Overconfidence Bias as an Explanation of Economic Behaviours

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Abstract. Overconfidence is a cognitive bias that primarily consists of three components: overestimation, overplacement, and overprecision. Overconfidence bias has a wide range of applications in real-life scenarios like medical, educational, and financial fields. This paper focuses on the impact of overconfidence bias in two economic areas: the stock market and entrepreneurship. In the stock market, overconfident investors can lead to mispricing and overtrading. In entrepreneurship, overconfidence can lead to excess entry into the market and delayed exit from the market. Lastly, the paper discusses ways in which individuals can minimize overconfidence during stock market investing and entrepreneurship, including using objective data and information, seeking relevant professional education, and obtaining advice from diverse perspectives. Based on discussing the existence of overconfidence bias and its related coping strategies, this paper highlights the prevalence of the effects of overconfidence bias and the need to pay more attention to overconfidence bias, not only for stock investors and entrepreneurs.

Keywords: Overconfidence bias, Stock market anomalies, Entrepreneurial failure, Minimize overconfidenc.

1. Introduction

Uncertainties and complex decision-making exist frequently on a daily basis, having confidence in one's decisions can avoid procrastination and help the individual to be more efficient, but being overly confident can lead to unfavourable outcomes. Overconfidence is a cognitive bias frequently mentioned when analysing problems in financial judgment and decision-making failures. It can manifest as overestimation, overplacement, and overprecision.

This study aims to review the literature on overconfidence bias and discusses the application of overconfidence bias in economic scenarios, building a clearer perspective of how overconfidence develops in the first place, how it distorts economic decision-making, and what individuals could do to control their overconfidence. Two economic scenarios, stock market anomalies and entrepreneurial failures, were chosen due to a relatively large amount of attention and literature support. For each scenario, the study gathered empirical and experimental evidence from previous papers and provided critical thinking ideas for future studies.

The existence of overconfidence bias in the stock market can lead to anomalies such as mispricing and overtrading. This is because overconfident investors may place excessive trust in private information and misevaluate the stock returns. This leads to aggressive trading behaviours, poor market timing and higher transaction costs, ultimately resulting in lower returns. For entrepreneurship, overconfidence is a significant predictor of entrepreneurs' excessive entry into the market, and delayed exit from underperforming markets. Entrepreneurs often overestimate their competitiveness and chances of success in the market. Leading to an excessive number of new entrants and a low success rate. Furthermore, overconfident entrepreneurs may hold onto a declining industry due to their unrealistic belief in the industry's future potential.

Last but not least, this study discusses a few strategies in which stock market investors and entrepreneurs can take to minimize overconfidence. For both, relying on objective quantitative analysis tools is beneficial. Besides, stock investors can engage in behavioural finance-related education to better identify and minimize overconfidence bias. For entrepreneurs, seeking external feedback from a diversity of perspectives including mentors, professionals, and employees can help

reduce the likelihood of overconfident decision-making and costly failures. The study finally highlighted the need for future studies to look at the mechanisms of overconfidence bias and ways to minimize overconfidence in different scenarios.

2. Concepts and Application of Overconfidence Bias

Overconfidence bias generally refers to individuals' self-beliefs that are excessively strong or overly specific, and hard to obtain a comparable real-life reference [1], it can manifest in three subtypes: overestimation, overplacement and overprecision. Overestimation is when people overestimate their actual abilities, quality of performance, control over circumstances and possibility of success. For example, a student might overestimate their understanding of exam material, believing they have mastered 100% of the content when they only understood 50%. This overestimation may lead them to spend less time revising, resulting in a lower grade than expected. Overplacement refers to people blindly believing themselves to be 'better than average'. Imagine in a workplace setting, the majority of employees might rate themselves as more competent than average, which is statistically impossible. This belief can cause some employees to underestimate the competition and miss opportunities. Overprecision is where individuals display excessive trust in the certainty of their predictions and beliefs and underestimate the degree of uncertainty [2]. A driver might be excessively certain that they know the best route to their destination, thus ignoring the uncertainty of traffic congestion and causing unnecessary delay.

The existence and consequence of overconfidence bias were widely discussed in various research fields, including medical, educational and economic. In medicine, overconfidence was found to be correlated to physicians' diagnostic errors in clinical treatments [3]. In education, overconfidence is often observed among beginners after they gain a bit of learning experience. Which is similar to the Kruger-Dunning effect, such that individuals with limited skills tend to develop unrealistic confidence in their abilities, due to a lack of experience and professional knowledge to challenge their beliefs [4,5]. In economics, overconfidence bias could lead to failures in entrepreneurship and anomalies in the stock market.

3. Overconfidence and Stock Market Anomalies

Stock market trading is an important scenario for the research of overconfidence bias, as the large number of uncertainties in the stock market make the effects of overconfidence particularly significant and consequential. Overconfidence can create a gap between individual beliefs and market realities. Due to this gap, some investors may underestimate market risks and overly trust their intuition about certain stocks, some investors may be overconfident about their market forecasts and take excessive risks in investment decisions. Their biased ideas are likely to trigger not only financial losses for themselves, but also anomalies in the stock market.

3.1. Mispricing

Overconfident stock investors tend to get captivated by private information and build their analysis based on such private information. They place excessive trust in their analysis, so might ignore or undervalue market signals such as earning reports and industry trends and react slowly to new information. Due to their overprecision, they tend to overestimate potential earnings while underestimating risks. Their expectations are likely to be unrealistic, and the actual stock returns tend to be lower than expected.

Mispricing is especially common in slowly growing companies. Scott and his colleague precisely discussed the application of overconfidence bias in the stock price changes of both slowly growing companies and rapidly growing companies [6]. According to the valuation theory, the earnings-to-price ratio (E/P) can be represented by the following formula:

$$E/P = r + k\,(r - r^*) / (1 - k) \quad (1)$$

Where k is the rate of investment, r represents the discount rate, and r* represents the expected return on the investment.

Systematic risk refers to the overall risk in the whole market that affects all companies regardless of its growing speed, like economic recessions, interest rate changes and government policy changes. Slow-growth companies have the same systematic risk and the same discount rate (r). Slow growth reflects either no investment (k = 0) or the investment is unprofitable (r=r*). Two conditions would both derive the same result:

$$E/P = r \tag{2}$$

When there is little objective data from investment and profit reports, overconfident investors are more likely to weigh largely on stories and subjective extrapolations. For example, if a slowly growing company recently established a favourable reputation, overconfident investors might overvalue the significance of this information. Leading them to form an overly precise belief that underestimates the risk premium in the discount rate (r) and overestimates the company's future earnings. Consequently, these investors may engage in aggressive purchasing of the company's stock, pushing up the stock price (P). This ultimately resulted in an abnormally low E/P. A low E/P ratio typically reflects a high investor expectation for future returns. However, such expectations are generally unrealistic, especially in slow-growing companies and would potentially lead to a lower-than-expected future return.

By contrast, the E/P ratio of rapidly growing companies reacts more complicatedly as r* and k would both affect the stock price. In this case, a price increment would occur following favourable news, as investors believe their investments are going to be more profitable (r*>r) and invest more (larger k), and vice versa. However, this price change is not completed until overconfident investors no longer persist in their original beliefs about r* and k.

3.2. Overtrading

Overtrading is another consequence of overconfidence bias, meaning the excessive buying and selling of stocks. Investors' higher overconfidence levels cause them to trade more often but get lower returns. Two studies can be understood comprehensively to prove this logic.

An online empirical study recruited data about the trading volume and overconfidence level from 215 individual investors and found that investors with higher levels of overconfidence also have a larger trading volume [7]. They used a self-report questionnaire to measure the level of overconfidence, based on miscalibration, volatility estimates and better-than-average effect. And recorded their trading volume based on number of stock market transactions, number of stock market purchases, and mean monthly stock portfolio turnover. This study initially recruited 3000 broker investors as participants, but only 215 investors' trading volumes were recorded and included in the final data, which is a fairly large difference.

Another study gathered data about the trading volume and annual net return among 35,000 households and found that each year male investors trade 45% more than female investors [8]. Based on the theory that overconfident investors trade more rapidly, the study concluded that male investors are more overconfident than female investors. Besides, the reduction in annual net return was 2.65% for male investors and 1.72% for female investors. The main causes of the return reduction are higher transaction costs due to the large trading volume, and poor market timing due to decision-making failures. For this study, a potential issue is that the number of male and female investors recruited in the stock market might take up different proportions in the overall male and female investor population. Despite these limitations, the two studies mentioned still provided valuable mundane insights into the application of overconfidence in the stock market.

4. Overconfident and Entrepreneurial Failures

Overconfidence plays a significant role in the entrepreneurial failures. Due to excessive self-confidence, entrepreneurs may underestimate the complexities and risks associated with starting a business. They tend to overestimate their managerial skills and competitivity, leading to wrong business decisions and greater vulnerability when facing market competition and financial pressures. Ultimately contribute to entrepreneurial failure.

4.1. Excess Entry

Excess entry is one of the main consequences of entrepreneurial overconfidence, which refers to an excessive number of new competitors entering the market, more than the prediction drawn by the economic model. Entrepreneurs who assess their business prospects based on subjective perceptions may overestimate the likelihood of success and over-precisely believe in their perceptions rather than objective probabilities of success.

An experimental study consists of eight trials aimed at examining the influencing factors behind excess entry, either an underestimation of the number of competitors or overconfidence in one's ability [9]. Participants in four trials were randomly recruited regardless of their knowledge and skill, while participants in the other 4 trials were self-selected based on their knowledge and skill. Participants were asked to estimate their skill level relative to others and decide whether to enter a market accordingly. Each trial consists of 24 rounds, participants were not aware of the number of participants who chose to enter the market until the end of each round. Most self-selected participants predicted the number of competitors quite accurately and processed the information rationally. The results indicate that they did not enter the market because they underestimated the level of competition. Besides, when participants make decisions based on their skills, they tend to enter the market because they have unrealistically high estimates of their capabilities. This suggests that overconfidence is one of the factors influencing entrepreneurial decision-making.

Similarly, an observational study provided a more realistic explanation for this phenomenon. Koellinger and his colleagues aimed to investigate the factors that motivate entrepreneurs to launch new businesses [10]. They gathered samples from the Global Entrepreneurship Monitor (GEM) dataset, which consists of over 40,000 samples from 18 countries. And classified samples based on their positions in the entrepreneurial process: nascent entrepreneurs who are in the process of starting a new business, baby business owners who have owned and managed a new business for less than 42 months, and experienced entrepreneurs who have owned and managed a new business for more than 42 months. The study generated and analysed subjects' responses to six entrepreneur-related questions. Results suggest three key influencing factors of excess entry: beliefs of good business opportunities, perceived risk reduction due to connections with existing entrepreneurs, and individual subjective perceptions of skills, knowledge, and abilities. Specifically, individuals who believe they have sufficient qualities to start a new business will be 1.93 times more likely to become start-up entrepreneurs than those who do not have this belief. However, their beliefs are often subject to overconfidence, the study thus concludes that this overconfidence may partially explain the high failure rate of new businesses.

These two studies work together to help future research understand the application of overconfidence in the entrepreneurial scenario. The experimental study allows for a more rigorous control of external variables, while the observational study provides a more realistic perspective for subsequent scientific research.

4.2. Delayed Exit

Likewise, overconfidence may lead entrepreneurs to delay exiting the market and lose value by failing to close underperforming businesses promptly [11]. To test this, an experiment divided 133 participants into two groups. 66 participants were in the 'entrepreneur' group, whose profit is directly related to company cash flow and exit decisions. 67 participants were in the control group, who were

'advisors' paid based on their assessment of the profitability of the business. The experiment stimulated a market, where participants were required to decide when to exit the business. The study found that since the entrepreneur group's profitability was directly related to the profitability of the business, the more they believed in the company's profitability, the less likely they were to exit. However, despite 'entrepreneurs' and 'advisors' reacting similarly to positive information, when dealing with negative information, 'entrepreneurs' were more likely to ignore the negative signals and tended to hold on to their optimistic beliefs, thus leading to delayed exit and losses.

5. Minimize Overconfidence

5.1. Minimize Overconfidence in the Stock Market

How to make more rational decisions when facing a large number of uncertainties has always been a key topic in behavioural finance, especially in stock trading. Firstly, investors should regularly assess their investment return performance and compare it with the market average. This objective numerical standard helps investors to better recognize the accuracy of their decision-making and identify their overconfident tendency earlier, thus adjusting their self-perception. In this case, investors can consider information more holistically and rely less on personal subjective judgment. For example, weigh more on statistical analysis like cash flow and sales growth, and use quantitative analysis tools like investment log. Secondly, education and training are also important. Investors can participate in training on behavioural finance and risk management to increase their awareness of and ability to cope with overconfidence.

5.2. Minimize Overconfidence in Entrepreneurship

As how overconfidence contributes to entrepreneurial failure was identified, effective strategies can be developed targeted to each aspect. It is important to implement regular and structured self-assessments. Similar to the stock market, entrepreneurs should systematically review their business decisions and outcomes, comparing them to their expectations. This involves reflecting on past failed projects, understanding why assumptions went wrong, and identifying overconfidence that may have been involved. Besides, failure to seek advice is a problem for overconfident investors and entrepreneurs [12]. An experimental study found that a higher overconfidence level is correlated to a lower willingness to seek professional advice and would cause more investment and higher exposure to risk. Thus, for investors to avoid overconfidence and minimize loss, it is highly recommended to seek advice. To be precise, entrepreneurs should actively engage with mentors, advisors, and industry experts to obtain their objective assessment of business strategies and decisions. This external perspective can balance out any bias that may exist due to overconfidence. Moreover, seeking the perspectives of members with different skills and experiences, and challenging each other's assumptions can lead to more balanced and realistic decision-making. Nevertheless, based on these existing ideas, future research should continue to explore strategies for measuring overconfidence and to form more applicable and operationalized strategies to minimize the effects of overconfidence bias.

6. Conclusion

In conclusion, this paper has first discussed the role of overconfidence bias in the stock market anomalies and entrepreneurial failure, then mentioned some ways of minimizing overconfidence. Overconfidence bias can manifest as overestimation, overplacement, and overprecision. In the stock market, overconfident investors often bias the stock price as they tend to place excessive trust in private information and underestimate risks. And may trade excessively which causes a decrease in return due to higher transaction costs and poor market timing. These behaviours contribute to lower-than-expected returns for the individual and stock market anomalies in the macro level. Similarly, in entrepreneurship, overconfidence would cause excess entry into markets and delays exits from

underperforming businesses. Entrepreneurs' overestimation of their capabilities and underestimation of market competition could lead to a higher chance of failure. Finally, for stock market investors and entrepreneurs to minimize overconfidence, it is highly recommended to weight more on objective quantitative analysis tools. Besides, finance-related education is beneficial for stock investors to develop abilities to identify and avoid cognitive biases. For entrepreneurs, seeking diverse external feedback from mentors, experts, and employees could lead to more rational decision-making, thus better navigating uncertainties. Lastly, this study encourages future research to emphasize in research on the mechanism and coping strategies of overconfidence bias.

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