The Impact of the US Federal Reserve's Interest Rate Hikes on Various Industry Stock Markets in China: An Empirical Analysis Based on Event Study Methodology

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Abstract: This study investigates the impacts of the Federal Reserve's rate hikes on various sectors, primarily focusing on the industrial, manufacturing, financial, scientific research, coal, and petroleum sectors. The scope of the study covers ten rate hike events by the Federal Reserve from March 2022 to May 2023. This aids in effectively determining the market's response to multiple rate increases. The primary research methodology adopted is the Cumulative Abnormal Return (CAR) method, which measures the effect of the Fed's rate hikes on various sectors by calculating the accumulated difference between actual returns and expected returns of stocks or markets within a specific time window. Additionally, hypothesis testing is employed to assess whether these abnormal returns significantly deviate from expected values, thus determining whether the market had anticipated the Federal Reserve's rate hikes or was actually influenced by them. The findings indicate that the rate hikes of the Federal Reserve had varying impacts on the stock markets of all six industries, and anticipatory behavior was observed in each of these industries. Among them, the industrial, manufacturing, and financial sectors displayed stronger sensitivity to the Federal Reserve's rate hikes.

Keywords: US Federal Reserve, interest rate hike, stock market.

1. INTRODUCTION

The consistent rate hikes in the U.S. since 2022 have significantly impacted international capital markets. Prior to comprehending how the Federal Reserve's rate hikes affect China, it is important to understand how macroeconomic data releases affect the foreign exchange, stock, and bond markets. Information on the state of the economy specifically affects the stock and FX markets favourably but the bond market negatively. Inflation data positively affects the stock market but negatively impacts the bond and foreign exchange markets. Money supply data has a positive influence on both stock and bond markets, yet exerts a negative effect on the forex market. This suggests that various types of macroeconomic data affect different financial markets in distinct ways [1]. However, the correlation between macroeconomic data and financial markets is dynamically changing, and financial markets' reactions exhibit time-varying

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characteristics [1]. The impact of macroeconomic data release on financial markets is modulated by other factors, among which monetary policy uncertainty plays a pivotal role. This uncertainty, by influencing future monetary policy expectations, modulates the financial market's response to macroeconomic data. Specifically, increased monetary policy uncertainty weakens the stock market's reaction to macroeconomic data but strengthens the bond and forex market's responses. This suggests that monetary policy uncertainty plays a significant role in the relationship between macroeconomic data and financial markets [1].

It's worth noting that various policy types and their characteristics and durations differently influence stock market performance. For instance, announcements related to interest rate policies and statutory reserve ratio policies significantly affect stock market volatility, while policy announcements from the China Securities Regulatory Commission have a minor impact, typically evident only for a very short duration. Regarding policy impact characteristics, changes in interest rate policies have the most prominent effect on market expectations, followed by statutory reserve ratio policies, while direct policy announcements are less significant. Market anticipations of policy announcements play a crucial role during the policy adjustment transmission process, influencing the stock market's operations. Interest rate policy adjustments usually exhibit short-term characteristics, whereas adjustments in statutory reserve ratio policies show long-term features [2]. Moreover, monetary policy also affects other nations via exchange rate and financial channels, leading to cross-border spillover effects, significantly influencing international financial markets and economies [3]. In conclusion, to comprehend the multifaceted impacts of U.S. rate hikes on China's stock market, this paper employs the event study methodology to empirically analyze the Federal Reserve's multiple rate hikes. It is proven that the Federal Reserve's rate hikes have varied effects on China's industrial, manufacturing, financial, research, coal, and petroleum sectors. Throughout our study of the ten rate hikes, each market also demonstrated varying degrees of anticipatory behavior in response to the rate hikes, reflecting the diverse sensitivities across industries. Table 1 displays the Federal Reserve's rate hike schedule from March 2022 to July 2023, totaling 11 rate hikes. Our research focuses on the first ten rate hikes, up to May 2023[4].

Table 1. Federal Reserve's Rate Hike Schedule [4].

2023

Date	Increase	Decrease	Level (%)
July 27	25	0	5.25-5.50
May 4	25	0	5.00-5.25
March 23	25	0	4.75-5.00
February 2	25	0	4.50-4.75

2022

Date	Increase	Decrease	Level (%)
December 15	50	0	4.25-4.50
November 3	75	0	3.75-4.00

Date	Increase	Decrease	Level (%)
September 22	75	0	3.00-3.25
July 28	75	0	2.25-2.50
June 16	75	0	1.50-1.75
May 5	50	0	0.75-1.00
March 17	25	0	0.25-0.50

2. LITERATURE REVIEW

Zhou Ailin et al. observed that following the continuous interest rate hikes in the U.S., the market grew bearish towards the stock market, resulting in significant withdrawals of U.S. dollars from equities and a shift towards U.S. government bonds [5]. Luoman and colleagues reported that funds in China's A-share market, whether domestic or foreign, showed a tendency to divest from equities and invest in bonds. This trend intensified investors' risk preferences, leading to tighter market liquidity. Beyond the risks of capital outflows and domestic asset price volatility, China's external debt repayment pressures have also increased [6]. Wang Lei summarized China's responses to U.S. rate hikes [7], noting that Chinese banks, in their attempt to stabilize share prices, have adopted continuous rate-cutting policies to diminish the attractiveness of bonds and boost equity appeal. Concurrently, they've been pushing for the internationalization of the Renminbi (RMB). Amid these interest rate hikes, the dollar appreciated significantly against most other currencies. The RMB, however, depreciated the least among them, bolstering international confidence in holding RMB [8]. Apart from governmental responses, He Qing and associates found that developments also had positive implications for China, setting it apart from other nations [9]. As a major manufacturing country importing raw materials and exporting finished products, China might benefit from a rate hike-induced decline in raw material prices, especially since its export performance has consistently been robust. In summary, U.S. interest rate hikes have multifaceted impacts on China's stock market, making it challenging to fully grasp China's overall repercussions following the rate increases. Current research on the effects of U.S. interest rate hikes on China predominantly focuses on identifying causality, with less emphasis on the process of these impacts. This paper mainly concentrates on the overall direction and specific timeline of U.S. rate hikes' effects on various sectors of the A-shares. Figure 1 displays the Interest rate comparison.

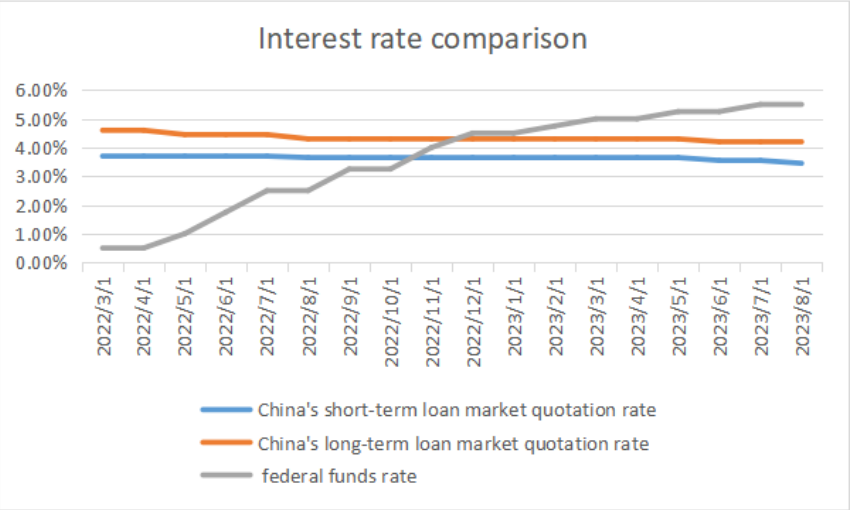


Figure 1. Interest Rate Comparison [Owner-draw].

3. METHODOLOGY

Theoretical Model: The formula below is used for comparing returns before and after the interest rate hikes:

$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \ldots \quad (1)$$

Here, $R_t$represents the return on an individual stock at time t, and $R_{mt}$is the market return at time t. Thus, an individual stock's return is proportional to the market return, with the proportionality constant being β. α is known as the unique return or arbitrage return. Theoretically,α should be close to zero. If α is significantly greater than zero, this indicates that the stock yields substantial returns unrelated to the market. Consequently, its demand will outstrip supply, eroding this advantage over time. If α is much less than zero, the stock's prices may drop due to its unpopularity, possibly leading to higher returns. Hence, this paper's approach is to: identify this linear relationship between individual stocks and the market, and then, after the interest rate hikes, compare actual returns with returns predicted by this linear relationship. A substantial discrepancy indicates the impact of the rate hike. The direction of the impact is inferred based on the sign of this discrepancy.

Two periods are selected, referred to as Window One and Window Two. Window One establishes the linear relationship between individual stocks and the market, while Window Two evaluates the difference between actual individual stock returns and those predicted following the event. This difference in returns determines the event's impact, with Window Two encompassing the exact time of the interest rate hike, T=0.However, due to the market's anticipatory behavior, wherein it reacts in advance of the actual rate hike and displays no significant reaction afterward, multiple selections for Window Two are necessary. It includes not just the time of the rate hike but also certain days prior to it.

A longer window is used to estimate $R_t = \alpha + \beta R_{mt} + \varepsilon_t$, deriving α and β, which then predict R_t within this time frame. The abnormal return during the event window, AR_t is defined below:

$$AR_t = R_t - (\hat{\alpha} + \hat{\beta} R_{mt} + \varepsilon_t).. \quad (2)$$

It is assumed that $R_{t-E} = \alpha + \beta R_{mt-E} + \varepsilon_{t-E} \ldots (3)$, with uncertainty arising from ε_t, and $\varepsilon_t \sim N(0, \sigma^2)$ hence $AR_t \sim N(0, \sigma^2)$. By aggregating the individual events over the entire event window, the result is

$$CAR(T) = \sum_{T=0}^{T} AR_t \sim N(0, T\sigma_\varepsilon^2).. \quad (3)$$

Since σ_ε^2 is unknown, it is estimated from the estimation window as $\hat{\sigma}_\varepsilon^2 = \sum_{t \in D} \frac{(R_t - \hat{R}t)^2}{D\text{-}1} \ldots (5)$.

The paper's null hypothesis posits that the event has no impact on individual stock returns. Its confidence interval is as follows:

$$\left(-1.96 \times \sqrt{T\sigma_\varepsilon}, 1.96 \times \sqrt{T\sigma_\varepsilon}\right).. \quad (4)$$

If the CAR value exceeds this interval, there is 95% confidence in rejecting this hypothesis.

CAR (Cumulative Abnormal Returns) is a common metric in event studies, primarily employed to investigate the effect of a specific event on stock or asset prices. Market anticipation refers to the market participants' foresight of a forthcoming event or information, pricing it in before the event occurs. In CAR analysis, observing abnormal returns prior to an event can be interpreted as market anticipation: if a stock's return differs significantly from its expected return (typically based on historical data or market models) days or weeks before an event, it might indicate the market's anticipation of the upcoming event.

4. DATA ANALYSIS

4.1 Window selection

The following dates were chosen as the periods when interest rates increased for the purposes of this study: 15 March 2022, 5 May 2022, 14 June 2022, 26 July 2022, 20 September 2022, 1 November 2022, 13 December 2022, 31 January 2023, 21 March 2023, 4 May 2023, and 15 March 2022. Window 1 spans from February 1, 2021, to February 7, 2022, for the rate increases on March 15, May 5, and June 14, 2022. Window 1 spans from June 1, 2021, to June 1, 2022, for the price increases on July 26, September 20, and November 1, 2022. Window 1 spans from November 1, 2021 to November 1, 2022 for the dates December 13, 2022, January 31, 2023, March 21, 2023, and May 4, 2023.

Window 2 is defined as the 22 trading days following each rate hike. In addition, to study the market's anticipation behavior regarding the rate hikes, several advanced windows were chosen that cover trading days not covered by the rate hike windows, referred to in this paper as "advance windows". Graphs named CARn (where n represents the nth rate hike) are generated using the rate hike windows, while graphs named CAR#n use the time prior to the nth rate hike as the advanced window. To avoid insider trading, the "Fred" window is advanced by one month.

It is essential to cite other literature in one or two sentences to justify our window selection. The selection of a one-month to one-year period prior to the 1st, 4th, and 7th interest rate hikes as Window One is intended to mitigate the influence of insider trading on the final results [10], and to divide the ten rate hikes into three separate intervals for updating Window One. Window Two is chosen to span 22 trading days post the rate hike, allowing for a comprehensive observation of the impact of the rate hikes on the industry.

4.2. Sectoral Index Performance

Figure 2 displays the daily returns for the Shanghai Composite Index, Industrial Index, Manufacturing Index, Financial Index, Research Index, Coal Index, and PetroChina for select periods between January 2022 and July 2023, as well as the dates of the Fed rate hikes. We also gathered full-year 2021 return data for these indices, though they are not represented graphically. The daily returns from these sectors will be used for subsequent calculations. All raw data was downloaded from the Resset Finical Database [11]. Data related to the oil sector was sourced from China National Petroleum Corporation, the largest oil producing company in China, while the remaining data comes from official domestic sources.

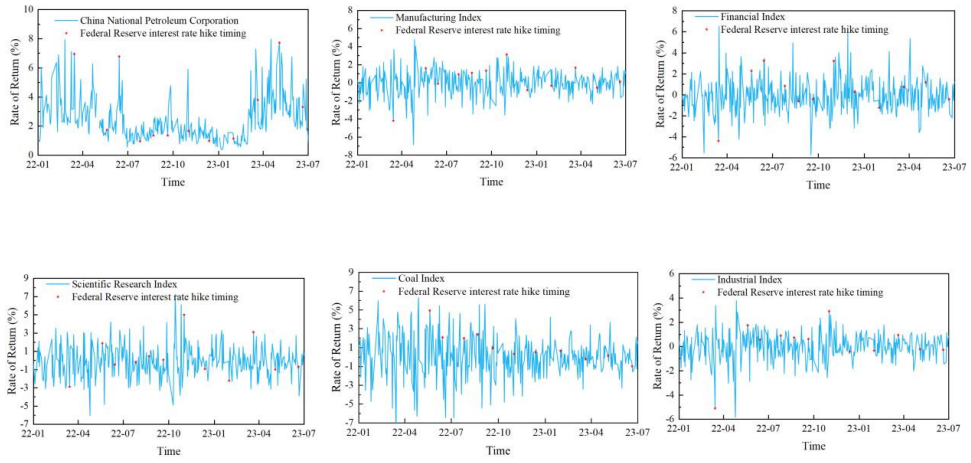


Figure 2. Daily Returns for the Shanghai Composite Index [Owner-draw].

5. Market Reaction to Rate Hikes

5.1. Industry

The Shanghai Composite Index return was employed as the market return for this study. In the industrial sector, the Industrial Index return served as the return for this domain, leading to the following regression results:

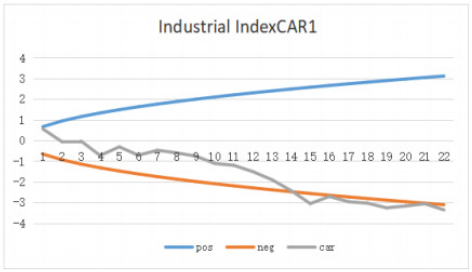
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \ldots \quad (5)$$

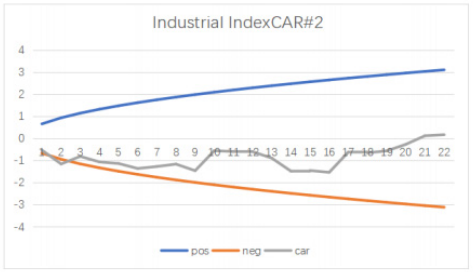
$y = 1.1447x + 0.0153$ $R^2 = 0.9007$

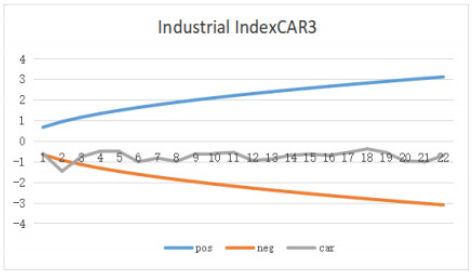
$y = 1.1072x + 0.0217$ $R^2 = 0.9252$

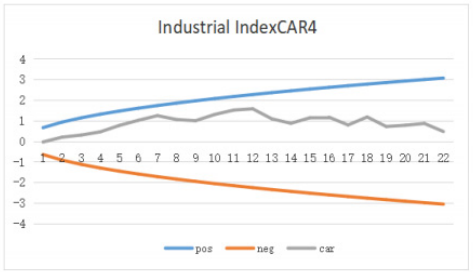
$y = 1.1039x + 0.004$ $R^2 = 0.9351$

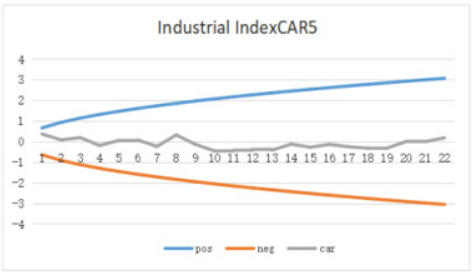
Based on our model, the AR, CAR, and confidence intervals are as follows:

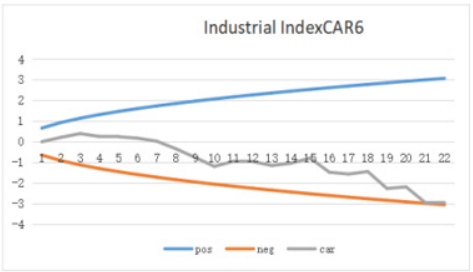


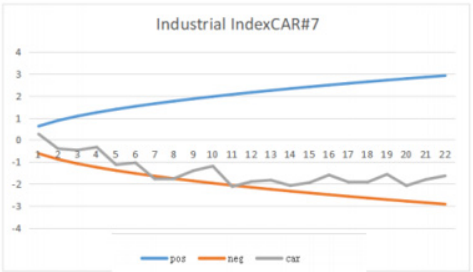


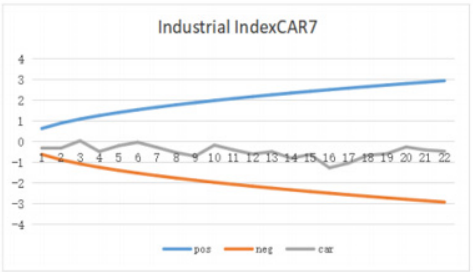












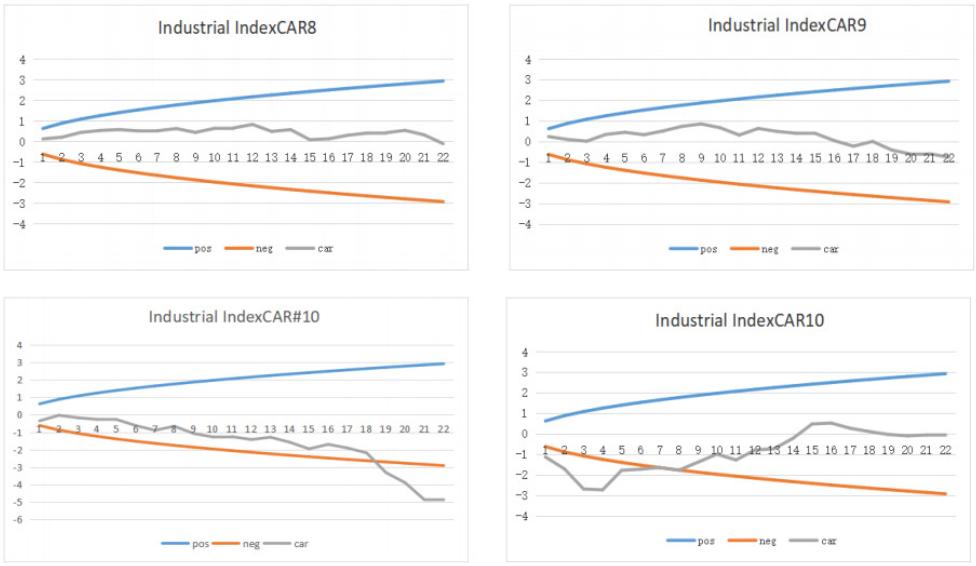


Figure 3. Industrial Index CAR[Owner-draw].

Figure 3 displays the CAR for the industrial index.

By comparing the Industrial Index returns with the Shanghai Composite Index returns, we confirmed a significant correlation between them, with R^2 values ranging from 0.9007 to 0.9351.

Post-rate hike market responses:

CAR3: In the three days following the third rate hike, from June 14, 2022, to June 16, 2022, the cumulative abnormal return (CAR) for the industrial sector significantly exceeded the 95% confidence interval. This indicates that the rate hike had a swift and marked impact on the market.

CAR10: During the seven days prior to the tenth rate hike, from May 4, 2023, to May 15, 2023, the CAR exceeded the confidence interval, signifying a significant impact on the market from this rate hike.

Market Anticipation Behavior:

CAR1: Starting 15 days after the first rate hike, the CAR exceeded the confidence interval, possibly indicating market expectations for the next rate hike or the sustained impact of the rate hike response.

CAR#2: Prior to the second rate hike, from April 1, 2022, to April 6, 2022, the CAR exceeded the confidence interval once. This behavior may suggest that, to some extent, the market had already anticipated the upcoming rate hike.

CAR#7: In the advanced window for the seventh rate hike, on November 29, 2022, and December 5, 2022, the CAR surpassed the confidence interval, possibly indicating the market's anticipation of the next rate hike.

5.2. Manufacturing

The Shanghai Composite Index return was utilized as the market return. In the manufacturing sector, the Manufacturing Index return was used as the sector's return, yielding the following results:

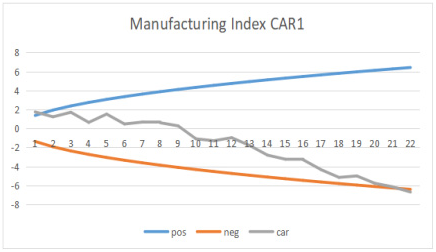
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \quad (6)$$

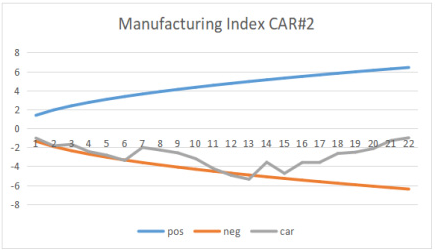
$y = 1.2029x + 0.0203$ $R^2 = 0.7016$

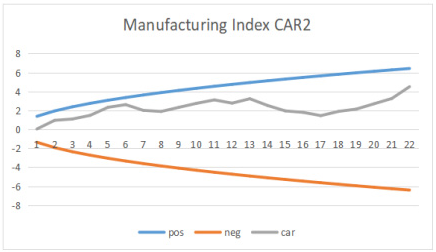
$y = 1.2081x + 0.0043$ $R^2 = 0.7575$

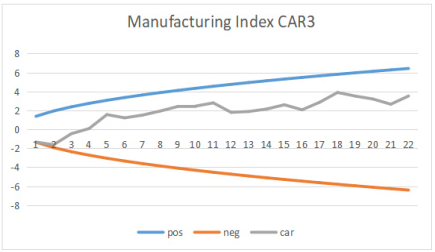
$y = 1.2362x + 0.0069$ $R^2 = 0.7824$

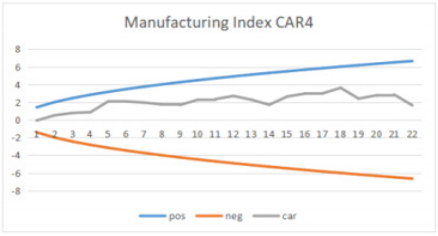
From our model, the AR, CAR, and confidence intervals are derived as:

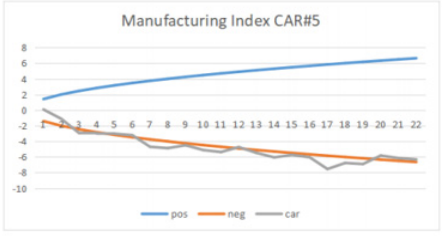


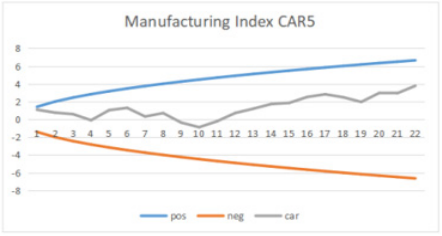












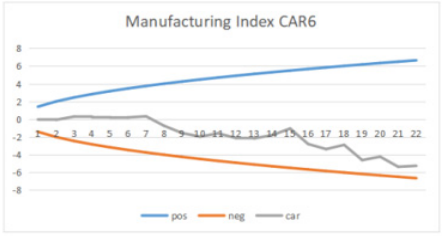


Figure 4. Manufacturing Index CAR[Owner-draw].

Figure 4 displays the CAR for the manufacturing index.

Upon comparison of the Manufacturing Index returns with the Shanghai Composite Index returns, a notable correlation was observed, with R^2 values ranging between 0.7016 and 0.7824.

Post-rate hike market responses:

CAR1: On the day following the first rate hike, the manufacturing sector's cumulative abnormal return (CAR) exceeded the 95% confidence interval, suggesting a transient but significant market impact from this rate hike.

CAR10: Four days after the tenth rate hike, from May 4, 2023, to May 9, 2023, the CAR markedly surpassed the confidence interval, indicating a significant market effect from this rate hike.

Market Anticipation Behavior:

CAR#2: Before the second rate hike, the CAR had once crossed the confidence interval, possibly indicating some degree of market anticipation for the next rate hike.

CAR#5: During the advanced window for the fifth rate hike, the CAR consistently exceeded the confidence interval, indicating market anticipation and adjustment for the subsequent rate hike.

CAR#7: Similarly, in the advanced window prior to the seventh rate hike, multiple instances were observed where the CAR exceeded the confidence interval, further suggesting market anticipation for the impending rate hike.

5.3. Finance

This study employs the Shanghai Stock Exchange Index returns as the market return.

In the financial domain, this paper adopts the financial index return as the return for the finance sector, resulting in the following regressions:

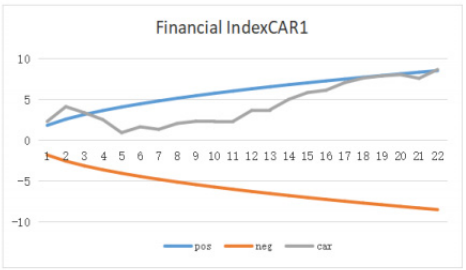
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \quad (7)$$

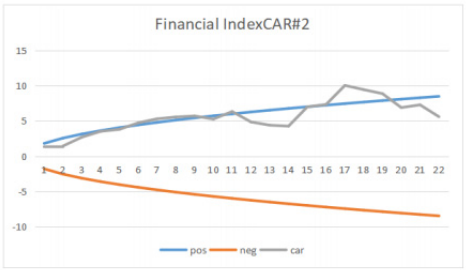
$y = 1.3502x + 0.0027 \quad R^2 = 0.6275$

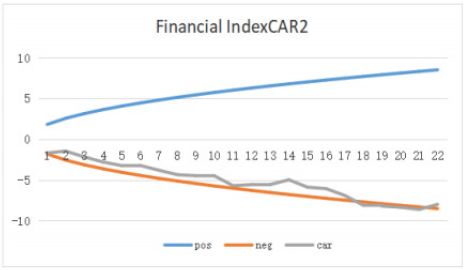
$y = 1.2397x - 0.0236 \quad R^2 = 0.6548$

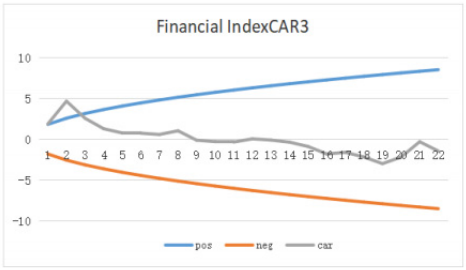
$y = 1.181x - 0.0483 \quad R^2 = 0.661$

From this, the study's model derived AR, CAR, and confidence intervals:









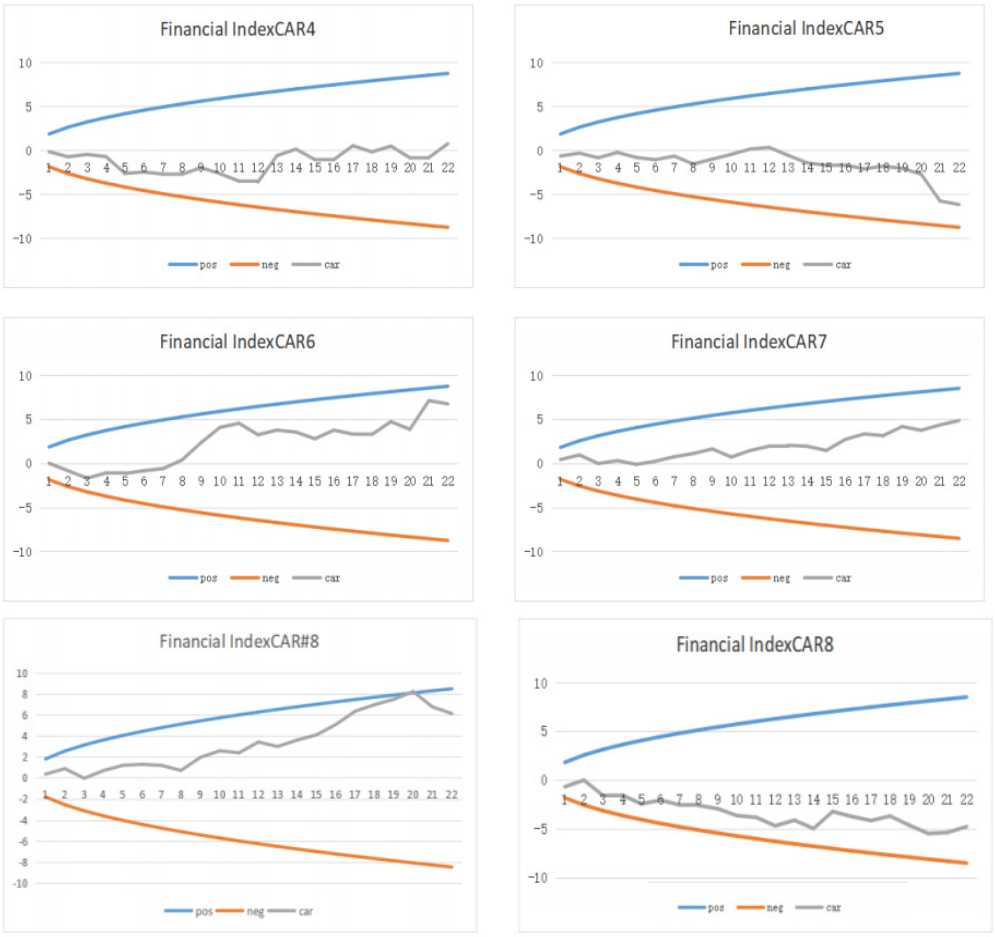


Figure 5. Financial Index CAR[Owner-draw].

Figure 5 displays the CAR for the financial index.

Upon comparing with the Shanghai Stock Exchange Index returns, we ascertain a significant relationship between the financial index return and the aforementioned index, with R^2 values ranging between 0.6275 and 0.661.

Market Reaction Post-Rate Hike:

CAR1: During the three days preceding the first rate hike, from 2022.3.15 to 2022.3.17, the cumulative abnormal returns in the financial domain notably surpassed the 95% confidence interval. This suggests a swift and evident market reaction to the rate hikes, indicating their significant impact.

CAR3: Within three days following the third rate hike, from 2022.6.14 to 2022.6.16, the CAR for the financial index considerably exceeded the confidence interval, denoting a significant impact on the financial market.

Market Anticipation Behavior:

CAR#2: Before the second rate hike, the CAR surpassed the confidence interval twice, specifically from 2022.4.8 to 2022.4.15 and 2022.4.22 to 2022.4.27. Such behavior may suggest that the market, to some extent, anticipated the forthcoming rate hike.

CAR2: On the 18th day after the second rate hike, i.e., 2022.5.30, the CAR once again exceeded the confidence interval. This could represent market expectations for subsequent rate hikes or the lingering impacts of the rate hike.

CAR#8: In the window prior to the rate hike, CAR#8 marginally surpassed the confidence interval. Though this change isn't pronounced, we cannot disregard the potential anticipatory market behavior or the influence of other external factors it might signify.

5.4. Scientific Research

The market return employed in this study is based on the Shanghai Stock Exchange Index returns.

In the research domain, this paper adopts the research index return as the return for the research sector, leading to the following regressions:

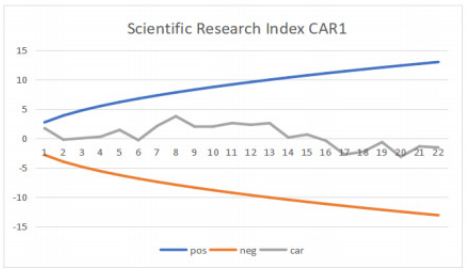
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \ldots \quad (8)$$

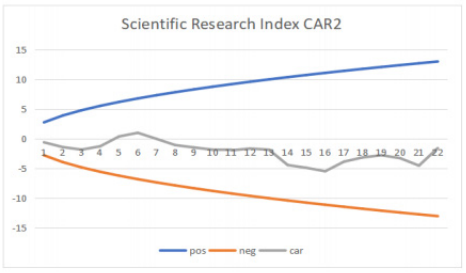
$y = 0.9513x - 0.0683 \quad R^2 = 0.2626$

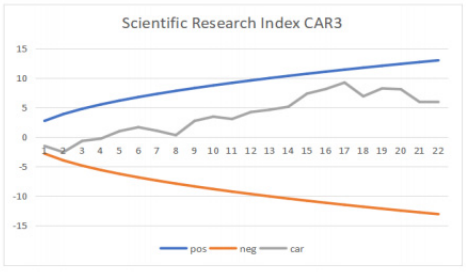
$y = 1.0399x - 0.1234 \quad R^2 = 0.3558$

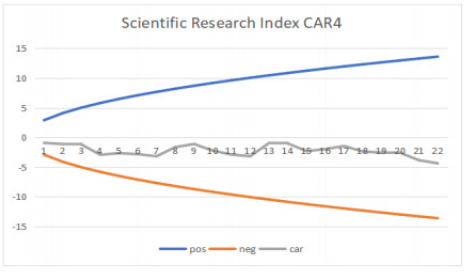
$y = 1.1483x - 0.0812 \quad R^2 = 0.4531$

From these, the study's model derived AR, CAR, and confidence intervals:









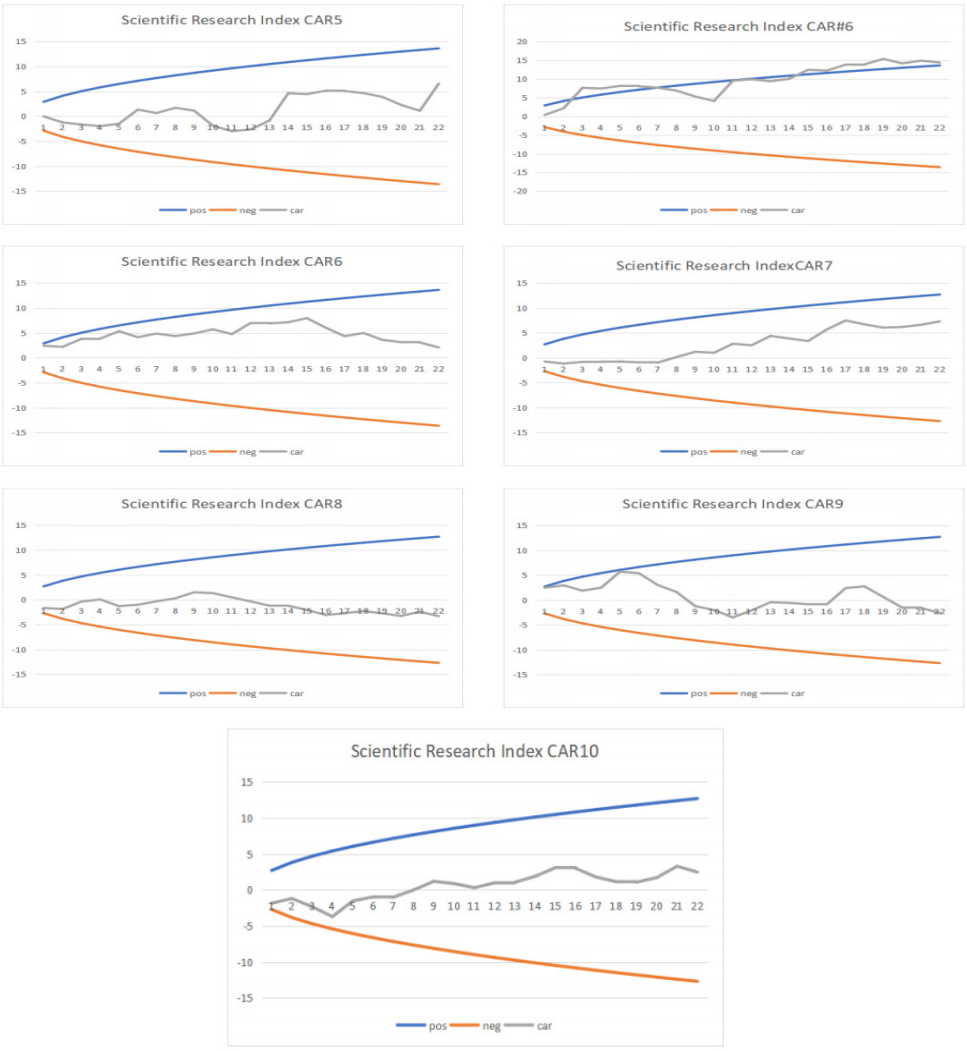


Figure 6. Scientific Research Index CAR[Owner-draw].

Figure 6 displays the CAR for the scientific research index.

By contrasting with the Shanghai Stock Exchange Index returns, we have confirmed a relationship between the research index return and the said index, with R^2 values ranging between 0.2626 and 0.4531.

Market Reaction Post-Rate Hike:

CAR#6: During the ten days leading up to the sixth rate hike, from 2022.11.1 to 2022.11.10, the cumulative abnormal returns in the research domain significantly exceeded the 95% confidence interval, indicating a notable impact on the research sector by this rate hike.

Market Anticipation Behavior:

CAR#6: Prior to the rate hike on 2022-11-01, on dates 2022-10-14, 2022-10-17, 2022-10-18, and 2022-10-19, which were 14 days post the fifth rate hike and before the sixth, the CAR exceeded the confidence interval, refuting the null hypothesis. These effects are inferred to be the market's anticipatory actions concerning the sixth rate hike.

6. Coal

This paper uses the Shanghai Stock Exchange Index returns as the market return. Within the larger energy module, this study has selected the coal index and China petroleum stock prices for examination. In the coal sector, this paper adopts the coal index return as the return for the coal industry, resulting in the following regressions:

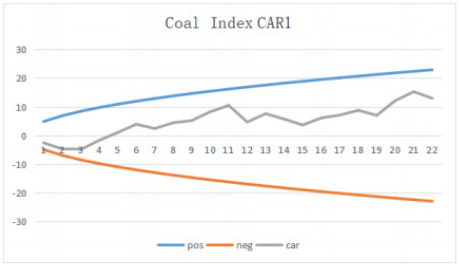
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \quad (9)$$

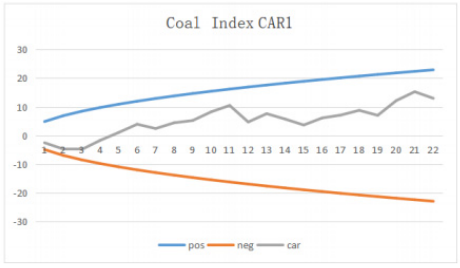
$y = 1.2179x + 0.2132 \quad R^2 = 0.1587$

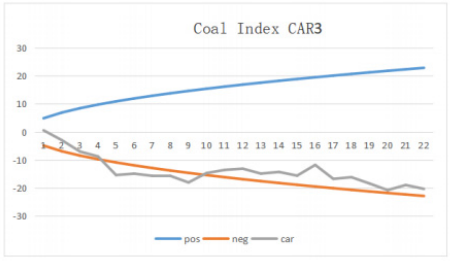
$y = 1.2339x + 0.3298 \quad R^2 = 0.2054$

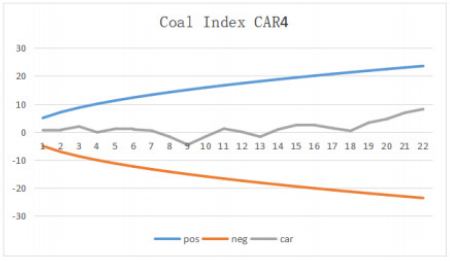
$y = 1.1578x + 0.2242 \quad R^2 = 0.2433$

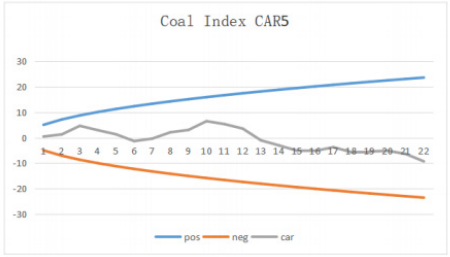
Based on these, the study's model derived AR, CAR, and confidence intervals:











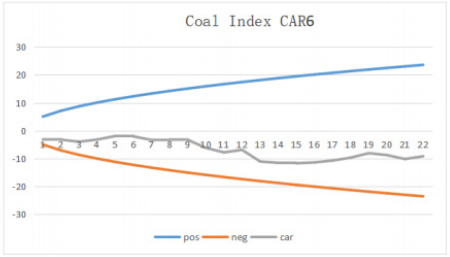


Figure 7. Coal Index CAR[Owner-draw].

Figure 7 displays the CAR for the coal index.

By comparing with the Shanghai Stock Exchange Index returns, we ascertain a relationship between the coal index returns and the aforementioned index, with R^2 values ranging between 0.1587 and 0.2433.

Market Response Post-Rate Hike

CAR3: From the fifth to ninth days after the third rate hike, specifically 2022.6.20 to 2022.6.24, the CAR notably surpassed the confidence interval, attesting to the significant influence of this rate hike on the market.

7. Petroleum

This study employs the Shanghai Composite Index returns as a proxy for market returns. Within the petroleum sector, the stock price returns of PetroChina serve as the representative for the petroleum industry's performance. The regression results obtained are as follows:

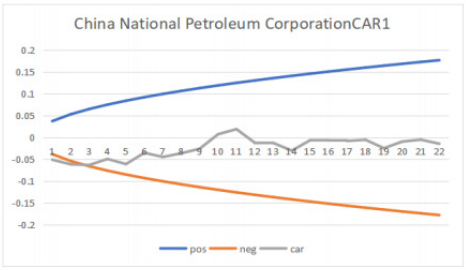
$$R_t = \alpha + \beta R_{mt} + \varepsilon_t \ldots \quad (10)$$

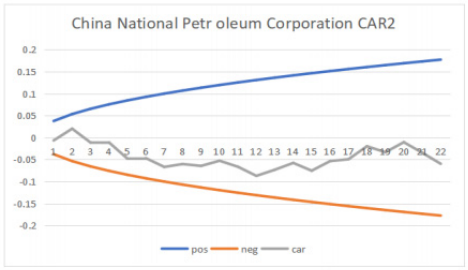
$y = 0.0071x + 0.0016$ $R^2 = 0.0976$

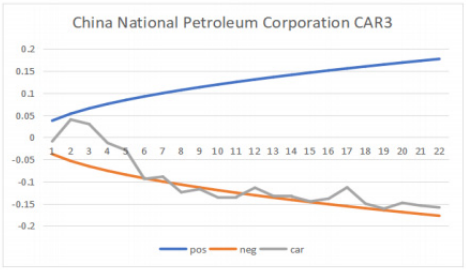
$y = 0.0074x + 0.0016$ $R^2 = 0.118$

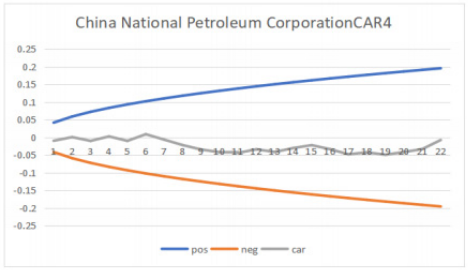
$y = 0.0038x + 0.0001$ $R^2 = 0.0413$

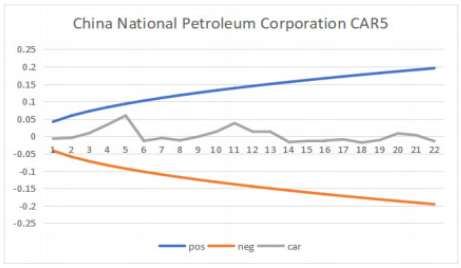
Based on these, the study's model derived AR, CAR, and confidence intervals:

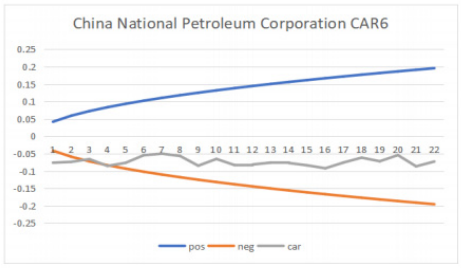

China National Petroleum CorporationCAR1
pos
neg
car

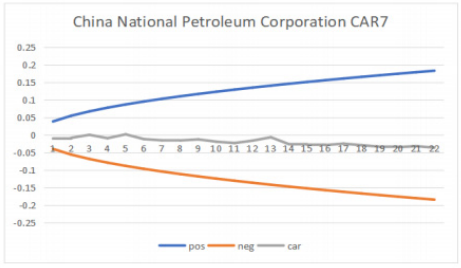

China National Petr oleum Corporation CAR2
pos
neg
car

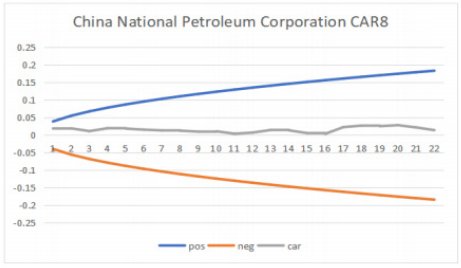

China National Petroleum Corporation CAR3
pos
neg
car


China National Petroleum CorporationCAR4
pos
neg
car


China National Petroleum Corporation CAR5
pos
neg
car


China National Petroleum Corporation CAR6
pos
neg
car


China National Petroleum Corporation CAR7
pos
neg
car


China National Petroleum Corporation CAR8
pos
neg
car

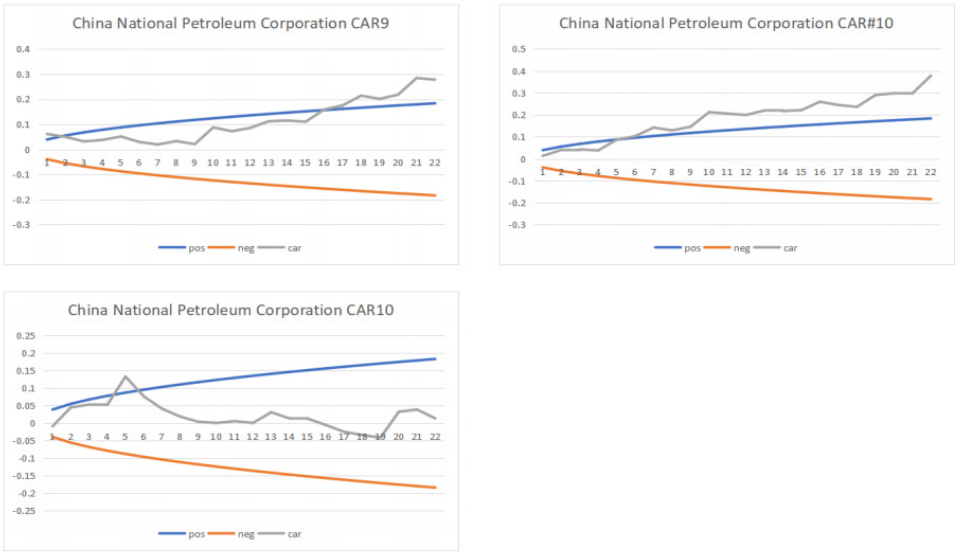


Figure 8. China National Petroleum Corporation CAR[Owner-draw].

Figure 8 displays the CAR for the China national petroleum corporation index.

Comparing with the returns from the Shanghai Composite Index, a correlation is established between the stock returns of PetroChina and the index, with R^2 values ranging from 0.0413 to 0.118.

Market Reaction Post-Rate Hike:

CAR1: Within two days post the first interest rate hike, spanning March 15th to 16th, 2022, the oil sector's CAR significantly exceeded the 95% confidence interval, suggesting a swift and evident market reaction to the rate adjustment.

CAR6: Similarly, two days after the sixth rate hike, from November 1st to 2nd, 2022, the CAR prominently surpassed the confidence interval, further reinforcing the substantial impact of this rate adjustment on the market.

CAR9: On the first day post the ninth rate hike, the CAR exceeded the confidence interval, indicating continued market influence.

CAR10: Five days subsequent to the tenth rate hike, the CAR again surpassed the confidence bounds, reflecting the pronounced influence of this rate change on the market.

Market Anticipation Behavior:

CAR#1: During the window preceding the rate hike, CAR#1 marginally surpassed the confidence interval. Although this deviation might appear subtle, it cannot be overlooked as it could symbolize market anticipatory actions or influences from external variables.

CAR3: Starting six days post the third rate hike, the CAR surpassed the confidence interval on two occasions. This behavior might suggest some level of market foresight towards the imminent fourth rate hike.

CAR9: From the 16th day post the ninth rate hike, the CAR consistently surpassed the confidence bounds, possibly reflecting market expectations for the next rate hike or the enduring effects of rate adjustments.

CAR#10: In the anticipatory window preceding the tenth rate hike, the CAR consistently exceeded the confidence bounds, indicating market foresight towards this particular rate hike.

7.1. Limitations and Improvements:

Empirical analysis may have overlooked potential factors, other than the Federal Reserve's rate hikes, that could introduce bias to the research results. For instance, changes in governmental policies or other macroeconomic indicators might cause deviations beyond confidence intervals. Future research could investigate other potential influencing factors during these periods of deviations [12,13]. The low R^2 values for the coal and oil sectors might imply potential inaccuracies in model predictions or suggest that model variables can explain only a minimal fraction of the observed data's variability. In sectors like coal and oil, prices might be influenced by temporal trends, seasonality, and other cyclical factors. Incorporating these effects could enhance the model's R^2.

8. CONCLUSION

Industrial Sector: A pronounced correlation is observed between the industrial index returns and the Shanghai Composite Index. Market foresight is evident before the second and seventh rate hikes. Excluding the third and tenth rate adjustments, the CAR remained within the confidence bounds during the event windows. The third and tenth rate hikes had a substantial impact on the stock market.

Manufacturing Sector: A significant association exists between manufacturing index returns and the Shanghai Composite Index. The market showed anticipatory behavior before the second, fifth, and seventh rate hikes. Apart from the first and tenth rate adjustments, CAR values remained within the event windows' confidence intervals. The first and tenth rate hikes markedly influenced the stock market.

Financial Sector: The financial index returns exhibit a significant correlation with the Shanghai Composite Index. Market foresight was observed preceding the second, third, and eighth rate hikes. Except for the first and third rate hikes, CAR values were within the event windows' confidence bounds. The first and third rate hikes had a pronounced influence on the stock market.

Research Sector: In comparison to other sectors, the research index doesn't demonstrate a strong association with the Shanghai Composite Index. However, during specific event windows, like before the sixth rate hike, market anticipatory behavior remains evident.

Coal Sector: Although the coal index doesn't strongly correlate with the Shanghai Composite Index, the market response to the third rate hike was still significant.

Petroleum Sector: Despite the relatively weaker correlation between the oil index and the Shanghai Composite Index, the reactions in the oil market post multiple rate hikes were pronounced and swift. Market foresight was observed before the first, third, ninth, and tenth rate hikes. During the first, sixth, ninth, and tenth rate hikes, CAR values exceeded the confidence bounds, and these rate hikes had a substantial impact on the stock market.

In summation, the stock markets across these six sectors were influenced, to varying degrees, by the multiple rate hikes of the Federal Reserve. The financial, industrial, and manufacturing sectors demonstrate pronounced correlations with the Shanghai Composite Index and exhibit greater sensitivity to the Fed's rate adjustments. While the stock markets were influenced by the Fed's multiple rate hikes, there were also several instances of market anticipatory actions. Although the research, coal, and oil sectors show relatively weaker correlations, market anticipatory behaviors and reactions remain evident and pronounced during monetary policy adjustments. This study's findings offer insights into the mechanisms of industry reactions to monetary policy changes for investors and provide pivotal references for policymakers to refine and enhance relevant policies.

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