Monetary Policy and Stock Market Return: The Case of Saudi Arabia Interest Rates hikes and Stocks Returns

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Abstract: The purpose of this research is to examine whether changes in macroeconomic variables have an effect on Saudi Arabia's main index, TASI and whether Monetary policy actions produce positive, negative or no effect at all for all listed companies. Accordingly, we examine the stock price adjustment around announcements of changes in interest rates, we examine the impact of a series of interest rate hikes on the stock returns under the main stock index in the Saudi Stock Market, TASI. The data covers four events between 16 March 2021 to 5 October 2022. We use an event study approach, with an estimation window length of [-250,-11] and an event window length of [-10,7], and we apply the OLS market model for daily data. The significance of the cumulative abnormal return CAAR is tested using the **t** statistics. The empirical results show that TASI responds negatively to three out of four announcements of interest rate hikes. The positive reaction occurs during the July 2022 monetary action. The positive reaction is attributed to the rising oil prices during that period. Finally, the results of this research open a window for future research to examine the impact of interest rates on the Saudi stock market over the long run.

Keywords: GCC Stock Market, Saudi Arabia, Event study, Monetary Policy, Interest Rates .

السياسة النقدية وعوائد أسواق الأوراق المالية: دراسة عن المملكة العربية السعودية

الدكتورة / سميه فهد الألمعي[1]، المحاضرة / علياء طلال الغانمي*[1]

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المستخلص: تهدف هذه الدراسة إلى البحث في أثر التغير في العوامل الاقتصادية على المؤشر الرئيسي في سوق الأسهم السعودية ، تاسي و تبحث نوع التأثير الذي تحدثه التغيرات في السياسات النقدية على الأسهم المدرجة تحت المؤشر الرئيسي، و تركز هذه الدراسة على بحث أثر سلسلة من الارتفاعات في أسعار الفائدة على مؤشر سوق الأسهم الرئيسي في المملكة العربية السعودية ، تاسي ، و تغطي بيانات هذه الدراسة أربعة إرتفاعات لأسعار الفائدة حصلت في الفترة بين 16 مارس 2021 و 5 أكتوبر 2022. تم تطبيق التحليلات الاحصائية بإستخدام بيانات يومية تغطي نافذة الحدث للفترات الأربعة التي تم إختيارها و قد تم إختيار فترة النافذة لتكون $[-10, 7]$ و أشارت النتائج الأحصائية إلى أن إستجابة تاسي لإرتفاع أسعار الفائدة جائت عكسية خلال ثلاث فترات من أصل أربعة، و كانت الاستجابة إيجابية خلال فترة واحدة فقط و كانت خلال شهر يوليو من سنة 2022 و هذه الاستجابة الايجابية يمكن إرجاعها إلى إرتفاع أسعار النفط خلال نفس الفترة، و يمكن المظر إلى نتائج هذه الدراسة كعامل محفز لإجراء دراسات مستقبلية تبحث أثر إرتفاع أسعار الفائدة على عوائد سوق الأسهم السعودية على المدى الطويل.

الكلمات المفتاحية: أسواق الأسهم الخليجية ، المملكة العربية السعودية ،دراسة الحدث، السياسة النقدية، أسعار الفائدة

1- Introduction

An efficient stock market contributes to higher economic growth and is essential to the development of the overall financial system. The stock market is a vital element of growth and can positively affect economic activity. The stock market helps companies raise capital, connects surplus-economic units to deficit-economic units, and creates liquidity. The market encourages investing, mobilizes saving, and reduces risk. Macroeconomic variables such as political upheaval, Repo Rate (RR), Reverse Repo Rate (RRR), and inflation rate can significantly influence stock prices and the stock market in general. Factors such as Repo Rate (RR) and Reverse Repo Rate (RRR) remain fixed over long periods of time; however, periodic adjustments of rates is often used by monetary authorities. It can be used as a tool to curb inflation, which can have a resulting effect on the stock market. Thus, it is essential to analyze macroeconomic variables to understand the behavior of the stock market.

Monetary policy is usually used by central banks to manage economic fluctuation and achieve price stability. Academicians, researchers, and policymakers have long investigated the effectiveness of monetary policy actions. Studies such as Bredin et al. (2009) examined the stock market reaction to policy changes in the United Kingdom and Germany. They found that monetary policy actions have a negative influence on the stock market return. Kholodilin et al. (2009) investigated the European stock market reaction to monetary policy actions. They report that the impact of Monetary policy tightening on European stock markets shows mixed results. Other studies, such as Fair (2006), investigated the effect of policy decisions on stock prices in the USA. At the same time, Vinod et al. (2020) focused on studying the impact of monetary policy decisions on India. However, none have studied the impact of monetary policy actions in Saudi Arabia. Unlike previous work, we will explore the recent monetary policy actions and its effects on Saudi Arabi's stock market returns.

The Saudi Stock exchanges play a prominent role in Saudi Arabian economic activity and act as an intermediary, which performs the role of both borrower and lender. The Saudi Stock Exchange is the dominant market in the Gulf Cooperation Council (GCC) and one of the main elements of the Saudi GDP, with more than 224 stocks listed representing different sectors of the economy. In Saudi Arabia, Interest rates remained relatively stable before COVID-19. It reached its lowest level of one percent in March 2020. The average Interest Rate in Saudi Arabia from 1992 to 2022 is 3.48 percent, with a record high of 7 percent in May of 2000. However, in 2022, A series of interest rate hikes hit the global market, and Saudi Arabia was no exception. Inflationary pressures pushed central banks to tighten their monetary policies. To maintain monetary stability, the Saudi Central Bank (SAMA) lifted key rates seven times in 2022 until it reached 4.50%-5.00% by year-end. Usually, the Saudi central bank (SAMA) follows the US Federal Reserve interest rate moves due to the Saudi Riyal and US dollar peg. The Saudi Central Bank (SAMA) raised key interest rates. SAMA raised both its Repo Rate (RR) and Reverse Repo Rate (RRR) following the US Reserve's decision to increase rates to curb inflation.

Problems of Study:

The research paper attempt to test the efficiency of the Saudi stock market, TASI. This study examines the stock price adjustment around announcements of changes in interest rates. In particular, we focus on the stock price's reaction after the recent changes of interest rates. In particular, we focus on interest hike announcements that occurred on (16 March 2022, 15 May 2022, 27 July 2022 and 21 September 2022). In 2022, inflationary pressures pushed central banks to tighten their monetary policies. To maintain monetary stability, the Saudi Central Bank (SAMA) lifted key rates seven times in **2022** until it reached 4.50%-5.00% by year-end. Between the year 1992 and 2022, the Interest Rate in Saudi Arabia averaged 3.48 percent and reached 7 percent in May of 2000 and reached a record low of 1 percent in March of 2020. The Saudi Central Bank (SAMA) raised key interest rates, it raised both its Repo Rate (RR) and Reverse Repo rate (RRR) following the US Reserve's decision to increase rates to curb inflation.

Questions of problems:

This research paper answers two important questions: (1) Does Monetary policy actions produce positive or negative effects on all listed companies? And (2) Does the new information affect shares listed on the Saudi Exchange significantly? To answer these questions, we use an event study methodology to measure the abnormal stock reactions during the period under examination.

Objectives of Study:

The research paper aims to investigate the impact of monetary policy decisions on the Saudi stock market, represented by

the Tadawul All Shares Index TASI. The main objective of an event study is to investigate the behavior of stock prices caused by a given event. In this paper, the event is interest rate hike announcements. The event study approach measures the abnormal performance of securities during the event; thus, we can measure the impact of the event. Moreover, according to (Brown and Warner, 1980, and Fama, 1991) event studies provide evidence of market efficacy. Our research paper shed light on the stock market reaction to a series of monetary policy announcements. In our research paper, we follow Brown and Warner's (1985) event study approach, where we examine daily stock returns. We will analyse the impact on shares pre the announcement and post the announcement period. To test the impact of interest rate announcements, we calculate the daily return, the abnormal return, the average abnormal return, and the Cumulative average abnormal returns.

Importance of Study:

Our research is of interest to policymakers and investors as we investigate the market reaction to policy actions, especially interest rates. This research paper will help policymakers, individual investors, and institutional investors understand the impact of monetary policy actions and gain more insight into the behavior of the TASI index. This research is also beneficial to investors and portfolio managers as it examines the share price movements and market reactions to policy shocks. This will help investors make better investment decisions.

Hypothesis of Study:

H_0 Interest rate strikes have no impact on stock returns under TASI

H_A Interest rate strikes have an impact on stock returns under TASI

Methodology of Study:

Using an event study methodology developed by Brown and Warner (1985), this study examines the stock price adjustment around announcements of interest rate hikes. For an event study, one must specify the event date, the event window, and the estimation window. The event window includes days surrounding the announcement date, while the estimation window length ranges between 30 and 750 days. In this study, we follow Bash, Alsaifi, and Al-Awadhi (2020), with the estimation window length of $[-250, -11]$ and an event window length of $[-10, +7]$. Following Dodd and Warner (1983) and Brown and Warner (1985), the daily abnormal returns (ARs) can be calculated based on three methods: (1) the mean adjusted returns, (2) the market-adjusted model, and (3) the OLS market model. The significance of the reaction in the prices is tested using the t-test.

Key Findings:

The key findings of this paper highlight that the Saudi Stock market reacted immediately to policy action announcements. The analysis results show a negative impact of interest rates on the stock return at a significant level. Only one event, the third interest hike announcement, showed a positive impact on the Tadawul Index (TASI) return. We attribute this result to the increase in crude oil prices during the event period.

The remainder of this paper is structured as follows: in the next section, we summarize the existing literature, followed by section 3, where we present the research data and methodology; in section 4, we present the empirical findings, analysis, and recommendations.

2-   Literature review (Previous Studies):

The stock market reaction to monetary policy shocks has always attracted the interest of researchers, investors, and policymakers. There is a complete consensus among researchers around the impact of monetary policy's role in stock price movements. The finance literature on the impact of monetary policy announcements in Saudi Arabia is slightly scarce; however, Studies such as Elsayed et al.(2023) investigate the relationship between monetary policy and financial stability in the Gulf Cooperation Council. At the same time, Abouwafia and Chambers (2015) study the stock market reaction in Kuwait, Oman, Saudi Arabia, Egypt, and Jordan to monetary policy and real exchange rate. They report mixed results due to different monetary policy shocks and stock market

characteristics of each country. They report a significant impact on the short run for countries with independent monetary policies and flexible exchange rates.

Many studies have investigated the efficiency of capital markets and its reaction to monetary policy announcements in developed and emerging economies. Most studies in the literature suggest that interest rates have a negative impact on stock returns and vice versa. Several studies such as (Mukherjee and Naka, 1995; Nasseh and Strauss, 2000; and Gan et al., 2006; Abu Aljarayesh et al. 2018; and CELİK, 2020) studied the relationship between stock prices and several macroeconomic variables, and all found that variation in interest can have a significant and consistent negative impact on stock prices. Celick (2020), for example, examines the impact of the exchange rate and interest rate on the return and volatility of a specific sector under the Turkish stock exchange, which is insurance companies. The results show a negative impact of interest on the stock returns at a significant level. However, both factors have a limited impact on the volatility.

Using monthly data for the period between 2006 and 2016, Abu Aljarayesh et al. (2018) examine the impact of interest rates on the Amman Stock Exchange. Their results found a long-term relationship between the stock market return and changes in interest rates. The empirical results show a negative impact on the stock return. While Alam and Uddin (2009) explore the weak form efficiency of the stock market across fifteen developed and developing countries, namely "Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippines, S. Africa, Spain, and Venezuela". This study also looks at the effect of interest rate adjustments on share prices. Their finding shows mixed results for all countries' stock exchanges except the Philippines. They do not reject the theoretical argument of the negative relationship between stock prices and interest rates.

On the other hand, Pinem. et al.(2023) examine the impact of various macroeconomic variables, including interest rates, on the Jakarta Composite Index (JCI). In their regression model, they use monthly data covering the period between January 2018 and December 2020. Their empirical results show that interest has a positive impact on the stock return at a significant level. Other studies, such as Singh and Tandon (2015) studied the influence of policy rates on the Banking sector in India. The study analyzed the relationship between the BSE-Bankex in India and Cash Reserve Ratio (CRR), Repo Rate (RR), and Reverse Repo Rate (RRR) for the period 2005-2012. Their finding suggests that the monetary policy actions do not significantly impact BSE Bankex.

3-   Data and methodology

This event has impacted many economies around the world; however, we choose to examine the impact on the stock exchanges of Saudi Arabia. The data set incorporates information of daily data for all listed stocks in Saudi Arabia. The data sample was obtained from Thomson Reuters and covers the period between 16 March 2021 and 5 October 2022. The data sample includes the event dates of several interest hike announcements (16 March 2022, 15 May 2022, 27 July 2022 and 21 September 2022). We only use trading dates in our analysis.

In our research paper, we follow Brown and Warner's (1985) event study approach, where we examine daily stock returns. To test the impact of interest rate announcements, we calculate the daily return, the abnormal return, the average abnormal return, and the Cumulative average abnormal returns. The significance of the reaction in the prices is tested using the t-test. For an event study, one must specify the event date, the event window, and the estimation window. The event window includes days surrounding the announcement date, while the estimation window length ranges between 30 and 750 days. In this study, we follow Bash, Alsaifi, and Al-Awadhi (2020), with the estimation window length of $[-250, -11]$ and an event window length of $[-10, +7]$. Following Dodd and Warner (1983) and Brown and Warner (1985), the daily abnormal returns (ARs) can be calculated based on three methods: (1) the mean adjusted returns, (2) the market-adjusted model, and (3) the OLS market model.

To measure the impact of the interest rate hikes on the stock market, we must calculate the "abnormal returns," which is the return that deviates from the expected return. The abnormal return AR is calculated by subtracting the estimates of the normal return from the normal returns (the actual return). Usually, for an event study, the OLS market model reveals better results (Dyckman et al., 1984). Thus, we use the OLS market model, which is calculated as follows

$$AR_{i,t} = DR_{i,t} - (\alpha_i + \beta_i \, DR_{m,t}) \tag{1}$$

Where α_i and β_i are OLS values for the period $[-250, -11]$. $DR_{i,t}$ denotes the daily return for a particular stock, i, $DR_{m,t}$ denotes the daily return on TASI weighted index for day t.

The actual daily return of a particular stock, i, is simply calculated by taking the first difference of the natural logarithms of daily prices.

$$DR_i = \ln\left(\frac{P_t}{P_{t-1}}\right) \tag{2}$$

$$DR_i = \ln(P_t) \ - \ \ln(P_{t-1}) \tag{3}$$

where DR_i simply denote the daily returns for a particular stock, i, $\ln(\cdot)$ is the natural log function, P_t is the price of stock i at time t and P_{t-1} is the price of stock i at time t-1.

The actual daily return of the benchmark index, TASI (Tadawul All Share *Index*) on day t is calculated by taking the first difference of the natural logarithms of daily prices as well.

$$DR_{m,t} = \ln\left(\frac{P_t}{P_{t-1}}\right) \tag{4}$$

$$DR_{m,t} = \ln(P_t) \ - \ \ln(P_{t-1}) \tag{5}$$

where $DR_{m,t}$ simply denote the daily return on TASI weighted index for day t.

To measure the potential impact of higher interest rates on the Stock market during the "event window", we sum the abnormal returns in order to get a cumulative abnormal return (CAR)

$$CAR_{i(t1,t2)} \ = \ \sum_{t=t1}^{t2} AR_{i,t} \tag{6}$$

where t1 refers to the start of the event window, and t2 refers to the end of the event window

The reaction of the market can be measured with the aggregation of abnormal returns (AAR) and cumulative aggregate of abnormal returns (CAAR).

$$AAR_t \ = \ \frac{1}{N} \sum_{i=1}^{N} AR_{i,t} \tag{7}$$

Where AAR_t simply denotes the average abnormal return at time t. AAR is used to calculate the CAAR for the event window. The significance of the reaction in the prices is tested using the t-test.

4- Empirical Findings

Table 1 and Table 2 report descriptive statistics for the average abnormal returns AAR along with their Skewness and Kurtosis in window days [-10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7]. It is evident from the Table that during the announcement, the firms had mostly a negative average abnormal return on the day of announcement day [0], which means that the investors suffered a negative return on their investments. However, in the second Interest rate hike (15 May 2022), and based on the average abnormal return, investors made a minor positive return, meaning that the investors did not react immediately to the news and took longer to react. After the announcement date [0], most firms responded negatively.

Table 3 and Table 4 report descriptive statistics for the cumulative average abnormal returns CAAR along with their Skewness and Kurtosis in window days [-10, -9, -8, -7, -6, -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7]. CAAR is the most used model as it captures the informational efficiency of the stock markets. Our finding reconciles several results in the literature concerning the stock market reaction to announcements of interest rate hikes (Mukherjee and Naka, 1995; Nasseh and Strauss, 2000; and Gan et al., 2006; Abu Aljarayesh et al. 2018; and CELİK, 2020). The CAAR coefficients in Table 3 for the first interest rate hike on 16 March 2022 are negative on window day [0] along with window days [-10, -9, -8, -7, -6, -5, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7]. In fact, by using the OLS market model, the results are negative for all window days except for day [-4]. Actually, the Saudi central bank (SAMA) follows the US Federal reserve interest rate moves, due to the Saudi Riyal and US dollar peg, and it is evident that prior to the event day [0], the market reaction is negative as well, which means that the information is already reflected in the stock prices.

However, in the remaining event dates (15 May 2022, 27 July 2022, and 21 September 2022), the market reaction is slightly different, indicating that the new information took longer to be processed by market participants. Table 3 and Table 4 show that the stock market reaction is mostly negative to the announcements of interest hikes in most event dates under examination, other than that for (the fourth interest hike), for which it is positive. This means that the firms suffered a negative return on their investments during most periods under examination; however, during the fourth monetary shock announcement, firms enjoyed a positive return. The positive reaction was fuelled by the continued price gains for crude during July 2022. According to Algahtani (2016) and Wong and Massah (2017), crude oil prices have a positive impact on stock returns.

For the first interest hike, Figure 1, shows the change in the average abnormal returns, AAR, and the cumulative average abnormal return, CAAR, for the periods before and after the announcement date [-10,7]. It can be noticed that the stock market return declined after the event date [0]. Figure 2 provides a similar reference to Figure 1. Figure 3 shows that the cumulative abnormal returns rose after the event date. On the other hand, Figure 4 shows that the cumulative abnormal return declined during the observation period and then rose post-day [2].

Table 1: Descriptive statistics for abnormal returns $AAR_{i,t}$ on the event day, before and after the event day.

	First interest rate hike -16 March 2022				Second Interest rate hike-15 May 2022			
	Mean	Median	Kurtosis	Skewness	Mean	Median	Kurtosis	Skewness
W-Day [-10]	-0.0035	-0.0037	3.8483	-0.4410	0.0055	0.0050	1.8649	0.7315
W-Day [−9]	-0.0029	-0.0037	1.6519	0.7600	0.0032	0.0027	4.3294	1.2396
W-Day [-8]	0.0041	0.0033	2.5904	1.0553	0.0006	-0.0003	7.5960	0.4471
W-Day [-7]	-0.0016	-0.0021	2.2957	0.6615	-0.0008	-0.0011	2.5519	0.6470
W-Day [-6]	-0.0003	-0.0012	6.9011	1.5632	0.0022	0.0019	3.0845	0.6559
W-Day [-5]	0.0036	0.0027	5.6842	1.2381	-0.0002	-0.0004	4.7183	0.8614
W-Day [-4]	0.0012	0.0012	8.7381	0.6834	-0.0014	-0.0016	12.1181	0.1114
W-Day [-3]	-0.0008	-0.0004	1.2505	-0.2976	-0.0067	-0.0065	4.7186	-0.0700
W-Day [-2]	-0.0019	-0.0013	3.4231	-0.6559	-0.0055	-0.0048	3.0306	-1.0758
W-Day [-1]	0.0013	0.0014	3.3999	-0.1644	-0.0062	-0.0065	2.1546	0.2941
W-Day [0]	-0.0033	-0.0040	15.2534	0.4354	0.0003	0.0006	6.4786	-1.1005
W-Day [+1]	-0.0015	-0.0018	3.8285	0.0812	-0.0057	-0.0044	2.3605	0.1787
W-Day [+2]	-0.0012	-0.0022	6.8307	1.7793	-0.0025	-0.0035	2.3783	0.2719
W-Day [+3]	-0.0008	-0.0007	1.1212	0.1658	-0.0005	0.0007	6.1124	-1.8067
W-Day [+4]	-0.0008	-0.0012	5.0090	0.8667	0.0006	0.0001	8.1335	-0.8908
W-Day [+5]	0.0002	0.0000	2.5561	-0.0306	-0.0014	-0.0014	3.0584	0.7195
W-Day [+6]	0.0011	0.0004	7.3851	1.0498	0.0019	0.0019	4.2270	0.6254
W-Day [+7]	0.0012	0.0004	2.9917	1.0371	0.0062	0.0050	1.6753	0.3548

Note: W-Day refers to Window Day

Table 2: Descriptive statistics for abnormal returns $AAR_{i,t}$, on the event day, before and after the event day

	Third interest rate hike- 27 July 22				Fourth interest rate hike -21 September 2022			
	Mean	Median	Kurtosis	Skewness	Mean	Median	Kurtosis	Skewness
W-Day [-10]	0.0020	0.0016	3.8084	0.4591	-0.0033	-0.0024	2.0574	0.0123
W-Day [-9]	-0.0049	-0.0043	4.6085	0.3086	0.0033	0.0025	2.9386	0.4494
W-Day [-8]	0.0009	0.0002	6.7934	1.0209	0.0028	0.0021	12.4728	2.1381
W-Day [-7]	-0.0011	-0.0021	2.6044	0.5681	-0.0009	-0.0010	5.3220	0.1061
W-Day [-6]	0.0024	0.0012	3.5429	0.4252	0.0009	0.0003	2.8143	-0.1082
W-Day [-5]	-0.0003	-0.0004	8.1852	0.1414	0.0003	0.0000	3.1332	1.0210
W-Day [-4]	0.0018	0.0010	1.9384	0.6942	-0.0008	-0.0010	15.8662	-1.5838
W-Day [-3]	0.0035	0.0028	2.4045	0.3923	-0.0040	-0.0041	0.3969	0.4701

	Third interest rate hike- 27 July 22				Fourth interest rate hike -21 September 2022			
W-Day [-2]	0.0012	0.0004	5.0106	1.4807	-0.0005	-0.0005	2.4339	0.3233
W-Day [-1]	-0.0016	-0.0013	8.2560	1.3467	0.0002	-0.0003	2.5511	0.8165
W-Day [0]	-0.0019	-0.0015	9.6332	-1.3261	-0.0014	-0.0013	1.2897	0.2389
W-Day [+1]	0.0035	0.0028	4.9817	1.4267	-0.0039	-0.0043	2.9604	0.6699
W-Day [+2]	0.0058	0.0050	3.4731	1.1290	0.0058	0.0055	2.7457	0.5544
W-Day [+3]	0.0036	0.0027	3.7231	1.2788	0.0034	0.0018	3.1095	1.1943
W-Day [+4]	0.0032	0.0014	3.1720	0.9456	0.0018	0.0002	5.1742	1.5747
W-Day [+5]	0.0035	0.0018	6.8090	1.8461	-0.0018	-0.0019	4.2661	0.9923
W-Day [+6]	0.0031	0.0024	6.3706	1.3735	0.0030	0.0020	6.7776	1.7807
W-Day [+7]	0.0027	0.0014	6.3301	0.4783	0.0026	0.0014	5.0658	1.0349

Note: W-Day refers to Window Day

Table 3: Descriptive statistics for cumulative average abnormal returns $CAAR_{i,t}$ on the event day, before and after the event day

	First interest rate hike -16 March 2022				Second Interest rate hike-15 May 2022			
	Mean	Median	Kurtosis	Skewness	Mean	Median	Kurtosis	Skewness
W-Day [-10]	-0.0035	-0.0037	3.8483	-0.4410	0.0055	0.0050	1.8649	0.7315
W-Day [- 9]	-0.0064	-0.0078	1.8607	0.3163	0.0087	0.0078	1.8357	0.3973
W-Day [-8]	-0.0023	-0.0051	1.1725	0.8789	0.0093	0.0072	1.3285	0.6521
W-Day [-7]	-0.0039	-0.0062	1.8976	0.7555	0.0084	0.0060	2.1154	0.7940
W-Day [-6]	-0.0042	-0.0050	0.9706	0.3214	0.0106	0.0094	1.5901	0.5105
W-Day [-5]	-0.0006	-0.0015	0.9190	0.0796	0.0104	0.0094	1.9596	0.2535
W-Day [-4]	0.0006	0.0001	1.1818	-0.1324	0.0090	0.0094	3.5431	0.4892
W-Day [-3]	-0.0002	0.0006	1.2122	-0.0807	0.0023	0.0031	5.8122	0.3228
W-Day [-2]	-0.0020	-0.0013	1.2981	-0.1481	-0.0032	-0.0032	5.7264	-0.8503
W-Day [-1]	-0.0007	-0.0006	1.1560	-0.0758	-0.0095	-0.0082	7.5020	-0.6939
W-Day [0]	-0.0040	-0.0046	2.4861	0.0959	-0.0091	-0.0051	10.2540	-1.3790
W-Day [+1]	-0.0056	-0.0052	2.8577	-0.0850	-0.0148	-0.0121	9.6303	-1.7928
W-Day [+2]	-0.0068	-0.0060	2.1721	-0.1415	-0.0173	-0.0137	11.3498	-2.1677
W-Day [+3]	-0.0076	-0.0061	1.8981	-0.2621	-0.0179	-0.0105	16.9592	-2.9624
W-Day [+4]	-0.0084	-0.0082	1.6037	-0.0923	-0.0173	-0.0095	23.8388	-3.7165
W-Day [+5]	-0.0082	-0.0076	2.0582	-0.4120	-0.0187	-0.0122	19.7075	-3.2791
W-Day [+6]	-0.0071	-0.0085	1.7534	-0.2485	-0.0168	-0.0104	21.3579	-3.4625
W-Day [+7]	-0.0059	-0.0085	1.2776	0.0071	-0.0106	-0.0058	24.9584	-3.8199

Note: W-Day refers to Window Day

Table 4: Descriptive statistics for cumulative average abnormal returns $CAAR_{i,t}$, on the event day, before and after the event day

	Third interest rate hike- 27 July 22				Fourth interest rate hike -21 September 2022			
	Mean	Median	Kurtosis	Skewness	Mean	Median	Kurtosis	Skewness
W-Day [-10]	0.0020	0.0016	3.8084	0.4591	-0.0033	-0.0024	2.0574	0.0123
W-Day [−9]	-0.0029	-0.0029	8.7410	0.8375	0.0000	0.0002	6.4547	0.4033
W-Day [-8]	-0.0020	-0.0022	4.2809	0.3512	0.0028	0.0023	4.6557	0.8006
W-Day [-7]	-0.0030	-0.0038	6.3081	0.6039	0.0019	0.0008	2.4303	0.5765
W-Day [-6]	-0.0006	-0.0006	6.3084	-0.4678	0.0027	0.0010	2.4264	0.7674
W-Day [-5]	-0.0010	-0.0005	15.0960	-1.7008	0.0030	0.0016	2.4675	0.8210

	Third interest rate hike- 27 July 22				Fourth interest rate hike -21 September 2022			
W-Day [-4]	0.0008	0.0019	14.0495	-1.8289	0.0022	0.0024	1.6535	0.3958
W-Day [-3]	0.0043	0.0059	11.3871	-1.6340	-0.0018	-0.0016	1.4643	0.4093
W-Day [-2]	0.0055	0.0065	11.7634	-1.7234	-0.0022	-0.0016	1.7865	0.4222
W-Day [-1]	0.0039	0.0055	11.3185	-1.6536	-0.0020	-0.0012	1.8202	0.3714
W-Day [0]	0.0020	0.0030	10.2798	-1.5602	-0.0035	-0.0041	1.7019	0.4694
W-Day [+1]	0.0055	0.0070	7.9773	-1.2212	-0.0074	-0.0072	1.8384	0.5428
W-Day [+2]	0.0113	0.0132	5.7455	-0.8839	-0.0016	-0.0025	2.3496	0.5726
W-Day [+3]	0.0150	0.0175	5.2791	-0.7571	0.0018	0.0001	2.7332	0.7007
W-Day [+4]	0.0182	0.0195	4.7455	-0.1999	0.0036	0.0015	2.5851	0.7978
W-Day [+5]	0.0217	0.0217	4.3891	0.0053	0.0018	0.0000	2.7533	0.8783
W-Day [+6]	0.0247	0.0266	4.3162	-0.0515	0.0048	0.0037	2.3846	0.8422
W-Day [+7]	0.0274	0.0257	4.3183	0.1514	0.0074	0.0076	1.7874	0.5767

Note: W-Day refers to Window Day

Figure 1. AAR and $CAAR$ during the announcement date 16 March 22
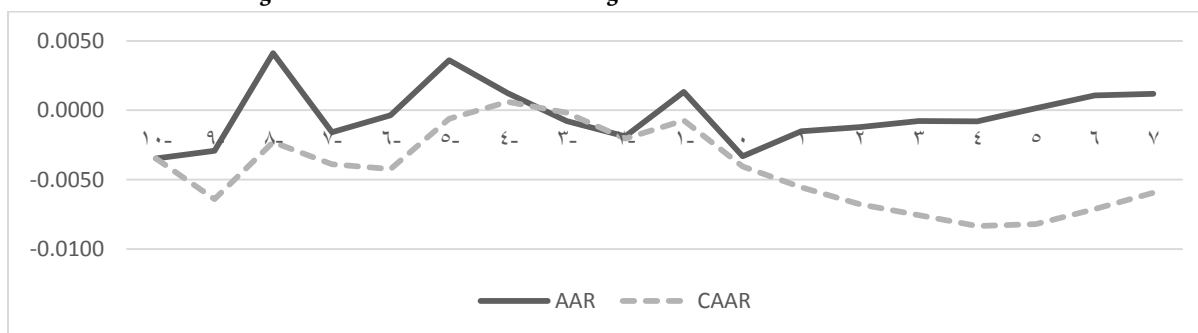

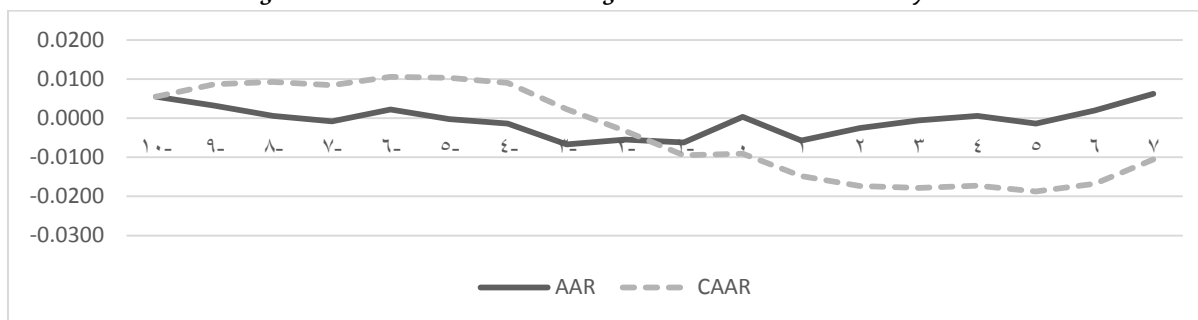Figure 2. AAR and $CAAR$ during the announcement date 15 May 2022

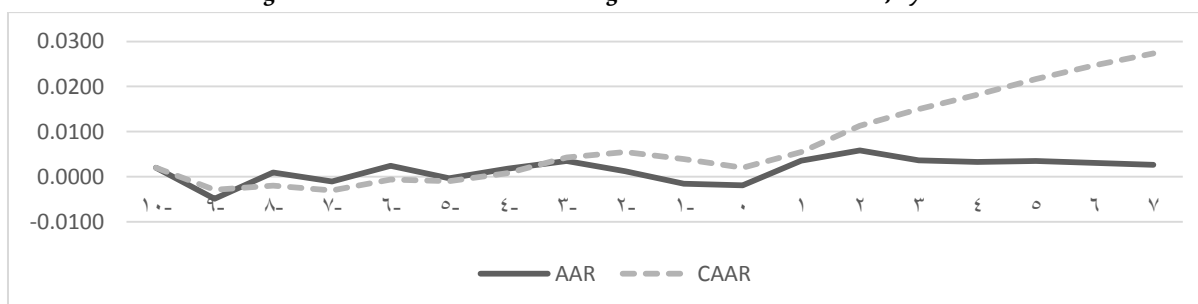Figure 3. AAR and $CAAR$ during the announcement date 27 July 2022

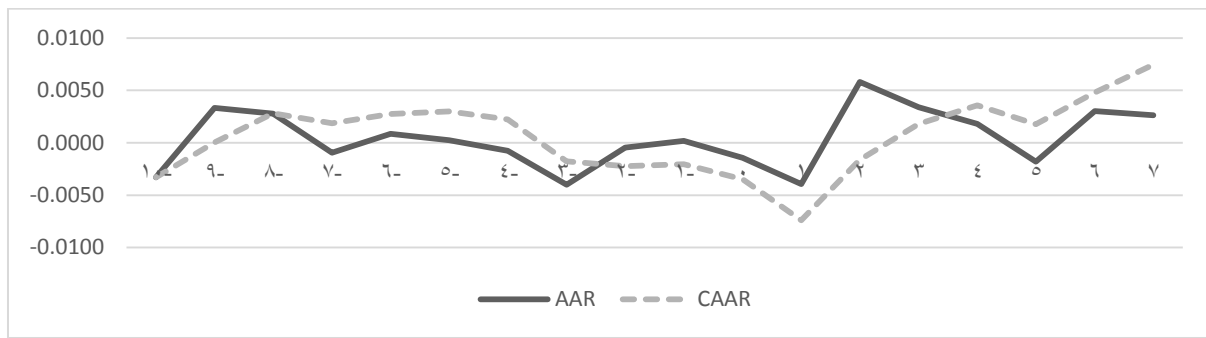Figure 4. AAR and $CAAR$ during the announcement date 21 September 2022

Table 5: Cumulative Average Abnormal returns $CAAR$ along with its statistical significance for different event windows

Event date		1st Announcement 16 March 2022	2nd Announcement 15 May 2022	3rd Announcement 27 July 2022	4th Announcement 21 September 2022
CAAR (-5,0)	Mean	0.0002	-0.0197	0.0026	-0.0062
	t test	0.0758	-3.2453***	0.8943	-1.8557*
CAAR (0, 5)	Mean	-0.0075	-0.0951	0.0178	0.0038
	t test	-2.4278**	-1.9556**	4.5617***	1.2048
CAAR (-1,1)	Mean	-0.0035	-0.0116	0.0003	-0.0052
	t test	-2.0805**	-3.2515***	0.0237	-3.1283***
CAAR (-2,2)	Mean	-0.0066	-0.0196	0.0070	0.0002
	t test	-2.6949***	-3.2505***	3.0201***	0.0591
CAAR (-3,3)	Mean	-0.0082	-0.0269	0.0142	-0.0004
	t test	-2.5271**	-3.1227***	4.2253***	-0.1146
CAAR (-4,4)	Mean	-0.0077	-0.0778	0.0192	0.0006
	t test	-1.8235**	-1.2080	3.7249***	0.1293
CAAR (-5,5)	Mean	-0.0040	-0.0293	0.0223	-0.0010
	t test	-0.8235	-2.2148**	3.4803***	-0.1718
CAAR (-6,6)	Mean	-0.0032	-0.0252	0.0278	0.0029
	t test	-0.5798	-1.7372*	3.5332***	0.4693
CAAR (-7,7)	Mean	-0.0036	-0.0198	0.0294	0.0046
	t test	-0.5423	-1.3133	3.0353***	0.6509
CAAR (-8,7)	Mean	0.0005	-0.0192	0.0303	0.0074
	t test	0.0611	-1.2466	2.8222***	0.9891
CAAR (-9,7)	Mean	-0.0025	-0.0161	0.0254	0.0107
	t test	-0.2932	-1.0083	2.4077**	1.2832

*, **, *** denotes statistical significance at the 10%, 5% and 1% levels, respectively.

Table 5 provides the results of the cumulative average abnormal returns along with their statistical significance for different event windows. The estimated cumulative abnormal returns are calculated by using the OLS market model. Based on the t stat in Table 5, it is evident that the market reaction is negative and highly significant during the first, second and fourth announcement periods. One can see that during most event windows, the market reaction is negative and highly significant. For example, in event window [−1, +1] the companies obtained negative returns. Interest rate is a key macroeconomic variable that can have a significant impact on the economy as a whole and on the stock market return. In theory, an increase in interest rate reduces the present value, which should depress stock prices. According to Fama (1981), there is much evidence of a negative relationship between stock return and interest rate. Moreover, according to Eldomiaty et al. (2020), interest hikes motivate market participants to invest in bonds since investing in bonds rewards higher returns when compared to investing in equities, in turn, stock prices decrease. Our results are consistent with (Fama 1981; Mukherjee and Naka, 1995; Nasseh and Strauss, 2000; and Gan et al., 2006; Abu Aljarayesh et al. 2018; and CELİK, 2020).

However, during the third interest hike under our examination, the market reaction was positive and highly significant, which is consistent with the results of Pinem.et al.(2023). The market reaction is positive and significant during event windows [0, +5], [-2,+2], [-3, +3], [-4,+4], [-5, +5], [-6,+6], [-7, +7], [-8,+7], and[-9,+7]. The Saudi index, TASI, bounced in July 2022, this impact is attributable to the continued price gains for crude, which have a significant impact on TASI according to the existing literature (Ismail et al. 2021; Algahtani 2016; and Wong and Massah 2017). Despite rising interest rates, most market sectors ended in the green. This gain in TASI was led by firms such as Al Rajhi, the Kingdom's largest valued bank, Saudi Aramco, and Saudi National Bank.

Results and Discussions:

This research paper examines the impact of rising interest rates on Saudi Arabia's Tadawul Index (TASI) returns. We examine the impact in four different events using an event study methodology. We analyze the abnormal and cumulative abnormal returns around four different announcement dates. The paper examines the stock price adjustment around announcements of interest rate hikes. In particular, we will examine the impact of interest hike announcements that occurred on (16- 22 March, 15 May 22, 27 July 22 and 21 September 22). Empirical results show a negative impact of interest rates on the stock return at a significant level. However, the third interest hike, showed a positive impact on the Tadawul Index (TASI) return. We attribute this result to the increase in crude oil prices during the event period.

The interest rate, which is a monetary policy tool used by the monetary authorities to curb inflation, has impacted companies in Saudi Tadawul. The interest hikes put downward pressure on Tadawul's performance, Saudi Arabia's main index was mostly impacted in a negative way due to interest rate hikes. According to the Saudi exchange capital market overview, in the first quarter of 2022, the total value traded of sukuk and bonds increased by 12.19%, which is consistent with the argument that interest hikes motivate market participants to invest in bonds. The results differ slightly for each event date, with a significant negative impact on the first, the second, and the fourth shocks. The third announcement date records a significant positive impact. However, we reject the null hypothesis-"There is no significant relationship between stock market indices and monetary policy announcements."

Our results are of interest to policymakers as we provide evidence of the market reaction to policy actions. This paper provides new evidence of monetary policy actions in Saudi Arabia's markets. The research paper is beneficial to investors and portfolio managers as it provides information about share price movements and market reactions. This will help investors make better investment decisions.

Recommendations:

As for our suggestions, it is recommended to raise awareness about monetary policy tools and its resulting effects on the market. Investors should not make decisions after the announcement of interest rate hikes due to the significant negative effect on the market. For future studies, we suggest examining the long-term impact of interest rate hikes on the stock market return.

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