# The Impact of Stock Price Fluctuations on the Financial Market

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**Abstract.** This article thoroughly examines the multitude of factors influencing stock price fluctuations and the analytical methodologies employed to comprehend them. Macro-economic variables such as economic growth, inflation rates, and monetary policies exert direct influences on stock prices. In addition, investor sentiment, a subjective factor among market participants, significantly shapes market dynamics. Emotional fluctuations and their cumulative effects can lead to the significant market volatility, potentially compromising market stability. To provide the deeper insights into stock price movements, the article introduces advanced analytical models such as the ARMA-TGARCH-M and GARCH-SVM models. These frameworks mentioned enhance the precision and scientific rigor of analyzing stock price fluctuations, catering to both investors and researchers. By advocating for the adoption of more accurate analytical techniques, the article aims to foster the stable evolution of financial markets, facilitating informed decision-making, and promoting sustainable market development, thereby contributing to the advancement and stability of the financial market.

**Keywords:** Stock Price Fluctuations, Macroeconomic Factors, Investor Sentiment, Analytical Models, Market Stability.

## 1. Introduction

As the core of the financial market, the stock market has an important impact on investors' asset allocation and risk management. The volatility of stock prices is one of the basic characteristics of the stock market. For investors, understanding the causes and mechanisms of stock price fluctuations has important decision-making significance. The fluctuations in stock prices are affected by a variety of factors, including macroeconomic factors and investor sentiment.

On the one hand, macroeconomic factors such as economic growth, inflation rate, monetary policy and fiscal policy directly affect the profitability of enterprises and the market environment, thereby affecting the fluctuation of stock prices. For example, good economic growth usually boosts investor confidence and drives up stock prices; while inflation may weaken the purchasing power of currency and have a negative impact on stock prices. On the other hand, investor sentiment, as a subjective factor among market participants, also has an important impact on stock price fluctuations. Fluctuations in investor sentiment may lead to violent market fluctuations, affecting the stability and effectiveness of the market. Therefore, understanding the impact mechanism of investor sentiment on stock price fluctuations is crucial for investors to better understand market behavior and improve the accuracy of investment decisions.

This article will first explore the impact of macroeconomic factors on stock price fluctuations, including analysis of economic growth, inflation rates, and monetary policy. Subsequently, it will conduct an in-depth study of the role of investor sentiment on stock price fluctuations, including analysis of sentiment fluctuations and the cumulative effect of sentiment. Finally, the ARMA-TGARCH-M model and GARCH-SVM model are introduced to model and analyze stock price fluctuations, providing a deeper understanding and prediction framework. Through the discussion of the above content, it aims to provide investors and researchers with more accurate and scientific stock price fluctuation analysis methods and promote the steady development of financial markets.

## 2. The Relationship Between Stock Price Fluctuations and Macroeconomic Factors

As the core of the financial market, the stock market is an important place for investors to invest and an important part of the capital market. Stock price fluctuations are one of the basic characteristics of the stock market. In the financial market, understanding and predicting stock price fluctuations is important for investors to make decisions. , risk management and asset allocation have a positive effect. Among the various factors that affect stock price fluctuations, macroeconomic factors are the basis for analyzing stock price fluctuations. The positive and negative correlations between gross domestic product (GDP), inflation rate, interest rate, exchange rate, monetary policy and stock price fluctuations among macroeconomic indicators are usually explored.

### 2.1. The Impact of Economic Growth on Stock Price Fluctuations

The economic environment will have an impact on social production and life, so it will also affect the operations of enterprises, and then have an impact on the stock market. In a fixed period, the better the economy develops, the higher the stock price will generally be. In addition, good economic development helps maintain the market environment, thereby increasing investors' confidence in entering the market. More funds flowing into the market will better promote economic development.

GDP is the most direct macro-indicator to measure economic growth, but since monthly indicators of GDP are unavailable, most literature chooses to use the month-on-month growth rate of industrial enterprises' added value or the growth rate of industrial added value to replace GDP growth rate. It was concluded that the long-term fluctuations of the stock market are significantly related to the growth rate of industrial added value through a significant positive correlation, which illustrates that economic growth has a positive impact on stock price increases [1]. However, Xuan Huifang concluded that the growth rate of industrial added value has a negative impact on stock prices, which is contrary to theoretical analysis. China’s stock market is still not perfect, and the role of the stock market has not been effectively played [2].

### 2.2. The Impact of Inflation on Stock Price Fluctuations

Inflation occurs because the imbalance between supply and demand causes price changes and the issuance of currency is greater than the demand for currency, which leads to currency devaluation. It is the phenomenon that the purchasing power of currency decreases due to the imbalance between supply and demand. Since stocks are securities based on currency, changes in the purchasing power of currency will have an impact on stock prices, causing stock price fluctuations. Due to the value preservation of stocks, moderate inflation will increase stock prices.

Generally, to measure the level of inflation, most literature chooses to use the consumer price index. This index is a relative number of changes in a group of representative goods and services, which can reflect the price changes in a country [3]. Long-term stock market volatility and CPI growth have a negative correlation. In the long run, inflation has a negative impact on long-term stock price fluctuations. Long-term inflation represents the decline in the purchasing power of money. The decline in the purchasing power of money will lead to a continued decline in stock prices [4].

### 2.3. Impact of Policies on Stock Price Fluctuations

In addition to economic growth and inflation, policies can also affect stock price fluctuations. Policies are generally divided into monetary policy and fiscal policy. Interest rates, exchange rates and money supply, as tools of monetary policy, will affect the amount of funds circulating in the stock market, thereby affecting stock price fluctuations. Fiscal policy is an integral part of national economic policy. It regulates aggregate demand through fiscal expenditure and taxation policies. If the fiscal scale expands and the country adopts a proactive fiscal policy, stock prices will rise [2]. To measure changes in interest rates, most literature chooses the yield to maturity of government bonds as an indicator. For the exchange rate, select the exchange rate indicator and select the US dollar to

RMB exchange rate. In the long run, exchange rates have a negative impact on long-term stock market fluctuations, but it is not significant. Long-term fluctuations in the stock market have a negative correlation with interest rates [5]. The implementation of tightening policies by the government will cause an increase in interest rates. Investors will be tempted to deposit more money in banks and expect a fall in stock prices due to the increase in interest rates. Ultimately, it will also cause investors to invest a lot in the market. Selling stocks causes stock prices to fall [3].

Based on the research results of the above literature, macroeconomic factors have an important impact on stock price fluctuations, but not a single indicator can affect its fluctuations, but are affected by the combined effects of multiple factors. Changes in indicators such as the economic cycle, fiscal policy, inflation rate and unemployment rate will all have an impact on the volatility of stock prices, so the specific impact mechanism needs to be analyzed in conjunction with the economic environment and policies at that time and other factors. Future research can further explore the impact mechanism of macroeconomic factors on stock price fluctuations under different economic environments, providing investors and policymakers with a more accurate reference basis.

## 3. The Relationship Between Stock Price Fluctuations and Investor Sentiment

In addition to macroeconomic factors, investor sentiment is also one of the causes of stock price fluctuations. At a broad level, all factors that influence investors' trading decisions become emotions. In fact, investor sentiment usually refers to investors' emotional state towards the market, including optimism, pessimism, panic, etc. These emotional swings can cause wild swings in the stock market, which can affect investors' decisions and the overall market trend. Therefore, it is of great significance to explore the impact of investor sentiment on stock price fluctuations, which will help investors better understand market behavior and provide reference data for investment decisions.

### 3.1. Sentiment and Stock Price Fluctuations

There are almost no rational investors in the market, so it is difficult to rationally analyze the returns and risks of their assets. Therefore, investors' own irrational investment behavior will affect the market and cause stock price fluctuations. Investor sentiment is affected by both internal and external factors. On the one hand, investor sentiment is related to the individual's own situation, that is, to his education level, understanding of the financial market, age, gender, etc.; on the other hand, it is also related to the social environment in which the investor lives at the time, such as during the epidemic. During this period, investors are more prone to panic.

Most literature studies the impact of optimism and pessimism on the stock market and concludes that investor sentiment has a positive impact on stock price volatility. It is pointed out that as investor sentiment increases, market trading volume increases and stock price volatility increases. When investor investment sentiment is not high, market trading volume decreases and stock price volatility decreases. There are many individual investors in China, and their trading behavior is often irrational, with obvious herding effect and a large proportion of irrational investments [6].

### 3.2. Emotional Cumulative Effect and Stock Price Fluctuations

In financial markets, the cumulative effect of investor sentiment refers to the mutual influence of investor sentiment, which leads to group behavior and thus affects market prices and trading activities. When positive or negative sentiment from certain investors spreads, it can have an impact on market trends. The cumulative effect of investor sentiment in the market often causes investors to overreact to market trends, leading to over-buying or selling in the market, thus affecting the stability and effectiveness of the market.

Hu Changsheng pointed out that investor sentiment in the A-share market has a cumulative effect, which reaches its peak in 10 to 15 trading days, and the cumulative effect of high and low sentiment is asymmetric. These results are, in most cases, more pronounced for stocks that are difficult to arbitrage. In addition, it was found that under the continued accumulation of high sentiment, funds in

the market will pour into assets with low volatility and good liquidity, while under the continued accumulation of low sentiment, funds will choose more speculative assets [7].

### 3.3. Indirect Impact on Stock Price Fluctuations

In addition to investor sentiment and the cumulative effect of investor sentiment, the margin trading system and fluctuations in the U.S. stock market will affect investor sentiment, thereby causing stock price fluctuations. The margin trading system can increase market liquidity and flexibility, but it can also increase market volatility and investor risks, thereby affecting investor sentiment. As the financial markets of various countries become more closely linked, many studies have begun to focus on the volatility spillover effects of U.S. stock market fluctuations on the Chinese stock market and concluded that U.S. stock market fluctuations have intensified the impact of optimism on Chinese stock market fluctuations [8].

After the introduction of the margin trading system, the impact of pessimism on stock realized volatility did not change significantly, while the impact on conditional volatility declined significantly. Therefore, although in the extreme situation of the stock market crash, the speculative function of margin trading amplified the impact of investor sentiment on stock price fluctuations, the introduction of a margin trading system can help reduce the impact of investor sentiment on stock price fluctuations and improve market efficiency. The impact of U.S. stock market fluctuations on Chinese stock market fluctuations is mainly achieved through optimism rather than pessimism. U.S. stock market fluctuations will intensify the impact of optimism on Chinese stock market fluctuations. This may be since the Chinese stock market is bullish and bearish. Compared with pessimism, optimism is more sensitive to fluctuations in the US stock market [8].

Based on the above literature research results, investor sentiment has a positive effect on stock price fluctuations. In addition, due to different selection of variables, other conclusions were drawn: Fluctuations in investor sentiment may lead to over-buying or over-selling in the stock market, thereby exacerbating stock price volatility. The cumulative effect of emotions and emotional cycles will also affect stock price fluctuations, further exacerbating market uncertainty. Future research can further explore the impact mechanism of different types of emotions on stock price fluctuations, providing investors and policymakers with a more accurate reference. Likewise, when studying the role of investor sentiment on stock price fluctuations, multiple factors need to be considered.

## 4. Analysis of Stock Price Fluctuations under Different Models

Due to the complexity of the stock market, stock price fluctuations are not the only pattern, so they may show different characteristics under different models. For investors and researchers, fully understanding the pattern of stock price fluctuations under different models can help implement better investment decisions. Comparing different models can better understand the volatility of the stock market, thereby promoting the healthy development and stable operation of the financial market. Generally, for prediction of stock price fluctuations, autoregressive conditional heteroskedasticity models and stochastic fluctuation models are often used.

### 4.1. ARMA-TGARCH-M Model

The ARMA-TGARCH-M model is a hybrid time series model. Different from the traditional GARCH model, this model introduces the ARMA model to construct changes in volatility, so the model can flexibly capture fluctuations in time series data. rate dynamics. This makes the ARMA-TGARCH-M model have strong application value in financial time series analysis, can better capture the complex volatility dynamics in financial markets, and has strong flexibility and adaptability.

This model is used to fit the problem of fluctuations in the 5-minute high-frequency return time series of the Shanghai stock market and the Shenzhen stock market. Liu Hu concluded that the investment risk in China's stock market is relatively high, and investors' investment behavior is still relatively blind. The premium risk represented by the conditional standard deviation is not well

reflected in the expected return rate of the stock market. The stock market return rate There is no statistically significant relationship with historical fluctuations [9].

### 4.2. GARCH-SVM Model

The GARCH-SVM model combines the characteristics of the GARCH model and the SVM model. The GARCH model is used to model the dynamics of volatility, while the SVM model is used to model the nonlinear characteristics of returns to improve the accuracy and robustness of predictions. . It is a hybrid model that combines time series modeling and machine learning, suitable for volatility and return prediction in financial markets, helping financial risk management and investment decisions.

Deng Jun divided the stock market stock price fluctuations into different prediction intervals, namely bull market, bear market and shock market, and tested the accuracy of the model. The model performs differently in three different research intervals. In a volatile market, the accuracy of the model is significantly higher than the other two intervals. That is, when the stock market is relatively volatile, the stock price is more susceptible to the subjective sentiment indicators of investors. When the market conditions are unclear, investors will have a distrust among themselves and will be more susceptible to the influence of other investors, thus making the selected subjective investor-related sentiment indicators more representative and certain. To a certain extent, it explains why the SVM prediction method that adds investor-related sentiment indicators is more effective when stock prices fluctuate significantly [10].

Different models have different explanations and prediction capabilities for the impact of stock price fluctuations. Therefore, understanding the explanations of stock price fluctuations under different models can help to better understand the operating mechanism of the market and provide scientific basis for investment decisions. Future research can further compare the ability of different models to explain stock price fluctuations and explore their application in actual investment.

## 5. Conclusion

Stock price fluctuations are a common phenomenon in financial markets and are affected by many factors. From a macroeconomic perspective, factors such as economic growth, inflation rates, and monetary and fiscal policies all have an impact on stock prices. At the same time, investor sentiment is also an important factor influencing stock price fluctuations. This article explores the impact mechanism of these factors on stock price fluctuations, and introduces two common models, namely the ARMA-TGARCH-M model and the GARCH-SVM model, for analyzing stock price fluctuations.

First, starting from macroeconomic factors, it finds that economic growth is usually positively correlated with stock prices. A good economic environment can improve corporate profitability and enhance investor confidence, thus driving up stock prices. Conversely, inflation can have a negative impact on stock prices, especially if long-term inflation reduces the purchasing power of money. In addition, adjustments to monetary and fiscal policies will also affect market liquidity and investor expectations, thereby affecting stock price fluctuations. Secondly, investor sentiment also has an important impact on stock price fluctuations. Fluctuations in investor sentiment may lead to violent market fluctuations, which in turn affects investors' decisions and the overall market trend. Research has found that there is a positive correlation between investor sentiment fluctuations and stock price volatility. When sentiment increases, market trading volume increases and stock price volatility increases. In addition, the cumulative effect of investor sentiment will also exacerbate market instability, making the market more susceptible to sentiment. Finally, the introduction of two models provides us with analytical tools. The ARMA-TGARCH-M model and the GARCH-SVM model can better capture the dynamic characteristics of stock price fluctuations and improve the prediction accuracy of volatility and return. The application of these models not only helps understand market volatility, but also provides investors with more scientific investment decision support.

However, most current studies on stock price fluctuations lack the analysis of intra-industry relationships, that is, considering whether the price fluctuations of one type of stock will have an impact on another type of stock.

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