

# **What Challenges Do Social Media Pose For Financial Markets?**

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**RESUMO:**

ESTA DISSERTAÇÃO ANALISA OS DESAFIOS APRESENTADOS PELAS REDES SOCIAIS NOS MERCADOS FINANCEIROS, TRAÇANDO A SUA ASCENSÃO EM COMPARAÇÃO COM OS MEIOS DE COMUNICAÇÃO TRADICIONAIS. COM BASE NA LITERATURA EXISTENTE, IDENTIFICA E EXPLORA OS VÁRIOS DESAFIOS, COMO A DESINFORMAÇÃO, MANIPULAÇÃO DE MERCADO E PREOCUPAÇÕES COM A PRIVACIDADE. A ANÁLISE DE CASOS COMO A TESLA DE ELON MUSK DEMONSTRA QUE INVESTIDORES INFLUENTES PODEM MANIPULAR O MERCADO A SEU PROVEITO, ENGANANDO OUTROS E LUCRANDO À SUA CUSTA.

**PALAVRAS CHAVE:** AÇÕES, MANIPULAÇÃO DE MERCADO, REDES SOCIAIS, ABUSO DE MERCADO, REGULAÇÃO.

**ABSTRACT:**

THIS PAPER EVALUATES THE CHALLENGES PRESENTED BY SOCIAL MEDIA WITHIN FINANCIAL MARKETS, TRACING ITS RISE AND CONTRASTING IT WITH TRADITIONAL MEDIA. DRAWING ON EXISTING LITERATURE, IT IDENTIFIES AND EXPLORES THE VARIOUS CHALLENGES, SUCH AS MISINFORMATION, MARKET MANIPULATION, AND PRIVACY CONCERNS. ANALYSIS OF CASES INVOLVING ELON MUSK'S TESLA DEMONSTRATES THAT INFLUENTIAL INVESTORS CAN MANIPULATE THE MARKET TO THEIR ADVANTAGE, DECEIVING OTHERS AND PROFITING AT THEIR EXPENSE.

**KEYWORDS:** STOCKS, MARKET MANIPULATION, SOCIAL MEDIA, MARKET ABUSE, REGULATION.

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## **ABBREVIATIONS**

CEO: Chief Executive Officer

ESMA: European Securities and Markets Authority

ESRB: European Systemic Risk Board

EU: European Union

FINRA: Financial Industry Regulatory Authority

IRD: Investor Relations Department

MAR: Market Abuse Regulation

Reg FD: Regulation Fair Disclosure

SEC: Securities and Exchange Commission

US: United States

## INTRODUCTION

At a time when virtual connectivity predominates, the influence of social media on economic markets is increasingly transforming into pure markets. From shaping investor sentiment to disseminating market information, social media structures hold enormous power in the financial landscape. However, this electricity is not without challenges and complexities. As social media structures continue to adapt and have a greater impact on financial markets, information and solutions to these issues are critical to maintaining market integrity and investor confidence. Based on these studies, this work addresses the following research questions: What various challenges do social media pose in economic markets, and how can these challenges be effectively mitigated to ensure the stability and integrity of monetary systems?

The first chapter of this thesis provides important background facts about the evolving environment of financial markets within the digital generation. It starts by clarifying the media's conventional role as the number one source of statistics and its subsequent transformation with the advent of social media. Based on a review of relevant literature, the chapter looks at the definitions of social media and clarifies their role in financial markets. It also explores the differences between traditional media and social media, highlighting their strengths and obstacles. Importantly, this chapter discusses the proposed EU social media law to compensate traditional media and takes a position that sees their relationship as complementary rather than adversarial.

Chapter 2 carefully dissects the myriad challenges that social media presents for financial markets. These challenges include market volatility, misinformation and rumors, regulatory compliance issues, influence on investor behavior, cybersecurity risks, market manipulation, reputation management, data privacy concerns, and regulatory responses. Each challenge is scrutinized in detail, drawing upon existing literature and research to provide a comprehensive understanding of its implications within the financial landscape. Furthermore, the chapter examines existing juridical solutions aimed at mitigating these challenges and proposes additional recommendations based on the author's perspective and analysis.

In the final chapter, we will examine the case study of Elon Musk and Tesla, focusing on how the tweets made by the CEO have a significant impact in the stock market, serving as a real life example of the role that social media plays in the financial markets. Specifically, we

will analyze the repercussions of Musk's activity on X and the subsequent intervention by the Securities and Exchange Commission (SEC). We aim to understand how social media can influence market behavior and evaluate the response of regulatory frameworks and legal mechanisms to such incidents. This analysis will serve as a bridge between our exploration of theoretical challenges and the practical application of solutions. Drawing upon principles of civil liability and legal mechanisms, the chapter explores potential solutions to address such scenarios in the future. Additionally, we offer our insights and recommendations for resolving the Elon Musk case using a combination of existing legal frameworks and innovative solutions.

In summary, the primary objective of this thesis is to identify the main challenges posed by social media in financial markets and propose a comprehensive framework for addressing them. We aim to improve awareness of the changing dynamics in modern financial settings by investigating the interactions between social media, traditional media, and regulatory measures.

## I. THE EVOLUTION OF MEDIA IN FINANCIAL MARKETS

The influence of the media extends beyond merely reporting news in the realm of investing; it has a direct impact on the performance of investments. This is achieved through the media's emphasis on price fluctuations, which in turn triggers subsequent alterations in prices. During the 1920s, stock prices escalated as speculation spread through the American stock market.<sup>1</sup> Captivated by dreams of attaining sudden wealth, members of the public drained their savings accounts and invested those funds into stocks.<sup>2</sup> Companies inflated profit expectations to attract more investment. This reckless optimism created an unstable bubble, as substantive financial valuations were ignored in the pursuit of profitability.

Stock brokers sought to persuade investors to purchase corporate shares. By 1929, there were many who believed that the market price of equity securities had risen excessively, a sentiment consistently reinforced by both the media and statements from influential government figures.<sup>3</sup> However, various companies and brokers made predictions lacking factual bases, with some claims being fraudulent.<sup>4</sup> The disclosure of these deceptive claims caused panic among investors, prompting them to withdraw their money from the stock market. The widespread withdrawal of money caused the stock market to crash in 1929, leading to the Great Depression. As a response, Congress sought to safeguard individual investors from stock market risks by creating a strong legal framework meant to protect them.

In the current digital era, media outlets play a progressively pivotal function in the lives of investors. Whether through traditional news reporting or social media platforms, any

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<sup>1</sup> Speculators may act as strategic traders who manipulate stock prices for profit, engage in short-selling based on the feedback effect from the stock market to corporate decisions (Goldstein and Guembel, 2008).

<sup>2</sup> Ruello, J. (2023). Insurgent Intentions: Are Retail Investors on Social Media Subject to Federal Market Manipulation Laws?. *Louisiana Law Review*. Vol. 83. p. 1021.

<sup>3</sup> Barsky, Robert B. and J. Bradford DeLong. Bull and Bear Markets in the Twentieth Century. *Journal of Economic History* 50, no. 2 (1990): p. 265-281.

<sup>4</sup> Securities law history. (visited on August 31, 2023). Legal Information Institute. Retrieved from [https://www.law.cornell.edu/wex/securities\\_law\\_history](https://www.law.cornell.edu/wex/securities_law_history)

stock exchange developments now propagate instantly. Numerous reports and studies have delved into the impact of traditional media on the stock market. Traditional media sources like news outlets, publishers, reputable consulting firms' reports, and expert evaluations have played a significant role in market analysis, covering various areas such as stocks, commodities, foreign exchange, and cryptocurrencies. These channels have served as controllers of financial news, filtering and conveying information to a wide audience.

### **1.1. Media as an Information Channel**

Eugene Fama (1970)<sup>5</sup> introduced the concept of an "informationally efficient" market, where prices incorporate all available information pertaining future values. The existence of informational efficiency is a direct consequence of competitive dynamics, the ease of market entry, and the low expenses associated with acquiring information. When there is a noticeable indication of high future values that have not been factored into market prices, competitive traders will purchase assets based on this signal. Consequently, prices will rise until they appropriately reflect the information conveyed by the signal.

More recently, the discussion has shifted to considering not just the information itself, but also how it is communicated and presented to investors. Later research recognized that the way data is shaped and shared can radically change financial outcomes. Where the past focused on whether numbers matched news, contemporary analysis examines how packaging and spreading information guides people's decisions up or down.<sup>6</sup> The literature has thus deepened its understanding of how what is said interacts with how it is conveyed to move market values.

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<sup>5</sup> Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance*. p. 383-417.

<sup>6</sup> Joseph Engelberg. and Christopher A. Parsons. (2009). *The Causal Impact of Media in Financial Markets*.

André Kostolany once stated that “*facts only account for 10% of the reactions on the stock market; everything else is psychology*”<sup>7</sup>, highlighting the significance of psychological factors in the volatility of market fluctuations and an investor's mindset toward the market. Shiller (1992) argued that investing is fundamentally a social activity defined by interactions between investors. In an identical direction, Hong et al. (2004)<sup>8</sup> uncovered credible evidence supporting the belief that social connections among investors lead to increased stock market involvement. Additionally, research conducted by Paul C. Tetlock<sup>9</sup> shows that skepticism in the media can lead to decreased stock prices, followed by a return to true value. On the other hand, extreme levels of skepticism can predict increased trading activity in the market.

Thus, attention now recognizes the power of presentation alongside pure substance.<sup>10</sup> In this context, two primary mechanisms shape how investors access and interpret financial information. Information intermediaries, including newspapers and television, selectively present what they consider relevant to investors. Simultaneously, the diverse interpretation of the same piece of information by individuals relies on their beliefs and the potential influence of personal cognitive biases. Although media reports on financial markets go beyond conveying information, their influence extends beyond simple reporting. Often, media functions as a watchdog overseeing companies for potential wrongdoings. Providing news coverage is crucial to strengthening corporate leadership by uncovering and stopping possible misbehaviors.

With the rise of social media, social platforms like X<sup>11</sup>, Facebook, and Reddit have replaced traditional media as a major source of information and reshaped the way

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<sup>7</sup> Nasdaq. (2019). *How Does Social Media Influence Financial Markets?*. Nasdaq.

<sup>8</sup> Stein, Jeremy & Hong, Harrison & Kubik, Jeffrey. (2004). *Social Interaction and Stock-Market Participation*. Journal of Finance. Vol. 59. p. 137-163.

<sup>9</sup> Paul C. Tetlock. (2005). Giving Content to Investor Sentiment: The Role of Media in the Stock Market. Journal of Finance.

<sup>10</sup> Emanuele Bajo. and Carlo Raimondo. (2018). The Impact of the Media on Financial Markets. University of Bologna Business School.

<sup>11</sup> X Corporation, established by Elon Musk in 2023, is an American technology firm that was created as the successor to Twitter, Inc.

financial information is shared and analyzed.<sup>12</sup> In various studies, it has been noted that financial market professionals assign substantial importance to the information found in professional analytical reports. This stems from the fact that market participants do not significantly discount this information, considering the methodological discretion and resulting ambiguity<sup>13</sup>. Within this context, social media emerges as a specific and valuable tool, ensuring access to a diverse array of market information crucial at different operational levels within contemporary financial institutions.<sup>14</sup>

## 1.2. Defining Social Media:

There are several definitional approaches to social media. Essentially, it is a collection of software-based digital technologies that offer users digital environments in which they can exchange digital content or information over an online social network.<sup>15</sup> Across literature, social media refers to a variety of services which include web 2.0 philosophy<sup>16</sup>, the concept of sharing<sup>17</sup>, social networks<sup>18</sup>, and innovative forms of socialization.<sup>19</sup> When taken as a whole, these traits portray social media as a potentially valuable data source for professionals in the financial markets at various operating levels. Specifically, social media platforms help decision-makers manage diversity while controlling portfolio risk by providing a wide variety of market-related information.

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<sup>12</sup> Gan, B., Alexeev, V., Bird, R., & Yeung, D. (2020). Sensitivity to sentiment: News vs social media. *International Review of Financial Analysis*, Vol. 67.

<sup>13</sup> Keller, J., and Pastusiak, R. (2016). The psychology of investing: Stock market recommendations and their impact on investors' decisions (the example of the Polish stock market). *Acta Oeconomica*, Vol. 66. p. 419-437.

<sup>14</sup> Cwynar, A., Cwynar, W., Pater, R., & Filipek, K. (2019). Social Media as an Information Source in Finance: Evidence from the Community of Financial Market Professionals in Poland. *The International Journal of Digital Accounting Research*, Vol. 19. p. 29-58.

<sup>15</sup> Appel, G., Grewal, L., Hadi, R. et al. (2020). The future of social media in marketing. *Journal of the Academy of Marketing Science*, Vol. 48, p. 79-95.

<sup>16</sup> Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, Vol. 53. p. 59-68.

<sup>17</sup> Meikle, G. (2016). *Social media. Communication, sharing and visibility*. 1st ed. London: Routledge.

<sup>18</sup> Boyd, D., & Ellison, N. (2008). *Social Network Sites: Definition, History, and Scholarship*. *Journal of Computer-Mediated Communication*, Vol. 13, p. 210-230.

<sup>19</sup> Obar, J.A. and Wildman, S. (2015). *Social media definition and the governance challenge: An introduction to the special issue*. *Telecommunications Policy*, Vol. 39(9). p. 745-750.

These technologies are usually presented in the form of apps and websites. However, it is also possible to perceive social media in a broader sense by looking beyond the digital tools and specific tech services. Instead, we have a virtual space where individuals carry out important activities in their lives. This perspective emphasizes the actions and communications undertaken by individuals in these virtual spaces rather than the technologies or platforms that enable such interactions.

Their dynamic role has been a focal point in the financial markets due to the unique potential that their continuous stream of information provides for market participants to navigate through a wealth of information. Hence, X gives investors an opportunity to collect inputs about specific stocks and communicate their opinions through the use of cashtags.<sup>20</sup> Financial specialists presently appreciate a more extensive scope of data sources and various perspectives, bypassing customary media gatekeepers. While social media has demonstrated its effectiveness in anticipating future stock returns<sup>21</sup>, steering compliance policies<sup>22</sup>, and forecasting firm equity value<sup>23</sup>, it is crucial to acknowledge that information obtained from these platforms may have limitations, including low quality, incompleteness, or potentially fake.

According to Clarke et al. (2020)<sup>24</sup> and Vosoughi et al. (2018)<sup>25</sup>, fake news spread more rapidly than real news, due to the algorithms used by social media platforms that prioritize content based on engagement metrics, leading to the spread of fake news. Posts that receive high levels of likes, shares, and comments are given more visibility in

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<sup>20</sup> Cashtags enable users to monitor and engage in conversations about financial subjects on social media channels, similar to using hashtags for general topics. This is indicated by a "\$" symbol followed by the stock or asset's ticker symbol.

<sup>21</sup> Bollen, J., Mao, H., & Zeng, X. (2011). *Twitter mood predicts the stock market*. Journal of Computational Science, Vol.2. p. 1–8.

<sup>22</sup> Chandra, R, and Zaorski, S. (2013). *Social media usage in the financial services industry: Toward a business-driven compliance approach*. Journal of Taxation and Regulation of Financial Institutions, Vol. 26. p. 5-20.

<sup>23</sup> Luo, X., Zhang, J., Duan, W. (2013). *Social media and firm equity value*. Information Systems Research, Vol. 24. p. 146-163.

<sup>24</sup> Clarke, J, Chen, H, Du, D, and Hu, Yu J.. (2020). *Fake News, Investor Attention, and Market Reaction*. Information Systems Research, Vol. 32.

<sup>25</sup> Vosoughi, S., Roy, D. and Aral, S. (2018). *The spread of true and false news online*. Science, Vol. 359. p. 1146-1151.

users' news feeds, regardless of their accuracy. This algorithmic promotion of content can worsen the dissemination of misinformation. Moreover, Chen et al. (2014)<sup>26</sup> and Luo et al. (2013)<sup>27</sup> suggest that social media provides fundamental knowledge in the stock market that has not yet been incorporated. By finding insights not yet priced in, these studies imply social media data could potentially offer incremental predictive value to analysts and investors. It highlights an opportunity to capitalize on emerging informational asymmetries. Hu et al. (2015)<sup>28</sup> argue that social media disseminates information that can build online social value.

Moreover, social media not only functions as an information channel but also as a real-time monitor for companies, contributing to the enhancement of the information environment. On social media platforms, companies face both commendation and critique, with individuals sharing information, whether accurate or not, intentionally or unintentionally. It is worth noting that rumors often exist independently of social media posts; the platform merely brings them into visibility, allowing for confirmation or refutation. Hence, research suggests that companies are more likely to proactively release announcements following attention on social media. This underscores the role of social media in enhancing the information landscape within financial markets.

### **1.3. Key Contrasts between Social Media and Traditional Media:**

Considering the importance of social media platforms in the current era, it is reasonable to examine what the distinctions between social media and traditional media are. Numerous studies have investigated the contrasting impacts of both sources to identify which has proved more influential. To exemplify, Dong et al. (2022)<sup>29</sup> reveal that social

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<sup>26</sup> Chen, H., De, P., Hu, Y., and Hwang, B.-H. (2014). *Wisdom of crowds: the value of stock opinions transmitted through social media*. Review of Financial Studies, Vol. 27. p. 1367-1403.

<sup>27</sup> Luo, L., Wang, Y., & Han, L. (2013). *Marketing via social media: A case study*. Library Hi Tech, Vol. 31. p. 455-466.

<sup>28</sup> T. Hu, W.J. Kettinger, and R.S. Poston. (2015). *The effect of online social value on satisfaction and continued use of social media*. European Journal of Information Systems, Vol. 24. p. 391-410.

<sup>29</sup> Dong, H., Ren, J., Padmanabhan, B., & Nickerson, J. V. (2022). *How are social and mass media different in relation to the stock market? A study on topic coverage and predictive value*. Information & Management, Vol. 59.

media excels in predicting absolute stock returns over a more prolonged timeframe (from  $t + 2$  to  $t + 10$ )<sup>30</sup>, in contrast to traditional media, which exhibits predictive capabilities limited to the next day. Traditional and social media also offer different material and have different functions. Specifically, traditional media covers a wider range of stock market-related information, whereas social media tends to focus on a limited amount of information. Yu et al. (2013)<sup>31</sup> also establish that social media holds a stronger connection with stock performance than traditional media.

In addition to being an outlet for information, social media also plays a filtering function, which tends to minimize the amount of information available. Within the context of the stock market, the information landscape offered by social media is considerably unified than the more extensive data provided by the traditional media. As the total amount of media information increases, the disparity in information variety becomes more apparent. In short, social media users have a herding mechanism that directs them to focus on a limited number of subjects rather than embracing a broader spectrum. Traditional media, on the contrary, appears to be less susceptible to this herding tendency and persists to provide a more diverse coverage.

Dong et al. also found that the information filtered by social media is more precise compared to the broader information from traditional media in predicting the performance of stocks over a prolonged duration. While traditional media excels in anticipating movements in the stock market for the next day, social media demonstrates superior performance over extended periods, despite its inclination to conform to popular opinion. These findings indicate that insights from traditional media and social media offer distinct indicators regarding the short-term performance of businesses, though both can be advantageous for investors.

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<sup>30</sup> This timeframe indicates a period starting two days after the initial time point ( $t$ ) and extending up to ten days after the initial time point.

<sup>31</sup> Yu, Y., Duan, W., & Cao, Q. (2013). *The impact of social and conventional media on firm equity value: A sentiment analysis approach*. *Decision Support Systems*, Vol.55. p. 919–926.

Another element of social media to consider is that information is provided by its users. These individuals have the freedom to contribute material anywhere and at any time, much like citizen journalists.<sup>32</sup> Conversely, professional journalists monitor traditional media and choose what news to report according to their areas of expertise. These professionals do not frequently review each other's work before determining what to post, unlike social media. The possibility of everyone adopting the same trend is decreased by this independence. Each media specialist does, however, have a specialty that adds diversity to the stories they cover. As a collection of disparate informational pockets, this specialization allows traditional media to be more receptive to multiple points of view. Hence, social media coverage of the stock market is becoming even less diverse than that of traditional media as the amount of information increases.

Another significant difference between these media sources is the cost associated with obtaining information. Professional investors frequently spend large sums of money to obtain analyst reports and subscribe to Bloomberg/Thomson Reuters terminals, which may not be financially viable for the average investor. Common avenues for these investors to seek stock information include traditional mass media and Google searches. However, this approach comes with hidden costs – investors must invest considerable time and effort in reading, filtering, and processing information. In fact, new and inexperienced investors may find this traditional information search daunting. A recent study highlights a drop in information demand during the early months of the Covid-19 pandemic, despite individual investors entering the market.<sup>33</sup> On the other hand, social media offers a cost-effective, timely, and interactive method for individual investors. Some social media platforms, like StockTwits, even provide free and credible analyst reports.

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<sup>32</sup> S.C. Lewis, K. Kaufhold, D.L. Lasorsa. (2010). *Thinking about citizen journalism: The philosophical and practical challenges of user-generated content for community newspapers*. Journal. Pract. 4. p. 163–179.

<sup>33</sup> Ji, X., Bu, N. (Tom), Zheng, C., Xiao, H., Liu, C., Chen, X., & Wang, K. (2022). *Stock market reaction to the COVID-19 pandemic: an event study*. Portuguese Economic Journal, p. 171.

Although information on social media comes at a lower cost compared to traditional channels, its quality is not necessarily inferior. Bollen et al. (2011)<sup>34</sup> shows that social media provides fundamental information not found in traditional sources. For instance, social media captures data on a company's product popularity, enabling predictions not just for stock returns but also for future financial reports of the company. It suggests that stock markets may react more to social media, which consolidates various information, than to individual pieces of information in the market.

Quantifying sentiment on social media extends across stocks, commodities, cryptocurrencies, and other financial assets, facilitated by advanced tools. This initially unstructured data evolves into a quantitative format, presenting metrics such as posts, comments, likes, and other indicators for a specific asset. These metrics are then translated into line charts and daily, sometimes hourly, figures, offering traders the comfort of dealing with familiar quantitative data. This allows traders to apply their well-known trend-fitting and chart analysis techniques to social media data, similar to their approach with price charts.

Conversely, traditional media's news and reports predominantly deliver qualitative information. Navigating through these pieces is essential for formulating an informed perspective on a specific asset. Although qualitative information is valuable in market analysis, it lacks the streamlined efficiency and structured nature associated with quantitative data. By employing sentiment data sourced from social media, we not only have the ability to analyze various market assets but also to keep tabs on the online sentiments and conversations surrounding both our brand and those of our competitors.

This is particularly advantageous for smaller brands. Traditional media can provide meaningful insights into online brand performance primarily if we belong to a large, well-established stock or cryptocurrency. However, numerous smaller brands, like small-cap stocks or newly emerging crypto projects, encounter difficulties in gaining

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<sup>34</sup> Bollen, J., Mao, H., & Zeng, X. (2011). Twitter mood predicts the stock market. *Journal of Computational Science*, Vol.2. p. 1–8.

sufficient coverage from traditional media outlets. Consequently, the utility of traditional media for tracking the brand performance of these smaller entities becomes considerably limited.

While it is true that social media can contain misinformation, it is crucial for regulators to question whether information from traditional media is inherently better. Fake news can also find its way into finance-related reports in traditional media. The key point here is that while we do observe misinformation on social media, regulated channels like traditional media don't necessarily fare better. In fact, misinformation and bias in traditional media can potentially harm investors more, given the higher level of trust investors place in it.

These findings suggest that traditional media and social media have different but equally useful functions in informing stock market participants. It emphasizes how important it is to avoid assuming one is better than the other based on snap judgments. Thus, when individual investors are deciding on an information source, they must consider the cost and benefit associated with each. Social media offers a more economical and speedy way to access information, although it comes with its flaws. Conversely, traditional media also has their drawbacks. The crucial point is that they employ different methods to predict future returns.

#### **1.4. Compensatory Relationship vs Complementary Comparison:**

Recently, the European Union (EU) has proposed legislation that suggests social media platforms should compensate traditional media for featuring news articles in their feeds.<sup>35</sup> This proposal is founded upon two important presumptions: both social media and traditional media function as information conduits, providing analogous utilities, and the association between both outlets is competitive. Social media has the potential

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<sup>35</sup> Social media platforms and challenges for democracy, rule of law and fundamental rights Policy Department for Citizens' Rights and Constitutional Affairs Directorate-General for Internal Policies PE 743.400 -April 2023.

to reduce traditional media viewership as additional readers depend on social platforms for reports. However, it is crucial to acknowledge that the relationship linking social media and traditional media could also be viewed as complementary. Redefining this relationship as complementary rather than competitive would carry implications for how the proposed legislation should be approached.

Bar-Gill et al. (2020)<sup>36</sup> examine the influence of email newsletters and Facebook recommendations on traditional media viewership. The conclusions of both studies are consistent with the assumption that there is a beneficial relationship between traditional media and social media usage, highlighting their complimentary character. Moreover, Jiao et al. (2020)<sup>37</sup> distinguish between the ways that social media and traditional media affect stock volatility and turnover, claiming that information from traditional media sources is frequently reproduced on social media.

Because investors have different abilities to process information, different news can have different effects on asset prices, even if the information is the same. For example, suppose valuable pricing-related information, whether positive or negative, is released. Often this information hits platforms with continuous updates such as X and attract the attention of many investors. However, institutional investors can process information faster and tend to react first, allowing them to be more efficient at digesting news and reacting.<sup>38</sup>

Moreover, considering the complementary relationship between social media and traditional media, co-regulatory approaches effectively balance the interests of the majority of stakeholders compared to compensation policies, whereas regulatory measures intended to compensate traditional media may have a dampening effect on the

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<sup>36</sup> Bar-Gill, Sagit & Inbar, Yael & Reichman, Shachar. (2020). *The Impact of Social vs. Nonsocial Referring Channels on Online News Consumption*. Management Science. Vol. 67.

<sup>37</sup> Jiao, Wen & Wang, Lin & Liu, Juan & Fang, Sh & Jiao, Fu & Mantovani, Massimo & Somekh, Eli. (2020). *Behavioral and Emotional Disorders in Children during the COVID-19 Epidemic*. Pediatric pharmacology. Vol. 17. p. 230-233.

<sup>38</sup> Milas, C., Panagiotidis, T. and Derglades, T. (2021). *Does It Matter Where You Search? Twitter versus Traditional News Media..* Journal of Money, Credit and Banking, Vol.53. p. 1757-1795.

innovation necessary for achieving the level of financial inclusion required. Thus, it acknowledges the ability of social media platforms to increase general awareness of news articles, leading traditional media outlets to further explore these in more depth.<sup>39</sup> From this perspective, the relationship between them remains one of integration, not of exclusion or cancellation.

Finally, it is advisable for traditional media agencies and organizations to transition into the online realm and leverage the benefits offered by social media platforms in order to prevent a potential decline in the demand for their media outlets. For instance, printed newspapers should establish a strong online presence and actively engage on various social media platforms. Additionally, providing downloadable versions of these newspapers is essential to capitalize on the rapid dissemination, accessibility, interactive features, and feedback from audiences available through social media networks and platforms.<sup>40</sup>

In conclusion, redefining the relationship between social media and traditional media as one of complementarity carries substantial implications demanding a thorough reevaluation of the EU proposal's underlying presumptions and framework. This can benefit both citizens and businesses by maintaining productive interactions and broadening the dissemination of diverse, high-quality information. Additionally, it is essential to recognize that the risk of spreading misinformation via social media can be mitigated by traditional media through improved information filtering and the provision of reliable information to investors.

This chapter provided us with an overview of how social media has become increasingly important in financial markets and explored the distinctions between traditional media and social media platforms. By looking at the EU's proposed legislation on compensation it is clear that both traditional and social media play vital

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<sup>39</sup> Bruno, N., & Nielsen, R.K. (2012). *Survival is success: journalistic online start-ups in Western Europe*. University of Oxford. CHALLENGES.

<sup>40</sup> Marwan Walid Mohammad Al-Quran. (2022). *Traditional media versus social media: challenges and opportunities*. Technium, Vol. 4. p. 145-160.

roles in shaping market trends and educating investors, which contributes to the efficient functioning of financial markets. Moving on to the next chapter we tackle the challenges that come with the rise of social media. By identifying gaps in the literature research we highlight areas where social media brings opportunities as well, as obstacles. Additionally we offer an examination of solutions and recommendations to effectively navigate these complexities.

## **II. NAVIGATING CHALLENGES IN THE AGE OF SOCIAL MEDIA**

Social media platforms face vulnerabilities to manipulation through information operations for a multitude of reasons. First, their recommendation systems operate by suggesting content based on users' consumption patterns, thereby reinforcing existing interests. This mechanism leads users with mainstream preferences towards content from established media outlets. Conversely, those with niche interests may find themselves falling into what are colloquially known as "rabbit holes," where exposure to increasingly radical viewpoints becomes prevalent. Additionally, strategically placed advertisements can exacerbate this phenomenon, accelerating the descent into these "rabbit holes". Adversaries adept at exploiting these mechanisms can effectively create echo chambers populated by radicalized users, perpetuating their own agendas.

Despite extensive efforts by major platform operators, the persistence of fake accounts on social media poses a formidable challenge. Troll factories, comprising large cohorts of individuals compensated to post comments online, can be mobilized to fabricate the appearance of substantial and engaged communities. Moreover, advancements in artificial intelligence enable the creation of convincing profile photos depicting fictitious individuals, while progress in generating articulate and credible text is also underway. Instances of inauthentic engagement have been repeatedly uncovered in online conversations surrounding sensitive subjects such as race, gender, and the pandemic.<sup>41</sup>

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<sup>41</sup> Claudia Biancotti and Paolo Ciocca. (2021). *Financial Markets and Social Media: Lessons From Information Security*. CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE. Cybersecurity and the Financial System, Vol. 10. p. 3.

## **2.1. Identifying challenges enhanced by social media in financial markets:**

Among the challenges posed by social media, market volatility is a major issue as social media platforms act as catalysts for sudden fluctuations in assets prices and trading volumes. In addition, the dissemination of misinformation and rumors on social media has introduced a new layer of uncertainty, undermining market integrity and investor confidence. Regulatory compliance presents another major challenge, as the rapid evolution of digital communication platforms outpaces regulatory frameworks, making it difficult for authorities to monitor and enforce compliance effectively.

Furthermore, the influence of social media on investor behavior cannot be overlooked as it influences market trends and trading decisions, sometimes leading to irrational exuberance or panic selling. In addition, widespread cybersecurity risks pose a threat to financial institutions and market participants as social media platforms become vectors for cyberattacks and data breaches. Market manipulation, reputation management and privacy concerns add to the challenges, so a comprehensive approach is needed to manage the multi-layered impact of social media on financial markets.

### *a. Market Volatility*

The stock market has experienced extreme volatility in recent years, and social media is partly to blame due to copious amounts of unconfirmed information or deliberate misinformation spreading rampant across multiple social media platforms. Left unchecked by the federal government, this volatility has the potential to completely destroy the stock market as we currently know it.<sup>42</sup>

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<sup>42</sup> Theodore Brothers. (2023). *The Increasing Influence of Social Media on the Stock Market*. JOURNAL OF HIGH TECHNOLOGY LAW. Suffolk University Law School.

The issue of market volatility, defined by notable fluctuations in stock prices, constitutes a significant barrier for investors and market stakeholders. This phenomenon could stem from multiple factors, including behavioral biases or uncertainties in the market. Another contributing factor may be the influence of narrative information disseminated by prominent and influential figures, which can sway perceptions of an asset's value in the short term. The inclusion of social media adds complexity, making it challenging to precisely measure its impact among the multitude of factors influencing the market.

The study conducted by Bollen et al. (2011) highlighted the rapid dissemination of information through social media and its profound influence on investor decision-making. Their research demonstrated that the collective mood expressed on platforms like X could effectively predict stock market movements. Specifically, positive sentiment conveyed on X tends to coincide with upward trends in stock prices, whereas negative sentiment frequently correlates with market downturns, contributing significantly to market volatility.

The media frequently focuses on short-term fluctuations in the market, potentially leading to a deceptive perception of the market. This propensity might lead investors to lose sight of the larger picture and make irrational judgments based on short-term market movements. Particularly in times of market drop, the media's focus on immediate losses may cause investor fear and lead them to sell off assets in advance, ignoring the market's beneficial prospective.

Research conducted by Antweiler et al. (2004)<sup>43</sup> showed that increased X activity correlates with increased volatility in the stock market. The events surrounding the GameStop case in 2021<sup>44</sup> highlighted the importance of the matter, as there was a notable increase in trading activity due to coordinated efforts by individual investors on platforms, such as Reddit's WallStreetBets forum. As a consequence, the stock market

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<sup>43</sup> Antweiler, W., & Frank, M. Z. (2004). *Is all that talk just noise? The information content of internet stock message boards*. *The Journal of Finance*, Vol. 59(3), p. 1259–1294.

<sup>44</sup> In the GameStop case study, individual investors collaborated via online forums such as Reddit's WallStreetBets to collectively purchase GameStop (GME) shares, resulting in a notable increase in the stock price and substantial losses for institutional investors engaged in short selling against the company.

encountered substantial volatility, witnessing fluctuations in stock prices and widespread disruptions.

Media coverage often stirs emotions, which can impact investor decisions and contribute to market volatility. Media coverage that evokes strong positive or negative emotions can reinforce these emotional biases and increase market volatility during political events. The media tends to emphasize negative information, which could result in investors having an overly pessimistic view of the market. This may trigger off a chain reaction in which investors begin withdrawing their securities, causing the market to decline even further. For instance, despite generally stable market fundamentals, investors panicked and sold their investments during the 2008 financial crisis due to the negative media coverage.

While the existing literature focuses heavily on the impact of media coverage on market volatility, certain topics require further investigation. Additional research is needed to understand the complex relationships between media content (the information provided), emotional biases (investors' emotional responses to the information), and market dynamics (how these reactions reflect in financial markets). In the end, a better understanding of these relationships can help develop measures to control and lessen the media's influence on financial markets. It can also offer insightful information on how the media affects investor behavior and market volatility. Furthermore, analyzing the distinct impacts of various media coverage types and regional differences in media influence may improve our comprehension of the complex factors that contribute to market volatility.

#### *b. Misinformation and Rumors*

A further issue stems from the extension of collective behavior, in which individuals tend to imitate the behaviors of others, resulting in illogical decision-making within financial markets. This can be illustrated by the impact of influential X users with

substantial followings endorsing or condemning a particular stock, prompting their followers to respond in a similar manner and consequently generating abrupt price fluctuations and heightened market instability.

Spreading false or misleading information, often through the dissemination of rumors or lies, represents an important source in decision-making for investors and can lead to a collapse of investor confidence and participation. Antweiler and Frank (2004) also found evidence that investors are susceptible to influence from the opinions and decisions publicized by others within their social networks. When financial information and opinions are widely shared on platforms, herd behavior can emerge as investors consciously or subconsciously conform to the crowd rather than independently evaluating stocks. A classic example is "short and distort" schemes where false negative rumors are spread about a company to drive down its price ahead of short selling the stock.

In SEC v. Craig<sup>45</sup>, the SEC filed a lawsuit against a defendant who set up a fake account resembling a securities research firm. The defendant's misleading tweets led to a 28% decrease in one company's stock price before NASDAQ stopped trading. The following day, the defendant's comparable tweets caused a 16% drop in another company's stock price. This spreads financial risks more widely which can destabilize the financial system, undermining sustainable market growth, and potentially cause social unrest.<sup>46</sup>

A lack of trust in the market can pose risks to an issuer's ability to issue new financial instruments or obtain credit from other market participants for funding its operations. Information spreads rapidly throughout the marketplace, leading to potential harm for investors and issuers that may persist until any false or misleading information is identified and corrected by the issuer or those responsible for its dissemination.

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<sup>45</sup> SEC v. Craig. (2019). 3:15-cv-05076. Litigation Release No. 24481. Securities and Exchange Commission.

<sup>46</sup> Zhang, H., et al (2022). *Effect of social media rumors on stock market volatility: A case of data mining in China*. Front. Phys. Sec. Social Physics. Vol 10.

According to the EU Market Abuse Regulation (MAR)<sup>47</sup>, it is deemed inappropriate to permit individuals active in financial markets to freely express information that contradicts their own opinions or better judgment, particularly if they are aware or should be aware that it is false or misleading and could harm investors and issuers. With the increasing prevalence of websites, blogs, and social media platforms, it is crucial to specify that spreading false or deceptive information online, including through social media platforms or anonymous blogs, should be regarded as comparable to doing so through conventional communication channels.

The European legislator includes a subjective requirement on the type of information disclosed in Article 12, no. 1, c) of the MAR. This provision states that the person who disclosed the information either knew or should have known that it could give rise to false or misleading ideas about the price or demand for a financial instrument or cause the price to be at an abnormal or artificial level is set.<sup>48</sup> The use of the term “should have known” in the provision implies that the publisher's negligence is sufficient to apply Article 12, no. 1, c) of MAR.<sup>49</sup>

Despite the increasing concerns, there are still deficiencies present in the existing body of research regarding misinformation and rumors concerning the impact of social media on financial markets. One notable gap is the insufficient research of methodologies for promptly detecting and identifying false information, alongside an incomplete understanding of the precise mechanisms facilitating the dissemination of misinformation and its effects on asset valuations and trade volumes.

This encompasses the investigation of approaches like natural language processing and machine learning to differentiate between truthful and deceptive content. Furthermore,

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<sup>47</sup> Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse (market abuse regulation).

<sup>48</sup> FINANCIAL CONDUCT AUTHORITY, “MAR 1.8.5.” in FCA Handbook, 2016, Available in: <https://www.handbook.fca.org.uk/handbook/MAR/1/?view=chapter>

<sup>49</sup> KLAUS SCHMOLKE, in: LARS KLÖHN, *Marktmissbrauchsverordnung*: (2018). MAR. 1ª edição, München, C.H. Beck. p. 576-577. Para uma diferente interpretação, ver. DUARTE ROSEIRO. (2017). *As sociedades de notação de risco e o crime de manipulação do mercado*. p. 44-45.

there has been a lack of focus on evaluating the efficacy of regulatory actions and the psychological elements that contribute to vulnerability to misinformation. Moreover, there is a requirement for cross-platform assessments to comprehend the propagation of misinformation across various social media channels and its collective repercussions on market volatility.

*c. Influence on Investor Behavior*

The persistent presence of cognitive biases renders individual decision-makers vulnerable to manipulation by those who can shape the decision-making environment. Specifically, we contend that market dynamics are often significantly impacted, if not dictated, by the capacity of certain actors to control the flow of information, shape the presentation of options, and influence the overall context in which market transactions take place. Acknowledging the systematic tendency of individuals to exhibit irrational behavior, it logically follows, from an economic standpoint, that others will exploit these tendencies for their advantage.

The potential for manipulation carries diverse implications for the analysis of legal policies, implications that have largely escaped notice until now.

Another critical element, particularly notable in niche discussion forums like wallstreetbets, is the presence of an informal hierarchy among users. Within these communities, a select few influencers wield considerable influence in shaping group decisions. Consequently, adversaries who manage to recruit such influencers can exert significant control over large segments of the community. While hierarchical structures exist offline as well, social media platforms serve as powerful amplifiers and accelerators, magnifying the impact of influencer-driven dynamics within these digital spaces.

Since approximately 2010, there has been a rise in scholarly interest in behavioral finance concerning the influence of social media on the dissemination of investment information and its impact on investor conduct, which in turn shapes stock market trends. Of particular note is the deployment of algorithmic techniques in numerous research works within this domain, specifically in the examination of X data. These studies aim to uncover the correlation between expressed sentiments in tweets and the performance of distinct stocks. Notably, the research paper authored by Bollen et al. (2011) demonstrated the ability of sentiment expressed in tweets related to companies to forecast the stock prices of those companies effectively.

Cookson and Niessner (2019)<sup>50</sup> show that conflicts among investors, both within and between groups, are associated with anomalous trading volumes. Their research emphasizes the significance of investor-focused social media platforms and demonstrates how investors perceive information signals differently based on their own investing strategies. Moreover, due to the compilation of data and the relative obscurity of X users, the majority of current research on sentiment analysis fails to differentiate between the actions of retail and professional investors.

Pelster and Hofmann (2018)<sup>51</sup> undertook a pertinent investigation concerning the informational aspect of social trading platforms. Their research revealed that individuals offering guidance via such platforms and attracting the highest number of followers emulating their trades displayed greater susceptibility to the disposition effect - wherein investors tend to divest stocks that have appreciated in value while retaining those that have depreciated. This trend applied to both forex and stock traders, indicating that influential advisors often base their selling decisions on social pressures rather than fundamental considerations.

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<sup>50</sup> Cookson, Joseph & Niessner, Marina. (2016). *Why Don't We Agree? Evidence from a Social Network of Investors*. SSRN Electronic Journal.

<sup>51</sup> Pelster, Matthias & Hofmann, Annette. (2018). *About the Fear of Reputational Loss: Social Trading and the Disposition Effect*. Journal of Banking & Finance. Vol. 94.

#### *d. Cybersecurity Risks*

Incidents targeting financial institutions or critical infrastructure are frequent occurrences, posing significant threats. These attacks offer adversaries avenues for financial gain, the extraction of sensitive data, and even the potential for systemic disruption of the economy. In response, adversaries may resort to information operations aimed at distorting price signals, eroding trust in financial institutions, or inducing disorder. Such tactics allow them to inflict substantial harm with reduced risks of detection and retaliation compared to traditional cyber campaigns. This highlights the evolving landscape of cyber threats and underscores the importance of implementing robust defense measures to mitigate these risks effectively.

Social media platforms can significantly expand a business's attack surface by inadvertently exposing internal information or employee contacts. Cybercriminals can exploit this information to launch various malicious activities, including phishing attacks, credential theft, data breaches, and other scams. Consequently, the widespread use of social media channels necessitates heightened vigilance and proactive measures to safeguard against potential security risks and protect sensitive business assets from exploitation.

Similar concerns extend to employees' personal social media accounts. Every post made on these accounts, when linked to a business, could potentially aid cybercriminals in exploiting social engineering tactics or other methods to compromise business systems and data. Since digital profiles are typically publicly accessible, any information uploaded by users increases the risk of cybercrime.<sup>52</sup> For instance, cybercriminals often create fake accounts on social media platforms to deceive unsuspecting users into divulging personal information or access credentials. They may also lure individuals into clicking on links that lead to the downloading of malicious software, perpetrating further cyber attacks.

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<sup>52</sup> Kyle Chin. (2023). *The Impact of Social Media on Cybersecurity*. UpGuard.

Despite the outlined frameworks in cybersecurity laws in some jurisdictions, these mainly address threats to IT systems such as unauthorized access and ransomware. For these models to be effective in confronting the wider mal-information operations spectrum they need to change with time. The current relationship between social media and retail trading reveals a vulnerability that cannot be ignored, but at the same time it must be noted that the whole financial system could become attacked.

*e. Market Manipulation*

In Article 12, no. 1, b) of the MAR, market manipulation is characterized as actions or conduct that have an effect, or the potential to have an effect, on the value of one or more financial instruments through the utilization of fabricated processes or any form of deceit or deception.<sup>53</sup> Therefore, market manipulation entails artificially distorting the price of a security, resulting in an inflated or deflated value, in order to reduce the market's economic efficiency. The manipulator attempts to influence the market to cause an increase or decrease in a security's price, disrupting the efficiency of resource allocation and decreasing market liquidity for risk transfer.<sup>54</sup> This causes the actual price to deviate from the true price dictated by the economic principle of market fundamentals<sup>55</sup> and enables the manipulator to profit by strategically buying and selling at certain times.<sup>56</sup>

It is essential for the legislator that the actions are carried out alongside simulated processes or other methods of deception or trickery. The concept of deception refers to conduct that has the potential to mislead a rational investor as to actual economic conditions, particularly regarding the availability of and interest in a financial

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<sup>53</sup> Article 12, no. 1, b) of Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014.

<sup>54</sup> Kyle, A. S. and S. Viswanathan. (2008). *How to define illegal price manipulation*. The American Economic Review 98. p. 274–279.

<sup>55</sup> Market fundamentals are the qualitative and quantitative information used to calculate a security's price.

<sup>56</sup> Hayes, supra note 38; U.S. Securities and Exchange Commission, supra note 38.

instrument.<sup>57</sup> The European legislator does not mandate a specific outcome but rather requires a certain likelihood ("is likely") of a particular behavior causing a certain effect. This reflects the broader effort to maximize the safeguarding of price formation mechanisms in financial markets, as evidenced by the European framework on market manipulation. Probability is assessed through the objective test of the reasonable investor, examining whether such an effect on the price would be anticipated by this investor.<sup>58</sup>

Examining 421 pump-and-dump schemes that occurred in Germany from 2002 to 2015, Leuz et al. (2017)<sup>59</sup> found this form of market manipulation to be prevalent, with 6% of investors having taken part in at least one scheme. The data also revealed substantial losses for market participants, with the average loss being 30%. Pump and dump schemes involve manipulators initially accumulating a significant stake in a stock. They then promote the stock to draw in other investors, causing the price to increase. Social media provides an effective platform for manipulators to hype up the stock during the "pump" phase, disconnecting the stock value from its fundamentals. Once the price reaches an artificially high level, the manipulators sell their shares to profit. This typically makes the price drop again, leading investors who purchased based on the false hype to lose money.<sup>60</sup>

Another form of market manipulation impacted by the role of social media is front running. Front running involves traders with privileged access illegally using social media to alert followers to upcoming trades or news that will impact markets, enabling advantageous trades before the public. The key factors in front running are the size of the order and the window between receiving the order and executing the trade. The

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<sup>57</sup> KLAUS SCHMOLKE, in: LARS KLÖHN, *Marktmissbrauchsverordnung: MAR*, 1ª edição, München, C.H. Beck, 2018, p. 562.

<sup>58</sup> José Luís Ferreira Teixeira. (2022). *O regime europeu da manipulação de mercado e as transações organizadas nas redes sociais*. Faculdade de Direito. Universidade do Porto. p. 70.

<sup>59</sup> Leuz, C., et al. (2017). *Who falls prey to the Wolf of Wall Street? Investor participation in market manipulation*. Working Paper 24083. National Bureau of Economic Research.

<sup>60</sup> Terve, C., and Erlingsson, M. (2021). *Tools and methods for analysis of stock market manipulation using social media - A longitudinal characterization of time series dynamics*. Linköping University. Department of Computer and Information Science. p. 4.

individual knows the order will influence market prices and uses the brief interval after getting the order but before making the transaction on the client's behalf to conduct their own trading activities.

For example, person A, an investment firm employee privy to nonpublic details of an upcoming merger, illegally exploits their position by creating an anonymous social media account on a popular financial forum and starts posting vague but tantalizing messages about a "game-changing event" in the market. Over time, person A gains a considerable following on the forum through posts seeming insightful. Right before public announcement, Person A secretly buys shares in the merging company expected to benefit. After securing their position, Person A explicitly reveals the merger to followers, who trust the tip and quickly start buying shares, increasing the price. Person A sells their shares at a major profit. As a result, many followers who bought inflated shares based on Person A's insider-like tip suffer losses when the price drops after Person A sells off their position.

Under the Portuguese law, the prohibitions against market manipulation behaviors are set forth in Article 379, no. 1 of the Securities Code. This article considers punishable anyone who discloses false, incomplete, exaggerated, biased, or misleading information, engages in fictitious transactions, or carries out other fraudulent practices likely to artificially affect the normal functioning of the securities market or other financial instruments.

The prohibition on the use and disclosure of inside information is set out in Article 248 of the Securities Code. This article states that inside information must remain confidential and may not be used or disclosed beyond the regular duties of those who hold it. This situation occurs when someone in the securities market uses economically relevant information that they have obtained through privileged access before it

becomes known to the majority of market participants and gains an advantage from this prior knowledge.<sup>61</sup>

It is important to note that this type of market manipulation includes not only persons who possessed and disclosed or used confidential information, but also those who have knowledge of obtained and used such confidential information, as stated in article 378, no. 1 of the Securities Code.

*f. Reputation Management*

Grover, Kar, and Ilavarasan (2019)<sup>62</sup> conducted additional research to explore the impact of social media posts made by financial firms and their agents on corporate image and perception. Misinformation regarding a company's financial performance, executives, or overall standing can swiftly damage its reputation among both investors and the general public. Furthermore, adverse commentary or critiques directed at a company through social media channels can swiftly gain momentum and reach a broad audience.

Even if such content lacks substance or is grounded in speculation, it can still have a detrimental impact on the company's standing and stock valuation. Social media may also serve as a platform for activist investors or individuals to initiate widespread campaigns against companies, scrutinizing their operational methods, environmental impact, or dedication to social responsibility. If not managed effectively, such campaigns have the potential to tarnish a company's reputation and diminish shareholder value.

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<sup>61</sup> Salgueiro, A. C. (2016). *Abuso de Informação Privilegiada - O Especial Caso dos Instrumentos de Remuneração dos Administradores*. In CMVM (Ed.), *Cadernos do Mercado de Valores Mobiliários*, Vol. 53. p. 37-56.

<sup>62</sup> Grover, Purva & Kar, Arpan & Janssen, Marijn & Ilavarasan, Vigneswara. (2019). *Perceived usefulness, ease of use and user acceptance of blockchain technology for digital transactions – insights from user-generated content on Twitter*. *Enterprise Information Systems*. Vol 13. p. 1-30.

The prevalent presence and rapidity of social media present a heightened level of difficulty in managing reputation within financial markets. Consequently, organizations are compelled to adopt a proactive approach in monitoring various social media platforms, rectifying any inaccurate information, and upholding transparent communication with stakeholders, particularly investors, in order to alleviate potential threats to their reputation.

*g. Data Privacy Concerns*

Social media platforms gather extensive user data, encompassing personal details, internet usage patterns, and individual preferences. Financial institutions might utilize this data to tailor ads or financial offerings to particular demographic groups, leading to apprehensions regarding privacy and data security.<sup>63</sup> This implies that social media platforms are susceptible to security breaches and unauthorized entry, potentially causing users' financial information to be compromised and making them vulnerable to identity theft or fraudulent activities. This poses a substantial threat to individuals engaging in financial transactions or revealing sensitive information via social media. According to Dinev and Hart (2006)<sup>64</sup>, these security issues carry significant weight in the realm of e-commerce transactions.

Furthermore, apprehensions arise from the dissemination of user data to third-party developers and advertisers, which may result in unauthorized entry and mishandling of personal information. Financial institutions partnering with social media platforms might inadvertently expose their clients' data to privacy risks. Acquisti and Grossklags (2005)<sup>65</sup> underscore this concern within the framework of individual decision-making and privacy implications.

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<sup>63</sup> Culnan, M. J., & Armstrong, P. K. (1999). *Information Privacy Concerns, Procedural Fairness, and Impersonal Trust: An Empirical Investigation*. *Organization Science*, Vol. 10(1). p. 104–115.

<sup>64</sup> Dinev, T., & Hart, P. (2006). *An Extended Privacy Calculus Model for E-Commerce Transactions*. *Information Systems Research*, Vol. 17(1). p. 61–80.

<sup>65</sup> Acquisti, Alessandro & Grossklags, Jens. (2005). *Privacy and rationality in individual decision making*. *Security & Privacy*, IEEE. Vol. 3. p. 26 - 33.

The absence of authority over personal information on social media platforms may result in feelings of vulnerability and privacy violation among individuals, which in turn may cause them to be hesitant in engaging in financial activities and disclosing financial details online.<sup>66</sup> Organizations utilizing social media for engaging consumers and investors must be cognizant of the legal obligations pertaining to data security to safeguard confidential data and adhere to legal standards. Failing to acknowledge these privacy issues has the potential to harm a company's reputation and lead to legal and regulatory consequences for the entities in question.

## **2.2. Addressing Regulatory Gaps and Exploring Existing Measures:**

While the research reviewed have offered useful insights into how social media influences market behavior, there are several gaps and limits based on the data supplied. A recurring element in many of the works is the predominant usage of X data, whereas sites like as Facebook, LinkedIn, and stock-focused forums have gotten far less attention. Given people's changing usage of different sites, investigating these alternative networks might provide a more comprehensive understanding of divergence patterns across platforms.

Similarly, much of the research has concentrated on sentiment analysis or attention signals on their own, but the link between the two ideas has received little attention. How does attention affect the evolution and dissemination of emotion in a networked system over time? Understanding the relationship more fully might give greater insight for their combined effects. Another gap is the paucity of study on social media's influence at the individual investor level, since most studies focus solely on aggregate market outcomes. Micro-level evaluation via surveys or interviews may provide further insights into perception and decision-making processes.

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<sup>66</sup> Malhotra, Naresh & Kim, Sung & Agarwal, James. (2004). *Internet Users' Information Privacy Concerns (IUIPC): The Construct, the Scale, and a Causal Model*. Information Systems Research. Vol. 15. p. 336-355.

The literature also reveals very little about how diverse perspectives and viewpoints influence the perception of information signals that circulate within highly networked online networks. More detailed research is needed to determine how echo chambers vs diversity of discourse influence attitude development and potential outcomes. Furthermore, most studies find merely correlational relationships rather than firmly demonstrating causation, giving an opportunity for experimental study approaches to improve causal conclusions. Contextual elements such as asset class, region, and firm characteristics that may influence social media's involvement are also relatively underexplored and need further investigation.

Additionally, cognitive processes such as attention allocation, social influence, and language patterns can be studied to better understand how and why social networking changes viewpoints. There is also space to use advanced computational social network analysis and quantitative modeling to supplement traditional empirical findings. Overall, resolving these highlighted deficiencies through targeted study would contribute to a more thorough and comprehensive understanding of social media's still-evolving influence on financial markets.

In response to these issues, regulators worldwide have implemented a number of regulatory measures aimed at maintaining market integrity and investor trust. The stock market and social media are complex systems with distinct algorithms that have unpredictable results. Both of these variables hold considerable power in the United States (US), with the stock market directly influencing the economy and social media directly shaping the socio-cultural environment. However, without intervention, social media users might have significant power over the economy with a single post.

The SEC acknowledges the increasing issue and has expressed its commitment to addressing it. In the US, the SEC holds a central position in overseeing the securities markets, implementing regulations such as Regulation Fair Disclosure (Reg FD) which necessitates the simultaneous release of significant information to all investors. In cases

of intentional information disclosure, the disclosures must occur concurrently, or promptly in instances of unintentional information disclosure. The primary objective of this regulation is to hinder the preferential dissemination of information to specific investors or analysts, thereby fostering market transparency and diminishing the likelihood of market manipulation.

Reg FD's application is subject to specified limits, excluding certain forms of communications, such as those involving individuals who are not linked with the issuing company. It particularly refers to communications with securities market professionals and individuals who hold the company's stocks in situations when the information could influence their trading decisions. Individuals subject to Reg FD jurisdiction include the company's senior executives as well as individuals who regularly interact with shareholders and securities market professionals. This allows firms to continue sharing information with the media and issuing standard business communications such as press releases.

In addition, self-regulatory bodies like the Financial Industry Regulatory Authority (FINRA) regulate exchanges and brokerage houses, conduct surveillance, and impose regulations that prevent market abuse. Investor protection from potential abuse and illicit conduct inside the financial industry is the primary benefit provided by FINRA. Investors may employ FINRA resources to establish if a person acting as a broker is, in fact, a member with legitimate standing. FINRA prevents numerous financial crimes by banning brokers who breach its rules of conduct.

Within the EU, the European Securities and Markets Authority (ESMA) is responsible for issuing regulatory directives and suggestions to member nations with the aim of enhancing investor safeguarding and upholding financial market integrity throughout the EU. These regulatory initiatives serve as proactive steps aimed at tackling the changing issues presented by social media in financial markets. Nonetheless, continuous attentiveness and adjustment are crucial in order to stay abreast of technological progress and emerging threats.

In Portugal, the safeguarding of investor interests is also a key focus within the framework of securities market regulations, holding a significant position in the broader strategic goals of the Securities Code, as delineated in Article 4 of Decree-Law No. 142-A/91 of April 10th, established by the Ministry of Finance. In this context, the main objectives of the CMVM are the promotion of an efficient, fair, and transparent securities market. To achieve this goal, there is need for mechanisms that foster market transparency while mandating continuous revelation of any essential data to all investors to make sure that they have correct and contemporary market information.<sup>67</sup> In order to satisfy the needs of the investors and protect their interests, financial institutions need to create risk management systems together with explicit accountability laws for these systems.

The need to ensure security and stability of the securities market has led to the implementation of policies that prevent systemic risks. Article 362 of Legislative Decree No. 486/99 which approves the Securities Regulatory Code focuses on continuous supervision while Article 363 addresses supervision over the companies carrying activities in the stock market. The setting up of the European Systemic Risk Board (ESRB) demonstrates the need for its preservation.

Measures targeted at preventing systemic risk in the securities market and ensuring that it is safe and stable. Thus, article 362 of Decree-law no. 486/99 is dedicated to continuous supervision under the Securities Regulation Code, while Article 363 deals with prudential supervision of market players. This goal is critical hence the establishment of the ESRB.

The Securities Code carries out its activities with the objective of guaranteeing market knowledge clarity; it also invites for investor guidelines and recommendations publication. Another way is to establish the Investor Relations Department (IRD) for

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<sup>67</sup> Pereira, J. N. (2000). *O Novo Código dos Valores Mobiliários e a Protecção dos Investidores*. In F. T. d. Santos (Ed.), *Cadernos do Mercado de Valores Mobiliários*. Vol. 7.

enhancing investors confidence. The IRD is aimed at increasing investor understanding about the market and its available tools. Also it accepts customer queries and complaints.

Due to its global nature, the Internet presents significant legal challenges in determining the applicable law for specific situations, particularly in assessing the legality of content. The reason for this complexity lies in the fact that data uploaded on the Internet is promptly available on a global scale, resulting in extensive and swift distribution.<sup>68</sup> When addressing civil liability for online content, it's crucial to determine the applicable law to assess its legality and the potential accountability of the agent. This is because what may be considered unlawful in one country may not be the same in others. It is evident that there is still a long journey ahead to achieve international harmonization of lawful and unlawful internet content, particularly due to the inherently transnational nature of the Internet.

According to Lilian Edwards<sup>69</sup>, there is a lack of strong legal precedent in web 2.0 issues. This deficiency can be attributed to the common practice of addressing such conflicts outside of court proceedings prior to trial, rather than the absence of solid reasons for holding parties liable.

### **2.3. Are These Mechanisms Enough? Proposing Potential Solutions and Recommendations**

It is a positive development that deliberate market manipulation by social media users is being monitored by the SEC. However, in the event of inadvertent market manipulation the SEC should also intervene to manage these potential occurrences and situations. The evolution of technology is ongoing, and many of the policies and regulations are

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<sup>68</sup> Consider MARIO E. CLEMENTE MEORO and SANTIAGO CAVANILLAS MÚGICA's work, "Responsabilidad civil y contratos en internet – su regulación en la Ley de Servicios de la Sociedad de la Información y de Comercio Electrónico," p. 35.

<sup>69</sup> LILIAN EDWARDS. *The Fall and Rise of Intermediary Liability Online*. Law and the Internet, p. 73.

established through experimentation. Consequently, forecasting the societal impact of emerging technologies is often challenging.

The proposal to let intermediary service providers act as “police officers” of their networks could have a negative impact on fundamental rights such as freedom of expression and information. If these filtering and monitoring measures are ineffective, this raises questions about the appropriateness of introducing such measures and the associated restrictions on fundamental rights. As Lilian Edwards points out, in the future the question will no longer be whether filtering through intermediaries is possible, but whether it will be mandatory. This raises questions about the level of accuracy required, the appropriate costs that can be charged, and the acceptable trade-offs regarding freedom of expression, privacy, legal process, and access to knowledge.

In our view, the SEC must balance its goal of combating intentional and unintentional market manipulation on social media with users' right to freedom of expression. While it is crucial for preserving this right, social media users need to recognize that freedom of expression does not exempt them of the real-world consequences of their online activity. In these cases, it is the victim who exposes themselves, in some way, provided that they are aware and willing, to a certain risk, to a situation of danger. Therefore, it is essential for the operation of the institute that the victim foresee, even if to a small extent, the possibility of the risk/danger occurring. Nevertheless, promoting financial literacy and educating investors about the potential risks of media influence can assist in reducing the negative impacts of noise trading behavior.

One effective approach to attain this goal is to establish robust legal frameworks. This necessitates the implementation of flexible organizational structures that facilitate seamless collaboration among entities with varying levels of access to classified information. Moreover, in numerous jurisdictions, adapting existing legislation on cybersecurity can further bolster these collaborative endeavors, enhancing overall effectiveness in combating online threats.

In times of market volatility, it is critical to resist the temptation to sell stocks based solely on current market trends. In times of market volatility, it is critical to resist the temptation to sell stocks based solely on current market trends. This does not imply acting carelessly; rather, we encourage evaluating an investment's future potential and role in your portfolio before being influenced by market noise. Hence, maintaining a long-term perspective is critical.

Trading during the opening and closing hours of the trading session should be handled with caution since these are regularly highly volatile periods. It is also advisable to trade with smaller positions and to examine the concept of "scaling" positions, which involves gradually buying or selling stocks as prices alter. Employing defensive measures including stop orders and stop-limit orders can help lock in unrealized profits or limit prospective losses in an existing position, improving decision-making processes and reducing reliance on impulsive decisions.

Another important aspect to consider is whether or not there are independent authorities involved in investigating, informing the government, and giving preliminary information or assessment details. It is very important to maintain secrecy, use the right skills, and prevent organizations from going against each other while all parties involved adhere to their legal requirements and duties. Collaborating successfully and preserving the credibility of investigative processes depends on how well we strike this balance.

Hence, we believe potential measures for reducing market disruptions should include increased surveillance and regulatory changes. Monitoring tools and algorithms could be improved to better examine social media interactions, allowing for immediate identification and alerting of potentially disruptive market behaviors. This capacity enables for the evaluation of social media content, which aids in making educated choices regarding investments. Furthermore, regulatory alterations are necessary, particularly is the construction of solid frameworks to address the challenges caused by

social media disruptions. This could include establishing clear protocols for responsible social media activity in financial markets, increasing transparency and responsibility, and placing specific measures in place to prevent market manipulation and the spread of misleading information.

Adhering to regulations that require social media platforms to monitor and take down incorrect or deceitful financial information is crucial in preventing the spread of misinformation. In this sense, regulators should be able to penalize platforms that fail to comply with these rules and encourage them to take proactive measures to address issues. Last but not least, platforms should be more transparent about the origin and dissemination of financial information can empower users to assess the credibility of the content they come across.

In this sense, encouraging cooperation among financial institutions, social media companies, and regulators could also significantly improve the struggle against false information. Financial institutions should assist authorities and social media platforms in promptly identifying and removing harmful content by providing information about suspicious activities. In our understanding, this cooperative strategy would strengthen the financial sector's overall reaction to misinformation and promote a more secure and reliable environment for both users and investors.

Society should also work towards raising awareness among Internet users to encourage responsible usage. As the Information Society evolves, the average user will become increasingly familiar with information technologies from an early age. Consequently, it is necessary to gradually impose greater responsibilities on users. Failure to do so may result in users being held accountable only in cases of intentional misconduct.<sup>70</sup>

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<sup>70</sup> João Pedro Fachana Cardoso Moreira da Costa. (2011). *A responsabilidade civil pelos conteúdos ilícitos colocados e difundidos na Internet: Em especial da responsabilidade pelos conteúdos gerados por utilizadores*. Faculdade de Direito. Universidade do Porto. p. 52.

### III. EXAMINING THE ELON MUSK AND TESLA SAGA: A CASE STUDY OF SOCIAL MEDIA'S INFLUENCE ON FINANCIAL MARKETS AND REGULATORY ENFORCEMENT

Among the various social media platforms, X has emerged as a prominent and widely-used micro-blogging service. Bollen et al. (2011) employed machine learning to categorize tweets and discovered that X moods affect stock market performance, thus providing a useful tool to evaluate market sentiment. It does not only act as a platform for financial predictions; it has also been utilized to gauge political elections. Research by Sprenger and Welp (2013)<sup>71</sup> revealed that the number of mentions received by political candidates on X accurately predicted election outcomes.

Moreover, X has been employed to analyze the sentiment conveyed by the actions of companies, Chief Executive Officer (CEO), and other influential figures within organizations, offering insights into stock market fluctuations. With over 100 million followers on X, Elon Musk stands as one of the most influential figures on the platform. This immense following has led to a growing interest in Musk's tweets and their impact on financial markets.

In a notable incident, Elon Musk, renowned as the CEO of Tesla and SpaceX, made waves on August 7th, 2018, when he tweeted about the potential privatization of Tesla, suggesting a buyout price of \$420 with funding seemingly secured. This tweet triggered a significant surge in Tesla's stock price, soaring by 11% and closing the day at \$379.57. However, Musk's proposal faced skepticism and uncertainty among investors, partly due to the association of the number "420" with marijuana culture, leading to doubts about the seriousness of the announcement. Furthermore, Musk encountered legal repercussions as the Securities and Exchange Commission (SEC) imposed a hefty \$20 million fine on him for making misleading statements, as revealed by the SEC (2018).<sup>72</sup>

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<sup>71</sup> Sprenger, T. O., Tumasjan, A., Sandner, P. G., & Welpe, I. M. (2013). *Tweets and Trades: the Information Content of Stock Microblogs*. *European Financial Management*, Vol. 20(5), p. 926–957.

<sup>72</sup> SEC.gov; Elon Musk Charged With Securities Fraud for Misleading Tweets. (Consulted on January 25, 2024).

On August 7, 2018, Elon Musk made a public announcement on X stating his intention to potentially transition Tesla from a publicly traded company to a private one at a share price of \$420, with assurance of secured funding. He further communicated that shareholders had the option to sell their shares at the mentioned price or retain them to participate in the privatization. Subsequently, Musk confirmed the backing of investors, noting that the final decision hinged on the outcome of a shareholder vote. Following these developments, Tesla's stock experienced significant volatility over the course of a week, witnessing fluctuations equivalent to approximately \$14 billion within ten days and resulting in no buyout.

Elon Musk exemplifies the archetype of a celebrity CEO<sup>73</sup>, encompassing a distinct set of characteristics. Foremost, he assumes the helm of Tesla Inc, The Boring Company, and SpaceX—three enterprises widely acknowledged for their groundbreaking innovations. Beyond his corporate leadership, Musk maintains a vibrant online presence, particularly on X, where his audience surpasses 35.9 million followers as of June 15th, 2020, as indicated on his X profile. Notably, his influence on the platform earned him recognition as one of the most impactful personalities on X in 2019 by Statista. Musk's digital footprint consistently incites discussions among his followers and commands significant attention from various media outlets.

In a study conducted by Kang Kim et al. (2021)<sup>74</sup>, the authors explored the relationship between Elon Musk's X account and the stock value of Tesla. They conducted sentiment analysis using various Machine Learning algorithms, including Logistic Regression and Support Vector Machine. The findings revealed a clear correlation: an uptick in the number of tweets/engagement was associated with an increase in Tesla's closing price, and conversely. Regarding the company itself, factors such as the launch of SpaceX satellites and notable insider selling activities by Elon Musk, particularly in relation to

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<sup>73</sup> Miguel Corte. (2020). *How Social Media usage by managers affects corporate value: The case of Elon Musk*. Universidade Católica Portuguesa. p. 11.

<sup>74</sup> Kang Kim, D.P., Lee, J., Lee, J., Suh, J. (2021). *Elon Musk's Twitter and Its Correlation with Tesla's Stock Market*. International Journal of Data Science and Analysis. Vol. 7, No. 1. p. 13–19.

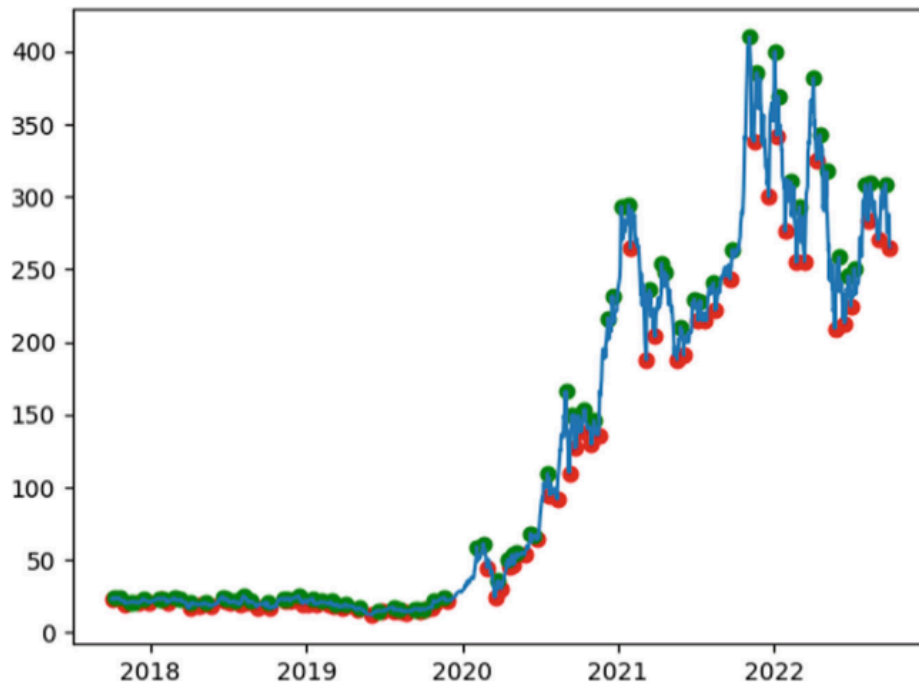
funding the X acquisition, played significant roles in influencing the stock performance.

Among the factors considered, additional inputs encompassed X data featuring Elon Musk's tweets up to five days preceding significant shifts in share price. This data included metrics such as the number of likes and shares for Musk's tweets, as well as tweets specifically referencing Tesla as a company. To streamline the analysis, tweets from the preceding five days were amalgamated into consolidated texts for each price change event. These aggregated texts formed the foundation for subsequent refinement and deeper analysis (see Table 1 for detailed breakdown).

<b>Year</b>	<b>Avg. Number of likes</b>	<b>Avg. Number of reshares</b>
2019	116241	16722
2020	164552	10175
2021	736097	71614
2022	739945	55298

**Figure 1.** Elon Musk Tweet society response (From J. S. Šević et al. (2023). *Impact of Twitter on Stock Market Performance: Evidence from Elon Musk and Tesla*. Singidunum University).

Tesla's daily stock price data was retrieved utilizing the Yahoo Finance Python library, covering an extensive 3-year period starting from October 1, 2019, up to October 1, 2022. This timeframe coincided with various impactful systemic events, including the onset of the Covid-19 pandemic, subsequent lockdown implementations, gradual economic reopening phases, and geopolitical tensions. These occurrences have induced unprecedented levels of volatility in stock prices, contrasting with the relatively stable conditions observed in the period preceding 2019 (consider Figure 1).



**Figure 2.** Tesla share price over time (From J. S. Šević et al. (2023). *Impact of Twitter on Stock Market Performance: Evidence from Elon Musk and Tesla*. Singidunum University).

Elon Musk's tweets related to Tesla tend to result in increased abnormal returns; however, a higher frequency of tweets per day diminishes the absolute magnitude of returns. Notably, findings suggest that a greater frequency of all tweets corresponds with periods of negative abnormal returns. Additionally, heightened social media pessimism is associated with negative abnormal returns, fewer CEO tweets, and heightened interest in internet searches for terms relating to Musk, Tesla, and X.

In a different study conducted by Ante (2022)<sup>75</sup>, the focus was on examining whether Elon Musk's presence on X and his tweets have any influence on cryptocurrency markets. This research aimed to explore similar hypotheses found in existing literature but applied them specifically to the cryptocurrency market, across a diverse range of equities. Throughout the analysis, the author uncovered noteworthy findings, indicating

<sup>75</sup> Ante, L. (2022). *How Elon Musk's Twitter Activity Moves Cryptocurrency Markets*.

"significant positive abnormal returns and trading volume" associated with Musk's tweets. While this discovery hints at a potential correlation between Elon Musk's tweets and the performance of Tesla stock, it's important to acknowledge that cryptocurrencies and publicly traded stocks are evaluated using distinct methodologies and criteria.

According to Knipmeijer's study in 2020<sup>76</sup>, there's evidence indicating a positive impact of tweeting on returns and trading volume, particularly when CEOs with a sizable audience engage in tweeting. This finding suggests that Elon Musk's tweets may yield similar effects. This assumption holds weight, especially given that at the beginning of 2021, Musk boasted a X following of approximately 41 million subscribers, which surged to around 65 million by the end of the year. This makes his account the second most followed on X, with a current following of 132 million.

The value of Bitcoin surged by over 20% to \$38,566 following an alteration in the personal X bio of Elon Musk, the world's wealthiest individual, to hashtag #bitcoin. This action prompted speculation regarding a potential increase in his holdings of the cryptocurrency (Shead 2021). Numerous individuals turn to social media as a source for their investment decisions. There is widespread dissatisfaction with Elon Musk among some quarters, as there is a perception that he is leveraging his influence in an unethical manner to further enrich himself.

The actions performed resulted in an investigation by SEC into Musk and Tesla for alleged fraud, which culminated in a settlement. Musk had to stand down as CEO of Tesla, and both he and Tesla were required to pay \$20 million each (for a total of \$40 million) to investors who experienced losses through an approved legal process. As for January 20, 2023, a class action lawsuit was started against Musk by Tesla investors who had stock in the company within the 10 days following his tweets. Previously, Federal District Judge Edward Chen ruled that Musk's tweets were misleading and that he intentionally made false claims. Two major questions will be considered by the jury

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<sup>76</sup> Knipmeijer, K. D. (2020). *The Effect of CEO Tweets on the Stock Market Activity*. Erasmus University Thesis Repository.

in this case: first, whether Musk acted negligently when posting the information and whether he caused financial harm to Tesla shareholders.

However, in Musk's case, it may be difficult to accurately determine liability if a CEO uses his personal social media account to communicate information that could be viewed as an expression of free speech and, given the medium, is unlikely to be taken seriously should be used to transmit the information. Defrauding investors is not uncommon among corporate executives – consider the recent Elizabeth Holmes/Theranos and Sam Bankman-Fried/FTX scandals.

Upon examination of the case study involving Elon Musk and Tesla, it becomes clear that these occurrences highlight the intricate interaction between corporate activities, social media communications, and their effects on financial markets. This review has brought to the forefront the obstacles faced by regulatory bodies in tackling instances of market manipulation in the digital era. It is now essential to redirect attention towards civil liability, a critical element in upholding responsibility and equity in financial markets. Through an examination of civil liability in the context of market manipulation, we can enhance our comprehension of the potential legal structures and solutions accessible for addressing such malpractice.

Regulators have provided advice to social media creators regarding generating content that does not qualify as "financial advice." The Financial Market Authority of New Zealand issued guidelines in January 2021 to offer advice to consumers and social media influencers involved in financial activities. Hence, the ESMA released a statement on October 28, 2021, defining investment recommendations, appropriate ways to share them on social media, and the repercussions of breaching the EU MAR.

However, individuals acting as financial advisors must follow rules by obtaining licenses and meeting set criteria. It's crucial for them to comply with these regulations, even when providing advice on social media. The Securities and Futures Commission of Hong Kong stresses that licensed advisors are accountable for their social media

actions. Despite this, numerous social media influencers lack the required licenses and thus do not conform to these guidelines.

ESMA, the EU's securities market regulator<sup>77</sup>, offers advice on the rules applicable to individuals, whether in or outside the EU, who share information advising on investment decisions in EU financial instruments to a broad audience. Expressing views on the present or future value of a particular stock, for example, is considered as disseminating information, termed as an investment recommendation in EU regulation.

Under EU law, an investment recommendation refers to information that explicitly or implicitly recommends an investment strategy involving financial instruments or their issuers, including opinions about the current or future value or price of these instruments. This information is intended for distribution through various channels, such as analyst reports, articles, traditional media, or social media. Therefore, investors require clear and transparent investment recommendations that allow them to evaluate the credibility and fairness of the advice, as well as the intentions of the advisors. This ensures that individuals can openly express their opinions without causing harm to others.

In general, investment advice usually comes from sources like banks, brokers, and financial analysts. However, individuals who share investment strategies with a wide audience, including on social media, are also seen as giving investment recommendations. Additionally, those who frequently offer investment advice, aim to reach a large audience, and present themselves as financial experts may be considered as experts and are subject to more legal disclosure requirements. These regulations can be found in the EU MAR and they oblige individuals providing investment recommendations to reveal their identities, present recommendations in an unbiased manner, and disclose any associations or situations that could compromise objectivity. Additionally, experts must adhere to extra regulations. EU regulators are actively

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<sup>77</sup> European Securities and Markets Authority (ESMA). (2021). *ESMA's Statement on Investment Recommendations on Social Media*. ESMA70-154-2780.

monitoring investors' behavior in the market, and if they find any violations of investment recommendation rules, they can impose fines or take further steps, which might involve involving public prosecutors.

It is our belief that the SEC appropriately took legal action against Musk for his tweets regarding the privatization of Tesla. Musk's tweets, implying that funding for the privatization of Tesla was confirmed, resulted in significant fluctuations in Tesla's stock value and deceived investors. The SEC's choice to accuse Musk of securities fraud and come to an agreement that required him to resign as Tesla's chairman and pay a penalty was fitting considering the gravity of the accusations and their potential repercussions on market transparency.

The SEC's enforcement measures were backed by compelling evidence of Musk's deceptive remarks and their repercussions on the market. Musk's tweets, lacking proper assessment of their potential effects and devoid of factual foundation, led to confusion and doubt among investors, triggering a notable surge in Tesla's stock price that was eventually followed by a swift decline upon realization that the funding for privatization was not confirmed. Such actions contravene securities regulations, which mandate precise and honest disclosures to investors.

In the context of civil liability enforcement mechanisms, the SEC's enforcement actions against Musk are critical in preventing future incidences of similar misconduct. By making Musk accountable for his actions, the SEC is able to tell the public that practices such as market manipulation or fraud will not be tolerated by imposing penalties or restricting his role within Tesla. Furthermore, the settlement terms necessitating Musk to resign as chairman highlight the significance of corporate governance and responsibility in safeguarding the interests of investors.

Adaptable implementation of social media surveillance is essential for the forthcoming period in order to uphold security regulations that safeguard the integrity of the market.

Consequently, investors need precise data to support their decision-making, while regulatory bodies rely on surveillance mechanisms to oversee the behavior of corporate executives. By promoting transparency, accountability, and ethical practices, it can be argued that regulators can help reduce the risks of market manipulation driven by social media and maintain investor trust in financial markets.

In our perspective, the determination of whether an action or an attempt to deceive investors constitutes an illegal behavior depends on the likelihood of such an event occurring. It is essential to acknowledge that the concept of the "reasonable investor" may not always accurately depict the real dynamics of the market. Investors, motivated by the goal of improving their financial position, often turn to more experienced individuals for advice, yet they may encounter difficulties in assessing the credibility of such guidance. Regulators should prioritize the promotion of financial literacy among investors to cultivate a more knowledgeable investor community. Nonetheless, they should also acknowledge the inherent susceptibility of investors and the significance of upholding their trust and confidence in financial markets.

## CONCLUSION

The influence of social media on stock market has a two-sided impact. On the one hand, its capability to widely and freely share information helps reduce information disparities among market participants, thus enhancing stock market efficiency and upholding financial market stability. Conversely, the dissemination of irregular, biased, or unverified information can impact stock prices, mislead investors, and undermine trust in the credibility and transparency of market information. Consequently, this may lead to decreased market funding capacity and a misallocation of societal resources.

This paper aimed to explore the challenges presented by social media platforms to financial markets. A thorough examination of each identified challenge revealed that social media provides a powerful tool granting unlimited access to individuals with potentially misleading or malicious intentions. This poses the risk of misguiding investors into making uninformed investment decisions or artificially inflating the value of their company stocks. The first chapter, which focuses on the evolution of media in financial markets, highlights the emergence of new challenges brought about by social media, separate from those encountered with traditional media sources.

While traditional media sources were once considered trustworthy sources of information and investment analysis, the rise of social media has introduced a new landscape filled with opportunities for investor manipulation and deceit, requiring the development of new defense mechanisms and regulatory responses. This issue is complex, involving debates concerning freedom of expression and opinion in investment decisions, while also requiring vigilance in identifying individuals with clear intentions to deceive investors in order to disrupt the stability of the stock market or to unlawfully profit.

It is important to note that the line between traditional media and social media is increasingly indistinct as many media outlets utilize their social media platforms to promote their content, which may then be shared further by social media users. This is largely attributed to the fact that numerous conventional media channels have adopted social media platforms as essential elements of their distribution tactics. Instead of functioning independently, these channels frequently employ their social media platforms to distribute their content to a wider audience.

The problem of market manipulation remains prevalent and is expected to escalate with the increasing integration of the internet, smartphone applications, and automated algorithms in the field of investing and day trading. This is evidenced by the ongoing development of software that enables the automation of day trading and leveraged trading through bots and algorithms, allowing users to pay a fee, establish their criteria, and let the bot operate as a day trader.

However, it is essential to investigate the mechanisms by which individuals perceived as influential can impact the global market, along with the extent of their influence. Based on our analysis of the case study in Chapter 3, we infer that individuals with significant power or influence may exploit poor investor decision-making to their advantage. Additionally, social media platforms such as Reddit can serve as tools for inducing price fluctuations in the stock market.

In order to address the impact of social media on financial markets and the subsequent increase in market instability, scholars and regulators have put forward several strategies. These encompass introducing more rigorous regulatory measures and surveillance systems to identify and hinder market manipulation and the dissemination of inaccurate information on social media platforms. Furthermore, initiatives such as educating investors and enhancing the utilization of advanced data analytics tools and algorithms to effectively evaluate and comprehend social media data have been recommended as plausible resolutions.

It is also crucial for regulatory bodies to collaborate in establishing and executing a more standardized definition of an investment recommendation. Alongside the promotion of financial products, we have noticed that certain influential individuals in the finance domain advise their followers to engage in purchasing, selling, or holding financial instruments. While the regulations pertaining to financial promotions and advertisements exhibit a considerable degree of thoroughness and consistency across the markets under scrutiny, there is a notable lack of clarity regarding what constitutes an investment recommendation, leading to variations in definitions across the covered markets. Striving for a more universal definition of an investment recommendation would ensure that the regulations adequately address the potential emergence of new online and offline entities in the future, especially those with transnational operations.

Social media platforms should also strengthen their controls to ensure that content creators conspicuously indicate advertising or misleading intents in their posts. For instance, YouTube has implemented features that prompt content creators to disclose advertising before posting, streamlining the process of advertising disclosure. Similar features could be integrated into other platforms, supplemented by human moderators and enhanced algorithmic model training and transparency for AI-based content moderation. These measures aim to verify that posts include appropriate disclosures. In this context, we contend that further research into the necessity of regulating social media platforms would be valuable and make a significant contribution to the existing body of literature.

It is noteworthy that social media presents challenges and can impact market volatility, yet it offers investors an expanded information and insight pool. Nevertheless, it is imperative for investors to approach these platforms with care, analytical thinking, and a knowledgeable investment approach to minimize the risks linked to the impact of social media on financial markets.

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## APPENDIX

**Figure 1.** Elon Musk Tweet society response (From J. S. Šević et al. (2023). *Impact of Twitter on Stock Market Performance: Evidence from Elon Musk and Tesla*. Singidunum University).

Year	Avg. Number of likes	Avg. Number of reshares
2019	116241	16722
2020	164552	10175
2021	736097	71614
2022	739945	55298

**Figure 2.** Tesla share price over time (From J. S. Šević et al. (2023). *Impact of Twitter on Stock Market Performance: Evidence from Elon Musk and Tesla*. Singidunum University).

