low levels of tax non-compliance (tax avoidance). This can be explained by the informational nature of stock price as liquidity makes the stock price more informative. Thus, the stock becomes more responsive to profits after deducting taxes, the very thing that is considered an incentive for managers to reduce taxes through tax avoidance. However, this effect becomes insignificant at high levels of tax non-compliance (tax evasion).

From the above, it is clear that although stock liquidity has been studied extensively for a long time, in addition to the many main aspects studied in that field, it still represents a prominent area of research in the field of finance and accounting since it seems to be the lifeblood of Finance markets. It also has various accounting effects on the performance of companies.

2.2. The risk of stock price crash:

Stock price crash risk has many definitions and concepts from several aspects. From the side of stock price returns, (Dang et al., 2018) believe that stock price crash risk indicates the possibility of a drop or a large, sudden, and non-recurring decline in the stock price of the company. This in turn leads to a sharp decline in the wealth of shareholders. On the other hand, some previous studies presented a concept for crash risk in the company's stock price in the light of the shape of the distribution of returns on the stock. It is defined by Liu and Zhongas (2019) the probability of a significant decline in the company's stock price that can be observed through the deviation or the negative skewness in the distribution of returns on the stock over a period of time of trading.

Some previous studies set the concept of crash risk of the company's stock price in the light of the accounts set as reasons for the crash. Crash risk of the company's stock price was defined as the risk that occurs due to the tendency of managers to withhold or prevent bad news and information from investors due to their compensation contracts and overriding fears (Zaman et al., 2021). From a comprehensive perspective, stock price crash risk can be defined as the possibility of a sudden and repeated sharp decline in the company's stock price that results in a sharp decline in the wealth of the shareholders. It can be identified or observed through the deviation or the negative skewness in distributing the return on stock over a relatively short period of time. This occurs since the managers tend to keep or withhold bad or negative news from the investors in

particular and the financial community in general for the longest possible period to get certain benefits such as maintaining their rewards.

Stock price crash risk has determinants and consequences that have been extensively discussed in the literature of accounting and finance. The study of (Habib, Hasan and Jiang, 2018) tested the determinants of stock price crash risk. The administrative incentives to withhold the bad news were the most important determinant of crash risk. Earnings manipulation, tax evasion, and voluntary disclosure were used by managers as mechanisms to hide the bad news. However, the retention in preparing reports, the external auditing, and corporate governance mechanisms can limit the managerial opportunistic use of procedures to hide the negative information (Wang, Li and Liu, 2021).

Stakeholder theory also suggests that the highest ratings of the environmental, social and governance standards reflect more transparent information environments. This results in the reduction of blocking out the bad news and thus lessening crash risk. When the socially responsible companies adhere to high standards of transparency and withhold less of the bad news, they will be less at stock price crash risk. This effect is more obvious when the institutional ownership decreases and governance mechanisms are weak (Kim et al., 2014).

However, if managers engage in the social responsibility to cover up bad news and divert shareholders' attention, corporate social responsibility may be associated with an increased stock price crash risk. This is what the agency theory indicates since the environmental, social, and governance evaluation systems motivate managers to hide news and use public benefit signals to obscure disclosure and thus increase stock price crash risk. In a study conducted by Feng, Goodell and Shen (2020) to test the role of corporate social responsibility and governance in reducing stock price crash risk, researchers found a negative relationship between them, the very thing that is consistent with stakeholder theory.

The study of (Bae et al., 2021) also tested the modifying role of financial restrictions on the relationship of social, environmental, and governance responsibility to stock price crash risk. The study concluded that the classifications of environmental, social and governance criteria reduce the risk of crash due to their positive impact on stock price and reducing the information asymmetry, enhancing the company's reputation, and enhancing voluntary disclosure. Greater financial constraints also limit the positive role of corporate social responsibility in mitigating crash risk. In a survey study conducted by Ali, Wilson and Husnain (2022) to evaluate the determinants of stock price crash risk at the macro, meso and micro levels, the results of the study indicated that macroeconomic factors such as corporate governance and political, legal and social factors affect the behavior of companies, the very thing that contributes to stock price crash risk. The characteristics of companies at the industry level, media coverage, ownership structure, and behavioral factors have an impact on the risk of crash. Eventually, at the micro level, the traits of the chief executive officer (CEO), compensation, business policies, earnings management, transparency, administrative characteristics, and company-specific variables affect stock price crash risk.

In the same context, the study of (Huang and Liu, 2021) tested the impact of the Coronavirus outbreak on stock price crash risk and whether companies that participate in more social responsibility activities are less at stock price crash risk. The researchers concluded that Covid-19 has an impact on stock price crash risk. Companies that engage in more social responsibility are less at crash risk in the post-virus period. This effect is less severe for state-owned enterprises than for non-state-owned enterprises in the post-Covid-19 period.

The quality of external auditing also has a negative impact on stock price crash risk, as it limits the ability of the management to withhold the bad news (Khajavi and Zare, 2016). In the same context, Abdel-Wanis (2021) tested the relationship between the quality of auditing, ownership structure, and stock price crash risk. The researcher also tested the interaction between the structure of ownership and auditing quality and their impact on stock price crash risk. It is indicated that increasing managerial and institutional ownership leads to an increase in crash risk due to the misleading information disclosed through the chief executive officer (CEO).

The quality of auditing also has a negative impact on crash risk. Shareholders benefit from improving the quality of auditing to provide a better environment for them to obtain a greater amount of information, to reduce information asymmetry and to increase their confidence in the validity of the information available about the company. This is reflected in the shareholders' decisions related to securities, such as the volume and price of trading in a way that reduces stock price crash risk. Companies that have weak internal control are more vulnerable to the risk of a crash in stock prices, especially when the weakness problems are linked to the company's financial reporting process. Therefore, the regulations of internal control play an important role in restricting stock price crash risk and maintaining market stability (Kim et al., 2019).

The characteristics of the CEO have an impact on stock price crash risk. The study of (Shahab et al., 2020) tested the relationship between the power of the CEO and the risk of a crash in stock prices, as well as the modifying role of the gender of the CEO and ownership structure on the relationship of the CEO's power to stock price crash risk. Researchers found that there is a correlation between the power of the CEO and the risk of crash. This relationship is significantly attenuated when the proportion of females on the board of directors and institutional ownership is high, and when the managers are motivated to cover the bad news such as the sensitivity of the managers' wealth to changes in stock price and having fewer skills. In addition, increasing board diversity in terms of gender, age, and education can reduce stock price crash risk future (Jebran et al., 2020).

If managers have the ability to evaluate stock price crash risk and if the benefits and returns are greater than the costs associated with the potential loss of reputation and litigation, managers will trade on the risk of stock price crash in the future for personal gain (He et al., 2021). Managers may exploit the ambiguity of financial reports, as they can successfully hide negative information through writing intricate financial reports that lead to stock price crash. This impact is more evident in companies that have either continuous negative news of earnings, temporary positive news, greater incentives for CEO stock options or lower litigation risk (Chaeet al., 2020).

Business strategies at the company level also have an impact on stock price crash risk in the future. Companies that follow innovative business strategies (prospectors) are more likely to exaggerate in the evaluation of stocks, which increases stock price crash risk (Habib and Hasan, 2017). The study of (Wu et al., 2022) has tested the impact of digital transformation of institutions on stock price crash risk. The results of the study revealed that the digital transformation reduces stock price crash risk significantly. This effect is more evident in advanced technology institutions and economically developed countries, where it leads digital transformation of enterprises to reduce information asymmetry, to improve the transparency of enterprise information, and to increase understanding of the enterprise by external investors, and in turn, reducing crash risk. In light of the above, it can be said that stock price crash risk is one of the most serious risks facing companies, due to its impact on investors, companies and stock markets. Management's withholding of bad news is one of the most important explanations for the occurrence of crash risk. Therefore, managerial incentives are one of the most important determinants of stock price crash that make the managers withhold the bad news.

2.3. The relationship between stock liquidity and the risk of stock price crash:

Stock liquidity serves as a measure of stock buying and selling activities. It refers to the ability of investors to buy and sell stocks at a reasonable price. The more liquid the stock is, the less time it takes to sell it and the lower the discount on the fair price of the stock. On the other hand, if the stock liquidity is limited, the number of sellers and buyers for the stock will be fewer. So, the trading volume greatly affects the stock price as it is difficult to find a buyer at a reasonable price in a short period. Thus, the sellers face difficulty in finding buyers willing to buy the stock at its fair price and as a result the stock price may collapse (Tang et al., 2023).

Crash risk occurs when the accumulated negative news hidden by managers is disclosed all at once. In this way, the liquidity of stocks can affect crash risk through the probability of revealing the bad news due to the poor management performance and the extent to which the bad news is hidden, and the extent of the market response or reaction to the disclosure of this news (Chang, Chen and Zolotoy, 2017). Therefore, the companies that enjoy liquidity have a greater probability of disclosing bad future profits, as liquidity makes managers withhold the bad news lest disclosing it should lead investors to sell their stocks, and ultimately the accumulated bad news is published all at once, causing a crash.

In a related context, the study of (Zhang et al., 2018) tested the effect of stock liquidity on stock price crash risk. The results of the study indicated that there is a positive effect of stock liquidity on stock price crash risk. High stock liquidity may, then, motivate investors to sell their shares to take advantage of the high price. What may result is an increase in the volume of supply and, consequently, a decrease in the price. The study showed that some companies come to hide the bad news in order to improve liquidity, but the accumulation of this news will lead to an increase in the crash risk.

The study of (Alp et al., 2022) examined the effect of stock market liquidity on stock price crash risk. The study also tested the effect of foreign investors (founders and individuals) on the relationship between stock liquidity and stock price crash risk. It also tested trading volume and removing restrictions on term sale on the relationship between stock liquidity and stock price crash risk. The researchers concluded that high stock liquidity increases the probability of stock price crash. The results also indicated that high stock liquidity increases stock price crash with the increase in the share of the foreign investors (founders).

However, in the case of the individual investors, this effect is insignificant. Also, the increase in trading volume raises liquidity. This, in turn, leads to an increase in the possibility of stock price crash as managers tend to cover the bad news due to the threat of the foreign investors to exit the market, although high liquidity makes it easier for foreign investors sell shares. Therefore, this conduct of selling amplifies the negative reaction of other participants towards the bad news related to the company, the very thing that may cause significant decline in stock prices and thus leads to stock price crash.

The study of (Deng et al., 2023) aimed to test the effect of stock liquidity on stock price crash risk and whether this effect is limited to the financial crises time. The researchers found that there is a positive effect of stock liquidity on stock price crash risk in the future, which is more evident in companies with high information asymmetry. This is due to the transient investor theory which states that for fear of potential sales by short-term investors and a decline in stock price in response to the disclosure of negative news, managers tend to withhold the bad news of companies rather than release it in the proper time. This leads to the accumulation of bad news, which, when finally published, will result in a severe negative reaction in stock markets, causing stock price crash. In contrast, other studies have found a negative effect of stock liquidity on stock price crash risk.

The study of (Ping, 2015) indicated that stock liquidity is an important factor that can affect stock price crash risk. The study made it clear that when stock liquidity rises, it is evidenced that there will be an increase in the ask volume and thus a rise in the stock price, the very thing that reduces crash risk.

Also, the study of (Chauhan et al., 2017) concluded that there is an inverse effect of stock liquidity on the crash risk. This result is due to the fact that increasing stock liquidity enhances control over the management, which helps in reducing its manipulation, concealing the bad news, and consequently reducing crash risk in the future. Stock liquidity may be an incentive for the company to have effective governance mechanisms to maintain current and prospective investors. Accordingly, these mechanisms will limit the reasons that may reduce stock price crash risk, especially the conflict of interests between the management and the shareholders in light of the agency theory.

On the other hand, some studies have tested the effect of illiquidity on stock price crash risk. The theoretical studies indicate that one of the components of market illiquidity is adverse selection that refers to the compensation for liquidity providers due to the transactions of investors of more information. Hence, the size of the cost of adverse selection increases owing to the information advantage the informed traders enjoy. This makes information asymmetry related positively to illiquidity and makes information disclosure less efficient. When negative information reaches a certain point that cannot be hidden, it is disclosed all at once, causing a sudden stock price crash (An et al., 2018). This conclusion is reached by (Wang et al., 2021). Thus, it is proposed to establish mechanisms for monitoring liquidity in stock market, early warning mechanisms, and leverage control.

Through the aforementioned studies dealing with the effect of stock liquidity on the risk of stock price crash, it becomes clear that there is an effect of stock liquidity on stock price crash risk. This effect may be positive because the increase in stock liquidity results from concealing the bad news by the management, the very thing that leads to an increase in the ask volume. However, the accumulation of news and its disclosure all at once will necessarily lead to a crash in stock price. In addition, some investors come to doubt the rise of stock liquidity, especially in times of financial crises. This makes the investors rid of these stocks, the very thing that may finally lead to stock price crash.

On the other hand, some studies have found a negative impact of stock liquidity on stock price crash risk since stock liquidity is an evidence for the increase in the volume of stock demand. This subsequently leads to raising prices and reducing stock price crash in the future. As a result of the conflict in the results of the previous studies, the current study tests the effect of stock liquidity on the risk of stock price crash. Accordingly, the first hypothesis of the study is formulated as follows: **H1:** *The liquidity of stocks has a significant effect on the risk of stock price crash of the companies in question.*

2.4. The modified role of financial analyst coverage

Financial analysts play an important role as information intermediaries in the stock market. They make predictions about the future prospects of the company and issue recommendations to investors regarding buying, holding, or selling stocks. This is done by obtaining information from public and private sources, processing it, and disseminating it in the market, which is reflected in the quality of the financial information that increases the informational efficiency of securities markets and reduces asymmetry among market participants (Hinze and Sump, 2019).

In addition, the financial analysts have a supervisory role over the management through their expertise in examining the company's information, in communicating directly with the management, and in asking questions about the company's profits in earnings announcement conferences. This helps to restrict the management's manipulation of financial reports, to discover the management's opportunistic conduct, and to limit the ability of the management to hide the bad news due to the ambiguity of financial reports, the very thing that contributes to reducing the risk of stock price crash in the future (Li et al., 2023).

Analyst coverage contributes to improving liquidity by reducing information asymmetry among stakeholders. The reason for this is that information asymmetry among investors leads to reducing their dealings in stocks to lessen losses that may result from information asymmetry among them. Therefore, the cost of dealing rises and liquidity decreases. (Dang et al., 2019). Consequently, transactions in the stock market may stop as a result of the decrease in stock liquidity due to the lack of bid-ask prices for stocks.

However, the coverage of financial analysts has a significant impact on stock liquidity, especially when used as a mediator and monitor of information. This improves the information environment and reduces adverse selection by investors due to the increase in the number of investors and their dealings, which leads to an increase in stock liquidity. In addition, the problem of information asymmetry in the securities market reduces. The price range decreases while trading volume increases. Also, the investors' confidence increases in stocks that attract the attention of financial analysts and thus their dealings increase (Huang, 2024). Volume 2

Many studies have examined the effect of financial analyst coverage on the risk of stock price crash. The study of (Xu et al., 2013) aimed to test the relationship between the coverage and optimism of the financial analyst and the risk of stock price crash. The results of the study showed that analyst coverage through their optimistic profit expectations can increase the crash risk of the companies they cover. This occurs because of not disclosing the bad news in the proper time to the external investors. When the accumulated information reaches a turning point, it will be revealed to the market all at once. Then, stock price crash occurs. In the same direction, the study of (Cho and Kim, 2020) revealed that the optimism of financial analysts can increase the risk of stock price crash, either by stimulating overvaluation or by providing managers with the opportunity to withhold bad news. This effect is more obvious in companies that have a non-transparent information environment that hinders the investors from evaluating the company's performance accurately.

In contrast, other studies have found that a high level of financial analysts' coverage is associated with a lower stock price crash risk in the future. The results of the study of (He et al., 2022) revealed that conclusion and that was because of the positive role of financial analysts as mediators and monitors of information in stock markets. This negative correlation is stronger in companies with high financial transparency. This means that the reports of the financial analysts have a role in making investment decisions by enhancing the quality and transparency of the information of the company and facilitating the external transactions, the very thing that helps in crash risk pre-evaluation. The media is also considered a medium of information in stock markets as it limits the managers' incentives and ability to withhold the bad news. It is more evident in the companies of higher coverage of the financial analysts (Wu et al., 2022; Zhao et al., 2023). The study of (Park and Song, 2019) tested whether stock price crash risk is affected by the appointment of financial analysts by a securities company within a business group known as group-affiliated analysts (chaebol). That group monitors the managers and reduces withholding the bad news. The results of this study revealed a negative relationship between the coverage of the analysts in the group and the crash of stock prices due to their information.

In a study conducted by (Huang, 2018), financial analysts were divided into star and non-star analysts. It is concluded that star analysts'

coverage can reduce stock price crash risk. They act as an effective external monitor that reduces the opportunistic activities of managers. They are also more professional and their expectations are more accurate. Thus, stock price crash risk reduces. However, the coverage of non-star analysts increases stock price crash risk. In the same context, a study by (Yvonne and Lee, 2016) examined the impact of changes in the analyst's coverage on stock price crash risk. The researchers concluded that changes in the analyst's coverage negatively relate to the risk of stock price crash in the following year. This result is consistent with the information gathering activities carried out by analysts, which limits the behavior of withholding the bad news. This effect is more evident when the change in the coverage of the analysts is attributed to star ones. Thus, combining skills and the advantages of access to information and the reputation allows star analysts to disseminate information more efficiently in the market and reduces the probability of the future crash of the companies they cover if compared to their non-star counterparts.

In the light of the conflicting results of the studies dealing with the relationship between the financial analysts' coverage and stock price crash risk, it can be said that financial analysts may play the role of monitoring the behavior of the management in addition to the positive role as intermediaries and monitors of information in stock markets. This affects stocks liquidity and simultaneously restricts the management manipulation of financial reports, and limits its ability to conceal the bad news, which contributes to reducing stock price crash risk in the future. However, the optimism of the financial analysts can lead to an increase in stock price crash risk because of not disclosing the bad news to investors in the proper time due to increasing stock liquidity. When this news reaches a turning point and is disclosed all at once, stock price crash risk will occur. A question arises here: Does the coverage of the financial analysts have an impact on the relationship of stock liquidity to stock price crash risk? Accordingly, the second hypothesis of the study can be formulated as follows:

H2: The coverage of the financial analysts has a significant impact on the relationship of stock liquidity to stock price crash risk of the companies in question.

In light of the logical presentation of the study hypotheses, a proposed model of the relationship between the study variables can be developed as follows:



Figure No. (1) The relationship between the study variables

3. Study methodology:

The methodology of the study contains the variables of the study and how to measure them, the population and sample of the study, the sources for obtaining study data, and testing the study hypotheses, as follows:

3.1. Study variables, and how to measure them:

The study examined the effect of stock liquidity on stock price crash risk, and the effect of the financial analyst' coverage on the relationship of stock liquidity to stock price crash risk. Accordingly, the study variables are as follows:

3.1.1. The independent variable (stock liquidity):

Stock liquidity was measured by using the Bid-Ask Quoted Spread measure, which has been used by many previous studies (Pham et al., 2020; Nadarajah et al., 2021) to measure the daily bid-ask difference divided by the average bid-ask price, the average relative differences in the daily trading prices of the stock are calculated. The larger the differences, the lower the liquidity of the stock. This measure is calculated by using the following formula:

$QSpread_{id} = 2x(Ask_{id} - Bid_{id})/(Ask_{id} + Bid_{id})$

Where $Ask_{i,d}$ reflects buying price of stock i on day d, Bid $_{i,d}$ reflects the ask price of stock i on day d, and the arithmetic mean of the daily price differences over the trading days of each year is calculated to estimate the annual relative price differences, and the higher value indicates the prices relative differences to the weak liquidity of the stock in the market.

3.1.2. The dependent variable (stock price crash risk):

Accounting and finance literature has presented four methods for measuring stock price crash risk. These methods depend on returns on the company's stock price, which makes risk measures reflect the specific factors of the company more than the broad movements in the market. They can also rely either on the daily or the weekly return on the stock price of the company in the market (Habib et al., 2017). Many previous studies have relied on the weekly returns to measure stock price crash risk when measuring the risk for a period of a fiscal year (Dang et al., 2018; Kim and Zhang, 2016).

Stock price crash risk was measured by the likelihood extremely negative firm-specific weekly returns. Stock price crash risk is defined as unusual events that appear when the standard deviation of a company's stock rises above the average weekly extraordinary returns of the same stock during a full fiscal year. The standard deviation by 3.2 degrees leads to a probability of 0.1% of the occurrence of an abnormal event such as the stock price crash during that year according to a normal distribution.

The probability that the weekly abnormal stock returns are negative in each sample company will be measured through the following steps:

- Calculating extremely firm-specific weekly returns for the stock of each company in the sample during the study period in the form of weekly cumulative windows. This is done according to the linear regression model that expresses the calculation of the estimated return for the company's stock R_{it} based on the market model, which takes the following linear relationship:

$$R_{it} = a_j + \beta 1_j R_{m(t-2)} + \beta 2 R_{m(t-1)} + \beta 3 R_{mt} + \beta 4 R_{mt(t+1)} + \beta 5 R_{mt(t+2)} + \varepsilon_{jt}$$

Where:

- α_j is the constant of the equation for the company j, which is the part of the return that is achieved regardless of the relationship between the market return R_m and the company's return R_j .
- β_j is the slope of the relationship between the company's stock return R_j during period t and the market return R_m during the same period t

 R_{it} : stock return of company i during period t.

 \mathbf{R}_{m} is the market return during period t.

- ε_{jt} The random error of the regression model, which expresses the abnormal returns of company _j stock in year _t.
- Estimating the value of the parameters in the regression model for each company in the sample through the actual weekly returns of each company's stock as well as the actual weekly market returns, based on data for the Egyptian Stock Exchange index during the study period.
- By substituting the value of the parameters in the previous step in the linear regression model and configuring it weekly for each company

separately during the study period, and calculating the value ε_{jt} which is the value of the weekly abnormal return for the company $_j$ stock during the week $_t$.

- Determining the value W_{jt} . It is the negative weekly abnormal returns for the company stock _j in the week _t. This value is calculated by taking the natural logarithm Ln of the total weekly abnormal return ε_{jt} plus one integer, and this is expressed by the following equation:

$$W_{it} = In(1 + \varepsilon_{it})$$

- Determining the frequency of the W_{jt} value falling below a standard deviation of 3.2, and a categorical variable is used to express the probability of the risk of a crash in the company's stock prices occurring during the study period. So, it takes the value 1 if the W_{jt} value is less than 3.2 and appears once during the study period, and it takes the value 2 if the value W is less than 3.2 and appears twice during the study period, and so on. If otherwise, the value is zero.

3.1.3. Modifying variable: (Coverage of financial analysts):

Many studies, including (Stagliano et al., 2018) used the natural logarithm (1+number of analysts) who follow the company as an indicator of coverage of financial analysts.

3.1.4. Control variables:

- Company size: it is measured by the natural logarithm of total assets.

- Financial Leverage: it is measured by the total liabilities over the total assets

- Corona crisis: it is a dummy variable taking the value one in the years before 2020 and the value zero in the years after 2020.

3.2. Community and sample of study:

The study population consists of all joint stock companies listed in EGX70 Index in the period from 2018 to 2022. Banks were excluded due to their specific nature, and companies registered in the periods after 2018 were also excluded. Accordingly, the study sample consisted of 63 companies, and the number of daily views was (15422).

3.3. Sources for obtaining study data:

Data related to the study variables were obtained from the following sources:

- Financial statements of the companies in question, available on the Mubasher website and the Egyptian Stock Exchange.
 - Website of the sample companies.
 - Investing website.

3.4. Testing the study hypotheses:3.4.1. Results of the descriptive analysis of the study variables:

A descriptive analysis of the study variables was conducted to identify the values of arithmetic means and standard deviations, as shown in the following table:

Variable	Minimum	Maximum	Arithmetic Means	Standard Deviations			
Stock liquidity	-5167.36	23.076	-96.164	399.43			
The risk of a Crash in stock prices	0	19	1.25	3.070			
Financial analyst coverage	0	8	3.27	2.042			
Leverage	0.1584	6.156	0.5123	0.4557			
Company size	6.1569	7.860	0.5123	0.4557			

Table No. (1) Descriptive analysis of study variables

Looking at the previous table, it becomes clear that:

- Stock liquidity ranges between -5167.36 and 23.076, and the average of the variable reached 96.164 with a standard deviation of 399.43.
- The minimum risk of a stock price crash was 0, while the maximum risk of crash was 19, with an average of 1.25 and a standard deviation of 3.070.
- The minimum coverage of financial analysts in the sample companies was 0, while the maximum was 8, with an average of 3.27 and a standard deviation of 2.042.
- Financial leverage ranges between 0.1584 and 6.156, and the average variable reaches 0.5123 with a standard deviation of 0.4557.
- The size of the company in the sample ranges between 6.1569 million and V.AJ.million, and the mean of the variable is 0.5123 and its standard deviation is 0.4557.

3.4.2. Analytical statistics:

The twenty-sixth edition of the Statistical Portfolio for the Social Sciences (SPSS) was used to test hypotheses in light of a set of analytical statistics, and the least squares method was used to estimate the parameters of multiple regression models. The estimates obtained from this method are characterized by being linear, unbiased, and have less variance. However, this method is subject to the availability of many conditions for its applicability. Therefore, it is necessary to test the non-occurrence of the regression models into measurement problems to ensure the validity of drawing conclusions before presenting the statistical results as follows:

First: Verifying the problem of normal distribution of data:

One of the basic assumptions in the least squares method is that the data follow a normal distribution. The Kolmogorov-Smirnov test and the Shapiro-Wilk test were used to verify that the data followed a normal distribution. It became clear from the test results that the data did not follow a normal distribution. To solve this problem, the inverse normal distribution function was used. The test results were as follows:

	Kolmogorov-Smirnov			Shapiro-Wilk			
	Statistic	Df	Sig.	Statistic	Df	Sig.	
cov	.033	294	.200*	.993	294	.196	
liq	.008	294	.200*	.999	294	1.000	
crash	.006	294	.200*	.999	294	1.000	

Table No. (2) Test of normal distribution of data

Second: Verifying the autocorrelation problem:

One of the basic assumptions in the least squares method is the absence of the phenomenon of autocorrelation, which is the correlation of sequential observations of the same variable during a certain period. The Durbin-Watson test was used to detect the extent to which the model falls into the problem of autocorrelation between random errors. The test value was 1.259, which means that there is no autocorrelation between the random errors. Thus, the autocorrelation condition has been verified.

Third: Verifying the problem of multi-collinearity:

The problem of multiple linear correlation is the lack of independence of the independent variables, i.e., the presence of a strong linear correlation between two or more independent variables explaining the changes in the dependent variable makes it difficult to isolate the effect of each of them on the dependent variable, the very thing that makes the regression coefficients calculated by the least squares method lose their significance. To reveal the extent of this problem, the Variance Inflation Factor (VIF) was used. When the value of the VIF is greater than 10, it means that there is a problem of collinearity. Using the VIF test, the value of this factor did not exceed (2), which confirms that there is no problem of bi-collinearity in the estimated regression models.

3.4.3. Results of the test study hypotheses: Results of testing the first hypothesis:

To test the validity of the hypothesis of the first study, multiple linear regression analysis was used to test the relationship between the independent variable (stock liquidity) and the risk of stock price crash (the dependent variable). The test results were as shown in the following table:

Table No. (3)

Looking at the previous table, it is clear that:

first hypothesis	"The liquidity of stocks has a significant impact on the risk of stock price crash in the companies in question"						
The	A diusted P				t		
independent variable	Square	p-value F		β	level of significance		
Constant	32%	0.009	3.422	1.267	0.641		
ST_LI				4.942	0.000		
total assets				-6.129	0.0698		
covid 19				5.494	0.421		
Leverage				0.048	0.995		

- The coefficient of determination was (32%), meaning that the independent variable (stock liquidity) and the control variables contribute to explaining (32%) of the change that occurs in the dependent variable (the risk of stock price crash), and that 68% of the changes that occur in the crash risk variable is due to other factors.
- From the previous table, the significance of the regression model is clear, as the calculated (F) value for the model was 3.422, which is significant at the (1%) significance level, where (P-value= 0.009).
- Referring to the T-Test, it is clear that there is a significant positive effect of stock liquidity on the risk of stock price crash, as the value reached (P-value = 0.000), and thus the hypothesis of the first study is accepted, which means that stock liquidity has a significant effect on the risk of stock price crash in the companies in question.

Results of testing the second hypothesis of the study:

To test the validity of the hypothesis of the second study, a Hierarchical Moderated Regression Analysis with modified variables was used to test the effect of financial analyst coverage on the relationship between stock liquidity and the risk of stock price crash, by comparing the estimation results of three multiple regression models. The first model is known as the Base Model that tests the significance of the direct effect of the independent variable (stock liquidity) on the dependent variable (risk of stock price crash). As for the second model, it is reduced as the regulating variable (financial analyst coverage) is entered to test the effect of this variable in addition to stock liquidity. The third is the full model that aims to test the effect of the interaction between stock liquidity and financial analyst coverage on the relationship of stock liquidity to the risk of stock price crash.

To test the validity of the second hypothesis, a hierarchical regression analysis (HMRA) was conducted. The following table shows the test results:

Table (A)

The effect of	financial analysts' liquidity to the ris	covera k of st	ige oi ock p	n the rel price cra	ationsł sh	nip of	f sto	ck
		0.0	· 1	1 / 1				.1

Second hypothesis	"The coverage of financial analysts has a significant impact on the relationship of stock liquidity to the risk of stock price crash in the companies in question"								
Dependent		Stock price crash risk							
variable	Base Model		Reduced	d Model	Full Model				
Independent variables	(T) Value	Sig.	Value(T)	Sig.	(T) Value	Sig.			
Constant	1.267	0.641	0.477	1.942	1.552	0.565			
ST_LI	4.942	0.000	0.001	0.001	-2.539	0.916			
total assets	-6.129	0.698	0.980	0.007	0.058	0.844			
Covid 19	5.494	0.421	0.720	0.129	0.211	0.553			
Leverage	0.048	0.995	0.366	-3.48	-0.285	0.454			
CO_FIN_ANA			0.050	-0.564	-0.677	0.018			
ST_LI*CO_FIN _ANA					0.020	0.004			
R Square	45%		58%		85%				
Adjusted R Square	32%		41%		66%				
F Change	3.422		3.542		4.454				
Significance of the model	0.009		0.004		0.000				

From the previous table it is clear that:

[•] The reduced model is statistically significant, as the F value for the model reached (3.542) with a significance level of 0.004. Also, introducing the 69

variable (coverage of financial analysts) in the model led to an increase in the guiding ability of the model, as the Adjusted R-squared reached (41%) and in the basic model it was (32%). The results shown in the table according to the (T) test also indicate the significance of the relationship between the crash risk in stock prices and both (stock liquidity - financial analyst coverage).

- For the (full) interactive model, the adjusted coefficient of determination is 66%, which means that the explanatory power of the model is 66%. It means that the variables (independent, modified, interaction, control) contribute to explaining the change that occurs in the dependent variable (stock price crash risk of companies') in this percentage. And that 34% of the changes that occur in the dependent variable are due to other factors. This indicates the high explanatory power of the model in explaining the change that occurs in the dependent variable by this percentage. It is noted that the entry of the modified variable into the financial analysts' coverage and its interaction with stock liquidity has led to an increase in the explanatory power of the model.
- Looking at the F-Test, the significance of the previous interactive regression model becomes clear at the level of significance (1%), where (F-Value=.4.454: P-value=0.000), which means the presence of an independent variable (at least one; Basic or Interactive) "of both the independent and control variables" having a relationship with the dependent variable.
- According to the previous point, the significance of the interaction variables is considered. The interaction coefficient became significant as it reached (P-value=0.004). In addition, as a result of entering the interaction variable, the relationship between stock liquidity and the risk of stock price crash became insignificant as it reached (P- value=0.919). This leads to accepting the hypothesis of the second study, which states that the coverage of financial analysts has a significant impact on the relationship of stock liquidity to the risk of stock price crash in the companies in question.
- In light of the previous point, it can be said that financial analyst coverage can be considered a variable modifying the relationship between stock liquidity and the risk of stock price crash.

4. Conclusions:

Stock liquidity is related to the efficiency of stock pricing, as the stock market enjoying liquidity allows investors to trade quickly at a low cost with a reduction in pricing errors. In return, low liquidity in the market hinders stock price discovery due to the slow flow of information related to the stock, which may make stock prices inconsistent with their quality. This makes stock liquidity the lifeline of financial markets.

One of the most important issues dealt with by previous studies about this topic is testing the effect of stock liquidity on the risk of stock price crash. However, a conflict is noticed in the results of those studies. Due to this conflict that motivates testing the effect of stock liquidity on stock price crash risk in the Egyptian market which differs in its characteristics from the developed markets, the study results revealed a significant positive effect of stock liquidity on stock price crash risk. This is consistent with the study of (Chang et al., 2017; Zhang et al., 2018; Alp et al., 2022; Deng et al. al., 2023) since the increase in stock liquidity may be caused by the management that hid the negative and bad news and showed only good news to improve liquidity, the very thing that results in an increase in the trading volume of the company's stock.

Because of the limited ability of the management to hide the negative news, it will be disclosed all at once resulting in stock price crash. Also, the increase in stock liquidity may lead some investors to doubt this rise, especially during the financial crises. So, these investors get rid of their stock. Therefore, an increase in the supply of stocks occurs and, consequently, stock price decreases. If a large number of investors follow this behavior (herd behavior), this will lead to an increase in the supply of stock, and this decline in stock price will turn into a crash.

In addition, if stock liquidity increases, some investors may sell their stock to benefit from this rise. Thus, when investors rid of their stock, a crash in stock price consequently occurs. Financial analysts' coverage improves the information environment of the company. The monitoring role of the financial analysts is another channel through which their coverage affects the risk of stock price crash as analysts are enabled to actively monitor the administrative procedures, announce them, reduce agency problems and administrative violations, and improve the efficiency of the company's investment and operational decisions. In this way, financial analysts can reduce the bad news of the companies and deter managers to cover and withhold it through their supervisory role.

Thus, the risk of stock price crash reduces. However, due to the managers' optimism, the negative news of the company is not disclosed in the proper time. Due to the discrepancy regarding the relationship of financial analysts' coverage to the risk of stock price crash, the current

study attempts to provide scientific evidence from the Egyptian environment that may reduce the controversy about this relationship. The results of the study revealed that there is a positive effect of financial analysts' coverage on the risk of stock price crash. This result is consistent with the study of (Cho and Kim, 2020; Xu et al., 2013) in the fact that the optimism of financial analysts may hinder the flow of information from the company to the market at the right time and may not limit the management's ability to withhold the bad news. It only discloses the good news which leads to increasing stock liquidity. It exploits issuing ambiguous or less transparent financial reports, which leads to increased trading volume and a temporary rise in prices. If this information is disclosed, a large amount of negative information floods the market and the temporary rise in stock prices quickly turns into a crash. The coverage of financial analysts as a modified variable is the reason for the lack of a relationship between stock liquidity and the risk of stock price crash. The reason for this may be the presence of other determinants such as the coverage of financial analysts that affect the risk of stock price crash. Therefore, it is expected that the results of the study will be useful to the investors as they cannot be deceived by high stock liquidity that may involve the management's coverage of the bad news, especially during the financial crises.

In addition, investors cannot be deceived by the financial analysts' optimistic coverage, which contributes somehow to stock price crash. In light of the findings, this study recommends increasing the quality of financial analysts' coverage services because of their impact on stock liquidity and the risk of stock price crash. Financial analysts are recommended to pay attention when preparing their research reports to practices related to earnings management and the reduction of the information asymmetry problem the investors encounter. They should improve the company information environment and reduce the opportunistic behavior of the managers who hide negative news, the very thing that is considered as one of the most important determinants of stock price crash in the future.

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