Impact of ESG Ratings on Securities Market Volatility: A Study on the Investment Mechanism Driven by Social Media

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Abstract. In recent years, with the increasing global focus on sustainable development, ESG ratings have become an important factor influencing investment decisions and market stability, and the rise of social media has further reshaped the patterns of information dissemination and investor behavior. This study takes ESG ratings, social media and fluctuations in the securities market as the core and systematically explores the dynamic relationship and mechanism among the three. Research has found that ESG ratings curb market fluctuations by reducing information asymmetry and attracting long-term investors, but differences in the standards of rating agencies may lead to divergence in market perception and exacerbate short-term volatility. Social media significantly moderates the impact of ESG information through emotional dissemination. The spread of negative ESG events through social platforms can trigger irrational selling and amplify stock price fluctuations. The proactive disclosure of ESG improvement measures by enterprises can guide optimism and cushion negative impacts. Furthermore, the differences in the user structure of social media (such as platforms dominated by professional investors and retail investors) further lead to the differentiation of market responses. The research emphasizes that the interaction between ESG ratings and social media reveals the complex driving mechanism of market fluctuations. Rational information dissemination helps stabilize the market, while emotional internal factors tend to trigger short-term volatility.

Keywords: ESG, social media, investment decisions, market volatility.

1. Introduction

As the core hub of the modern economic system, the importance of the capital market is mainly reflected in the synergistic effect of three major functions: in terms of resource allocation, it converts dispersed social savings into long-term capital through market-oriented pricing mechanisms, drives the flow of resources to high-efficiency areas, supports industrial upgrading and technological iteration - historical experience shows that the capital market, through risk pricing and capital aggregation, promotes the widespread application of technology and the reconstruction of industrial ecology in the industrial revolution and technological revolution, becoming the underlying driving force for economic transformation; In terms of innovation incubation, a unique risk sharing mechanism combined with a multi-level market structure provides continuous capital support for high investment, long-term, and high-risk technological innovation. The design of registration systems and other institutional measures broadens the access of innovative entities, and the merger and acquisition market accelerate technology integration, forming a positive cycle of "technology capital industry", making the capital market the core engine of the development of new quality productivity. The growth of private equity funds and venture capital funds further strengthens the incubation ability of disruptive technologies; In terms of financial stability, expanding the proportion of direct financing to optimize the financial structure, reducing the concentration of risks in the banking system, its price discovery function can reflect economic expectations in advance and provide signals for policy-making, diversified tools (such as derivatives) help market entities hedge risks, cross-border capital flow mechanisms can buffer external shocks, and modern corporate governance standards strengthen the foundation of economic resilience at the micro level by enhancing corporate transparency. The continuous expansion of the global capital market highlights that it has surpassed the scope of traditional financing tools and become the core field for shaping industry rules, balancing efficiency and risk. It is not only a buffer valve for hedging short-term fluctuations, but also the cornerstone for cultivating long-term prosperity.

In recent years, ESG ratings have received increasing attention in the global capital market, such as in areas like risk management, long-term value creation, policy compliance, and market reputation. Ratings serve as indicators to measure a company's environmental, social, and governance performance. In today's era, ESG ratings have become an important tool in modern investment decisions. They not only help reduce investment risks but also promote the sustainable development of enterprises. As global attention to ESG continues to increase, ESG investment strategies are expected to play a greater role in the future and become an important trend in the financial market.

The aim of this study is to explore the impact of ESG ratings on the fluctuations of the securities market and analyze the moderating role of social media in the investment mechanism. Against the backdrop of the increasing global financial market's focus on sustainable investment, ESG ratings have become an important basis for investors' decision-making. However, the scoring criteria of different rating agencies vary, and there is a lack of consensus in the market's response to these changes [1]. This article holds that regulatory authorities should take the lead in establishing an open-source ESG and social media data sharing platform to support precise research in both academia and industry and develop an "intelligent ESG investment framework" based on artificial intelligence. This framework can integrate rating, public opinion and market data in real time and provide dynamic strategy suggestions for investors (such as volatility warnings and sentiment indices). Meanwhile, the wide dissemination of social media has profoundly changed the way investors obtain information, and investment sentiment and market behavior have presented new characteristics driven by social platforms. Therefore, based on multi-dimensional data and using empirical analysis methods, this study explores how ESG ratings affect market prices, trading volumes and volatility, and further analyzes whether social media sentiment amplifies or buffers this impact. The final goal of the research is to construct a framework of ESG investment mechanisms driven by social media, revealing how social media influences investors' understanding of ESG information and decision-making, thereby providing scientific basis for market regulators, institutional investors and policymakers, optimizing ESG investment strategies and enhancing market stability.

2. Relationship between ESG Ratings and Volatility of Securities Market

ESG ratings, as an important indicator for measuring a company's environmental, social and corporate governance performance, have played an increasingly significant role in the capital market in recent years. Research shows that enterprises with high ESG ratings usually have stronger risk management capabilities and transparency, which helps to reduce market volatility. For example, Wang & Ye conducted an empirical study based on A-share listed companies and found that ESG performance can significantly reduce the volatility of stock returns, especially during market downtimes [2]. The mechanism lies in the fact that ESG alleviates the problem of information asymmetry, attracts more long-term institutional investors to hold shares, and thereby enhances market stability. Similarly, Mao & Wang & Lin found that during the 2008 financial crisis and the 2020 COVID-19 pandemic, enterprises with higher ESG ratings demonstrated more stable stock prices and faster recovery capabilities [3]. In addition, Serafeim & Yoon pointed out that a higher ESG rating can enhance investor confidence. In particular, institutional investors are more inclined to hold the stocks of these enterprises for the long term, thereby reducing short-term market fluctuations [4]. However, the standard differences among various ESG rating agencies may lead to market divergence in the ESG performance of the same enterprise, and such divergence may further intensify market volatility [5]. The supply chain research by Zhao, Sun, Feng and Liu further reveals that the differences in ESG ratings of suppliers have weakened the operational resilience of key enterprises through negative public opinion and financing restrictions, especially among enterprises in the eastern region and large enterprises [6]. For every increase of one standard deviation in the rating difference, the stock price volatility rises by 9.6%. Although the Guosen ESG 2.0 version of the Shenzhen Stock Exchange has added localized indicators such as "carbon emission reduction technological innovation", Chinese rating agencies still present a "diversified and fragmented" model, with insufficient transparency of indicators, which has exacerbated the differences in market perception and caused market fluctuations.

3. Impact of Social Media on Fluctuations of Securities Market

The popularity of social media has profoundly changed the way investors obtain information and make decisions. Its rapid information dissemination ability and emotional rendering characteristics have significantly amplified market sentiment. For example, real-time discussions on financial social media platforms such as Stock Twits may trigger irrational trading behaviors among investors. The Wall Street Bets case on Reddit is a typical example of the herd effect formed by retail investors through social media, which has led to a significant increase in market volatility. However, the authenticity and emotionality of social media content may also lead to investors' decision-making biases, such as over-reliance on short-term emotions while neglecting long-term value [7]. In contrast, ESG ratings, as an important tool for measuring a company's sustainable development capabilities, play a significant role in curbing market volatility by enhancing information transparency and optimizing the investor structure [8]. However, its effectiveness is limited by factors such as differences in rating standards and the risk of "greenwashing". Improving the quality of ESG information disclosure is the key to curbing fluctuations, but "greenwashing" behavior may trigger the risk of valuation correction. The behavior of enterprises covering environmental risks through ambiguous expressions or selective disclosures (such as a certain European energy company falsely reporting carbon emission reduction data), if rating agencies cannot effectively identify it, may lead to the collapse of investor confidence and cause significant fluctuations in stock prices in the short term.

4. Interaction between ESG Ratings and Social Media

Social media significantly influences the market response to ESG risk events through immediate and emotional dissemination. Research shows that the rapid spread of negative ESG information (such as environmental violations or governance scandals) on social platforms can trigger irrational selling by investors, leading to short-term sharp fluctuations in stock prices. For instance, Nicolas, Desroziers, Caccioli & Aste, based on an analysis of 114 million tweets of S&P 100 index components from 2016 to 2022, found that social media discussions involving ESG risks (such as environmental violations or governance scandals) soared. It may lead to an average decrease of 0.29% in abnormal returns on the relevant stocks [9]. This kind of fluctuation is particularly prominent at the social and governance levels, as it is more likely to trigger public moral disputes (such as labor rights disputes or opaque board decision-making). The widespread spread of emotional tags (such as #Greenwashing) further magnified market panic, creating short-term consensus selling pressure. However, social media also has a buffering function: By proactively disclosing ESG improvement measures (such as supply chain transparency or progress in carbon reduction), enterprises can guide the aggregation of optimistic sentiment and partially offset negative impacts. In addition, the differences in user structures among different platforms significantly affect the effect of information dissemination: Platforms dominated by professional investors (such as X) tend to rationally analyze ESG quantitative indicators, while those dominated by retail investors (such as Reddit) are more likely to form a consensus on emotional trading. A typical case includes the abnormal stock price fluctuations of GameStop driven by the Wall Street Bets forum in 2021. It is worth noting that when ESG rating agencies have significant differences in their ratings of the same enterprise (for example, one agency rates it as A while another lists it as high-risk), controversial discussions on social media will exacerbate market confusion, trigger short-term arbitrage activities and push up volatility. To address this challenge, the research suggests integrating artificial intelligence technology to monitor social media public opinion and ESG rating changes in real time (such as identifying emotional tendencies through natural language processing), while promoting the unification of ESG disclosure standards (such as adopting the TCFD/GRI framework) and strengthening third-party audits to enhance information transparency and market stability [10].

5. Conclusion

This study reveals the core mechanism by which ESG ratings curb market volatility by reducing information asymmetry and enhancing corporate resilience, while highlighting the crucial role of social media in amplifying or buffering this process. The results show that rational ESG information dissemination helps stabilize the market, while emotional content may exacerbate short-term fluctuations. For regulatory authorities, it is necessary to strengthen the governance of false information on social media and promote the unification of ESG rating standards. For investors, it is necessary to balance long-term ESG value with short-term emotional disturbances and optimize investment strategies. In the future, with the deep integration of artificial intelligence technology and ESG research, the construction of an "intelligent ESG investment framework" will become an important direction, providing scientific support for the development of sustainable finance. Furthermore, the long-term impact of social media on ESG investment still needs to be analyzed in depth in combination with big data and artificial intelligence technologies. These studies will provide a scientific basis for market regulators and policymakers to optimize ESG investment strategies. To improve and perfect the ESG rating system, an international organization (such as the ISSB) should take the lead in formulating a globally unified ESG framework to coordinate rating differences. Introduce international standards to reduce the cost of investor information collection and analysis. At the same time, enterprises are required to disclose ESG data in accordance with standard templates (such as TCFD/GRI), and third-party audits are introduced. Enhance the transparency and reliability of ESG data and strengthen market trust. Moreover, standardized governance reduces market information asymmetry and enhances market efficiency and stability. A unified ESG standard helps promote global sustainable development.

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