



# Trading Robots: Effective but Limited in Replacing Human Traders for Short-Term Investors

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**Abstract.** This study aimed to explore how stock investors have responded to the adoption of trading robots in the capital market, particularly during the Covid-19 pandemic, and to investigate the efficacy of these robots in trading. A qualitative phenomenological approach was used to investigate investor behavior from an emic perspective. The study used in-depth interviews, observation, and content analysis to gain a comprehensive understanding of the phenomenon. The results suggest that trading robots are preferred by short-term investors who frequently trade in the market. The automation of trading effectively reduces fear and greed, allowing for more efficient decision-making. However, there are situations where trading robots are unable to replace human functions in the market. The implications of this study are that trading robots can be effective in reducing risks and maximizing returns for short-term investors, but they should not be viewed as a complete substitute for human traders.

**Keywords:** Phenomenology · automatic trading · investor behavior · qualitative · psychological bias

## 1 Introduction

The stock price is determined because of the behavior of market participants. When they are optimistic, the stock price rises, and vice versa. The market decline has resulted from damaging behavior. As a result, rather than being rational as it should be [1] [2], the stock price is more influenced by the psychological elements of market players [3] [4].

Investors' discriminatory behavior includes representativeness, loss aversion, and self-attribution [3] [5]. [6] states that representativeness biases decision-making based on stereotypical thinking or analogy and will cause investors to make financial decisions that do not increase returns. Loss aversion is a more incredible urge to avoid losses than to gain profits [7]. Loss Aversion makes investors risk-averse when evaluating possible profits because avoiding losses is more important than making profits [8]. Self-attribution bias is the tendency to describe the success experienced due to internal factors while the failure experienced due to external factors. This bias will causes: (1) Overconfidence

[5], (2) overtrading [9] [10], and (3) investors only hearing what they want to hear [11], and (4) holding an underdiversified portfolio [12].

The covid-19 pandemic has mentally paralyzed investors. Many investors are resorting to automated stock trading programs to reduce risk and maximize profits in the face of uncertain market circumstances and the covid-19 pandemic. [13] used data mining and machine learning approaches to create a prediction model to determine whether to purchase, sell, or keep shares. [14] offer automated swing trading utilizing deep reinforcement learning to identify whether to buy, sell, or hold positions.

According to [15], deep reinforcement learning (drl) in stock trading has excellent application potential and, under reasonable assumptions, can compete with expert traders [16]. This condition raises the interest of the researchers to explore the behavior of investors using applications to reduce trading psychology. Sophisticated technology and algorithms owned by robots trading are expected to be able to provide profits without the complete control of traders. Even though the trading experience is not sufficient, trading robots are considered to be able to provide benefits equivalent to professional traders. However, is it true that trading robots can work so efficiently that we can fully trust them? Will robots control trade activities in the future? The specific purpose of this research is to explore the behavior of individual investors using robotic applications and attempt to answer the question: what is a trading robot? Why do investors use trading robots? And how do investors do stock transactions using trading robots?

## 2 Methodology

This study used a qualitative interpretive paradigm with Schutz's phenomenology and deontology methods. It aims to see the phenomenon's meaning and the moral aspects of investor behavior—determination of informants with purposive and snowball techniques. The research setting is individual investors. The search for informants was carried out using a purposive method, namely selecting informants by looking at predetermined qualifications. Informants are active investors who have invested in stocks for at least five years. In-depth interviews were conducted at a place agreed upon by the informants within four months. The data collection process is interactive, with a duration of 1 to 2 h, depending on the conditions of the interview. To get key informants, researchers obtain information from securities companies, then search for informants using the snowball technique. In-depth interviews were conducted three to four times until they reached saturation depending on the researcher's subjectivity and the research problem to be investigated [17] [18] [19]. We interviewed 5 Informan for this research.

The criteria used for the validity and reliability of qualitative data are [20, 21], credibility/trustworthiness using triangulation, member checking, and external audit. Authenticity/confirmability is done by bracketing and epoche. To complete the data and understand the problem under study, the researchers also took videos from YouTube using content analysis as part of the triangulation method. Data analysis used phenomenological data analysis [22].

### 3 Result and Discussion

Robot trading is a type of automated trading. The software executes trading deals entirely automatically and according to programmable algorithms. Humans alter only the program parameters while this software operates autonomously. Robots used in trading are not like those in science fiction. It takes the form of server-side software (high-performance computer). Therefore, traders of the future will be a group of trading servers [23].

There are several advantages of using trading robots, including (1) Total elimination of the psychological elements involved in trading. Thus, it is expected that trading robots can eliminate human error; (2) large volume of transactions that can make continuously. The trading robot can carry out continuous transactions on all markets, applying the same algorithm repeatedly, without lag; (3) Speed; trading robots can execute transactions very quickly. It is analogous to the velocity of an electron. When first introduced trading robots, the speed factor became an advantage. But as more and more users of trading robots, the speed factor is no longer the main advantage.

In March 2014, Virtu Financial, an HFT company, reported that it had made 1277 profitable trades over the past five years out of 1,278 days. Virtu only lost one day in 5 years. The claims given by Virtu indicate that trading robots can be profitable. But not all trading robots can be beneficial. For a trading robot to be good, it must have two conditions: 1. an excellent algorithm. 2. High-speed servers.

Retail traders do not have these two conditions. Fast servers are costly. Algorithms that are more powerful than institutions are also challenging to create. It takes intellectual abilities and very high research costs to make these algorithms. Trading robots are all merely extensions of human emotions, even though they are getting more and more common. In the market, human psychology continues to be necessary. And because of that mentality, even the most advanced algorithms cannot predict the market. For traditional traders, mainly those still trading manually, there is always a chance to profit from the market.

The first reason why Forex employs trading robots more than the stock market is that the stock market is not as intense as the forex market. Thus retail traders don't need to use trading robots, claims Informant 1 (Fj) from Pintraco Securitas. Stocks and foreign exchange operate differently from one another fundamentally. Investors can sell foreign exchange in forex transactions even if they do not have foreign currency. Margin trading is the phrase used in trading. However, margin trading is not permitted in the capital market. As purchasing shares entails purchasing a corporation, an investor who already has shares may sell them. Foreign exchange transactions are more accessible in transferring ownership from one investor to another because they are not related to the right to dividends as in stocks, so the recording is easier.

The absence of conditional orders is the second justification for not using robot trading in stock trading. It indicates that in certain securities businesses, charges set in the trading system application are used to execute transactions involving the purchase or sale of shares. The state of the market largely influences every transaction made when you set up a purchase or sale order. It is contrary to the automatic purchase and selling transactions that take place in foreign exchange.

The GTC (Got Till Cancel) menu, which is a feature to sell shares at the desired price with a time limit of one month or until the investor cancels the instruction, is present in stock trading programs, particularly in the Pintraco system. Investors who want to sell shares at a specific price without tracking the market and placing sell orders continuously are the target audience for this product. Therefore, if investors wish to sell their shares at a specific price, they can do it by using the GTC menu without having to keep an eye on price changes.

The term stop loss means selling at a loss. It is performed by investors if the stock price continues to decline. To limit his losses, he uses the stop loss menu. If the price has been reached, the system will automatically sell to avoid more severe losses. There is another term called trailing stop. This menu is used when investors want to monitor the market and make transactions according to market conditions. Because stock transactions are lengthy and highly conditional, according to Fjr, trading robots are rarely used in them. Instead, investors must keep an eye on the market and alter their menu as necessary. Investors can set up transactions using the settings menu in the securities application system.

The stock market is more passive than the Forex market, which is the third reason there is no need for trading robots in stocks. The capital market is less dynamic than the foreign exchange market, which changes rapidly every minute or even second. If the price is as desired, you simply monitor the market and sell it if necessary possibly even on a different day for swing traders or position traders. In contrast to the foreign exchange market, which may be set up with a 1% selling down, it still requires manual market monitoring from humans every day, except for setting up robots.

Because of shares are stored rather than sold daily, mainly until they are sold at a loss, long-term investors who purchase shares to be maintained do not need to use stop loss, GTC, or trailing stop facilities. Because stock prices change, it is preferable to save. According to the interview with Fjr, many investors still behave in the described manner simply because they were unaware of the differences between day trading and long-term investing.

In line with the development of transactions on the stock exchange, transactions are generally carried out by manual trading. Manual trading is trading stocks manually. If there are exciting shares to buy, buy trading is carried out by investors manually by entering a buy order into the application system at a securities company by determining the desired price. And when it is felt that the profit obtained is quite large, then a sell order is manually entered into the application system at the desired price.

Automation is when a process is set up, so we don't have to watch it constantly. On the Indonesia Stock Exchange, automation has been there while in the application system used by securities firms, such as the "pending order" feature when planning to sell shares at a specific price. Since the application system at the broker handles transaction execution, numerous third parties provide apps outside of stock brokers that create concepts for analysis before returning to the broker. As Ryan Filbert states, facilities like trailing stops are utilized to perform share buying or selling operations. Still, the system is necessary to monitor the market as investors desire [24].

The fact that the forex market is open 24 h, five days a week, means that traders need more tools to monitor the market and even conduct regular trading, which brings us to

the fourth reason why Forex needs trading robots more than stocks. On the other hand, the capital market is more laid back because it is only open from 9:00 to 15:00. Bear in mind that no trading robot can ensure that using a specific robot will always result in a profit and never a loss. It should mention that it is really a gimmick if something is offered. Every investment decision must have a risk associated, so no investment made utilizing any application will be risk-free [24].

On the other side, the use of robots was influenced by the state of the economy. The usage of trading robots is hazardous when the economy is unstable since investors find it challenging to set up trading robots owing to shifting circumstances.

## 4 Conclusions

Investors in the short term who trade frequently need trading robots. The establishment of psychological bias and cognitive bias behavior is often a consequence of trading with high frequency and limited time horizon. Trade automation will be particularly effective in minimizing the fear and greed that frequently overshadow trading, making investors' decisions worse and lowering returns. This biased behavior will be significantly reduced.

Various degrees of trading automation demonstrate the system's level of sophistication. Securities firms continuously offer inventive and unique menus to aid investors in automated trading. Stock trading does not require a trading robot because of several factors that set it apart from Forex trading: (1) The stock market is less volatile than the forex market, (2) Order-conditional justifications, (3) The stock market is more passive compared to the currency market, (4) The forex market is open five days a week, twenty-four hours a day, forex traders require more instruments that can track the market and even engage in regular trading.

Trading robots and automation will be employed more and more in the future, but it is important to keep in mind that no matter how clever a trading robot is, it cannot take the position of humans because it must be programmed by humans. However, those who refuse to change with the times and adopt new technology will be displaced by those who can keep up with IT because, in the future, automation will be so advanced that it will permeate all industries, including finance.

**Acknowledgment.** This research was funded by the Directorate of Research, Technology and Community Service, Directorate General of Higher Education, Research and Technology, Ministry of Education, Culture, Research and Technology for the fiscal year 2022, Number SP DIPA-023.17.1.690523/2022 2<sup>nd</sup> revision, April 22<sup>nd</sup>, 2022.

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