The Impact of Social Media on Investor Sentiment: Exploring Information Inefficiency, Herding Behavior, Overconfidence, and Framing Effects

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Introduction

The rise of social media has created a formidable force on investor sentiment which significantly impacts the dynamics of the financial market. Nowadays, many individuals' views and opinions are influenced by the use of social media through various platforms such as X, Instagram, Facebook, etc. The unprecedented amount of information available in posts, tweets or forums found on these platforms exposes individuals to various expert insights and public views or opinions. *This trend creates a significant effect on the general attitude of investors towards particular assets or markets, and thus significantly shapes and magnifies the investor sentiment*.

Inflation and unemployment rates, GDP growth, and many other economic indicators are considered to be the traditional factors affecting the investor sentiment. Moreover, the financial performance of corporations and geopolitical situations also majorly influence investors' views. However, the rise of social media has now become another significant factor affecting the financial market and reshaping the market's dynamics. While the readily accessible information on social media certainly provides benefits from a communication standpoint, the lack of regulation is conducive to the spread of misinformation. Furthermore, as a result of social media's ever-evolving personalized algorithms, individuals are often exposed to information that mainly aligns to their views and interests. This contributes to the false consensus effect and overconfidence, encouraging investors to take more risks and trade more frequently. In addition, the issue of herding behavior often arises here as well, as investors then choose to act more in accordance to group behavior, rather than making decisions based on their own personal beliefs.

As social media has grown to become a significant force of the modern financial market (with no sign of stopping), it is imperative to understand its influence on investor sentiment, and thus the financial sector as a whole. This cognizance allows shareholders, economists, and regulators to better analyze the trends of financial markets and make more informed decisions.

Theoretical Framework

The behavioral theories underpinning the relationship between social media and investor sentiment are many, revealing a myriad of psychological effects which manifest to impact decision making behavior.

Pertinent factors include but are not limited to **information inefficiency**, **herding behavior**, **overconfidence**, and **framing effects**.

The case of **information inefficiency** is not surprising. Within the context of social media, the lack of regulation and limits on who can share information (as opposed to formalized sources like news reports) paves way for misinformation, or even misleading framing of correct information. As demonstrated by *Arcuri, Gandolfi, and Russo (2023)*, fabricated news regarding stock returns of targeted firms has significant short-term effects on returns (for negative fake news – positive and neutral news showed no significant effects). In fact, examining the (-1, 1) day window of the event study methodology implies abnormal negative returns that are statistically significant at a 99% confidence level. While the study finds no difference between the outlet use to share the fake news (traditional vs. social media), disseminating such information over social media is undoubtedly more commonplace given the lower transaction costs, regulation, and geographical reach.

Herding behavior is a classic instance of social cognitive theory (SCT). SCT suggests that people (in this case, investors) model the behaviors observed in others, especially those perceived as successful. Keynes pioneered much of the literature on herding behavior in economics, citing several possible reasons. He proposed that herding could be attributed to social pressures, remarking "it is better to fail conventionally than to succeed unconventionally". Another suggestion is that herding is a natural course of action following uncertainty and self-perceived ignorance, thus submitting to the notion of the "wisdom of the crowd". A study by *Chen et al. (2022)* classifies text data on social media before quantitatively analyzing if the investment sentiment of posts correlates with excess returns (see Figure 1). It substantiates the claim that investor sentiment positively correlated with excess stock returns,

Name of topic	Capital game	Sector situation	The situation of a market index	SMT data	Industry development	Corporate development	Corporate dividend
Topic word	Main force	Adding to positions	Stock	Rubbish	Vaccine	Corporate	Securities trader
	Capital	Buy at bottom	Market situation	Limit up	Come on	Performance	Retail investor
	Sell out	Buy	Rising	Limit down	Indeed	Stock price	Continue
	Buy in	Liquor	Rebound	Market price	Goal	Leading corporate	Rationed shares
	Tomorrow	Severe	Bull news	Clearance	COVID-19	Market	Huge decline
	North orientation	Once	Adjustment	Clearance	Take off	Price	Stock market
	Foreign capital	New peak	Fall	Liquidate at a loss	Finally	Shareholder	Huge rally
	Sell out	Success	Stock market	Afternoon	Vaccination	Market value	Short position
	Pull up	Lock in	Trend	Opportunity	Epidemic	Growth	Sell short
	Disgusting	Reduce stock	Tendency	Plunge	IPO	Industry	Sector
	Pull high	Acquisition	Market	Capital raising	State	Securities trader	Leeks
	Cost	Sci-Tech	Investment	Securities lending	mrna	Announcement	Fully invested

Figure 1, Top 12 Keywords for each Topic

as evidenced by the regression. It is notable that negative sentiments disproportionately influenced abnormal returns, implying some level of asymmetry in the effect on the market.

Nair and Shiva (2023) examine the presence of **overconfidence bias** in investing. The study employs a moderated-mediation approach to study the role of the bias on trading decisions, as well as the influence of social media on said relationship. The regression analysis clearly substantiates a significant influence, which suggests a layer of nuance between investor psychology and the intertwined nature of social media and financial markets. The implication is that interactions on social media could amplify the overconfidence bias in investors, leading to a greater risk appetite and altered decision making.

The **framing effect** is inherently ever prevalent in social media. According to the Pew Research Center, 50% of U.S. adults "often" or "sometimes" get their news from social media. The issue lies in the fact that there are much lower barriers to entry in the digital space. Historically, financial news could only be obtained through a select few sources. On social media, anyone can create a post containing misinformation, or misleading information, hence exacerbating the framing effect. In a medium where a piece of information can be conveyed by an individual, biases and their manifestations in the *framing* of that information can rarely be avoided. In the context of investing, this could mean stock news being shared with the undertones of the given poster's investor sentiment, bullish or bearish. This was exemplified during the GameStop (NYSE:GME) short squeeze in 2021, wherein countless social media posts *framed* the situation as that of a David and Goliath battle between the everyday investor and large hedge funds. This contributed to a near 3000% increase in the stock price in January alone.

The consideration of behavioral aspects then seems to challenge traditional financial theories, such as the efficient market hypothesis (EMH). The EMH (in its strongest form) posits that all

known information is already reflected into a stock's price ("priced-in"), and it is therefore impossible to consistently achieve abnormally high returns. However, it does not account for the idiosyncrasies of human behavior, which evidently lead to market inefficiencies. The GameStop frenzy, for example, certainly overlooked fundamental financial analyses, thereby illustrating the significance of not trivializing the role of behavioral biases in investing.

Application of Behavioral Finance

The continuous ebb and flow of asset prices is driven by investor sentiment, whose influence over trading decisions determines market movement (via speculative episodes, for instance).

Herding behavior, the phenomenon of individuals following the crowd or other people's decisions, often influenced by irrational factors such as fear, greed, or peer pressure. The ever-increasing reliance on social media has led to a mass-herding effect as people are constantly exposed to others' opinions, and correspondingly, the audience's response. Given the propensity of algorithms to recommend posts that are generally well-received, popular, and widely accepted, there is an innate social pressure imposed to conform. This can lead to individuals making decisions that contradict their own beliefs, or even subconsciously convincing themselves that they share said belief. This notion undoubtedly follows in the financial field.

Further, herding may allow for irrational enthusiasm that can develop into a market bubble and can hinder individuals from making good decisions with respect to forecasts and risk perception. Therefore, herding contributes to the increase of market volatility. This concept is often linked to economist Charles P. Kindleberger, who discusses speculative episodes and so-called "manias" extensively in his 1978 seminal book "Manias, Panics, and Crashes: A History of Financial Crises".

FOMO, or "Fear of Missing Out", is an (aptly named) sentiment, which when applied to finance, can partially explain the decision to follow the herd when buying stocks, as opposed to doing independent fundamental analysis and forecasting. Fear is a strong emotion, and it can easily take over and dictate the way we think and act. Nvidia shares (NASDAQ:NVDA), for instance, have experienced a significant surge in price recently. In the fourth quarter of FY

2024 alone, the stock price rose by over 80%, driven in part by a wave of investor FOMO as earning reports proved encouraging for the future of the industry.

FOMO can clearly lead investors to make impulsive decisions. While the initial hype may in fact cause a surge in prices, the momentum can often end abruptly, especially if emotion played a substantial role in the episode and was not associated with an equally strong conviction for the future of the stock.

Echo chambers, in the context of social media, are groups or communities which function as closed systems wherein members only share and receive correspondences that reinforce their collective pre-existing beliefs and ideologies. In these spaces, views are amplified and 'echoed' back to us. In finance theory, echo chambers often play a role in producing investors who make decisions driven by biases and emotions rather than the true perceived value of investments. New research from the Leeds School of Business at the University of Colorado Boulder sheds light on how prevalent echo chambers are becoming in influencing investment decisions. It found that users which fell into echo chamber loops were more likely to be active traders, perhaps in a dangerous way, given their limited and incomplete information. Even professional traders are not insulated from echo chambers. Although the degree to which it impels investment decisions is lesser than that of novices, the desire to confirm existing beliefs makes experts nevertheless susceptible.

Alternative Explanations

Given that the stock market preceded the existence of social media by a few centuries, there are other justifications for investment decisions that may be attributed to the influence of social media.

Traditional Media Coverage leads to Herding Behavior

It has been made clear that social media is known for its role in spreading rumors and perpetuating herding behavior. However, herding behavior has been an issue on investments even before social media through traditional media coverage. When traditional media outlets report on firms, the firm experiences an increase in the number of investments and hence a reaction in their stock prices (Yang et al., 2019).

Studies have shown that trading behavior is not only influenced by the amount of media coverage, but also the quality of this media coverage and that investors often respond greatly to the tone of the news (Dong et al., 2021). Thus, with many investors often basing their decisions from the same media source, related media coverage, or other investors' behavior, the effects are reminiscent of those linked to social media. A company experiencing wide media coverage will influence investors in a certain manner, often manifested in herding behavior, and will therefore reach the same or very similar effects to social media.

Natural Overconfidence

Many people presume overconfidence in investments stems from social media. However, no studies have conclusively linked overconfidence in investing to social media interactions as of yet. Overconfidence affecting trading decisions has however been researched by considering the general personalities and environments that investors are in – it is believed that this optimism does not necessarily stem from social media but is primarily cognitive.

Many financial analysts and traders believe themselves to be above average, known as illusory superiority. This leads to consequences in certain investment behavior such as more frequent trading and riskier deals. Overconfidence derives from subconscious frameworks that are developed over time. It may also come from behavioral biases which produce inaccurate recollections of past events – the hindsight bias (also known as the "knew-it-all-along" effect), and the availability heuristic, where judgements are based on information that is readily available (e.g., easily recalling successful investments but not failed ones, leading to overestimation of their skill). Such biases are present independent of social media. As the nature of investing is based off of information and the aptitude in knowing what to do with it, overconfidence characteristically occurs in investors due to the abundance of knowledge they presume to hold.

Traditional Spread of Misinformation

While social media is assuredly a vast breeding ground for misinformation, misinformation is spread through various other outlets which may seem less obvious to investors and hence can be even more dangerous in influencing their behavior. The spread of misinformation has been an issue in traditional media for many years. Furthermore, financial websites and blogs have

also spread misinformation or supported heavily biased investment decisions, sources which are generally regarded to be reliable.

Despite the recent scrutiny of social media and the deviation of investors towards more traditional news outlets (with the presumption of trustworthiness), many cases have proven that these can propagate misinformation all the same. A critical approach is vital to evaluate all sources of financial information to ensure untainted trading decisions.

Conclusion

The emergence of social media has profoundly shaped the dynamics of the financial market by creating and breeding behavioral biases that affect investor sentiment. Social media contributes to overconfidence bias of the investors and creates echo chambers that amplify investor sentiment extremes as a result of the limited exposure to diverse views. Moreover, it intensifies the psychological effects that lead to herding behavior, and the misinformation present on social media affects short-term returns. Emotional and uninformed trading decisions linked to social media's existence challenge the efficient market hypothesis; analyzing its prominent role on investor sentiment is essential to understanding modern financial markets.

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