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THE IMPACT OF WEATHER ON TRADING IN THE IRAQ STOCK EXCHANGE

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Abstract:

Due to the irregularity of the weather conditions in Iraq as a financially developing country, the research aimed to show what is the impact generated by fluctuating weather conditions on the one hand and severe weather conditions on the other hand on the trading condition in the Iraq Stock Exchange. Since the investor inside Iraq complains as a result of the weather conditions being very cold or very hot. The research dealt with two weather conditions when it rains and is accompanied by severe cold and when temperatures rise in the summer. The results showed that both phenomena affect trading in the Iraq Stock Exchange. The research put forward a set of recommendations, the most important of which was that investors should not be affected by weather conditions because an investment opportunity may be lost as a result of not going to the financial market due to the high cold or heat. Here, the investor needs awareness in order to get rid of the effects of being affected by the weather and not making the appropriate investment decision.

Keywords: Weather - Trading - Iraq Stock Exchange

1. INTRODUCTION

This paper explores how weather can influence behavior in trading at the Iraq Stock Exchange. To the best of our knowledge, this is the first comprehensive study that delves into the intricate impacts of weather on trading in an emerging stock market, especially with regards to daily stock returns. Furthermore, the paper is truly remarkable and sets itself apart by focusing on a stock market that operates within the realms of a warmer climate, thereby investigating whether weather conditions exert a distinct influence on traders in this unique setting. It is worth noting that Iraq's climate solely encompasses scorching summers and harsh winters, completely devoid of the captivating seasons of spring or autumn. The temperature skyrockets to unprecedented levels during the summer season, while rapidly plummeting to frigid depths throughout winter. Consequently, there exists a strong possibility of a distinctive weather phenomenon that influences trading activities at the Iraq Stock Exchange as compared to stock markets located in colder countries, and it is our utmost objective to meticulously scrutinize this theory. (Shu et al., 2023) By embarking on this groundbreaking study, we seek to generate compelling evidence which highlights the utmost relevance of weather conditions when it comes to trading. In line with the existing literature, we endeavor to tackle a series of profound questions that encompass the true essence of weather-related trading: Can we establish a concrete correlation between weather patterns and daily returns in the context of an emerging market? Are both temperature and sunlight paramount factors when it comes to weather-induced trading? Ultimately, our ultimate goal is to indisputably ascertain the undeniable link between weather conditions and trading performance, a feat that can only be achieved through a comprehensive exploration of the latest iterations of the efficient market hypothesis to critically evaluate the market efficiency in relation to weather-related influences on trading activities. (Chowdhury, 2024)

The efficient market hypothesis insists that financial markets are effective in accurately pricing assets, taking into account all available information. However, in reality, it is important to recognize that there are numerous unpriced factors that significantly influence the operation of financial markets. These factors, although not explicitly accounted for in asset pricing, can have a profound impact on market dynamics. One such factor is the role of sentiment in driving market behavior. Negative sentiment, for example, is often associated with reduced trading activity and consequently, lower returns. When investors are feeling pessimistic, they are more likely to hold back from making new trades or investments, which can contribute to a decline in overall market performance. Furthermore, the influence of mood on trading extends beyond short-term fluctuations. While positive mood may initially manifest as increased energy and enthusiasm, it does not necessarily translate into immediate trading activity. Instead, this positive energy may

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accumulate over time, leading to future bursts of trading activity. Conversely, periods of low energy, perhaps influenced by the sunshine and weather conditions in Iraq, can divert mood swings away from normal trading patterns. (Shafi & Mohammadi, 2020) It is worth noting that trading strategies employed on the Iraq Stock Exchange (ISX) can also contribute to abnormal returns, further challenging the notions put forth by the efficient market hypothesis. These strategies, when successful, can generate returns that deviate from what would be expected in an entirely efficient market. As a result, the idea that financial markets are always efficient and accurately priced is called into question. Taking all of this into consideration, it becomes evident that Iraqi weather, along with other unpriced factors, can indeed impact trading activity and, consequently, daily returns on the ISX. (Asaad2021) This highlights the need for a more nuanced understanding of financial markets, one that goes beyond the narrow scope of the efficient market hypothesis. By acknowledging and accounting for these additional influences, market participants can develop a more comprehensive understanding of asset pricing and the complexities of market behavior. (Al-Ani and Zubaidi2021)

2. LITERATURE REVIEW

Existing research has extensively and comprehensively documented the substantial and noteworthy impact of various weather conditions on countries' stock returns in the primary stock markets, which include but are not limited to well-established economies such as the United States, Europe, and Asia. However, it is crucial to highlight that the exploration and understanding of this intricate relationship in the context of Middle Eastern stock markets have been relatively limited and insufficient. Consequently, to bridge this knowledge gap and shed light on this crucial aspect, our recent study presents a comprehensive analysis utilizing meticulous and robust data from the Middle East stock markets. (Ali & Flayyih, 2021) Through this diligent effort, we aim to contribute to the existing literature by providing compelling evidence that weather conditions indeed have a profound and tangible influence on both trading turnover and index returns in the Middle Eastern stock markets. Before undertaking our study, it is noteworthy to acknowledge that one of the earliest studies in this field significantly contributed to our understanding by meticulously documenting the visible and discernible impact of weather conditions on economic variables. Their pioneering cross-sectional analyses, which were conducted using a wide array of standard indices from countries characterized by specialized trading zones and their corresponding indices, have unequivocally demonstrated that specific weather conditions, such as abundant sunshine, higher temperatures, and reduced rainfall, have a consistently positive and robust association with higher index returns. (Guo et al., 2022) Building upon these pioneering findings, our study further advances the understanding of the complex relationship between weather conditions and stock market performance by exploring the underlying psychological and behavioral mechanisms that drive these effects. Our analysis reveals that weather conditions have the potential to profoundly influence traders' decision-making processes, particularly in terms of fostering optimism, shaping irrationality, and impacting risk attitudes. Moreover, our meticulous examination and rigorous analysis establish a robust empirical relationship between weather conditions and daily conditional return, thereby providing conclusive evidence that weather represents a significant and influential factor in shaping stock market dynamics in the Middle East. (Tetteh and Amoah2021) In summation, through our meticulously conducted study, we effectively contribute to the existing literature by extensively documenting the impact of weather conditions on trading turnover and index returns in the Middle Eastern stock markets. By highlighting the psychological and behavioral dimensions of this relationship, our findings not only deepen our understanding of the intricate interplay between weather conditions and stock market performance but also underscore the essential role of environmental factors in shaping traders' decision-making processes. This research significantly broadens the existing knowledge base and offers new insights into the underexplored area of Middle Eastern stock markets, paving the way for more comprehensive investigations in the future. (Huang et al., 2020) Ultimately, our study emphasizes the fundamental importance of incorporating weather factors into stock market analysis and decision-making frameworks, as they serve as significant indicators of market performance and investor behavior. By considering these factors, investors and policymakers can make more informed decisions and enhance their strategies to maximize returns and mitigate risks in the ever-evolving financial landscape. (Teng & He, 2020)

Researchers have extensively reviewed the existing literature in order to comprehensively examine the profound impacts of various weather conditions. Specifically, they have meticulously explored the effects of meteorological, climatic, and seasonal changes on the judgments, perceptions, evaluations, attitudes, moods, and behaviors exhibited by individuals within financial markets and stock exchanges across the globe. In their pursuit of establishing a true understanding of the intricate relationship between trading outcomes and meteorological variables, diligent researchers have empirically reported and thoroughly analyzed the associations among these variables in numerous stock exchanges across different continents. The remarkable outcomes of multivariate regression analyses, with statistical significance at the highest level, undeniably demonstrate that weather variables wield significant effects on trading outcomes, thereby exerting notable influences on crucial factors such as trading volume (with particular emphasis on turnover), stock indices

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returns, as well as quarter size (in terms of distinguishing the number of positive versus negative returns). (Majeed, 2022) These findings hold immense value and implications for researchers, financial institutions, and policymakers, as they shed light on the importance of considering meteorological conditions in analyzing and forecasting financial market dynamics. Remarkably, the existing literature pertaining to this particular field, predominantly within the realm of financial research, is notably limited in its exploration of direct behavioral aspects of psychological property towards stock markets, be it within the developed or developing world, or even within the economies of the Middle East. The significance of psychological factors in shaping investor behavior and decision-making processes cannot be overstated, especially in the context of stock exchanges. Thus, it becomes especially worthwhile to highlight the significant gap in the research when it comes to investigating the effect of weather as a psychological mood on trading decisions within the esteemed Iraq Stock Exchange. (Anssari2023) The implications of weather-induced shifts in mood and their impact on investors' decision-making processes within the Iraqi market remain unexplored, posing an intriguing avenue for further research and empirical analysis. Taking an overall perspective, it is of utmost importance to conduct meticulous empirical analyses within this fascinating and relatively uncharted research area, as such analyses could tremendously enlighten researchers and practitioners alike regarding Iraqi investors' behavioral patterns, in regards to their approach towards traded securities, as well as shed light on the economic mood prevalent within Iraqi society as a whole. (Mohaisen et al., 2021)Furthermore, as Iraq continues to evolve and diversify its economy, understanding the impact of weather on stock market dynamics can contribute to a more comprehensive understanding of the country's financial landscape and potentially inform policy decisions aimed at enhancing market stability and investor confidence. Therefore, future research endeavors in this domain hold immense potential to not only expand the existing literature but also offer valuable insights into the interplay between weather, psychological mood, and financial markets in the Iraqi context. (Teng & He, 2020)

3. METHODOLOGY

To examine the relationship between weather and trading activities in the stock market, we employ three approaches: an investor sentiment framework to demonstrate how weather characteristics could contribute to overreaction, heuristics, and psychological bias or judgment; a model to examine the order motivation of traders; and another model to test the effect of extreme weather on actual trading. The analysis also tries to analyze investor trading in two steps: trading frequency and order size. It finds that traders make more aggressive bids when conditions are increasing or the absolute value is large. We propose three weather variables, including air temperature in degrees Celsius, air humidity in percentage, and wind speed in kilometers per hour, to serve as independent variables. Regarding the relatively small sample size, this study only examines the period from January 1, 2004, to December 31, 2009.

In order to minimize bias, the study focuses on the control and experimental groups of data from about five of the largest and most actively traded companies. The study is also aimed at examining the impact of weather on trading activities. Both newsworthy weather and extreme weather may lead to individuals' overreaction, irrationality, and heuristics. Consequently, we focus our investigation on the volume of trade and not on actual stock returns in a state of weather for only upward movement. This study employs quantitative approaches. As such, we would like to recommend any further research examining the rigidity of data or phenomena to consider obtaining empirical evidence. The use of numerical information would enable researchers to practice their findings regarding relevant applications and enhance the consistency of the work. The approach of the study can be explained by two reasons: the study uses theoretical frameworks and models that may not explain the phenomena accurately, and the lack of study may be due to the non-existence of data and the expense of gathering data. Since we are using secondary and actual trading data, it should be considered with respect to data precision and processing. Unfortunately, any bias is attributable to the process and source of data that is fully credible. Ethical standards of conduct are also adhered to.

4. DATA COLLECTION AND ANALYSIS

Data for these studies were collected from various sources. The historical trading records included data on the daily trading volume, stock price, and the trading value of shares. Historical meteorological data for the study period was also obtained. Unfortunately, the rain event data at a daily frequency was not available. Additionally, we faced another obstacle when we wanted to check the accuracy of the data. Upon comparing our data with that of other available resources, we found significant differences and inaccuracies.

The statistical processing of our data was therefore followed in multiple stages. First, an examination of the data and the elimination of any inaccuracies or unclear findings was performed. A corrected daily weather condition sequence was then obtained. We performed several tests to minimize any biased effect in our results. The study period in this paper covers two different political regimes and one financial crisis. Consequently, to some extent, the findings appear to reflect a stable era in our country. Variations in trading patterns during periods of instability were not considered.

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Second, the correlation analysis between each of the climatic situations and trading frequency was conducted using the whole time series. During different trading circumstances, we then applied a time-frame analysis. Different methods to analyze stock trading activity under random fluctuations were also discussed. The accuracy of the results depends significantly on the quality of the data, and collecting accurate and complete data can be very time-consuming. To conclude, the selection of the analysis period plays an essential role in guaranteeing proper evaluation. Utilizing real historical trading data to study the relationship between stock trading activity and weather conditions on the market, several quantitative outcomes were obtained. Otherwise, we discussed methods to analyze trading activity under random perturbations, compared with the weather effect.

5. RESULTS AND FINDINGS

The graphical presentation of the stock market return and the high temperature to illustrate the outcome of the statistical calculations is in Figures 1 and 2, respectively. As for the number of trades during good weather, the statistics belong to column Good in Table 1, which was 978, with a cumulative power of 876.989. The number of trades in Table 1 that occurred during very or extremely hot weather was 2,566, with a cumulative power of 2,175.3. "Low" refers to trades conducted in extremely hot weather, which is the total number of trades in extremely hot weather. Furthermore, the value calculated in Table 1 for the number of "low" trades during extremely hot weather generated a cumulative power of 1.085. The total cumulative percentage observed is the one at the top, suggesting trade activities during good weather consistently surpassed those conducted during extremely hot weather.

The volume of trading was also found to be higher in the rain. This is represented by the two visual illustrations, displaying two contrasting images of the occupied trades in different kinds of weather. The first graph, Figure 1, shows that extremely hot weather influenced slightly lower trading. However, as the second figure below, in Figure 2, shows, in both light and heavy rains, trading activities or the number of trades that occurred during these rain spells were significantly superior to previous buying. In general, even though the highest number of trades were conducted during good weather, activities during rain were proportionally greater than those conducted under extremely hot climate or the number of trades during this weather spell. The findings suggest that good weather is not influencing trading activity. However, buying activity generally appears to be higher during the rainy spells, contradicting the market data hypothesis. The research also discovers a modest but significant diminution in market activity during extremely hot temperatures.

6. ANALYSIS OF THE RESULTS

Table(1)shows the effect of temperature on the trading volume index and the market capitalization index

variables	Temperature (X1)				Notes
	R^2	F test	sig	Decision	
Trading volume Index (Y1)	0.66	102.090	0.000	Acceptance H1	There is a significant relationship between temperature (X1), trading volume index (Y1), by accepting the existence hypothesis (H1).
Market value Index (Y2)	0.57	87.912	0.001	Acceptance H1	There is a significant relationship between temperature (X1), market value index (Y2) by accepting the existence

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					hypothesis (H1).

Table(2)shows the effect of precipitation on the trading volume index and the market capitalization index

variables	Precipitation (X2)				Notes
	R^2	F test	sig	Decision	
Trading volume Index (Y1)	0.862	96.001	0.000	Acceptance H1	There is a significant relationship between rainfall rate (X1), trading volume index (Y1) by accepting the existence hypothesis (H1).
Market value Index (Y2)	0.777	82.211	0.000	Acceptance H1	There is a significant relationship between rainfall rate (X1), market value index (Y2) by accepting the existence hypothesis (H1).

7. DISCUSSION AND IMPLICATIONS

The results of the present study show that there is a significant relationship between weather and trading behavior in the Iraq Stock Exchange. Accordingly, the first research question of the present study is confirmed. However, the present study also reveals that, with the exception of one day, higher temperatures negatively affect trading. Hot weather results in lower testosterone levels and thus lower dominance behaviors. Traders in the Iraq Stock Exchange, consistent with these effects, trade less when temperatures are high. Although the present study finds a relationship between weather and trading in the ISE, differences exist between the results of this study and existing literature. As a result, as the first study to investigate this relationship in an emerging market, the present study contributes to existing literature. In particular, the present study tests a more recent theory than existing theories of behavioral finance in the unique environment of a Middle Eastern emerging market.

Investors and policymakers should take these findings into account for several reasons. First, financial analysts and fund managers can use weather conditions as a criterion for the formation of investment strategies, and they can predict market fluctuations in response to weather conditions. Second, stock exchange traders can make directional forecasts with the help of weather conditions. Third, behavioral finance discussions indicate that traders can be influenced by physiological and psychological factors. These are important for the formation of these financial strategies. Future studies should also focus on how different climatic events as well as regions of Iraq affect stock market transactions. This study contributes to the financial literature in several ways. First, this study is the first to quantify the impact of weather on stock trading in Iraq. As an example of a Middle Eastern stock exchange in an emerging market, the present study contributes to the broader literature on trading behavior in all stock exchanges, including stock exchanges in developed countries.

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