T.R.

ISTANBUL SABAHATTIN ZAIM UNIVERSITY

GRADUATE SCHOOL OF EDUCATION

DEPARTMENT OF ISLAMIC ECONOMICS AND FINANCE

TESTING THE IMPACT OF MAJOR EVENTS ON CONVENTIONAL AND SHARIAH COMPLIANT STOCK INDICES OF SELECTED COUNTRIES

Ph.D. DISSERTATION

Abdul Basit Sohail

Istanbul

May, 2025

T.R.

ISTANBUL SABAHATTIN ZAIM UNIVERSITY

GRADUATE SCHOOL OF EDUCATION

DEPARTMENT OF ISLAMIC ECONOMICS AND FINANCE

TESTING THE IMPACT OF MAJOR EVENTS ON CONVENTIONAL AND SHARIAH COMPLIANT STOCK INDICES OF SELECTED COUNTRIES

Ph.D. DISSERTATION

Abdul Basit Sohail

Supervisor

Prof. Dr. Turan EROL

Istanbul

May, 2025

THESIS APPROVAL

This research has been accepted in partial fulfilment of the prerequisites for Ph.D. Degree in Department of Islamic Economics and Finance.

Supervisor: Prof. Dr. Turan Erol

Jury Member: Prof. Dr. Mehmet Bulut

Jury Member: Prof. Dr. Şakir Görmüş

Jury Member: Prof. Dr. Yusuf DİNÇ

Jury Member: Assistant Prof. Dr. Waqar BADSHAW

Approval by

Prof. Dr. Erhan İÇENER
Director, Graduate Education Institute

DECLARATION OF SCIENTIFIC ETHICS AND ORIGINALITY

I guarantee that the PhD thesis titled “Testing the impact of major events on conventional and shariah compliant stock indices of selected countries” is my original and novel work. I have deeply followed the scientific principles and academic guidelines during my whole journey to complete my thesis. I have compiled and utilized the material according to research principles and instructions described in the dissertation writing manual of Istanbul Sabahattin Zaim University. I have completely cited the material that I have utilized in my thesis. The structured sentences are my own. I employed the event study methodology and DCC MGARCH method in R Studio. I enjoyed the whole journey from learning different tools to creating something new and contributing to literature.

Abdul Basit Sohail

March, 2025

PREFACE

It's my pleasure to acknowledge my creator Allah Ta'ala for giving me strength and opportunity to accomplish my PhD's research in Türkiye. I am also thankful to Dr Noman Arshed who helped me in early completion of MS degree and advised me to opt for quantitative research. I took his advice during my PhD journey. I want to thank Associate Prof. Dr. Burhan ULUYOL (Ex-Supervisor) for initial guidance.

It's my pleasure to thank Prof. Dr. Turan EROL (New Supervisor) for his kind approach and guidance for further improving my research. It's my pleasure to thank jury members Prof. Şakir Görmüş (Marmara University) and Dr. Merve Büşra Altundere Doğan for their kind guidance and support. I am thankful to Dr Rashed Jahangir (Sakarya University) for his support during research. I am thankful to the Bilimsel Araştırma Projeleri (BAP) Istanbul Sabahattin Zaim University for supporting financially during thesis writing period.

Abdul Basit Sohail

ABSTRACT

TESTING THE IMPACT OF MAJOR EVENTS ON CONVENTIONAL AND SHARIAH COMPLIANT STOCK INDICES OF SELECTED COUNTRIES

Abdul Basit Sohail

Ph.D. Dissertation, Islamic Economics and Finance

Supervisor: Prof. Dr. Turan EROL

March-2025, 175 + XII Pages

The research intends to investigate the impact of COVID, Glasgow Climate Pact, Ukraine War and ChatGPT Launch on the conventional and Islamic stock indices of G7, GCC, Türkiye and Pakistan. According to the researcher's horizon, this is the novel study that combined these 4 events together to see the impact. The researcher employed the event study methodology to check the impact of the four events. As the researcher had the data, He also employed additional estimation (DCC MGARCH) for diversification that is not dependent on the mentioned events. Results depict that Overall G7 markets were negative before declaring COVID as a global pandemic. Mostly GCC indices were stable to COVID. Overall G7 markets were negative to the Glasgow Climate Pact. Mostly GCC indices were stable to the GCP. G7 indices were mostly negative to Ukraine War. Overall GCC indices were stable to Ukraine war. Mostly G7 and GCC indices were negative to the ChatGPT launch. Dynamic Conditional Correlation is moderate among G7 Islamic and Conventional stock indices indicating moderate level of diversification. DCC among GCC Islamic and Conventional is less than 0.2 and offers more diversification. Investors can diversify their portfolio among G7 and GCC stock indices for better return with less risk.

Keywords: COVID, Glasgow Climate Pact, Ukraine War, ChatGPT Lauch, Event Study, DCC MGARCH, Diversification.

ÖZET

Önemli Olayların Seçilmiş Ülkelerin Konvansiyonel ve Şeriata Uygun Hisse Senedi Endeksleri Üzerindeki Etkisinin Test Edilmesi

Abdul Basit Sohail

Doktora, İslam Ekonomisi ve Finansı

Tez Danışmanı: Doç. Dr. Turan EROL

Mart-2025, 175+ XII Sayfa

Araştırma, COVID, Glasgow İklim Paktı, Ukrayna Savaşı ve ChatGPT Lansmanının G7, GCC, Türkiye ve Pakistan'daki konvansiyonel ve İslami hisse senedi endeksleri üzerindeki etkisini araştırmayı amaçlamaktadır. Yazarın bilgisine göre, bu dört olayı bir arada ele alarak etkilerini inceleyen ilk çalışmadır. Araştırmacı, bu dört olayın etkisini analiz etmek için olay çalışması metodolojisini kullanmıştır. Araştırmacı, elindeki verilerden yararlanarak, bahsi geçen olaylara bağımlı olmayan çeşitlendirme amacıyla ek bir tahmin yöntemi (DCC MGARCH) de kullanmıştır. Sonuçlar, G7 piyasalarının COVID'in küresel bir pandemi olarak ilan edilmesinden önce genel olarak negatif olduğunu göstermektedir. GCC endekslerinin çoğu COVID'e karşı istikrarlıydı. G7 piyasaları, Glasgow İklim Paktı'na genel olarak olumsuz tepki vermiştir. GCC endekslerinin çoğu ise GCP'ye karşı istikrarlıydı. G7 endeksleri Ukrayna Savaşı'na genelde olumsuz tepki verirken, GCC endeksleri Ukrayna Savaşı'na genel olarak istikrarlı kalmıştır. G7 ve GCC endekslerinin çoğu, ChatGPT Lansmanı'na karşı olumsuz tepki vermiştir. Dinamik Koşullu Korelasyon, G7 İslami ve Konvansiyonel hisse senedi endeksleri arasında orta düzeyde bir çeşitlendirme olduğunu göstermektedir. GCC İslami ve Konvansiyonel endeksleri arasındaki DCC ise 0.2'den düşüktür ve daha fazla çeşitlendirme imkanı sunmaktadır. Yatırımcılar, daha az riskle daha iyi getiri elde etmek için G7 ve GCC hisse senedi endeksleri arasında portföylerini çeşitlendirebilirler.

Anahtar Kelimeler: COVID, Glasgow İklim Paktı, Ukrayna Savaşı, ChatGPT Lansmanı, Olay Çalışması, DCC MGARCH, Çeşitlendirme

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

AR: Abnormal Returns

BIST: Borsa Istanbul Stock Exchange (Türkiye)

CAR: Cumulative Abnormal Returns

DCC: Dynamic Conditional Correlation

DJIM: Dow Jones Islamic Market (USA)

DJIMTR: Jow Jones Islamic Market Turkey (Türkiye)

ESG: Environmental, Social and Government

FTSE: Financial Times Stock Exchange (UK)

GCC: Gulf Cooperation Countries

GCP: Glasgow Climate Pact

KMI: KSE Meezan index (Pakistan)

KSE: Karachi Stock Exchange (Pakistan)

MSCI: Morgan Stanley Capital International (USA)

S&P: Standard and Poor (USA)

CHAPTER I

INTRODUCTION

1.1 Background:

The securities market is the quickest and most significant indicator of a nation's economy. The securities market is very sensitive to every environmental, technological, economic, social, and political issue or event. The effect of any major event is first observed in the stock market. The funds needed for the mass economic projects are raised and traded in the securities market. The efficient working of the securities market is crucial for the country's economy. The thorough exploration of the different events' effect on the stock market is vital for future analysis for the investor, regulators and the government as well (Saiti, Bacha and Masih, 2014: 2).

The stock index facilitates measuring and gauging the working of the securities market. The index value describes the variation in nominal value relative to the value in the base year. As a result, values can be compared to previous values. It provides an overview of the securities market. The working of a specific segment is compared to the total performance of the market. Stock indexes can be made based on different methodologies. Within the domain of this study, the researcher bifurcates the indices as shariah stock index and non-shariah stock index. Shari'ah index means that which meets the conditions or criteria that aim for gradual compliance with Islamic teachings. It is not possible or reasonable to expect immediate 100% compliance. The system learns by making mistakes and then matures. The Conventional index is one that does not meet the conditions/criteria that aim to conform to Islam's teachings. The shariah compliant stock index is recent phenomenon developed because of demand of a target market (Muslim investors at large). Even non-Muslim countries also maintain the shariah stock indices like USA, UK etc. Sukuk was a major invention to stimulate the growth of Islamic Capital Market (Saiti, 2015: 1).

Islamic Capital Market operates under the same environment as its counterpart but with different methodology. That's why ICM is also affected by the different external events as its counterpart. The effect of the external event may be less or more because of different

methodology. ICM does not allow interest, loan securitization, trading forward contracts, trading future contracts, trading derivatives, short selling, conventional bonds, interest-based Treasury bills, interest based commercial papers and non-permissible activities (Usmani, 1998: 80).

The world is facing severe existential risks, IIPC report 2022 IPCC (Intergovernmental Panel on Climate Change) mentioned the top ten risks/ threats to the globe over the next 10 years. The top 3 threats belong to environmental comprises (1) Climate working negligence (2) acute climate (3) Loss of Biodiversity. Next three belong to the societal (4) Loss of social co-existence (5) Unemployment (6) Pandemics. Again, the next two belong to environmental (7) Human damaging environment (8) Depleting natural resource (9) Debt issue belongs to Economics (10) Political conflicts is the tenth that falls under the geopolitical category.

These environmental, social, economic, infectious diseases, geoeconomic and political dramatically affect the securities markets that are the main barometer of the growth. There is a dire need to explore the proportionate outcome of mentioned factors on the securities markets (Birindelli et al., 2023: 2).

The researcher intends to research and investigate the disease COVID-19 pandemic, environmental, political and technological events and their proportionate impact on the shariah and conventional indices of G7, GCC, Türkiye and Pakistan. COVID-19, Glasgow Climate Pact, Ukraine War and ChatGPT are the crucial events that have crucial effect on the globe. These are the events that changed the course of debate in the world. The researcher aims to explore the effect of novel COVID, Glasgow Climate Pact, Ukraine War and ChatGPT on the shariah besides conventional stock indices of G7, GCC, Türkiye and Pakistan.

Infectious diseases are also one of the major threats to the globe and the world witnessed this in recent widespread COVID-19. Singh et al. (2020) mentioned that Wuhan city of China was the center point of spreading the novel COVID-19 virus to the world since December 31, 2019. It was an unprecedented event which eventually stopped the social, economic and political activities of the whole world. Stock markets of the world behaved negatively. COVID-19 was an unpredictable event with respect to appearance, intensity

and disappearance. First death in the world was witnessed on January 11, 2020. Intensity of COVID -19 increased over time and WHO had to declare this disease as a global pandemic (Waheed et al., 2020: 1).

The Glasgow Climate Pact is the first major global environmental agreement that was concluded at the CO26 conference to find out the solution to the major environmental threats. The conference continued from October 31 to November 13, 2021 for protection of environment including the decline in the persistent coal usage. Nearly 200 countries agreed to the Glasgow climate pact and unfortunately it is not legally binding on the agreed countries. The literature is scanty that talks about the Glasgow climate pact with respect to the impact on the stock markets (Pandey, Kumar and Kumari, 2022: 2).

Negligence of climate protection, Linear Economy, Fossil Fuel production is inversely affecting the globe. The world is facing adverse climate conditions. That is becoming the source of the floods, heat waves etc. The business-as-usual model is causing acute issues to the globe. This is essential to add climate to the economic model. If we don't have good environmental policies about fossil fuels production, then there will be an increase in adverse climate and in result there will be disasters that will lead to life and economic loss. Considering the climate in economic model is pivotal for economy as well. Climate should be embodied in the economic structure (Ouadghiri et al., 2021: 14).

After the COVID-19, there was need to recover the economies from the economic shocks of COVID-19, the Russia's attack on Ukraine on the February 24, 2022 affected the scenario again & gave another shock to the markets. Suddenly the economic restrictions were applied on Russia that increased the prices of different commodities. It also caused an increase in the price of gas. Moscow's MOEX stock index showed a decline of 9% in the first week of the invasion. Seven million Ukrainians became refugees. Russia exports wheat to European countries, GCC countries, African and Ukraine itself that is 75% of their need (World Bank, 2022b: 50). Ukraine also exports seed oil that is 40% of the global exports. Ukraine also exports corn and wheat that is 13% and 5% of the global exports respectively. Russia is exporter of natural gas, coal, crude oil, wheat and fertilizer that account for 25%, 18%, 11%, 18%, 14 % respectively (Izzeldin et al., 2023: 6).

ChatGPT is drastically changing the financial course of action in the finance industry by assisting the analysts with financial data, financial accounts and other financial information that is significant in financial and investment decisions. ChatGPT was introduced on Nov 22, 2022. ChatGPT got a million users within the first week of its launch. Literature majorly focuses on qualitative topics related to finance and accounting. Literature does not have empirical studies that relate ChatGPT with quantitative financial and stock market matters. Literature is missing about the aspects of the Natural language processing (NLP) technologies (ChatGPT) on the stock market. This study wants to explore the effect of the ChatGPT release for Islamic besides conventional stock indexes of the GCC nations in comparison with G7 employing the event-based methodology and MGARCH model (Alshurafat, 2023: 1).

The study in hand intends to expand the literature of the research to other dimensions simultaneously. The study will investigate and conclude which of the mentioned factors are more important for the shariah besides conventional stock indexes of the securities markets. This study is unique in this respect. The study can help to figure out the more influential factors on both types of stock market. The literature also did not compare the sample as mentioned in this study. The study in hand intends to explore the Islamic besides conventional stock indices of G7, GCC, Türkiye and Pakistan. The proposed research will be unique in (1) combining these four different events (2) events belong to different dimensions like environmental, technological, infectious disease and political (3) selection of the G7, GCC, Türkiye and Pakistan (4) Islamic and conventional stock indices.

G7 countries are financially and economically developed. They have a major influence on economic and political decision making in the world. Because of globalization and technological advancements, the one event originated from United States can influence the whole economies in the world evidenced in 2008 crises. UK, Germany & France are located in the west and plays vital role among the Europeans countries. Japan is located on eastern Asia and very much developed country (Waheed et al., 2020: 7). The comparison of G7 and GCC will give valuable insights.

The role of the gulf cooperation countries in the world is also important. These countries are financially rich and have oil to run the factories and the industries of the advanced and developing nations. The minor change in lubricant prices plays a crucial role in the economic conditions of the countries. The Gulf Cooperation countries are expanding their other economic segments other than dependency on the oil (Cunha et al., 2021: 2).

Türkiye and Pakistan are included because of strong association and correlation with the G7 and GCC. Türkiye is also correlated with G7 and GCC. Pakistan is correlated with GCC countries. The study in hand is interesting and unique in this respect that it is exploration of environmental, technological, economic, social and political issues on the countries that are central and significant in the world.

Apart from secular dimensions, the sample is also based on religion. The GCC, Türkiye and Pakistan are Muslim countries and the second sample of the G7 developed nations is non-Muslim. The research plans to check the effect of the major trending events on major Muslim and non- Muslim stock markets. How did these issues impact the securities markets of the selected countries? Is the trend same in Muslim and non-Muslim countries or otherwise?

The study wants to investigate the effect of different crucial trending events on the shariah besides conventional stock indexes G7, GCC, Türkiye and Pakistan. The literature mostly focused on one dimensional effect on the securities market. The different studies investigated the effect of one factor at one time separately rather than investigating different factors combined. The literature is scanty on the selected sample and combining the different environmental, technological, economic, social and political issues (Yan and Qian, 2020: 15).

1.2 Statement of the Problem (Research Gap):

Novel COVID, Glasgow Climate Pact, Ukraine War and ChatGPT are the crucial events that have crucial impact on the world. These are the events that changed the course of debate in the world. COVID-19, Glasgow Climate Pact, Ukraine War and ChatGPT are the crucial events that had effect on the globe's economy and affected the developing and developed nations. Literature explored scientific clues to the effect of these incidents on the different segments, population and markets. But literature did not investigate these

factors together. After empirical investigation of the outcome/effect of the most influential factor for shariah besides conventional stock indexes of selected countries, that factor can be taken seriously. Previous studies did not use these five events collectively to the selected shariah besides conventional stock indices sample.

A comparative probe of effect of different crucial trending events on the Shariah compliant and conventional stock indices of G7, GCC, Türkiye and Pakistan from 2013 to 2023. Every event will have its own separate event day. Major Trending Events to be investigated are (1) COVID-19 (2) Glasgow Climate Pact (3) Ukraine War and (4) ChatGPT launch.

G7 Countries comprises (1) Canada (2) French Republic (3) Federal Republic of Germany (4) Italian Republic (5) Japan (6) United Kingdom (7) United States of America

(1) S&P_TSX 60 is Canada's main index (2) CAC 40 is France's main index (3) DAX is Germany's main index (4) FTSE MIB is Italy's main index (5) Nikkei 225 is Japan's main index (6) FTSE 100 is UK's main index (7) S&P 500 index and Nasdaq 100 Index are USA's main index. These main indices are used in Event study estimation.

Gulf Cooperation Countries comprises (1) kingdom of Bahrain (2) State of Kuwait (3) Sultanate of Oman (4) State of Qatar (5) Kingdom of Saudi Arabia (6) United Arab Emirates plus (7) Türkiye (8) Pakistan

(1) MSCI Bahrain Islamic (STRD) (1) Bahrain all share index (2) Dow Jones Islamic Kuwait (3) MSCI Oman Islamic (4) QE Al Rayan Islamic (5) MSCI Saudi Arabia Islamic Index (5) Tadawul all share (6) MSCI UAE Islamic Index (GDTR) (7) BIST Participation 100 (8) KMI 30 (9) Dow Jones GCC USD.

The researcher plans to research and investigate the disease COVID-19, environmental, political and technological events and their proportionate impact on the shariah besides conventional stock indexes of G7, GCC, Türkiye besides Pakistan. COVID-19, Glasgow Climate Pact, Ukraine War and ChatGPT are the crucial events that have crucial effect on the world. These are the events that changed the course of debate in the world.

1.3 Research Questions:

The following are the research questions:

1. How Shariah and conventional stock indices of selected countries responded to the event of COVID-19? (Event Date: March 11, 2020.)
2. How Shariah and conventional stock indices of selected countries responded to Glasgow Climate Pact 2021? (Event Date: November 13, 2021)
3. How Shariah and conventional stock indices of selected countries responded to (resilience) shock or event of Ukraine War? (Event Date: February 24, 2022)
4. How Shariah and conventional stock indices of selected countries responded to event of ChatGPT launch? (Event Date: (November 22, 2022)
5. Are there diversification opportunities among selected countries. (Not dependent on events)

1.4 Research Objectives:

The following are the aims of the research:

1. To explore the effect of novel COVID on the mainstream besides Islamic stock indices of selected stock indices.
2. To explore the outcome of Glasgow climate pact on the conventional and Islamic stock indices of selected stock markets.
3. To explore the outcome of Ukraine war on the conventional and Islamic stock indices of selected stock indices.
4. To explore the effect of ChatGPT launch on the mainstream besides Islamic stock indices of selected stock markets.
5. To investigate the diversification opportunities among selected countries using DCC MGARCH. (Not dependent on events)

1.5 Research Hypothesis:

Null Hypothesis:

1. Selected Shariah stock indices provide better CAR than counterpart in response to the COVID-19 event.
2. Selected Shariah stock indices provide better cumulative abnormal returns than counterpart in response to the Glasgow climate pact.
3. Selected Shariah stock indices provide better CAR than counterpart in response to the Ukraine war.
4. Selected Shariah stock indices provide better CAR than counterpart in response to the ChatGPT launch.
5. There are diversification opportunities among the selected countries.

1.6 Significance of the Study:

The research is unique, covering the health, environmental, political and technological factors and their effect on the selected securities markets. The study is unique with others because of investigating the major trending events on the shariah stock indices besides mainstream stock indices of the Muslim besides non-Muslim countries. The selected population is playing a significant role in the world. This study is important for contagion analysis, prediction and diversification purposes. If there is contagion so we can predict the indices.

Study in hand is unique in this respect that its estimation window comprises one year before the event and observed window comprises one year after the event. One year before analysis is necessary to understand the true trend of the dependent variable (without any event). Short term may not be depicting true picture in presence of any other factor. The research can help the government, policy makers and investors to take care of the more influential factors on the stock market and to understand the order of preference and order of importance with respect to the effect on the securities market. The research can assist investors in investment decisions. The study can assist in diversification of the resources and prediction of the stock returns. The study will give a comparison to the investors about the gulf cooperation countries and developed European markets. The study will guide

them with respect to the shariah compliant stock indices and conventional stock index and the comparison between them.

Summary of the Chapter:

The researcher wants to explore the results of novel COVID, Glasgow climate pact, Ukraine war besides ChatGPT launch on the mainstream and Islamic stock indices of G7, GCC, Türkiye besides Pakistan.

CHAPTER II

EMPIRICAL LITERATURE REVIEW

2.1 Literature Related to COVID:

Khan (2023: 13) investigated COVID-19 effect for sixteen countries and concluded negative returns. In the beginning of novel coronavirus, there was no impact on market but eventually due to increase in cases market inversely responded. Shanghai stock market was impacted in short term window but recovered early because of better policies of government. Study applied the Pooled OLS regression for panel data to conclude the results for the research.

Singh et al. (2020: 22) researched the novel COVID effect on G 20 countries and concluded significant negative abnormal returns in four sub event windows. Authors used an event study approach for sensitivity of share prices on 19 economies (excluding the European Union). Data was obtained from investing.com. But later markets rectified from negative AR to positive AR. Study suggested investing in the long run in such cases.

Yan and Qian (2020: 17) researched the effect of novel COVID on consumer industry in securities exchange. Study employed event study approach for objectives of research. Writers found that the first three days inversely affected the shares of the consumer market but after that share prices were constant and stable due to government intervention. Study collected data from RESSET financial database.

Baker et al. (2020: 14) wrote the comparison of viruses with historical pandemics and its outcome on the securities market and inferred that the US market reacted better in this pandemic than 1918-19, 1957-58 and 1967 pandemics. Research employed automated and human literature for previous pandemics and this research is theoretical rather quantitative and empirical in nature.

Khan et al. (2020: 14) researched the effect of novel COVID epidemic in Pakistani securities exchange. This research was limited to 61days of event window. This is not peer-reviewed research. This research also concluded inverse response in stock returns after the window.

Waheed et al. (2020: 14) also researched the outcome of novel COVID on KSE 100 index of Pakistan stock exchange. Research employed quantile-on-quantile method, surprisingly found that Pakistan stock market reacted positive in COVID-19 situation, in early phase of disease, market pattern was inverse because foreign investors withdrawn their money because of panic but after the news from loan extension and grant from IMF to deal with COVID-19, it created good impact for stock market. After the Government took better positive steps, the Market reacted positively. Study employed ARIMA approach besides an exponential smoothing method to predict the possible options. The period of study investigated was February 26, 2020 till April 17, 2020.

Khan et al. (2020: 2) researched the influence of novel COVID in Pakistani securities exchange. This study is confined to 61days of event window. This is not peer-reviewed paper. This study also concluded with a negative response in stock returns after the window but study in hand is more comprehensive because it includes 623 observations.

COVID-19 also greatly influenced the securities markets. Singh et al. (2020: 2) inferred novel COVID is not the first phenomenon that fiercely influenced the socio-economic conditions of the people but a unique instance, different from past pandemics (Chen et al., 2007) because the world had to face lockdown situation. Only online working was possible but face to face working, and interaction was banned. The COVID-19 pandemic influenced every facet or area of life. The novel COVID epidemic hindered the entire working of the globe.

Novel pandemic of COVID arrived in Pakistan two months later from Iran rather than China directly. This deadly virus reached Pakistan on February 26, 2020. First case was witnessed in Karachi and first death was seen on March 18, 2020 (Khan et al., 2020: 2).

Shafi, Liu and Ren (2020: 13) mentioned that small besides medium companies are mostly affected by novel COVID-19 rather than big corporations. Data sample is 184 companies from Pakistan. The authors floated online questionnaires and finalized that these small medium companies are greatly influenced by the global pandemic. These companies are influenced in every economic indicator e.g. profit etc.

Nicola et al. (2020: 06) inquired into the social besides economic effects of novel COVID on different angles of life. Demand for medical equipment and food was rocketed. People

were buying due to widespread panic. WHO announced COVID-19 as an emergency on January 30, 2020. Oil prices underwent negatively due to this pandemic because production in every sector stopped and there was no demand for oil. The manufacturing sector encountered real challenges. The finance sector also suffered greatly. There were inverse trends in financial markets and stock markets. Investors were perplexed and were taking the capital out of the markets. Hotel and travel industry was mostly hit by pandemic, it was impossible for this sector to pay the staff. Sports activities were hindered, and stadiums were empty.

He et al. (2020: 13) researched the outcome of deadly virus on multiple industries of China and inferred that transportation, mining and electronic sector effected greatly but manufacturing, information technology, education and hospitals performed better in this scenario. Behavioral finance theory posits the factors that influence the psychology and emotions of investors. That has an influence on the actual value of stock price, so COVID-19 as a factor changed the investors' emotional pattern and thus as a result changes in share prices have been noticed. The writers claimed the first study that employed the event study in industry level. 160 days have been selected as estimation window for the accuracy of prediction and forecasting. The author did not recommend choosing too short or too long otherwise forecast and prediction accuracy will be influenced. Event study is basically employed to variations in the abnormal returns of firm’s stock prices after the particular event.

Saadat, Rawtani and Hussain (2020: 15) investigated the environmental aspects of the COVID. The total social besides economic life was shut down. There were restrictions on transportation and that’s why environmental conditions improved. There were no carbon emissions and air quality across the world improved. There was a drop in water pollution.

Elshqirat (2021: 17) explored the results of MSCI Islamic besides mainstream stock of GCC indices for the era of novel COVID. Risk-adjusted performance measures were employed for diversification. The study infers that the outcome of the novel COVID was the same and there were no diversification opportunities.

Abdulla and Rabbani (2021: 05) wrote about the COVID-19 and the S&P GCC stock indices. The researchers employed three risk-adjusted performance measures that are

calculated before events besides during the era novel COVID period. The study concluded that risk profile of the shariah indices is low than the counterpart.

Abdullahi (2021: 14) wrote about the projectories (extend from surface) of the Islamic stock indexes during the time of novel COVID by using GMM, ARDL and MGARCH. The study investigated Pakistan, Malaysia, Nigeria, India, USA, Canada and Japan. The results show co-movements, market returns are cointegrated and volatility possibility is high during COVID.

Nwosa (2021: 12) investigated the outcome of novel COVID on the exchange rate, oil price besides securities market performance. The study reveals that COVID negatively impacted the oil price along with exchange rate besides securities market performance in Nigeria. Oil prices had an influence on the currency rate and securities market. COVID had consequences for the foreign direct Investment in Nigeria.

Salman & Ali (2021: 15) researched the influence of novel COVID on the securities market of GCC nations. The research concluded that COVID had a bad outcome on the GCC securities market. The GCC securities markets were less sensitive than world securities markets. There is two-sided spillover result on the GCC securities markets because of Chinese securities market.

Elhassan (2021: 11) explored the asymmetric effect of novel COVID volatility of the GCC securities market profits employing the GARCH and exponential GARCH (EGARCH) models. COVID affected the GCC markets according to GARCH. EGARCH also reiterated the outcome of COVID-19 on the GCC securities markets and negatively impacted the markets.

Rafiuddin et al. (2021: 6) researched the co-movements among the securities markets of GCC and oil prices represented by Brent, WTI. The study also investigated the S&P 500 index besides Dow Jones index and employed the time frequency space wavelet transform approach. The study inferred that there was no association among them in the short term.

Jain (2021: 12) explored the outcome of novel COVID on the Indian securities market besides firm bitas by employing the Conditional CAPM and MGARCH. The study concluded that betas increased during the time of first corona virus wave but not during the second corona virus wave.

Elshqirat (2021: 21) explored the response of the Islamic besides mainstream equity indexes with respect to the GCC nations in between novel COVID epidemic. The research's motive was to investigate the effect on both the indices and diversification opportunities among them. Risk-adjusted capacity measures were employed to achieve the objectives. The study concluded that outcome of the novel COVID on the shariah and mainstream indexes of the GCC nations was almost similar and Islamic indices do not provide the diversification opportunities.

Yousaf et al. (2022: 5) looked into the sensitivity transmission and hedging variation for the GCC during GFC and COVID-19 by utilizing the bivariate VAR-asymmetric-BEKK-GARCH. The study concluded that spillovers between GCC countries increase during these events. Gold provided risk free investment for some of the GCC nations according to the Time-Varying correlations.

Aliani, Al-kayed and Boujlil (2022: 11) wrote about novel COVID's effect on the movements of the Islamic besides mainstream stock indices in GCC with the help of wavelet besides the DCC GARCH. The study concluded that Islamic besides mainstream indices movements are same during the COVID-19, but Islamic indices were less volatile.

Gaio et al. (2022: 17) investigated the market effectiveness in advanced countries during the Russian and Ukraine war. Market efficiency was analyzed during the COVID and war. Multifractality was present and did not accept the perfect market hypothesis and shows the forecasting of asset prices during the time of turbulence besides GFC.

Shamsudheen et al. (2022: 11) probed the response of GCC securities markets with regard to return and volatility to the COVID-19. Exponential GARCH was used for volatility and movements. The research concluded that inverse returns and high volatility for both types of indices.

Anggraini, Utami and Wulandari (2022: 15) wrote systematic literature about COVID impact on the stock markets by employing review procedures and co-ward analysis to map themes. The study concluded from the 89 Scopus articles that its impact is observed in many countries.

Ghouse et al. (2022: 13) probed the asymmetric spillover outcome of novel COVID on the KMI 30 (Islamic stock index of Pakistan) by utilizing the asymmetric GJR-GARCH. The outcomes show that volatility spillover is witnessed from COVID to KMI.

Al-Maadid, Alhazbi and Al-Thelaya (2022: 9) probed the effect of coronavirus news on the securities markets of GCC nation by using the machine learning approaches. The research reveals that UAE, KSA and Qatar securities markets were affected by the COVID-19 news. Bahrain stock market was resilient that did not impact by coronavirus news.

Al Refai, Zeitun and Eissa (2022: 5) investigated the effect of novel COVID case, besides lubricant price sensitivity on the securities markets of GCC countries by employing the Kalman filter to get unpredictable lubricant price sensitivity. The research revealed that GCC countries reacted to the positive besides negative lubricant price sensitivity.

Shamsudheen (2022: 15) investigated GCC stock market performance. In addition to that research also investigated the continuous dynamics of correlation among GCC stock market and COVID-19. Exponential GARCH models were utilized to assess the sensitivity and co-movements in between stock returns and COVID. The research concluded the negative returns and high volatility. There is no effect of oil price plunge.

Loang and Ahmad (2022: 11) investigated the presence of herding besides effect of economic as well as political factors on the Islamic stock indices of GCC. It also investigated the presence of herding attitude under the market stress besides cross stock herding attitude among Islamic beside mainstream stock. The research utilized panel data regression besides panel quantile regression. The study concludes that the herding attitude was present before the COVID-19, but it was more significant among both types of indices after the pandemic. It concludes that economic factors are significant to herding but political factors were important before the COVID.

Sundarasen, Kamaludin and Ibrahim (2022: 15) investigated the effect of novel COVID on the sensitivity of Islamic besides conventional stock indices of GCC with comparison of ASEAN countries employing the Morlet's wavelet method. The research concluded that ASEAN stock markets were more sensitive than GCC countries. Secondly shariah indexes

were more sensitive than conventional during the COVID. GCC index pairs depicted the similarities among Islamic and conventional.

Alotaibi and Morales (2022: 19) investigated the effect of global health cries and Saudi Arabian and Russian oil price war employing the GARCH and FIGARCH models for the Kuwait market. The research concludes that there is proof of sensitivity across the markets.

Alkhatib et al. (2022: 10) investigates the most sensitive stock market of GCC by COVID. The study concluded that Kuwait securities market was affected the most from the COVID among the GCC securities markets.

Karim, Chowdhury & Masih (2022: 6) explored the relationship between oil and securities market returns of BRICS by employing the MGARCG DCC and Wavelet amid the novel COVID. The probe concluded the profits of China besides India's stock market are associated with lubricant price and noticed less sensitivity. Overall, the oil price returns lead to the securities market returns of BRICS.

Allam et al. (2022: 13) investigated effect of novel COVID besides Russia–Ukraine conflict from the different dimensions of climate financing that is emphasized in the GCP. The authors concluded that both caused a novel rise in the prices of commodities and labour. These two slowed down the speed of green technology for developing countries.

Sghaier, Kouki and Messaoud (2023: 27) investigated the contagion effect of COVID among the Chinese and G20 securities markets by employing the time varying copula method. The study concluded the significant proof of contagion impact among the Chinese and G20 countries excluding the US, Argentina and Türkiye.

Frikha et al. (2023: 17) explored the COVID, Ukraine conflict and its relationship to the US besides China securities market, main crypto market besides commodity market by employing the wavelet method. The study concluded the significant co-movements during the first and second COVID wave. S&P 500 is a transmitter for Bitcoin. Same for BNB, and Ripple but Ethereum is transmitter for S&P 500 and SSE.

Attia (2023: 5) investigated the diversification benefits in the US with its major trading partners for the Islamic besides mainstream investors over the novel COVID epidemic.

The study applied three time-varying and timescale-based techniques to achieve the objectives. The research concluded that US investors can get diversification opportunities for short term investment horizons, but they don't get diversification benefit for longer period of time. COVID-19 crises did not provide diversification opportunity for the US investors.

Lee and Baek (2023: 2) investigated the changes in 20 Cryptocurrencies by employing the sparse Vhar MGARCH model. The study concluded that there was volatility spillover and market crash because of novel COVID. The research explored the results before the COVID, during the COVID and after the COVID. There are fluctuations in the contagion before the COVID. The spillover parameter showed a greater level without interconnection among cryptocurrencies.

Ampountolas (2023: 4) investigated the spillover effect of the novel COVID on the global securities markets and cryptocurrencies by utilizing the two stages DCC EGARCH. The findings show the noticeable short-term besides long-term transmission effect.

Chancharat and Sinlapates (2023: 2) wrote about the linkage and spillover of WTI crude oil besides securities markets of ASEAN along with 6 countries amid the novel COVID and Russian-Ukraine conflict. The authors employed DCC-GARCH to explore the aims of the research. The probe inferred that the sensitivity of crude oil influenced all countries. The sensitivity and spillover of crude oil was not significant during the pre and COVID-19 era as well as Russian-Ukraine war. The investors should acknowledge the dynamic volatility and correlation of crude oil and stock while planning diversification (maximizing returns and decreasing returns).

Bodhanwala and Bodhanwala (2023: 4) investigated whether the adoption of the environmental policies by the company makes resilient to the downside risk amid the time of turmoil like novel COVID. The research employed different multivariate methods to achieve the goal of the research. The outcomes show that there is no major difference between the high and low ESG compliant companies.

Abdulla and Rabbani (2023: 5) the results of novel COVID on the Islamic stock indices (S&P) of GCC nations. The research used three risk adjusted performance measures that are gauged before and after the novel COVID. The probe concluded that the Islamic stock

indices offered higher returns than mainstream stock indices. The study depicts the risk profile is low for the Islamic stock indices than the mainstream stock indices.

Rehman and Karimullah (2023: 17) investigated the black swan events (US Mortgage and credit turmoil 2008 besides the novel COVID epidemic) and behavior of the GCC stock markets. The research applied the ARCH and GARCH model. The study concluded that these two black swan events had heterogenous response. During the GFC, the effect was more severe than the COVID-19.

Soltani, Taleb and Abbes (2023: 15) investigated the relationship/connectedness among the GCC securities markets and cryptocurrencies. The study also investigated the effect of RavenPack novel COVID sentiment on the GCC securities indices with the conventional cryptocurrencies. Wavelet coherence statistical method was used for the similar movements among the GCC securities market, RevenPack COVID sentiment and cryptocurrencies. The research concluded the high spillover among RavenPack COVID sentiment, Islamic besides mainstream stock profits and cryptocurrencies. The RavenPack novel COVID sentiment was the main transmitter of shocks.

Aloui (2023: 20) investigated the effect of cryptocurrencies on the G7 and BRICS index due to the novel COVID by employing quantile regression and NARDL analysis. The results reveal that statistically insignificant negative coefficient for the Italy, France, China, and Indian stock market for the bitcoin.

2.2 Literature Related to Glasgow Climate Pact:

Cheung (2010: 19) investigated the issue that do investors in the stock market of the USA give importance to climate sustainability or not by employing event study methodology. The research analyzed the inclusion and exclusion of the companies from the Sustainability World Index of Dow Jones Dow Jones amid the period 2002 to 2008. The research investigated the impact in terms of liquidity, risk and stock return. The research did not find any significant impact of announcement on risk and securities returns. There was a short-term increment (decrease) in stock profit on the announcement day. After the announcement day, liquidity became worse but recovered early. Idiosyncratic risk becomes higher after the announcement of inclusion/exclusion.

Blancard and Laguna (2010: 13) investigated the novel topic that how the stock market responds to climate negligence that led to chemical disasters. The study examined 64 chemical disasters in chemical plants and refineries in the world during the period 1990-2005. The results showed that petrochemical companies depicted a 1.3 % decline in the market value for two days after the accident. The study investigated the multivariate method for the research.

Seetharam (2017: 28) investigated the performance of listed US stock corporations and how these listed corporations were influenced by climate negligence that led to the 122 US natural disasters in between 1980-2014. The event study revealed that exposed companies had to face reduced returns. The estimated loss from these disasters translates into US $ 9 million to US$22 million.

Farag (2018: 4) investigated GCC markets, Climate impact, Neom city's opportunities and challenges, mentioning that KSA is building a new city. The line in Neom that will use 100% renewable resources of energy without roads, cars and emissions. The city will focus on the health and wellbeing of residents rather than transportation and infrastructure. The city comprises 170 km besides only 200 meters wide, it will be 500 meters above sea level. The city's capacity for accommodation will be up to 9 million people. This place will be made on a footprint of 34 square km only. The climate of the city is so rich in nature that people will enjoy the whole year. The high-speed rail will be available with all facilities within 5 minutes walking distance. The line is a unique project.

Fernandez-Cuesta (2019: 8) investigated the consequences of the environmental performance (reduction of carbon) on financial debt of European nations by utilizing panel data regression. The outcome depicted the positive outcome of carbon emissions on financial debt. The corporations that performed well environmentally can take more financial debt.

Griffin, Lont and Lubberink (2019: 14) investigated the event of extreme high surface temperature EHST on the companies of the US. The study concluded the negative response of the companies of US to the EHST. The study employed univariate tests and multiple regression models.

Rogova and Aprelkova (2020: 13) explored the impact of the IPCC (Intergovernmental Panel on Climate Change) announcements and regulatory reports on the securities market of US. The ten industry indexes of S& P 500 during 1990 to 2014 employing event study method have been analyzed. The study found that various sectors react abnormally to the IPCC reports. Literature majorly focused on the Paris agreement that is considered the turning point when the authorities gave importance to environmental issues. So, the pricing of the climate related risk also became significant. Corporate profits also depict the risk of transferring to the low carbon economy. There is evidence that low carbon assets also increased their stock market profits after the Paris agreement.

Guo, Kuai and Liu (2020: 9) researched about the heavily polluting companies of China and their impact on securities market employing event study approach. The study investigated the 10 environmental policies those were issued by the central authority of China during the period of 2014–2017. The study concluded that policies create an impact on the securities profits of the corporations in the short term. Baidu index measured the awareness of traders with respect to the climate issues besides mentioned that it plays an important role. Research found that the higher Baidu index showed declines in stock return for the heavily polluting companies. With respect to the Heterogeneity analyses further show that magnitude, holding structure, profitability besides industry also important characteristics in the understanding of inverse outcome of climate policies on the stock returns.

Saadat, Rawtani and Hussain (2020: 12) investigated the environmental aspects of the novel COVID. The total social besides economic life was shut down. There were restrictions on transportation and that's why environmental conditions improved. There were no carbon emissions and air quality across the world improved. There was a drop in water pollution.

Torre (2020: 10) investigated the outcome of ESG index on the securities profits. The probe employed a two-step approach to measure the effectiveness of the companies. (1) Euro Stoxx 50 index of Europe amid the 2010-to-2018-time horizon as per their ESG indicator (2) To categorize the corporations regarding ESG pledges, we club together different ESG indicators (quantitative measurements, scorings and qualitative

assessment). The outcomes reveal that performance of the Eurostoxx50 companies did not affect due to their effort regarding the ESG commitment.

Phama, Ramiah and Moosa (2020: 22) investigated the impact of climate regulations on the French securities market with the help of event study methodology. The outcomes reveal that French securities market is affected by the environmental regulations.

Castro (2021: 9) explored the results of climate performance on the securities price of company by with the context of green and innovative environmental aspects of the nations. The research found that environmental performance is important except during bad events. Renewable energy policies and the transmission effect of technology are valued by investors.

Nerger, Huynh and Wang (2021: 10) investigated the Donald Trump election as president of USA, changes in environmental policies and regulation on the 49 industry segments of USA. The study investigated the 19 events amid the Donald Trump presidency by utilizing the event study approach. The authors assumed; Donald Trump loosened the environmental rules to boost the US economy. The study concluded that lax regulations were not very effective. Only the coal industry was the beneficiary because of abnormal returns in this industry. Other industries showed mixed results. Researchers also investigated the US presidential elections as a sign for future climate policies. The Trumps 2016 tenure, the trump coal industry earned significant returns because of loose environmental policies. In contrast to this tenure of the Obama in 2008 was different because of his strong focus on the environmental policies. So many industries were affected by those policies negatively.

Ramelli, Ossola and Rancan (2021: 13) also explored the outcome of the novel global climate protest on March 15. 2019 on the stock companies of Europe. It was an important turning point in climate activism. The success of the strike caused the decline in the stock price of the carbon intensive companies. It was also because of public awareness of climate activism.

Cunha et al. (2021: 9) probed the Brazilian securities market with the aim that does low carbon investment gives better returns or not? The study concluded that low carbon

companies outperformed and reduces the climate risk for the companies. The study investigated from 2010 to 2019 and used carbon efficient index (ICO2) for the research.

Ouadghiri et al. (2021: 14) explored the attention of the public and its result on the securities market of the USA. The study compared the sustainable stock indexes with their conventional parent indices. The study concluded that attention from the public has significant effects on the USA market and awareness reduced the returns of other indexes. 2004 to 2018 is the duration of the study.

Chien et al. (2021: 12) probed the time frequency association among novel COVID besides securities market. The study employed the Granger causality based on wavelet for the objectives. The novel COVID epidemic reduced stock market.

Sharma et al. (2021: 10) investigated the increasing magnitude of securities market in the four south Asian nations and its effect on the carbon intensity. The research concluded on the basis of CS-ARDL model that securities market development, trade expansion and per capital income increased the carbon quantity in these four south Asian nations. Renewable energy besides technological advancements did not solve the issue of stock market led carbon intensity.

Ouadghiri et al. (2021: 14) investigated the outcome of public awareness to the climate modifications besides pollution on the US stock indices of sustainability by comparison with mainstream parent indices. They revealed that people's attention for environmental matters has an important role in the returns of the US sustainability (Conventional) stocks indices. High public awareness of climate issues may drive traders to support sustainable companies.

Pandey, Kumar and Kumari (2022: 22) investigated the effects of GCP on the AR of global energy stocks. The research applied the event-based approach and cross-sectional multivariate regression method for the objectives of the research. 18 companies from the global clean energy index of S&P from 17 countries were investigated. Time duration of the study was from January 26 of 2021, to December 07 of 2021. The probe concluded that GCP inversely impacted the stock returns of the selected companies. But climate change performance index (CCPI) impacted positively. CCPI was used as proxy for the stiffness of the climate policies in any country.

Allam et al. (2022: 10) investigated effect of novel COVID besides Ukraine conflict from the different dimensions of climate financing that is emphasized in the GCP. The authors concluded that these mentioned crises caused an unparallel rise in the prices of commodities and labor. These two slowed down the speed of green technology for developing countries.

Hassan (2022: 17) investigated the impact of carbon related price fluctuations employing the GARCH and EGARCG model. The study concludes that price rises besides decrease in carbon emission related securities markets are considered good or worse news in the technology related index (NASDAQ). It further concludes that traders that are interested in trading in the neat energy industry should factor the events that cause chaos in the carbon market while calculating the risk.

Morea (2022: 18) investigated the association between circular economic strategies and performance of the market. The study took ESG score as proxy for Circular Economy. The study found that the ESG profile has better outcome on the working of the stocks. Further there is no clue that the green Economy influences securities returns.

Zhang and Shang (2022: 16) investigated the impact besides the digital economy on the tourism industry and reduction of carbon emissions. The study employed the two-sided fixed effects besides mediating effects model. the population was 30 provinces in China. The outcome reveals that digital economy can dramatically make tourism better and has a role in reducing carbon emissions.

Zahid et al. (2022: 5) investigated the sensitivity transmission of energy prices (climate fluctuations) to the south Asian securities markets (i.e., Bangladesh, India, and Pakistan) by employing the ARCH-GARCH and Granger causality test. The study concludes that bidirectional causality is present among the environmental prices (energy markets) and the securities markets of Bangladesh, Pakistan besides India. Energy securities markets of Pakistan besides India sensitivity transmission is present but not for Bangladesh.

Xu et al. (2023: 15) wrote about consequences of environmental uncertainty on the securities markets of China and USA by employing the copula function. The study used the Shanghai Composite Index (SSCI) besides NASDAQ. The results show China's Climate policy uncertainty trend is like US but differences in impact.

Kumari (2023: 15) investigated the impact of the GCP for 52 Countries' oil besides gas stock industry by utilizing the event study approach. The study concluded that emerging markets showed negative AR.

Birindelli et al. (2023: 14) researched the expectations of the securities market and COP26 (Glasgow climate compact). The authors applied the event-based approach to investigate the objectives of the research. Objectives were to investigate the conference announcements and their effect on the securities prices of the 7587 corporations from the four countries comprises European Union, USA, China besides India. The research concluded that securities prices were dependent on the actions of the country's authorities towards the announcement of the conferences rather than the announcement of the conference itself. Markets behaved negatively towards stringent policies and markets behaved positively towards less stringent policies. The investors' decision is also important towards the transition to the green economy. European investors showed concern while investing. Polluting industries had losses in the face of COP 26. Investors of USA, China and India did not show concern about the net zero economy, and they continued to invest in those companies. (Only one study related to topic)

Chopra and Mehta (2023: 22) wrote about the possibility of green bonds as safe haven besides hedge for stocks by employing the DCC MGARCH model. Green bonds provide the safe haven and protection for the eleven securities sectors of America. They also depict the strong hedge asset with high pollution discharge sectors excluding the financials during the corona virus periods. The safe haven advantage of climate friendly bonds is not linked with the climate disclosure point of company. Traders can pick green bonds to the stock portfolio and can enjoy the diversification opportunity.

Zhao (2023: 7) investigated the influence of natural resources besides stock market development (growth) on LCF in BRICS-T countries. The study employed different techniques comprised of CS-ARDL approach and the outcome depicting natural resources have bad impact on environmental quality and decreased LCF by 0.1814%. Securities market development negatively impacted the LCF by 0.1409%. Renewable energy enhances the environment's quality according to the regression results. Unidirectional

causality is witnessed from rechargeable energy, non-renewable energy besides stock market development to LCF.

Liang (2023: 6) investigated the impact of stock market capitalization on the environment and energy transition by analyzing the economic progress, natural assets and international business in Asian nations. The outcomes revealed an amazing phenomenon that securities market capitalization, energy transmission and natural assets decrease CO2 emissions. World business and economic progress are positively related to CO2 emissions.

Kumari (2023: 17) investigated the effect of Global GCP on the world lubricant besides gas sector stocks/securities. The research also investigated AR around the particular event. An event-based approach is utilized in research to find out the objectives. The results revealed that emerging markets showed inverse AR on the Glasgow Climate Pact event. Sensitivity is inversely related to the pre besides post event AR.

Ngwakwe (2023: 4) investigated the outcome of climate related working on the rechargeable energy stocks prices by employing the OLS quantitative approach. The results reveal that the climate related working index has an inverse impact on the renewable stocks related to energy investors who are willing to sell the stocks short or plan to sell the stocks long for the period of declined prices and to get hedged profits while the prices are increased.

2.3 Literature Related to Ukraine War: (Event Date: 24 February 2022)

Boungou and Yatié (2022: 2) investigated the effect of the Ukraine conflict on securities market of 94 countries during the period of January 22 to March 24, 2022. The research concluded the negative and inverse relationship after the invasion. The study got the data from investing.com comprises 3750 daily observations.

Boubaker et al. (2022: 25) researched the Heterogeneous effects of Ukraine conflict on the world securities market by utilizing the event-based approach. The results are similar to other research that the Ukraine conflict affected the markets negatively. The study investigated the developed and emerging markets indices of MSCI index Provider.

Adekoya et al. (2022: 8) investigated that Oil connect with other major assets differently amid the Ukraine conflict. The probe analyzed the intraday data during the war. The study

investigated that how oil connects with conventional bonds, crypto currencies, U.S. currency, gold, and securities. The study found that the connection of oil with others is stronger amid the war compared to the war before it started. Oil became a source of contagion during the war (Oil was a receiver of spillover before the war).

Najaf, Joshipura and Alshater (2022: 13) explored the outcome of the conflict in between Russia and Ukraine on the securities markets of both (Russia and Ukraine). The study concluded that news of the war increased the volatility in the securities markets of both nations. The Russian securities market showed more steepness because of US and European sanctions.

Boubaker et al. (2022: 25) explored the outcome of the global banking stocks to the Russian Ukraine conflict by utilizing the event-based approach. The research analyzed the stock prices of the banks that explains the CAR. The study found a 1.5% decline in the returns of the banking industry. The decline in the European banking industry was severe about 4%. The stocks of the global banks fell 1 % on the war date.

Umar et al. (2022: 11) researched the outcome of Russian and Ukraine conflict on the European financial markets besides global commodity markets. The probe employed TVP-VAR approach. The revealed that European and Russian conventional bonds were the transmitters of shock, war affected the sensitivity and return connectedness in short besides long term.

Nerlinger and Utz (2022: 6) explored the outcome of the Ukraine war on 1630 energy stocks by utilizing the event-based methodology. The study reveals that energy stocks outperformed, and their cumulative abnormal returns were positive. The outperformance is higher than the north American energy companies.

Gaio et al. (2022: 7) investigated the market effectiveness of advanced countries during the Russian and Ukraine war. Market efficiency was analyzed during the COVID and war. Multifractality was present and did not accept the efficient market theory besides shows the forecast of securities prices during the time of turbulence besides GFC.

Yousaf, Patel and Yarovaya (2022: 5) investigated the reaction of the Ukraine conflict on the securities markets of the G20 nations by employing the event study approach. The research reveals that inverse effect on the event day. Hungary, Russian federation,

Republic of Poland, besides Slovakia were affected negatively first. Other nations were influenced later.

Abbassi and Pandey (2022: 12) investigated the outcome of the Ukraine tussle on the constituent's companies of the leading stock index of G7 counties by employing the event-based approach. The results reveal the negative AR.

Beraich et al. (2022: 16) investigated sensitivity transmission impact in the American, European besides Chinese stock market pre and post Russia-Ukraine by using DY methodology. The research reveals the increment in the sensitivity transmission index over the war, but such an increment was lessor than the increment over the novel COVID.

Mahran (2022: 15) investigated the Russian conflict with Ukraine and its outcome on the sensitivity correlation among the Egyptian securities market segment by using the DCC GARCH method. The study finds that the transportation segment is the leader that transfers volatility.

Allam et al. (2022: 13) investigated outcome of novel COVID and Ukraine conflict from the different perspectives of climate financing that is emphasized in the GCP. The authors concluded that these mentioned crises caused an unparallel rise in the prices of commodities and labour. These two slowed down the speed of green technology for developing countries.

Frikha et al. (2023: 17) explored the novel COVID, Ukraine tussle and its relationship to the American and Chinese securities market, main crypto market and commodity market by employing the wavelet approach. The study concluded the significant co-movements during the first and second COVID wave. S&P 500 is a transmitter for different types of crypto currencies, but Ethereum is transmitter for S&P 500 besides SSE.

Kumari, Kumar and Pandey (2023: 11) explored the sensitivity of the western securities market due to Russia-Ukraine war by employing event study approach. The study concludes the adverse effect on the western securities markets. Poland, Portugal and Denmark showed the positive abnormal returns after the war in between Russian and Ukraine.

Silva, Wilhelm and Tabak (2023: 16) examined the role of international business in the 70 international equity market amid the war among Russia besides Ukraine. The study concluded that trade exposure is irrelevant for European countries. Trade exposure is relevant and substantial for non-European countries. Proximity has a negative and significant effect on the European countries but not for non-European nations.

Wu et al. (2023: 11) explored the sensitivity of securities market and the war among Russia besides Ukraine. The study concludes that conflict between both reduced the volatility in start but when Russia invaded the Ukraine then volatility increased. The study investigated the outcome of war on NATO besides non-NATO countries.

Maurya, Bansal and Mishra (2023: 11) explored the Ukraine and Russia Crises and its effect on the world inflation by applying the event study approach. Study used monthly consumer price index data of 60 countries. A major increase in inflation was seen in European countries.

Ciocîrlan and Nițo (2023: 25) wrote about the contagion and geopolitical risk with respect to the European securities markets in the face of Ukraine conflict. The authors utilized the frequency-domain transmission methodology and event-based approach for the objectives of the research. Central besides Eastern European markets showed the transmission effect. The results also depicted little contagion in the markets.

Izzeldin et al. (2023: 11) investigated the effect of the Ukraine conflict on the world financial markets by utilizing the Markov-switching HAR approach on daily sensitivity and compared the war with the COVID-19 and 2008 financial crises. The reaction of the securities markets and the commodities was rapid but not much as to the COVID-19 and 2008 financial crises (GFC). Wheat and Nickel were mostly affected assets because Russian besides Ukraine are the suppliers of these commodities.

Kamal, Ahmed and Hasan (2023: 23) investigated the impact of the Russian and Ukraine war on the securities market of Australia by utilizing the event-based method. The probe concluded with the inverse AR on the event day. Australian stock market recovered early from the event. The study concluded that small, medium companies are also affected by the event but high growth, illiquid and exporting companies were affected more.

Assaf, Gupta and Kumar (2023: 13) investigated the effect of Ukraine and Russian tussle on the world financial markets by utilizing the event-based methodology. The research reveals that markets showed negative AAR and CAAR after the event. The advanced markets were more volatile than developing.

Ahmed, Hasan and Kamal (2023: 29) investigated the reaction of the Ukraine conflict on the securities markets of European nations by using event-based methodology. The probe reveals that European stocks reacted negatively during the post-event.

Shaik et al. (2023: 11) explored the effect of geopolitical effect on the securities, oil prices, gold, amid the GFC, novel COVID besides Russia and Ukraine war by employing the wavelet power spectrum besides wavelet coherence transformation methodologies. The study concluded that GPR (geopolitical risk) showed higher variations during the war than COVID-19, the least variation during GFC. DJ global index and WTI with more variations amid GFC and novel COVID followed by conflict. Gold offers diversification opportunities against WTI and DJGI.

Bossman and Gubareva (2023: 11) investigated the comparative analysis of E7 besides G7 assets with asymmetric effects of Russian war by utilizing the nonparametric quantile-on-quantile regression model. The probe concluded that all countries other than Russia and China reacted favorably to GPR (geopolitical risk). Resilience was shown by Federative Republic of Brazil, People's Republic of China, Russia, and Republic of Turkey (France, Japan, and the US).

Khalfaoui, Gozgor and Goodell (2023: 10) investigated the outcome of Ukraine conflict on the cryptocurrencies by employing the quantile dependence analysis. The study observed the co-movements among the cryptocurrencies and war attention on market. War attention inversely affected all cryptocurrencies in the short term.

2.4 Literature Related to ChatGPT:

Chopra and Sharma (2021: 19) critically investigated the application of artificial intelligence (ChatGPT) in securities market analysis. The securities market is synonymous with extreme fluctuations, non-linearity and change in the internal and external environmental variables. AI can catch the non-linearity that can help the stock prices predictions. 148 studies have been reviewed that used neural and hybrid-neuro techniques

to forecast the stock market. The study concluded that AI can be utilized successfully to understand the stock market price future behavior.

Ferreira and Gandomi (2021: 17) provided the systemic literature review of 2326 papers from the Scopus website during 1995 to 2019, categorizing the literature in four categories (1) portfolio optimization (2) stock market prediction using Artificial Intelligence (3) financial sentiment analysis (4) combination involving two or more approaches. Artificial Intelligence in financial investment gained popularity in 1990 with the technological development and popularity of personal computers.

Wenzlaff and Spaeth (2022: 20) wrote about the role of the ChatGPT in defining the terminologies and definition regarding the crowdfunding and other financial definitions. OpenAI's model of ChatGPT permits the users to ask different questions and ChatGPT answers the questions by utilizing artificial intelligence and machine learning. The ChatGPT answers are dependent on the nature of the questions. The authors used crowdfunding, community finance and alternative finance because there is no consensus on the definitions among academicians.

Gonzales and Hargreaves (2022: 8) investigated the use of artificial intelligence (ChatGPT) for the purpose of stock recommendation and risk management. The study concluded that stock recommendation was better with minimal financial loss.

Song and Jain (2022: 11) explored the impact of artificial intelligence (ChatGPT) on the stock market analysis than average investors. The study compared the traditional and Artificial Intelligence investors with the help of long run survival analysis. The study found that the usage of Artificial Intelligence does not guarantee AI investors to beat the stock market always.

Joshi, Wang and Busler (2022: 16) investigated the volatility spillover in the S&P 500 index of US cryptocurrency market (BGCI) by employing the MGARCH-BEKK for volatility transmission and the advanced machine learning tools. The study concluded that inverse sensitivity or events impact the S&P 500. There is proof of one sided cross-market asymmetric volatility spillover from the crypto market to S&P 500 stock during the time of COVID-19. The study concluded the diversification benefits among S&P and BGC.

Lee and Baek (2023: 12) investigated the changes in 20 Cryptocurrencies by employing the sparse VHAR MGARCH model. The study concluded that there was volatility spillover and market crash because of COVID-19. The study investigated the impact before the COVID, during the COVID and after the COVID. The sensitivity index showed a high level without interconnection among cryptocurrencies.

Zaremba and Demir (2023: 8) explored the role of ChatGPT technology in financial dimensions and how it can improve the financial applications that are NLP based. The authors also discussed ethical and future research directions in the field of finance. The authors concluded that ChatGPT can improve those financial applications. The researchers emphasized ethical considerations in the use of ChatGPT technology in the era of finance.

Lopez-Lira and Tang (2023: 23) investigated the role of ChatGPT in predicting the stock returns with sentiment analysis of news headlines. Researchers used ChatGPT to know if news is good or bad or irrelevant for the stock market returns. The authors found that ChatGPT performed better than conservative sentiment analysis methods. The researchers found that GPT-1, GPT-2, and BERT do not forecast the returns accurately. ChatGPT-4 is better in investment decision making.

Alshurafat (2023: 1) explored the effectiveness of chatbots (ChatGPT) for accounting and finance professionals. The author concluded that ChatGPT can play a significant role in accounting field by incorporating the existing. ChatGPT in accounting also has some challenges comprised of incorporating the existing system, privacy and security of the data, training of the users etc.

George, George and Martin (2023: 13) researched the effect of ChatGPT on different businesses. ChatGPT can also be used in customer service applications as well as to create virtual assistants for text and voice conversations. It also allows multiple conversation threads for better conversation. It is useful in e-commerce via chat, finance, education, entertainment, health, news and productivity.

Saggu and Ante (2023: 7) investigated the impact of ChatGPT (language model) on artificial related cryptocurrency assets with the help of synthetic difference-in-difference methodology. The study found significant impact of ChatGPT on artificial intelligence related crypto assets and their return increased.

Aysan et al. (2023: 6) explored the relationship between twitter based economic uncertainty (TEU) and the metaverse stocks by utilizing the Wavelet Local Multiple Correlation analysis. The research found statistically significant correlation among metaverse stocks and TEU on all time horizons investigated. It shows the importance of virtual environment in the real world.

Zhou (2023: 8) investigated the impact of ChatGPT on Metaverse. ChatGPT is also growing in the metaverse. They investigated the benefits and disadvantages of ChatGPT on the metaverse based personalization, entertainment, education and support. ChatGPT based service in Metaverse can assist rather than competition. ChatGPT can improve human creativity in the metaverse.

Xie (2023: 10) investigated the capabilities of ChatGPT in multimodal stock movement predictions by extensive zero-shot analysis. The study concluded that ChatGPT is neophyte (new) in the stock market and has limited success in predicting the stock market. There is a need for specialized training and improvements for ChatGPT.

Lopez-Lira and Tang (2023: 23) investigated the ability of ChatGPT to forecast the stock market returns by employing the sentiment analysis of news headlines. The study concluded that incorporating the advanced models can improve investment decision making.

Chen et al (2023: 8) investigated the ChatGPT and its impact on the stock market prediction. The study concluded that developed models (graph neural networks enhanced by ChatGPT's graph inferences) outperformed the deep learning-based benchmarks. In addition to that the portfolio that was developed based on this model provided better returns with reduced volatility.

Kim, Muhn and Nikolaev (2023: 31) investigated the usefulness of ChatGPT tools in processing and summarizing the financial information by taking stock market as laboratory. The study concluded that summaries are effective in explaining the stock market reactions.

Chen (2023: 15) investigates the stock prices movements and metaverse linkage with the help of three-factor and five-factor Fama-French model. The authors selected the different US industries and concluded that metaverse impacted the stock prices of technology

stocks. metaverse impacted the real estate market as well. The worldwide internet companies like Meta, Tencent, NetEase and ByteDance are trying to seize the opportunities in metaverse. Metaverse is an innovative business model in the financial market.

Wen (2023: 4) investigates and proposes the approach to predicting stock prices in the metaverse world by employing the long-short term memory (LSTM). The model provides better tools for emerging markets of metaverse.

Zaremba and Demir (2023: 8) investigated the future of ChatGPT that is based on NLP in the financial sector. The study concluded on the basis of literature that ChatGPT can improve the NLP based financial applications, but it should also address the ethical and regulatory issues.

Ante and Demir (2023: 2) investigated and analyzed the returns of AI- themed crypto assets and launch of the ChatGPT chatbot. The study concluded significant returns (41% over) for AI tokens after the ChatGPT launch. It means ChatGPT and AI at large motivated the cryptocurrency markets that resulted in the increase of AI related cryptocurrencies.

Aysan et al. (2023: 6) investigated and claims first mover to analyze the connectedness among the popular metaverse stock index and financial markets during the normal, bearish and boom market conditions. The Nasdaq index (technology companies are listed here) is the leading spillover transmitter to the metaverse stock index.

Koa and Leea (2023: 10) investigates the ChatGPT efficiency in assisting the portfolio management regarding asset allocation and diversification by employing the quantitative tool. The study concluded that ChatGPT is statistically significant in terms of diversification rather randomly asset selection. The portfolios based on ChatGPT outperformed than the randomly chosen assets.

Bertomeu et al. (2023: 35) investigated the impact of ChatGPT (generative AI) and its ban in Italy based on data protection law violations on March 31, 2023. The Italian companies that had exposure to the technology showed underperformance than those with less exposure to the technological exposure.

2.5 Literature Related to Islamic Indices:

Miniaoui, Sayani and Chaibi (2015: 10) investigated the consequences of the financial crises in Islamic and conventional indices of GCC (Dow Jones Islamic Market Index) by augmented GARCH models. The results show that volatility of Bahrain, Kuwait and UAE was affected. Islamic index behaved same in terms of volatility as conventional index.

Mensi et al. (2015: 7) explored the gold, US treasury hedges (safe havens) and shariah stocks for the GCC market. Whether Dow Jones Islamic World Emerging Market index, gold, U.S. Treasury bills (T-bills) can be safe haven assets or hedge in GCC stock market by employing a vine copula approach. The findings depict that risk diversification can be achieved by gold or DJIMEM but not in US T-bills.

El Alaoui (2015: 20) investigated the movements of Islamic Dubai Financial Market by comparing the index with the GCC index, ASEAN index, Developing Countries index, Emerging Countries Index, and the Global Sukuk by using the wavelet techniques. The study concluded DFM UAE, and (GCC and Saudi) are movement same in the long run.

Naifar and Hammoudeh (2016: 6) investigated the co-movements and casual relationship in between GCC Islamic bond return and global financial crises (GFC) with the help of quantile regression analysis. The findings depict that global financial turmoil and oil uncertainties have a negative impact. The Islamic bonds index was impacted by the uncertainties in conventional bond market.

Bakkali and Masih (2017: 16) explored the GCC Islamic index apart from the link with conventional LIBOR interest rate. The study concludes Islamic index has co-integration with Islamic and conventional sectors. Secondly GCC Islamic index is also cointegrated with LIBOR. The GCC market is related to the US and conventional LIBOR.

Aloui, Jammazi and Hamida (2017: 20) investigated the multivariate co-movements in between bond market and Islamic stock in the GCC by employing the Wavelet approach. The findings reveal that there is negative link in short term but positive in long run between Islamic bonds and Islamic stocks.

Mensi et al. (2018: 14) explored the multifractality of the GCC stock markets by employing the MF-DFA method. The authors compared GCC to the global markets. The

findings show that all stock markets depict multifractal features. GCC markets depicted less efficiency than the global and Islamic markets.

Chaffai and Medhioub (2018: 12) investigate the herd behaviour in the GCC markets. Generalized auto regressive conditional heteroskedasticity (GARCH)-type models and quantile regression analysis were employed. The results showed herding behaviour. Finding is consistent with the research in China, Japan and Hong Kong. The Islamic finance can influence the behavior positively.

Boujelbène (2018: 17) researched the spread of shocks of oil market and Islamic and conventional indices of GCC. Dynamic conditional correlation–generalized autoregressive conditionally heteroskedastic model for contagion, the filter of Kalman for pure contagion were used. Results showed the contagion in oil and markets during 2008 and 2014 turmoil.

Mensi et al. (2019: 14) explored the spillover of risk besides effectiveness of hedging for oil and gold for the Islamic and conventional bank stock indices for GCC by using the DECO-FIGARCH model. The study concludes the less relationship between the GCC IBs indices and Oil and gold. But there is a significant risk spillover for the GCC Bank and oil and gold.

Ahmed (2019: 5) wrote about the Islamic (MSCI ACWI Islamic stock index) and conventional equities (US, developed, and GCC). The study concluded the volatility spillover from conventional (mainstream) to the Islamic indices. The study did not show opposite volatility spillover. The study used three phase approach (1) filtering process (2) possibility of structural breakdown (3) two-step cross correlation function.

Haddada, Mezghani and Al Dohaiman (2020: 15) wrote about the relationship, spillover in between the Dow Jones Islamic stock market indices for US, UK, Canada, Europe, Asia-Pacific, Japan and GCC and global risk factors by applying the permanent-transitory (P-T) decompositions approach. The study concluded that DJIM US, Islamic DJ UK, Islamic DJ Europe besides Islamic DJ GCC indices are susceptible to local and foreign shocks, unlike DJIM Canada, DJ Islamic Japan and DJ Islamic Asia-Pacific are sensitive to local shocks. DJIM US is the transmitter for the return and volatility to DJIM GCC as DJIM GCC is the receiver.

Boubaker and Rezgui (2020: 8) researched the common movements of oil, gas and gold in comparison with the Dow Jones Islamic Market index. Wavelet squared coherence and Windowed Scalogram Difference (WSD) were employed. It concluded co-movements between DJIM and oil, lesser movement with gas. Investors of Islamic index does not count on oil, gas and gold for investing in Islamic stocks.

Abdulkarim et al. (2020: 16) investigated the nexus of Islamic stocks of Africa and prices by employing the wavelet and Multivariate-GARCH model. The study employed MODWT, CWT, and multivariate-GARCH-DCC to investigate diversification opportunities. The study concluded that Egyptian market leads all. Low nexus between Egypt and Tunisia. Tunisia has low volatility with oil index. So, there are diversification opportunities for investors.

Saleh, Moradi-Motlagh and Zeitun (2020: 14) explored the drivers of the inefficiencies in the GCC banking sector by comparing the Islamic and conventional banks. Authors employed the innovative non-parametric methodology to study deposits, fixed assets, loans, operational expenses, non-performing loans and securities. The study concluded that NPL, fixed assets, were the main drivers of the inefficiency. Islamic banks were better to narrow the gap of inefficiency.

Elshqirat (2021: 21) explored the response of the Islamic and Conventional equity indices with respect to the GCC countries in between the novel COVID epidemic. The research's motive was to investigate the effect on both the indices and diversification opportunities among them. Risk-adjusted performance measures to achieve the objectives. The study concluded that effect of the novel COVID on the Islamic and conventional indices of the GCC countries was almost similar and Islamic indices do not provide the diversification opportunities.

Al Rahahleh, Akguc and Abalala (2021: 13) explores the operational performance of Dow Jones Islamic Index (DJII) firms with non-DJII firms during crises. 1,128 unique firms by univariate tests complemented with multivariate regression analysis for performance. Firms of DJII showed more profits and were not influenced by the financial crisis.

Abdulla and Rabbani (2021: 5) wrote about the COVID-19 and the S&P GCC stock indices. The researchers employed three risk-adjusted performance measures comprised

of Sharpe ratio, Treynor ratio and Jensen alpha that are calculated before and during the COVID-19 period. The study concluded that risk profile of the shariah indices is low than the counterpart.

Abro and al Mustafa (2021: 7) investigated the impact of Ramadan on the GCC returns and volatility. Data was taken from datastream. ARCH-GARCH is employed for return and volatility. Study founded the effect of Ramadan on Saudi Arabia and UAE but not for Bahrain and Oman.

Alshubiri (2021: 11) investigated the four portfolios return of Islamic indices in GCC by employing the ARDL (autoregressive distributed lag) Model. The study concludes that S&P GCC shariah, S&P GCC Shariah Dividend, and the S&P Shariah Domestic are related positively but S&P GCC Investable Shariah in inversely related to Islamic stock price index.

Abdullahi (2021: 18) wrote about the projectories (extend from surface) of the Islamic stock indices during the time of COVID-19 by using the GMM, ARDL and MGARCH. The study investigated Pakistan, Malaysia, Nigeria, India, USA, Canada and Japan. The results show co-movements, market returns are cointegrated and volatility possibility is high during COVID.

Azrak et al. (2021: 6) compared the Islamic and conventional banks stock price volatility in response to the information disclosure. Does high disclosure is related to high price volatility or not? The researchers build the disclosure index. The authors conclude insignificance.

Shamsudheen et al. (2022: 15) researched the response of GCC stock markets in terms of return and volatility to the COVID-19 financial package for both conventional and Islamic. Exponential GARCH was used for volatility and movements. The research concluded that inverse returns and high volatility for both types of indices.

Yousaf et al. (2022: 16) explored the volatility spillover and hedging variation among the GCC during GFC and COVID-19 by employing the bivariate VAR-asymmetric-BEKK-GARCH. The study concluded that spillovers between GCC countries increase during these events. Gold provided the safe haven for most of the GCC countries according to the Time-Varying correlations.

Aliani, Al-kayed and Boujlil (2022: 20) wrote about the COVID's impact on the movements of the Islamic and conventional stock indices in GCC with the help of wavelet coherency approach and the DCC- GARCH. The study concluded that Islamic and conventional indices movements are same during the COVID-19, but Islamic indices were less volatile.

Labidi, Laribi and Ureche-Rangau (2022: 13) investigated the effect of price and trading volume on the quarterly Dow jones Islamic market GCC revisions by employing the event study methodology. The results show a negative price reaction for deleted stocks or excluded stocks.

Essayem, Gormus and Guven (2023: 23) explored the factors that influence the stock market dynamics in GCC by employing the non-parametric quantile regression. The market showed a heterogeneous reaction to the regional factors. The Islamic and conventional indices do not provide the diversification in most of the cases.

Sundarasen, Kamaludin and Ibrahim (2023: 15) examined the volatility differences among Islamic and conventional indices of ASEAN and GCC by employing the Morlet's wavelet method. The findings show that ASEAN markets and Islamic indices were more volatile. GCC markets showed same for Islamic and conventional.

Prandi and Colecchia (2023: 22) recently investigated the GCC and shariah stock indices in the market timing strategy perspective Asymmetric GARCH models (GJR-GARCH) is utilized. The results encourage the volatility-based market timing models in emerging and Islamic indices.

2.6 Literature Related to Event Study Method:

There is a plethora of research that explored the financial effect of climate related policies and regulation by applying the event study methodology. Emission and return association are explored with respect to the climate announcements. Overall, the Paris agreement negatively impacted on the stock returns of the high polluting industries. The literature based on event studies shows that tight environmental policies have a negative financial impact on the high emitters as compared to most rewarded while the climate policies were loosely structured.

Event studies were also used to assess the impact of natural disasters like storms and hurricanes, excessive warm temperature on the stock markets, some research shows that inclusion of the stock companies in the sustainability index does not significantly increase the stock returns of that company. Other studies show that during the public attention period, the investor reacts accordingly. Environmental rating is also used as proxy to judge the seriousness of the companies. Awarding the awards to environmentally performing good companies also showed positive behaviour in stock returns. (Global Carbon Atlas, 2020: 21)

Bohmi and Holz (2006: 13) inquired into the repercussions of spam emails on the investment of the company employing the event study methodology. Spam is synonymous with unrequested or unsolicited bulk emails (UBE) that are forwarded to many people from unknown senders. Spam consists of 70% of the emails a person receives in the inbox. Stock spam means spam that is aimed at or targeted at advertise the securities traded over the counter. The data consists of 21935 spam messages from 2004 to 2006. The study concluded that spam messages also positively influenced the investment of the companies with significant abnormal returns.

Antweiler and Frank (2006: 10) investigated the influence of news stories on US stock prices by applying the event study methodology. Literature has a plethora of evidence of applying event study to investigate the influence of different events. 250000 news stories have been utilized for analysis from 1973 to 2001. The study pinpointed the significance of long observed window. The study in hand is unique in respect of long observed window consist of one year before and after the event. The study employed event study for every topic with synonymous events. The study finalized the market overreaction before and after the event.

Acquisto, Friedman and Telang (2006: 7) went into the consequences of companies' Information breech on share prices of that company by employing the event study methodology. The company's privacy breach is the day of the research. Research has concluded that there is a major negative effect on the market value of the companies. After immediate breach share values decline and they corrected with elapse of time.

DellaVigna (2010: 17) looked over the ethnic implications of the success of the Obama as president of United States of America by employing the event study methodology for the analysis. Election day is the event day of study. Study investigated discrimination in labour. The research finalized that there is discrimination in the environment before the winning of the Obama and there are no major changes in ethnic discrimination after success of Obama in short term. The research posits that there may be variations in the long run.

Aamir and shah (2011: 7) probed the 26 dividend announcements on the share prices of Cement and oil and gas companies of Pakistan by employing the event study methodology. Data time period from 2004 to 2008 is taken in the research. The research finalized that there is a positive relationship between dividend announcement and share prices of cement and oil companies. The share prices have been appraised in comparison to rival companies for better analysis. The results are supporting with the literature.

Cheung (2010: 5) investigated the issue that do investors in the stock market of USA give importance to sustainability or not with the help of the event study methodology. The research analyzed the inclusion and exclusion of the companies from the Dow Jones Sustainability World Index during the period 2002–2008. The research investigated the impact in terms of liquidity, risk and stock return. The study did not find any significant impact of announcement on risk and stock returns. There was a temporary increase in the stock return on the announcement day. After the announcement day, liquidity became worse but recovered early. idiosyncratic risk becomes higher after the announcement of inclusion/exclusion.

Patro, Wald and Wu (2014: 22) investigated the market reaction of MSCI to the devaluation of the country's currency by employing the event study methodology. The study concluded with the negative trend in the markets and later markets reacted positively. The stock market's negative reaction is severe if reserves are low, the country's current account deficit increased, or the credit rating of the country decreased.

Seetharam (2017: 28) investigated the impact of top 122 US natural disasters (between 1980-2014) on the performance of listed US stock companies. The event study revealed

that exposed companies had to face reduced returns. The estimated loss from these disasters translates into US $ 9 million to US$22 million

Geyikci (2017: 13) investigated the failed military coup and its impact on the participation 30 of Türkiye's shariah compliant stock index with the help of event study methodology. The findings of the study show that the index behaved negatively on the day of the failed coup. But it corrected early, and the abnormal returns of participation were higher than the ISE 100 that is non shariah stock index.

Geyikci and Tepeci (2017: 9) explored the impact of the failed military coup, Russian plane crises and terrorist attack on the Istanbul stock exchange. The study applied the event study methodology to achieve the targets and used GARCH for the conditional volatility. The results depicted that market reacted the coup and Russian airplane crises. The terrorist attack also affected the stock market.

Rehman et al. (2018: 17) explored the event study methodology for the impact of terrorism attack on Pakistan stock exchange. Terrorism was the mostly reported word in the newspapers after 9/11 terrorist attack. Terrorism not only murders innocent people but also creates an uncertain environment for the business community. The stock market always reacts first to important incidents or events. The research investigated about the impact of the important attacks on the indices of Pakistan stock exchange. EGARCH model is applied for volatility, event study for Quetta bombing on January 10, 2013, and Peshawar APS massacre on December 16, 2014. The research concluded attacks that killed more than 100 people had a negative impact on Pakistan stock exchange indices. Army Public School attack also had negative impact for Pakistan stock exchange.

Phama, Ramiah and Moosa (2020: 6) investigated the impact of environmental regulations on the French stock market with the help of event study methodology. The results reveal that French stock market is affected by the environmental regulations.

Khan et al. (2020: 14) investigated the impact of COVID-19 in Pakistani stock exchange. This research was limited to 61days of event window. This is not peer-reviewed research. This research also concluded inverse response in stock returns after the window.

Singh et al. (2020: 22) researched the novel COVID effect on G 20 countries and concluded significant negative abnormal returns in four sub event windows. Authors used

an event study approach for sensitivity of share prices on 19 economies (excluding the European Union). Data was obtained from investing.com. But later markets rectified from negative AR to positive AR. Study suggested investing in the long run in such cases.

Yan and Qian (2020: 17) researched the impact of COVID-19 on consumer industry in stock exchange. Study employed event study method for the objectives of the study. Writers found that the first three days inversely affected the shares of the consumer market but after that share prices were constant and stable due to government intervention. Study collected data from RESSET financial database. www.resset.cn.

Khan et al. (2020: 13) researched influence of novel COVID in Pakistani securities exchange. This study is confined to 61days of event window. This is not peer-reviewed paper. This study also concluded with a negative response in stock returns after the window but study in hand is more comprehensive because it includes 623 observations.

Rogova and Aprelkova (2020: 15) explored the impact of the IPCC (Intergovernmental Panel on Climate Change) reports and regulatory announcements on the stock market of US. The ten industry indexes of S& P 500 during 1990 to 2014 with the help of event study methodology have been analyzed. The study found that various sectors react abnormally to the IPCC reports.

Sulehri and Ali (2020: 11) investigated that how political uncertainty effects in Pakistan stock exchange by employing event study methodology. Different 18 events were selected, and data is got from DAWN and Business Recorder of Pakistan. Eight out of 18- were positive and 10 out of 18 were negative. These events comprise the nuclear test, general elections and 14th amendments etc. The murder of Benazir Bhutto inversely affected the stock market, and the market had to face a 5% fall. The stock exchange of Pakistan is volatile in nature. The event study methodology works better in the case of efficient market scenario. The study investigated the past events from 1995 to onward.

Guo, Kuai and Liu (2020: 9) researched about the heavily polluting companies of China and their impact on stock market with the help of event study methodology. The study investigated the 10 environmental policies those were issued by the central government of China during the period of 2014–2017. The study concluded that policies create impact on the stock returns of the companies in the short term. Baidu index measured the attention

of investors with respect to the environmental issues and mentioned that it plays an important role. Research found that the higher Baidu index showed declines in stock return for the heavily polluting companies. With respect to the Heterogeneity analyses further show that size, ownership structure, profitability and industry also important characteristics in the understanding of negative impact of environmental policies on the stock returns.

Nerger, Huynh and Wang (2021: 10) investigated the Donald Trump election as president of USA, changes in environmental policies and regulation on the 49 different industry sectors of USA. The study investigated the 19 different events during the Donald Trump tenure by utilizing the event study approach. The authors assumed; Donald Trump loosened the environmental rules to boost the US economy. The study concluded that lax regulations were not very effective. Only the coal industry was the beneficiary because of abnormal returns in this industry. Other industries showed mixed results. Researchers also investigated the US presidential elections as sign for future climate policies. The Trumps 2016 tenure the trump coal industry earned significant returns because of loose environmental policies. In contrast to this tenure of the Obama in 2008 was different because of his strong focus on the environmental policies. So many industries were affected by those policies negatively.

Yousaf, Patel and Yarovaya (2022: 7) investigated the reaction of the Russia and Ukraine war on the stock markets of the G20 countries by employing the event study methodology. The research reveals that negative impact on the event day. Hungary, Russia, Poland, and Slovakia were affected negatively first. Australia, France, Germany, India, Italy, Japan, Romania, South Africa, Spain, and Turkey were affected later.

Abbassi and Pandey (2022: 12) investigated the effect of the Russia and Ukraine war on the constituents' companies of the leading stock index of G7 counties by employing the event study methodology. The results reveal the negative abnormal returns.

Boungou and Yatié (2022: 5) investigated the impact of the Russian and Ukraine war on 94 countries during the period of January 22 to March 24, 2022. The research concluded the negative and inverse relationship after the invasion. The study got the data from investing.com comprises 3750 daily observations.

Boubaker et al. (2022: 28) researched the Heterogeneous effects of Ukraine war on the global stock market by using the event study approach. The results are consistent with other studies that the Ukraine war affected the markets negatively. The study investigated the developed and emerging markets indices of MSCI index Provider.

Nerlinger and Utz (2022: 6) investigated the impact of the war between Russia and Ukraine on 1630 energy stocks by using the event study methodology. The study reveals that energy stocks outperformed, and their cumulative abnormal returns were positive. The outperformance is higher than the north American energy companies.

Labidi, Laribi and Ureche-Rangau (2022: 12) investigated the effect of price and trading volume on the quarterly Dow jones Islamic market GCC revisions by employing the event study methodology. The results show a negative price reaction for deleted stocks or excluded stocks.

Pandey, Kumar and Kumari (2022: 22) investigated the effects of Glasgow climate pact on the Abnormal Returns of the global energy stocks. The research applied the event study method and cross-sectional multivariate regression model for the objectives of the research. 18 companies from the S&P global clean energy index from 17 countries were investigated. Time duration of the study was from January 26, 2021, to December 07, 2021. The study concluded that GCP inversely impacted the stock returns of the selected companies. But climate change performance index (CCPI) impacted positively. CCPI was used as proxy for the stringency of the environmental policies in any country.

Boubaker et al. (2022: 25) explored the reaction of the global banking industry to the Russian Ukraine war by using the event study approach. The research analyzed the stock prices of the banks that explains the cumulative abnormal returns. The study found a 1.5% decline in the returns of the banking industry. The decline in the European banking industry was severe about 4%. The stocks of the global banks fell 1 % on the war date.

Kumari, Kumar and Pandey (2023: 15) explored the vulnerability of the western stock market due to Russia-Ukraine war with the help of event study methodology. The study concludes the adverse and negative impact on the western stock markets. Poland, Portugal and Denmark showed the positive abnormal returns after the war in between Russian and Ukraine.

Ciocîrlan and Nițo (2023: 25) wrote about the contagion and geopolitical risk with respect to the European stock markets in the face of Ukraine war. The authors used the frequency-domain spillover methodology and event study approach for the objectives of the research. Central and Eastern European markets showed the spillover effect. The results also depicted little contagion in the markets.

Kamal, Ahmed and Hasan (2023: 17) investigated the impact of the Russian and Ukraine war on the stock market of Australia by employing the event study methodology. The study concluded the negative abnormal returns on the event day. Australian stock market recovered early from the event. The study concluded that small, medium companies are also affected by the event but high growth, illiquid and exporting companies were affected more.

Ahmed, Hasan and Kamal (2023: 12) investigated the reaction of the Russia Ukraine war on the stock markets of European countries by using event study methodology. The study reveals that European stocks reacted negatively during the post event.

Assaf, Gupta and Kumar (2023: 20) investigated the effect of Ukraine and Russian war on the global financial markets by employing the event study methodology. The research reveals that markets showed negative AAR and CAAR after the event. The developed markets were more volatile than emerging.

Kumari (2023: 14) investigated the impact of the Glasgow climate pact on the global (52 Countries) oil and gas stock industry by utilizing the event study approach. The study concluded that emerging markets showed negative abnormal returns.

2.7 Literature Related to the Multivariate GARCH DCC:

Horvath and Petrovski (2013: 16) compared the stock market co-movements of Western Europe (Czech Republic, Hungary and Poland) and South easter Europe (Croatia, Macedonia and Serbia) by employing the multivariate GARCH approach. The stock markets of central Europe have a higher degree of co-movement.

Majdouba and Mansour (2014: 13) investigated the conditional correlation among the Islamic equity markets of emerging countries (Turkey, Indonesia, Pakistan, Qatar, and Malaysia) and US stock markets. The MSCI indices were used and multivariate GARCH

BEKK, CCC, and DCC were employed. The authors concluded that Islamic stock indexes have weakly correlation over time. There is no clear evidence that US market spills over the Islamic stock indices of the emerging countries.

Miniaoui, Sayani and Chaibi (2015: 11) investigated the consequences of the financial crises in Islamic and conventional indices Dow Jones Islamic Market Index GCC by augmented GARCH models. The results show that volatility of Bahrain, Kuwait and UAE was affected. Islamic index behaved same in terms of volatility as conventional index.

Rahim and Masih (2016: 16) wrote about the diversification benefits for the Islamic investors with trading partners of Malaysia (China, Singapore, Japan, United States and Thailand) by comparing Islamic indices of those countries by employing the MGARCH-DCC and wavelet approaches. The Islamic investors cannot get diversification from China and Singapore but can get average diversification advantages in Thailand besides Japan. The Islamic investors can benefit more from US shariah stock index in the long-term investments.

Caia, Tiana and Hamorib (2016: 8) investigated the DCC (dynamic conditional correlations) among the eight east Asian stock markets with the US stock market. The study concluded that there is an increase in the conditional correlation in the first phase of GFC and its contagion from the US market. They employed the DCCX MGARCH (a DCC Multivariate GARCH model with exogenous variables) and DECOX-MGARCH (a dynamic Equi correlation multivariate GARCH model with exogenous variables) to achieve the targets.

Saiti and Noordin (2017: 12) investigated the diversification advantages in the Islamic equity investments to the conventional investors of selected Asian and European nations by employing the multivariate GARCH approach. The stock indexes of Japan offer higher diversification rather than the southeast Asian nations. The stock indices of the USA offer higher diversification than the European nations.

Sakti et al. (2018: 13) investigated the diversification benefits for the Indonesian Islamic equity investors in the trading partners of Indonesia and commodities (gold, crude oil, and cocoa) by employing the MGARCH and Continuous Wavelet analysis. The authors comprise Dr Burhan Uluyol concluded that investors should invest in the US and Indian

shariah stock indices, but diversification opportunity is more in USA. Gold provides safe haven for diversification benefits. The investors who want to diversify in commodities should not hold portfolio more than 16 days for diversification.

Buriev (2018: 11) investigated the diversification advantages for the Turkish stock traders besides investors in MENA nations during the Arab spring by employing the MGARCH DCC approach. The empirical findings suggest that Turkish investors cannot benefit diversification in the Egypt but can benefit diversification in Lebanon.

Mechri (2018: 14) investigated the volatility of exchange rate on the stock markets of Türkiye and Tunisia by employing the GARCH model. The study concluded that exchange rate volatility has a significant impact on the stock markets of both countries.

Chaffai and Medhioub (2018: 18) investigate the herd behaviour in the GCC markets. Generalized auto regressive conditional heteroskedasticity (GARCH)-type models and quantile regression analysis were employed. The results showed herding behaviour. Finding is consistent with the research in China, Japan and Hong Kong. The Islamic finance can influence the behavior positively.

Jaffar, Dewandaru & Masih (2018: 17) investigated the linkage of profit and loss sharing financing with the portfolio optimizing opportunities for the Islamic asset managers and investors. The study explored the diversification opportunities with venture capital (profit and loss sharing) by employing MGARCH-DCC, Markov Switching, and Wavelet Approaches. Islamic financial institutions are often criticized to offer the PLS investments. The study concluded that there are portfolio and diversification opportunities for the fund manager and investors in PLS in the long run. Getting venture capital data is difficult so the study used the FBM Ace as proxy for the performance of the venture capital investments. Ace is mainly a market for the emerging companies with minimal criteria for listing.

Alfreedi (2018: 11) investigated the shocks, events and volatility spillover from stock markets of developed markets (United States of America, the United Kingdom and China) to the GCC stock markets (Kuwait, United Arab Emirates, Qatar, Saudi Arabia, Oman, and Bahrain). The authors employed MGARCH-BEKK and concluded that correlation among the developed and GCC stock markets. The markets move in the same direction.

The US is affected by the spillover (return, shocks and volatility) from United Kingdom and China.

Boujelbène (2018: 18) researched the spread of shocks of oil market and Islamic and conventional indices of GCC. Dynamic conditional correlation–generalized autoregressive conditionally heteroskedastic model for contagion. The filter of Kalman for pure contagion. Results showed the contagion in oil and markets during 2008 and 2014 turmoil.

Karime and Sayilir (2019: 13) investigated the political news from 2008 to 2019 and its impact on the stock market of Türkiye. The study analyzed the good and bad news and volatility of the stock market. The daily data was taken from Electronic Data Delivery System (EVDS) web service. The study used the GARCH model. The results showed a significant impact on political news.

Saiti et al. (2019: 11) wrote about the benefits of diversification for the conventional Chinese equity investors in the Islamic investments by employing the Multivariate GARCH GCC model. The authors investigated the FTSE different Islamic indices of China. MGARCH DCC estimated the time-varying linkages of returns of the chosen stock indices. The study concluded that Islamic stock indexes are not more sensitive than the mainstream indices. Results depict that Chinese stock investors can take advantage from Islamic stock indices especially by diversifying with DJ Islamic Greater China.

Joyo and Lefen (2019: 19) about the co-movements of Pakistan stock market with its trading partners by employing the Multivariate DCC-GARCH approach. The study used the MSCI indices for the China, Indonesia, Malaysia, UK and United States. The study concluded that stock market of Pakistan was integrated during the GFC 2008, but integration decreased later. The study concluded that there are diversification opportunities for the investor among Pakistani stock market and its trading partners.

Seth and Singhania (2019: 14) investigated the volatility spillover and linkages among frontier markets by employing the multivariate GARCH model, BEKK besides DCC. The study concluded that frontier markets are not linked in the long run as per Cointegration test. Secondly the market does not cause each other even in the short run according to the Granger Causality test. The effect of the shock from the own market has not persisted for

a long time according to the BEKK. The shock from other markets persists for longer according to the DCC test. All markets depicted the volatility spillover.

Shahateet, Shrydeh and Mohammad (2019: 14) investigated the linkages and relationship among the Arab stock markets by employing the GARCH model, panel and individual stationarity, co-integration tests. The study concluded with weak linkage among the GCC markets.

Mensi et al. (2019: 11) explored the transmission of risk besides effectiveness of hedging for oil and gold for the Islamic and conventional bank stock indices for GCC. using the DECO-FIGARCH model. The study concludes the less relationship between the GCC IBs indices and Oil and gold. But there is a significant risk spillover for the GCC Bank and oil and gold.

Kartsonakis-Mademlis and Dritsakis (2020: 14) investigated the importance of MGARCH model on volatility spillover from oil price and stock market of G7 countries. Volatility spillovers are important for portfolio diversification and risk management. The study concluded the importance of the asymmetric BEKK model. The study further concluded that oil assets provide the diversification of stock.

Rusmita (2020: 10) explored the co-movements of capital markets in southeast Asia. The study investigated the correlation of Islamic and conventional stock indices with regional and global indices employing the MGARCH. The authors concluded that conventional index of Malaysia is less volatile than Islamic index and both with correlation movements. Overall markets have correlated movements. During the time of global distress, the Malaysian and Indonesian markets do not provide the diversification opportunities.

Abdulkarim et al (2020: 7) investigated the nexus of Islamic stock of Africa and prices by employing the wavelet and Multivariate-GARCH model. The study employed MODWT, CWT, and multivariate-GARCH-DCC to investigate diversification opportunities. The study concluded that Egyptian market leads all. Low nexus between Egypt and Tunisia. Tunisia has low volatility with oil index. So, there are diversification opportunities for investors.

Jain (2021: 13) investigated the impact of COVID-19 on the Indian stock market and firm bitas by employing the Conditional capital asset pricing model and MGARCH. The study

concluded that betas increased during the time of first corona virus wave but not during the second corona virus wave.

Elhassan (2021: 15) investigated the asymmetric effect of COVID-19 volatility of the GCC stock market returns employing the GARCH and exponential GARCH (EGARCH) models. COVID affected the GCC markets according to GARCH. EGARCH also reiterated the impact of COVID-19 on the GCC stock markets and negatively impacted the markets.

Abdullahi (2021: 16) wrote about the projectories (extend from surface) of the Islamic stock indices during the time of COVID-19 by using the GMM. The study investigated Pakistan, Malaysia, Nigeria, India, USA, Canada and Japan. The results show co-movements, market returns are cointegrated and volatility possibility is high during COVID.

Abro and al Mustafa (2021: 17) investigated the impact of Ramadan on the GCC returns and volatility. Data was taken from datastream. ARCH-GARCH is employed for return and volatility. Study founded the effect of Ramadan on Saudi Arabia and UAE but not for Bahrain and Oman.

Baek & Lee (2021: 19) investigated the volatility transmission effect among the American stock markets and novel COVID by employing the BEKK model. The study concluded that the volatility also depends on past COVID-19 shocks. The bad news affected the market more than the good news. The study witnessed the volatility spillover effect.

Abdullah (2022: 11) investigated the hedging and diversification opportunities for the Australian investors that hold the conventional and Islamic stock indices crude oil, gold, Bitcoin, and the Australia–US exchange rate. The authors applied the MGARCH DCC, Continuous Wavelet Transform, and maximal overlap discrete wavelet transform (MODWT) for the objectives of the research. The study concluded that Bitcoin provides diversification opportunities, but high volatility is issue in Bitcoin.

Yousaf et al. (2022: 15) explored the volatility spillover and hedging variation among the GCC during GFC and COVID-19 by employing the bivariate VAR-asymmetric-BEKK-GARCH. The study concluded that spillovers between GCC countries increase during

these events. Gold provided the safe haven for most of the GCC countries according to the Time-Varying correlations.

Aliani, Al-kayed and Boujlil (2022: 17) wrote about the COVID's impact on the movements of the Islamic and conventional stock indices in GCC with the help of wavelet coherency approach and the DCC- GARCH (1,1). The study concluded that Islamic and conventional indices movements are same during the COVID-19, but Islamic indices were less volatile.

Kyriazis and Economou (2022: 13) investigated the impact of geopolitical uncertainty on the Turkish lira against other currencies during the time of Erdoğan by developing the innovative uncertainty index and using modern GARCH methodologies. The econometric results show that geopolitical uncertainty impacts the depreciation of TL against US dollar.

Kılıç, Uluyol and Hassan (2022: 9) investigated the portfolio diversification opportunities for Türkiye based investors in the top trading partners of Türkiye by employing the Multivariate-GARCH model. The authors analyzed the diversification opportunities for the conventional and Islamic stock indices. GARCH-DCC is used to measure the time-varying correlations in between Turkish stock index returns and stock index returns of trading partners of Türkiye. The study used the MSCI indices of Germany, Italy, UK, USA, France, Spain, Netherland and Russia. The study concluded that USA provides the most diversified opportunities for conventional and Turkish Islamic equity investors. The Islamic stock index has lower correlation with trading partners than conventional index. Turkish and Russian indices were most volatile indices.

Karim, Chowdhury & Masih (2022: 7) investigated the relationship between oil and stock market returns of BRICS by employing MGARCG DCC and Wavelet during COVID-19. The study concluded the returns of China and Indias stock market are less associated with oil price and noticed less volatile. Overall, the oil price returns led to the stock market returns of BRICS.

Hoque et al. (2022: 11) investigated the association and spillover effect of US climate policy uncertainty on the energy stock, alternative energy stock and carbon energy emissions futures. The research investigated the spillover effect before and after the Paris agreement by employing the MGARCH approach. The study concluded that energy stocks

and carbon emission futures are linked with the US climate policy uncertainty. Uncertainty in US climate policy is the transmitter, but global alternative energy and carbon market is receiver. The research concluded the increase in connectedness after the Paris agreement. There was a spillover effect.

Zahid et al. (2022: 7) investigated the volatility spillover of energy prices (environmental fluctuations) to the south Asian stock markets (i.e., Bangladesh, India, and Pakistan) by employing the ARCH-GARCH and Granger causality test. The study concludes that bidirectional causality is present among the environmental prices (energy markets) and the stock markets of Bangladesh, Pakistan and India. Energy to stock markets of Pakistan and India volatility spillover is present but not for Bangladesh.

Mahran (2022: 16) investigated the Russian war on Ukraine and its impact on the volatility connectedness among the Egyptian stock market sectors by using the DCC GARCH approach. The study finds tha9t the transportation sector is the transmitter of volatility.

Ghouse et al. (2022: 9) investigated the asymmetric spillover impact of COVID-19 on the KMI 30 (Islamic stock index of Pakistan) by employing the asymmetric GJR-GARCH. The return and volatility spillover are seen from COVID to KMI in each wave.

Kyriazi and Economou (2022: 13) investigates the linkages between Turkish geopolitical uncertainty with the lira fluctuations against other currencies. The study used the innovative geopolitical uncertainty index and modern GARCH approaches and revealed that geopolitical uncertainty drives the lira devaluation against the dollar.

Hidayat et al. (2022; 7) investigated the conditional correlation and volatility spillover among USA and ASEAN Islamic Stock market by employing three Multivariate GARCH models (BEKK, diagonal VECH, and CCC model). The authors used MSCI Islamic stock indices for the analysis. The study concluded that there is return and volatility spillover among the US and ASEAN Islamic stock markets. Despite these there are diversification opportunities as per estimated time-varying conditional correlations and volatilities. The investors can benefit from diversification in MSCI Thailand, Indonesia and Singapore because these are less correlated with US MSCI Islamic stock index.

Joshi, Wang and Busler (2022: 6) investigated the volatility spillover in the S&P 500 index of US cryptocurrency market (BGCI) by employing machine learning tools. The study

concluded that inverse shocks or events affect the S&P 500. There is a clue of one sided cross-market asymmetric volatility transmission from the crypto market to S&P 500 stock during the time of COVID-19. The study concluded the diversification benefits among S&P and BGC.

Alotaibi and Morales (2022: 8) investigated the impact of global health cries and Saudi Arabian and Russian oil price war employing the GARCH and FIGARCH models for the Kuwait market. The study concludes that there is evidence of volatility across the markets.

Stoupos, Nikas and Kiohos (2023: 14) analyzed the Turkish financial markets and lira depreciation by employing the Factor-augmented error correction model and fractionally integrated exponential GARCH. The authors investigated that lira depreciation can lead to economic collapse as compared to the economic thrive after the 2001 economic crisis. The study reveals negative dynamics among exchange rate of lira and Turkish stock market. Türkiye sooner or later must abandon the low interest policy or apply for IMF.

Chang and Chang (2023: 16) investigated the linkage of exchange rate, stock price and oil price for China by employing the Bayesian Multivariate Quantile on Quantile with GARCH approach. The study found that there is a link between stock and oil market. There is a negative connection between the exchange rate and the stock market.

Hussain, Bashir and Rehman (2023: 11) investigated the stock price volatility and exchange rate relationship in the BRICS by using the GARCH model. The study concluded that exchange rates and stock markets are related during the pandemic. Russia has strong unidirectional volatility connectedness with India. China has less volatility connection with other BRICS members.

Sreenu (2023: 6) investigated the effect of inflation, exchange rate on the stock market volatility by employing the autoregressive distributed lag (ARDL), GARCH and the corresponding Error Correction Model (ECM). The results show that there is a significant correlation between the stock market and exchange rate in the long run.

Rehman and Karimullah (2023: 7) investigated the black swan events (US Mortgage and credit crisis GFC 2008 and the COVID-19 pandemic) and behavior of the GCC stock markets. The research applied the ARCH and GARCH model. The study concluded that

these two black swan events had heterogenous response. During the GFC, the impact was severe than the COVID-19.

Prandi and Colecchia (2023: 11) recently investigated the GCC and shariah stock indices in the market timing strategy perspective namely Tadawul All Share Index, FTSE Abu Dhabi General Index, Qatar All Share Index and Qatar Al Rayan Islamic Index. asymmetric GARCH models (GJR-GARCH). The results encourage the volatility-based market timing models in emerging and Islamic indices.

Fortin, Simonato and Dionne (2023: 8) investigated the usage of multivariate models for stock market related research. The authors concluded that both have the same accuracy level, but univariate models are easy and simpler to use than multivariate models.

Dasa and Roy (2023: 6) wrote about the co-movements and volatility spillover of returns among the currencies of BRICS countries with the four developed countries by employing the flexible multivariate generalized autoregressive conditional heteroskedasticity (MGARCH)–dynamic conditional correlation (DCC) model and a vector autoregressive (VAR). The currency markets of developed countries are the leaders and transmit volatility to BRICS.

Gil-Alana et al. (2023: 12) wrote about the long run co-movements of seven stock indices from Europe, Asia and North America. The study concluded that indices are individually persistent. There is less persistence in co-movements among the indices.

Chopra and Mehta (2023; 16) wrote about the possibility of green bonds as safe haven and hedge for stocks by employing the DCC MGARCH model. Green bonds provide the safe haven and hedge for the eleven stock sectors of the USA. They also depict the strong hedge property with high emission sectors excluding the financials during the corona virus periods. The safe haven benefit of green bonds is not linked with the environmental disclosure score of company. Investors can add green bond to the stock portfolio and can enjoy the diversification opportunity.

Chancharat and Sinlapates (2023: 7) wrote about the linkage and spillover of WTI crude oil and stock markets of ASEAN plus 6 countries (Australia, China, Indonesia, India, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Vietnam) during the COVID-19 and Russian-Ukraine War. The authors employed the DCC-

GARCH to investigate the objectives of the study. The study concluded that volatility of crude oil influenced all countries. The volatility and spillover of crude oil was not significant during the pre and COVID-19 era as well as Russian-Ukraine war. The investors should acknowledge the dynamic volatility and correlation of crude oil and stock while planning diversification (maximizing returns and decreasing returns).

Ampountolas (2023: 11) investigated the spillover effect of the COVID-19 on the global stock markets and cryptocurrencies by employing the two stages DCC EGARCH. The empirical findings show the significant short-term and long-term spillover effect.

Noman et al. (2023: 16) investigated the contagion effect and relationship among DJI, DJIM, gold, silver, oil, bitcoin, ethereum and cryptocurrency index during the COVID pandemic. The authors employed the MGARCH-DCC, MODWT and Wavelet Coherence analysis for the objectives of the research. The empirical findings of the research reveal that gold offers a safe opportunity because of lower volatility and relationship with the stock market investments unlike other assets.

Khan (2023: 17) investigated the integration and dynamics of volatility spillover in BRICS (Brazil, Russia, India, China, and South Africa). The author investigated the diversification opportunities in the other BRICS countries. The author employed the Granger causality test to know the direction of causality, VAR technique to know that movements in the Indian markets are affected by its own past values or past values of the BRICS, DCC-MGARCH to know the degree of integration or volatility spillover from the Indian stock market to the stock markets of the BRICS. The study concluded that volatility is spilling over from Indian stock market to other stock markets of the BRICS. It means the Indian stock market is the transmitter for the BRICS. No diversifications for the Indian investors in the BRICS market.

Abdullah et al. (2023: 6) investigated the co-movements of US and China stock indices for the portfolio diversification benefits with the gold, crude oil and Bitcoin as well as the exchange rate of Chinese Yuan Renminbi against US dollar. The study employed the vector error correction model (VECM), namely, maximum overlap discrete wavelet transformation (MODWT). The study concluded based on VECM that changes in the Bitcoin price, crude oil and CNY/USD affect the Chinese and US stock market indices

and gold too. The study concluded based on MODWT that Bitcoin price leads the crude oil. US investors can diversify in gold. Continuous wavelet transformation depicts that diversification opportunity will persist only for 64 days.

Bernardoa, Campanib and Roquete (2023: 13) investigated the Brazilian REIT for the diversification opportunity by analyzing the dynamic relationship with the stock and bond indices by employing the VAR-DCCt MGARCH (vector autoregressive multivariate dynamic conditional correlation GARCH model with Student's t distribution) Brazilian REIT provides continuous diversification opportunity for the Brazilian investors.

Melki and Ghorbel (2023: 8) investigated hedging in the emerging eastern European stock markets with the commodity market. The study employed the three types of MGARCH models (DCC, ADCC and GO-GARCH). The study concludes that eastern European stock market can hedge industrial metals and energy commodities.

Shi et al. (2023: 9) investigated the supply chain market of China new energy vehicles. The authors used the VAR model and DCC-GARCH to analyze the risk spillover effect of new vehicle firms stock market, stock market of lithium suppliers and spot market of raw material. The study concluded that there is spillover effect among the lithium battery stock price and NEV stock price. Price of raw material of lithium battery does not have significant impact on lithium battery stock price and NEV stock price. The study is unique in this respect that it investigated the multiple dimensional risk spillover impact on the new energy vehicles NEV from macro and micro level plus stock and spot markets.

Aloui (2023: 12) investigated the relevance of global geopolitical risk in the conventional and Islamic bonds by employing the multivariate GARCH model under dynamic conditional correlations (DCCs) to the daily data of GCC countries. The study concluded that geopolitical risk positively influenced the dependence among the Islamic stock and sukuk. This trend is the same for the conventional counterparts too.

Al-Hajieh (2023: 16) investigated the predictive directional volatility spillover among the S&P 500 of US and 12 chosen Asian pacific countries employing the DECO GARCH models. The authors used the generalized VAR, variance decomposition, and spillover index to find out the directional spillover. The results find out that Hong Kong and Singapore have direction of return to the other stock markets, but China is net receiver of

it. Hedge ratios, portfolio weights, and hedging efficacy are better in India, Hong Kong, and New Zealand.

Saleem et al. (2023: 11) investigated the volatility spillover and dynamic conditional correlation of the FAANG stocks (Facebook, Amazon, Apple, Netflix, and Google) between the gold and shariah compliant stock equities for the portfolio purposes. The study employed the Multivariate GARCH model for the objectives. The study concluded that the gold and shariah compliant stock equities provide the diversification opportunities for the FAANG stocks.

Attia (2023: 17) investigated the diversification benefits in the US with its major trading partners (United Kingdom, Canada, China, Japan, Malaysia, and Turkey) for the Islamic and conventional investors before and after the COVID-19 pandemic. The study applied three time-varying and timescale dependent techniques (1) continuous wavelet transform (CWT), (2) the wavelet multiple correlation (WMC), and (3) the wavelet multiple cross-correlation (WMCC) to achieve the objectives. The research concluded that US investors can get diversification benefits for short investment horizons, but they don't get diversification benefit for longer period of time. COVID-19 crises did not provide diversification opportunity for the US investors.

Lee & Baek (2023: 21) investigated the changes in 20 Cryptocurrencies by employing the sparse VHAR MGARCH model. The study concluded that there was volatility spillover and market crash because of COVID-19. The study investigated the impact before the COVID, during the COVID and after the COVID. The transmission/spillover index showed a greater level without interconnection among cryptocurrencies.

Guru, Pradhan and Bandaru (2023: 14) investigated the volatility spillover/contagion among oil and stock markets of G7 countries plus India and China employing the Diebold and Yilmaz (2012) technique. The study concluded that there is volatility connectedness among the G7, India and China but no significant spillover among the oil prices and stock markets for all countries. There was a bidirectional spillover between oil and stock markets during the COVID-19 pandemic.

Katyoka & Stevenson (2023: 16) investigated the volatility spillover/transmission in the UK REIT and stock market by employing multivariate analysis with both (1) Constant

Conditional Correlation (CCC) and (2) Dynamic Conditional Correlation (DCC) GARCH. The study found the volatility presence and transmission.

2.8 Global Islamic Indices Providers:

Arshed et al. (2019: 16) explained that Islamic finance is beneficial for Muslims and non-Muslims. The word Islamic does not represent its target market but its methodology. Many non-Muslim investors are searching for economic model based on realism, morality and justice. Islamic Finance can provide them diversification opportunities. Almost every global index provider offers Islamic stock indices that is global recognition of Islamic finance.

a) Malaysia:

Malaysia was the premier and first mover country that started the Shari'ah compliant stock index in 1996 by the RHB Unit Trust Management Bhd. Later, Kuala Lumpur Shari'ah index was launched in 1999 (Yildirima & Ilhanb, 2018: 4).

b) S&P Global Maintains S&P and Dow Jones

S&P global maintains the S&P Dow Jones stock indices. S&P Global introduced Dow Jones Islamic market index February 1999. Dow Jones Islamic Market index series consist of many blue-chip companies. DJIM makes stock indices for 66 countries. DJ introduced many Islamic stock indices for different companies of different countries. DJ maintains a Separate index for companies from developed markets that follow certain screening criteria. DJ maintains Dow jones Islamic Market World Index by selecting the worldwide companies. Small cap, mid cap and large cap for the companies traded in US have separate indices. Companies from Europe have separate Islamic index. The corporations from Asia, GCC and emerging markets have separate Islamic indices. Separate Islamic index is developed for the 100 Chinese companies that pass the shariah criteria. Dow Jones Islamic Sri Lanka index is separately developed. Separate index is there for Türkiye with the name of Jow Jones Islamic Market Turkey (DJIMTR) Index and was launched in 2004. This is calculated float adjusted index, consisting of 17 constituents (the constituents change with span of time). This index is developed to calculate the performance of corporations that are traded in Borsa Istanbul Stock Exchange (BIST) Türkiye and these

corporations follow the Shari'ah screening criteria of Dow Jones (Khamlichi et al., 2014; Yildirima & Ilhanb, 2018: 6).

c) S&P Global also Maintains the S&P Series.

S&P maintains indices for almost 70 countries and shariah series was introduced in2006. S&P 500 Shari'ah and S&P 1200 Shari'ah are introduced to measure the performance of Shari'ah compliant stocks that are traded in United States of America and follow the stock screening criteria. These are parallel to the conventional stock indices S&P 500 and S&P 1200 but different in the sense that these do not follow certain Shari'ah screens. S&P/TSX 60 Shari'ah is developed for Canadian stocks that are traded in Canadian stock market. This is also like the conventional counterpart but does not care about Shari'ah screens. 350 stocks of Europe that pass Shari'ah screen have separate shariah index. S& P also introduced Shari'ah indices for health, property, financial, energy and industrial sectors. S&P also developed shariah stock index for Japan, South Africa, Bric, Bangladesh and India. S&P BSE 500 Shari'ah compliant is developed from Indian stocks and works parallel to the S&P BSE 500. This index is maintained in Indian rupee (Khamlichi et al., 2014; Yildirima & Ilhanb, 2018: 4).

d) FTSE Group:

FTSE group is owned by the London Stock Exchange. Its previous name was financial times. FTSE Group developed series of Islamic indices in October 1999 to be maintained in London Stock Exchange. FTSE Group also maintains three index series for Singapore stock exchange, Nasdaq Dubai 2006 and Bursa Malaysia 2006. FTSE also maintains Islamic index for Taiwan and Thailand. FTSE Bursa Malaysia Hijrah Shari'ah Index (FBMH) is consisting of 30 companies. It is developed based on free float, liquidity and investibility. Yasaar limited is responsible authority for screening process of stocks. Yasaar consists of Shari'ah scholars of major school of thoughts. It maintains credibility of the indices. These days investors are heedful about sustainable investment (the corporations that consider climate and environment etc.) and Environment, Social and Governance (ESG) such indices consider waste, pollution, deforestation, climate change, employee health and safety, corruption and board diversity in their investment etc. (Khamlichi et al., 2014; Yildirima & Ilhanb, 2018: 3).

e) Morgan Stanley Capital International:

MSCI Global Islamic indices were developed in 2007. It maintains indices for 70 countries. MSCI world Islamic index is developed from 23 developed countries consists of 340 companies. MSCI USA Islamic index composed with 94 large and mid-cap stocks of USA that follow the criteria. There is Separate Islamic index made up for Japanese 64 companies. Islamic index of Latin America composed 16 constituents from 6 emerging market of Latin America. There is Separate Islamic index developed for Singapore that is made up of 12 constituents. Qatar Islamic index composed of 12 companies on free float pattern. Malaysian Islamic index consist of 19 constituents. MSCI India Islamic Index Composed 35 companies. Frontier Markets also have Islamic index composed of 27 countries constituents of 15. Frontier Market is that is less developed than emerging markets but better than least developed countries. Frontier markets comprise Bangladesh, Bahrain, Jordan, Lebanon, Morocco, Oman, Romania, Sri Lanka, Kazakhstan, Nigeria etc. All these indices are maintained in US currency.

MSCI Islamic index series obeys the screening criteria. This also follows both qualitative and quantitative criteria to be included in the index. The income from prohibited activities should not be more than 5%. Interest bearing debt should not be more than 33% (Khamlichi et al., 2014: 6).

Summary of the Chapter:

Literature mostly shows that markets were negatively reactive to the COVID-19 and Ukraine war. Literature mostly did not focus on investigating the impact of Glasgow climate pact on the stock markets. There are few studies on this topic. Literature about the impact of ChatGPT launch on the stock market is scanty but there is a recent trend to cover this gap. This research is also contributing to this gap.

CHAPTER III

THEORETICAL FRAMEWORK/ FOUNDATION

3.1 Impact of COVID-19, GCP, Ukraine War & ChatGPT on Stock Indices:

This chapter establishes the theoretical foundation for probing the effect of major global events, namely COVID-19 pandemic, Glasgow Climate Pact, Ukraine War, and launch of ChatGPT on conventional and Islamic stock indices in G7, GCC, Türkiye and Pakistan. The researcher integrated the insight from the Efficient Market Hypothesis, behavioral finance, and contagion theory, employing them to the unique structural characteristics of Shariah-compliant stock indices. By doing so, it builds a logical pathway to the development of this study's core hypotheses. The reaction of stock markets to major unexpected information/events is a central theme in financial economics. Three primary theoretical streams guide this research.

The Efficient Market Hypothesis (EMH), famously described by Fama (1970), mentions that asset prices fully reflect all available information. The EMH asserts that all publicly available information such as the announcement of a pandemic or a geopolitical conflict is immediately and fully incorporated into stock prices. If markets are perfectly efficient, there should be no systematic difference in the risk-adjusted returns of conventional and Islamic indices following these public global events. Any price adjustment would occur instantaneously, and it would not be possible for one index class to consistently "perform better" than the other. Therefore, finding significant differences in their responses would suggest deviations from market efficiency, which can be explored through alternative theories (Gaio et al. 2022: 7).

According to macroeconomic theory, global shocks or events that are unexpected such as pandemic (COVID19, Glasgow Climate Pact, Ukraine War and ChatGPT Launch) create uncertainty that effects the aggregate demand, supply chain system, output, employment and financial markets (conventional and Islamic Stock Indices). Major events like a pandemic or Ukraine war are not merely financial news; they are profound macroeconomic shocks. They disrupt global supply chains, alter aggregate demand, and create significant policy uncertainty (Baker et al., 2020: 5).

According to Behavioral finance, financial stock indices (conventional and Islamic) rapidly incorporate every new information such as COVID19, Glasgow Climate Pact, Ukraine war and ChatGPT launch. Behavioral finance challenges the purely rational assumptions of EMH by incorporating insights from psychology. It argues that investors are not always rational and are subject to cognitive biases that can influence market outcomes. Key concepts relevant to this study include:

- Investor Sentiment and Herding: Shocks can trigger waves of fear or optimism, leading investors to make decisions based on emotion rather than fundamental analysis. This can result in herding behavior, where investors irrationally follow the actions of a larger group, amplifying market volatility (Shleifer & Summers, 1990).
- Overreaction Hypothesis: Research by De Bondt and Thaler (1985) suggests that markets tend to overreact to unexpected and dramatic news events, leading to predictable reversals over the long term. (He et al. 2020: 13)

This study posits that the principles underpinning Islamic finance—such as the prohibition of speculation (maisir) and excessive uncertainty (gharar)—may foster a more disciplined investor base, potentially mitigating the effects of negative sentiment and herding.

According to Contagion theory in financial economics describes that crises in one sector or market can transfer to other sector or market. COVID, Glasgow climate pact, Ukraine war and ChatGPT launch affects the financial markets (conventional and Islamic). Contagion theory explains how these shocks can propagate across markets and borders. A crisis originating in one sector (e.g., the conventional banking sector) can spread to the broader market. (Zaidi et al., 2015: 4).

This framework theorizes that the structural composition of Islamic indices, particularly their exclusion of the conventional financial sector, may act as a firewall, insulating them from certain channels of financial contagion.

This framework provides the basis for empirically investigating the extent and nature of COVID-19, GCP, Ukraine war and ChatGPT Launch's impact on the conventional and Islamic stock indices. The COVID-19 pandemic, GCP, Ukraine war and ChatGPT launch

had significant impact on both Islamic and conventional stock indices, but the nature and magnitude of the effect could be different due to differences in their investment principles.

3.2 The Theoretical Implications of Shariah-Compliant Screening

The core of this thesis lies in the argument that the differences between conventional and Islamic indices are not trivial, they are structural. These structural differences, rooted in Shariah screening criteria create theoretically sound reasons to expect divergent responses to shocks. A primary quantitative screen for Islamic indices is a ceiling on a firm's leverage, typically requiring that its total debt-to-total assets ratio be below 33.33%. Corporate finance theory suggests that firms with lower leverage are inherently more resilient during economic downturns. They face a lower risk of bankruptcy, have more stable cash flows, and are less vulnerable to credit crunches when financial conditions tighten (Modigliani & Miller, 1963). This lower financial risk profile should, in theory, translate to greater stability at the index level during systemic crises.

Islamic indices apply qualitative screens that exclude specific industries deemed haram (impermissible). These include conventional financial services (banking, insurance), alcohol, tobacco, and pork-related products, defense and weapons manufacturing, gambling and adult entertainment. These exclusions are directly relevant to the events under study. The exclusion of conventional banks provides a potential shield from contagion originating in the financial sector. The exclusion of defense contractors creates a clear compositional difference during geopolitical conflicts like the Ukraine War. Furthermore, this "ethical" screening creates an overlap with modern environmental, social, and governance (ESG) principles, which may influence reactions to policy shocks like the Glasgow Climate Pact.

3.3 Hypothesis Development: Linking Theories and Events

Based on the synthesis of theories above, the following event-specific hypotheses are proposed. The primary metric for testing will be the Cumulative Abnormal Return (CAR).

Event 1: The COVID-19 Pandemic (Systemic Health & Economic Shock)

- Theoretical Rationale: This event tested corporate resilience on a global scale. The low-leverage and financial-sector-exclusion characteristics of Islamic indices are theoretically primed to offer protection during such a systemic economic crisis.
- Hypothesis 1: In response to the declaration of the COVID-19 pandemic, selected Shariah stock indices will exhibit statistically significant smaller negative Cumulative Abnormal Returns (CARs) compared to their conventional counterparts in both G7, GCC, Türkiye and Pakistan.

Event 2: The Glasgow Climate Pact (Regulatory & Policy Shock)

- Theoretical Rationale: This event signaled a global policy shift against carbon-intensive industries, which form a significant part of conventional indices. The ethical and social responsibility inherent in Islamic finance may align its portfolios more closely with sustainable goals, even if not explicitly mandated.
- Hypothesis 3: The announcement of the Glasgow Climate Pact will be associated with a more positive (or less negative) CAR for selected Shariah stock indices than for their conventional counterparts, reflecting a lower implicit exposure to climate transition risk.

Event 3: The Ukraine War (Geopolitical & Commodity Shock)

- Theoretical Rationale: This shock directly impacted on the defense and energy sectors. Islamic indices exclude weapons manufacturers, which likely rallied in G7 countries. However, the GCC region, being a major energy exporter, experienced a different economic impact. This allows for a nuanced test of the sectoral exclusion principle.
- Hypothesis 3: In response to the outbreak of the Ukraine War, selected Shariah stock indices in G7 countries will underperform their conventional counterparts (due to the exclusion of rallying defense stocks), while the effect in GCC countries will be less pronounced and driven more by commodity effects.

Event 4: The ChatGPT Launch (Technological Disruption)

- Theoretical Rationale: This represents a positive, innovation-driven shock, primarily benefiting the technology sector. This event tests whether the screening criteria of Islamic indices hinder or help in capturing upside potential. The low-debt requirement may favor financially robust, cash-rich technology firms.
- Hypothesis 4: Both index types will react positively to the ChatGPT launch, but Shariah stock indices will exhibit comparable or superior CARs, indicating that their financial screening criteria effectively select for resilient and innovative technology firms without impeding growth potential.

3.4 MSCI Shariah Stock Screening Criteria:

First, qualitative screens are checked that the company should not be involved in certain prohibited activities. These activities include alcohol, tobacco, pork-related products, conventional financial services (banking, insurance, etc.), defense/weapons, gambling/casinos, Music Hotels, Cinema and Adult entertainment.

If the company passes the qualitative screen, it is gauged according to the quantitative screens. MSCI also does not take companies which get significant income from excessive leverage. The common financial ratios that are used in selection criteria are these:

(1) The total debt over total assets of the company should be lower than 33.33. (2)

(2) Cash besides interest-bearing securities of the company should be less than 33.33% of total assets.

(3) The amount of income generated from shariah non- compliant activities should be below 5% of the total revenue.

There are both the chances that conventional indices can perform better, or Islamic stock indices can respond better to major events. Since Islamic stock indices are don't include companies which are involved in excessive speculation and derivative trading. That's why Islamic indices can respond better after happening particular event than conventional stock indices. Many authors investigated the effectiveness of mainstream and Islamic stock indices. Rejeb & Arfaoui, (2019: 7) wrote that Islamic stock indices are more

efficient than the mainstream stock index. Islamic indices provided the more returns and diversification for the investors. Islamic indices are considered less risky as compared to conventional stocks. Islamic stock index can respond negative after happening particular event because it cannot take interest bearing loans in crises to survive. It can encounter more problems after a particular event happens than the conventional stock index. Alansari & Shaheen, (2021: 7); Trabelsi et al., (2020: 9) inferred that there is no difference in terms of effectiveness.

Hypothesis is developed based on previous research that response of Islamic stock indices provides more cumulative abnormal returns. Hypotheses are

1. Selected Shariah stock indices provide better CAR than counterpart in response to the COVID-19 event.
2. Selected Shariah stock indices provide better cumulative abnormal returns than counterpart in response to the Glasgow climate pact.
3. Selected Shariah stock indices provide better CAR than counterpart in response to the Ukraine war.
4. Selected Shariah stock indices provide better CAR than counterpart in response to the ChatGPT launch.

Secondly Islamic stock indices are dominated by mainstream stock indices. The Islamic stocks/assets/equities investors are in limited numbers. The question arises here that lower number of Islamic equities (that exclude companies which exceed the debt/equity ratio threshold.) provide risk-return profile while we compare with conventional assets. This research attempts to assess the return, risk and correlation. This research also attempts to compare both types of stock indices.

Glasgow Climate Pact, ChatGPT, COVID-19 and Ukraine War are the significant events that have significant impact on the world. These are the events that changed the course of debate in the world. Glasgow Climate Pact, ChatGPT, COVID-19 and Ukraine War are the significant events that had impact on the world's economy and affected the developing and developed nations. Literature explored empirical evidence of the impact of these factors on the different segments, population and markets. But literature did not

investigate these factors together. After empirical investigation of the effect of the most influential factor on the shariah and conventional stock indices of selected countries, that factor can be taken seriously. Previous studies did not use these five events collectively to the selected shariah and conventional stock indices sample.

A comparative analysis of the impact of the different major trending events on the Shariah compliant stock indices of GCC, Türkiye and Pakistan in comparison with conventional stock indices of G7 Countries from 2013 to 2023. Every event will have its own separate event day. Major Trending Events to be investigated are (1) Glasgow Climate Pact (2) ChatGPT launch (3) COVID-19 (4) Ukraine War

Gulf Cooperation Countries comprises (1) Bahrain (2) Kuwait (3) Oman (4) Qatar (5) Saudi Arabia (6) United Arab Emirates plus (7) Türkiye (8) Pakistan

(1) MSCI Bahrain Islamic (STRD) (1) Bahrain all share index (2) Dow Jones Islamic Kuwait (3) MSCI Oman Islamic (4) QE Al Rayan Islamic (5) MSCI Saudi Arabia Islamic Index (5) Tadawul all share (6) MSCI UAE Islamic Index (GDTR) (7) BIST Participation 100 (8) KMI 30 (9) Dow Jones GCC USD

G7 Countries comprises (1) Canada (2) France (3) Germany (4) Italy (5) Japan (6) United Kingdom (7) United States

a) 30 Indexes to be investigated:

MSCI Canada (measures the mid and large cap, comprises the 87 companies, covers the 85% approximately free floated adjusted market capitalization). MSCI Canada Islamic (it includes 34 companies). MSCI France (it includes 61 companies). MSCI Germany (it includes 50 companies). MSCI Italy (it includes 25 companies). MSCI Japan (it includes 320 companies). MSCI UK (it includes 100 companies). MSCI US (it includes 600 to 700 companies). MSCI Bahrain (it includes companies). MSCI Kuwait (it includes 13 companies). MSCI Oman (it includes companies). MSCI Qatar (it includes 10 to 15 companies). MSCI Saudia Arabia (it includes 35 to 40 companies). MSCI UAE (it includes 10 to 15 companies). MSCI France Islamic (it includes companies). MSCI Germany Islamic (it includes companies) MSCI Italy Islamic (it includes companies). MSCI Japan Islamic (it includes companies) MSCI United Kingdom (it includes companies). MSCI USA Islamic (it includes companies) MSCI Bahrain Islamic (it

includes companies). MSCI Kuwait Islamic (it includes companies) MSCI Oman Islamic (it includes companies). MSCI Qatar Islamic (it includes companies) MSCI UAE Islamic (it includes companies). MSCI Turkey (it includes companies). MSCI Turkey Islamic (it includes companies). MSCI Pakistan (it includes companies) MSCI Pakistan Islamic (it includes companies).

b) Market indices of each country maintained by that country: (Used in Event Study Methodology)

(1) S&P TSX Composite Canada (2) CAC 40 Index France (3) DAX 40 Germany (4) FTSE MIB 40 Index Italy (5) Nikkei 225 index (6) FTSE 100 Index UK (7) S&P 500 index USA (8) Bahrain all share index (9) Premier Market Kuwait (10) MSM 30 Oman (11) QE General Qatar (12) Tadawul All share index (13) DFM UAE (14) BIST 100 (15) KSE 100.

The researcher intends to research the COVID-19 pandemic, environmental event, political and technological major events and their proportionate impact on Shariah compliant stock indices and conventional stock indices of G7, Gulf cooperation countries plus Türkiye and Pakistan.

3.5 Method:

The researcher aims to employ a quantitative method for conducting this research. The researcher will use time series data from January 1, 2013 to December 31. 2023. Data related to the selected countries will be taken from Dow Jones/investing.com. COVID-19 will be taken from www.ourworldindata.org website. The event dates of the five events will be taken as event dates.

Simple regression will be employed for intercept, slope, R square and standard error that is compulsory to calculate expected returns according to the market model. The Researcher aims to utilize the event study approach to know the behavior of both types of indices. Event study was gradually ameliorated by Fisher, Jensen, Roll and Fama. It is also called event history analysis.

3.4 Event Study Methodology:

Event study is considered most appropriate for examining the impacts of events on stock prices/returns' performance. The event study has been considered a better approach to see the impact of different events e.g. merger, amalgamation or any corporate event. Researchers also employed an event study to investigate the impact of disease. Singh et al. (2020) explored the COVID-19 impact on G 20 countries and concluded significant negative abnormal returns in four sub event windows. Singh et al. employed event study approach for trend of share prices in 19 countries (excluding the European Union). Data time period 150 days before the event and 58 days after the event (Yan & Qian, 2020; 13).

The anticipated return rate is the return (gain or loss) that an investor is hoping for or anticipating from an investment. This is calculated based on historical values but there is no security of these anticipated returns, it may or may not, investors only get a clue of estimated expected gain. anticipated return is greatly significant in business, Modern portfolio theory MPT and pricing model of assets etc. (Yan & Qian, 2020: 12).

Anticipated rate of return = (% of chances x outcome) + (% of chances x outcome) so on we can realize this with the help of examples. This is a straightforward way to calculate the anticipated or expected returns. There are 10% chances of 100% gain and 90% chances of 50 % return.

$$ER = 0.1(1) + 0.9(0.5) = 55\%$$

If a security has 20 % chances of providing 10% rate of return, 50 % chances of providing 12 % rate of return and 25% chances of providing 14% rate of return.

$$ER = 0.2(0.1) + 0.5(.12) + .25(.14) = 11.5\%$$

If an investment has 50% chances of 20 % gain and 50% chances of losing 10%.

$$ER = 0.5(.20) + .5(-0.10) = 5\ \%$$

Sulehri and Ali (2020) mentioned that Actual return is the return that an investor gets in real life from an investment, asset or portfolio. The actual return shows the performance of securities and portfolios. The difference between anticipated and actual return provides the analytical invitation to find out the factors that influenced the anticipated return. Actual

return = (ending value - beginning value) / beginning value x 100 OR Actual return = Market return - expected return.

Abnormal return is the additional return (profit or loss) from anticipated return generated from security or portfolio. If the actual returns are greater than the anticipated return it is called a positive abnormal return and if the actual returns are smaller than the anticipated return it is called a negative abnormal return. Abnormal returns give the clue about performance of security with respect to market or benchmark. Abnormal returns are influenced due to different factors (Syani & Balkrishnan, 2013).

3.6 Market Model for Abnormal Returns:

Fama et al. (1969) proposed the event study approach that needs the calculation of abnormal and cumulative abnormal returns. There are distinct models/methods/benchmarks to calculate abnormal returns. (1) The average adjusted return rate model (It is not appropriate where bull and bear happens on event day). (2) The market index adjusted return rate model. (It is not better because it needs strong association assumption that is applicable in most cases. (3) And the market model is considered the best approach to forecast or predict effect or impact of an event on sample. (4) Capital asset pricing model (Khan et al., 2020: 7).

3.7 Expected Returns Under Market Model:

The market model presumes that market return at specific t is the only factor that determines the return on stock at that time.

The equation of this argument is described in linear form.

$$E(Ri, t) = b0 + b1 \cdot E(RM, t)$$

In easy form: Expected return = intercept + slope * market return

Sulehri and Ali (2020) mentioned that Market model is like the capital asset pricing model yet with some differences to CAPM because it takes intercept as constant rather than risk free rate as used in capital asset pricing model. So, variables or parameters used by market model can be obtained or calculated with the help of simple regression (Ordinary least square). First, we must acquire estimated intercept and slope values then we can calculate

the predicted/expected return for observed window (after the event). The model depicts the expected return that is attainable in a normal course.

$$ARi,t = Ri,t - E(Ri,t)$$

In easy and uncomplicated form: Abnormal return= actual return – Expected return

Sulehri and Ali (2020) explained that Cumulative abnormal return is the total, sum or addition of abnormal returns over a given period of time. It gives investors a hint about security performance over the time period. Generally, CAR is calculated for small windows or short period because some studies proved that calculating CAR for long term can create bias. CAR is used to see the effect of news etc. CAR helps you with decision making for investing.

$$CART = \sum AR$$

Arshed et al. (2019) explained that event study gives better results in efficient market. Price variations are random, so predictions do not work. Investors should choose long-term investment in an efficient market. Short term investment in an inefficient market as speculation works.

Sadaf and Andleeb (2014: 9) wrote that Capital asset pricing model is the model for calculating the anticipated return of security or portfolio. It is well received or in demanded way to evaluate the risky stocks etc. It delineates the relationship/link between systematic risk and anticipated returns. Market model presumes that market return at specific t is the only factor that determines the return on stock at that time. Equation of this argument is described in linear form.

$$E(Ri, t) = b0 + b1 \cdot E(RM, t)$$

In simple form: Expected return = intercept + slope * market return

Steps to calculate CAR:

(1) Calculate the market return, it will show you about trend in market. Is there an increase or decline in market? (2) calculate the return for individual stock, it will show you about trend in that stock. Is there an increase or decline in that stock? (3) Subtract market return

from return of 34 individual stock. This is abnormal return. (4) Repeat this process for your window. (5) Add abnormal return to from each of the days (Khan et al., 2020: 8).

Sadaf and Andleeb (2014: 8) defined that Capital asset pricing model is the model for calculating the expected return of security or portfolio. It is a popular way to evaluate risky stocks etc. It explains the association/link between systematic risk and expected returns.

3.8 DCC MGARCH Method:

The GARCH model is used to forecast the volatility of the return on the financial assets. MGARCH stands for multivariate generalized autoregressive conditional heteroskedasticity. MGARCH DCC stands for Dynamic Conditional Correlation. MGARCH DCC is used for spillovers, volatility, linkages, co-movements and diversification purposes.

The DCC MGARCH is made to gauge the time-varying relationship/connection/linkages of the chosen indexes, for ten years daily basis data beginning from 1 of January 2013 to 31 of December 2023.

One of the major approaches/strategies in investment decision is asset diversification, that is popularly employed in different type of assets, e.g. sukuk, bonds, stocks, commodities and real estate at national and international markets. The main purpose of this study is to explore the DCC among the returns of G7, GCC, Türkiye and Pakistan.

The results of this research may have several important contributions for the G7, GCC, Turkish and Pakistani investors and fund managers to plan their asset allocation between G7, GCC, Turkish and Pakistani Islamic indices besides the mainstream G7, GCC, Turkish and Pakistani indices.

In result, the scientific inferences give fruitful ideas for G7, GCC, Turkish and Pakistani traders and businessmen to get suitable monetary benefits by diversifying portfolio in Islamic stock indexes. Moreover, it might enhance the understanding of authorities to plan for better policies related to the development of Islamic capital market in G7, GCC, Turkish besides Pakistan, and then encourage the growth of G7, GCC, Turkish and Pakistani economy.

The research uses the multivariate DCC MGARCH approach to precisely gauge the time-varying sensitivity and association of returns of the chosen indices, as employed by Saiti et al. (2014: 4). The DCC approach is employed to notice besides analyzing the accurate timings of movements in the DCC among asset returns (Engle, 2002: 6).

The advantages of the DCC MGARCH approach are significantly described in pertaining studies. According to Lee (2006: 9), it assists in capturing the system of calculating DCC volatilities and DCC concurrently. It imparts not only a demystified procedure in gauging the dynamic association matrix but also considers true time-varying volatility to adjust the correlation coefficients continuously. In addition to that, this method can be employed to gauge correlation coefficients of the standardized residuals and correlations between multiple assets returns as it has a certain degree of flexibility like univariate GARCH model.

Specifically, the DCC MGARCH method comprises two steps estimations. Firstly, it is significant to gauge the conditional variances of every equity index by employing the following univariate GARCH (X, Y) model, given the k number of index returns:

$$h_{it} = \omega_i + \sum_{x=1}^{Xi} \alpha_{ix} r^2_{it-x} + \sum_{y=1}^{Yi} \beta_{iy} h_{it-y}, \text{ for } i = 1, 2, ..., k$$

Secondly, it is significant to gauge the time-varying conditional correlation among index returns. The standardized residuals gauged from the last step will be utilized as inputs in the following DCC estimator.

$$H_t = D_t R_t D_t$$

H_t stands for the multivariate conditional covariance matrix,

D_t is a diagonal matrix of conditional time-varying standardized residuals (ε_t).

$R_{t\ is}$ the symbol of the time-varying correlation matrix (off-diagonal elements). R_t is the sign for the time-varying correlation matrix (off-diagonal elements) (Pesaran and Pesaran, 2010).

Summary of the Chapter:

Event study is used to check the impact of CIVID-19, Glasgow climate pact, Ukraine war and ChatGPT launch. In addition to that DCC MGARCH is applied which does not rely on these events.

CHAPTER IV

EMPIRICAL ANALYSIS

There are three conditions for the stationary series. (1) Constant means (2) constant variance and (3) autocovariance should not be dependent on time. If series is fulfilling these three conditions so series would be considered stationary. Otherwise, it would be a non-stationary series. It is necessary to check the stationarity of time series for regression analysis because if the series is not stationary, then regression results will not be valid. It will be spurious or non-sense regression. There are three different methods to detect stationarity of series. The study is not intended to run regression analysis based on the time series. Study applied event study approach for the abnormal returns, so there is no need to check the series' stationarity as evidenced in the literature. Absence of stationarity analysis does not affect the results of the study. March11,2020 is the event date.

4.1 Event Study Estimation:

The detailed graphs based on the event study approach are depicted below for all the four major events. The graphs show the impact on the cumulative abnormal return of each stock indices. The graphs for each country individually and collectively are given below.

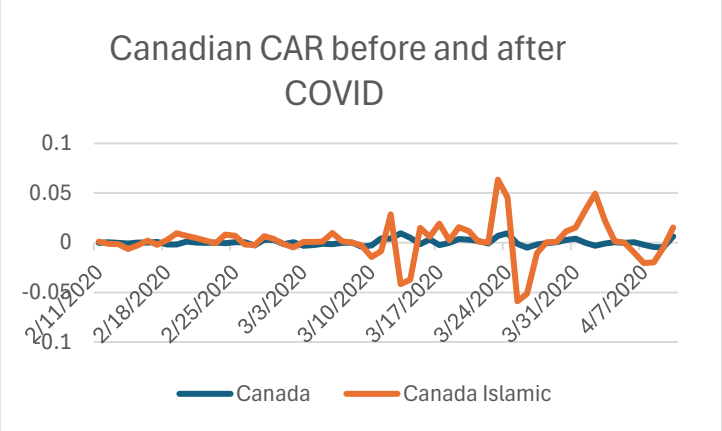

Figure 4.1: Canadian Both Indexes Before and After the COVID

Source: Excel, 2016

The MSCI Canada showed significance 5 times (negative 3 times) before the COVID and MSCI Canada showed the significance 11 times (negative 4 times) after the COVID. The MSCI Canada Islamic showed significance 9 times (negative 4 times) before the COVID

and MSCI Canada Islamic showed the significance 17 times (negative 7 times) after the COVID. Significant days mean there were days in which the index offered abnormal returns for the investors, either in the shape of positive or negative. but further investigating the matter with respect to negative values. The Index had days with negative values, it means the market was affected negatively in respect of abnormal returns for those days. The MSCI Canada shows the same pattern before and after the event of COVID. The CAR of MSCI Canada Islamic shows more abnormal returns than the conventional MSCI Canada stock index especially after the COVID event. Before the event of COVID both indices showed the same trend in terms of CAR. But after the COVID the difference is significant on the graph. MSCI Canada Islamic offered more CAR after the COVID and provides diversification for the investors. MSCI Canada behaved in the same way and did not affect by COVID. It may be stable but with less return opportunities.

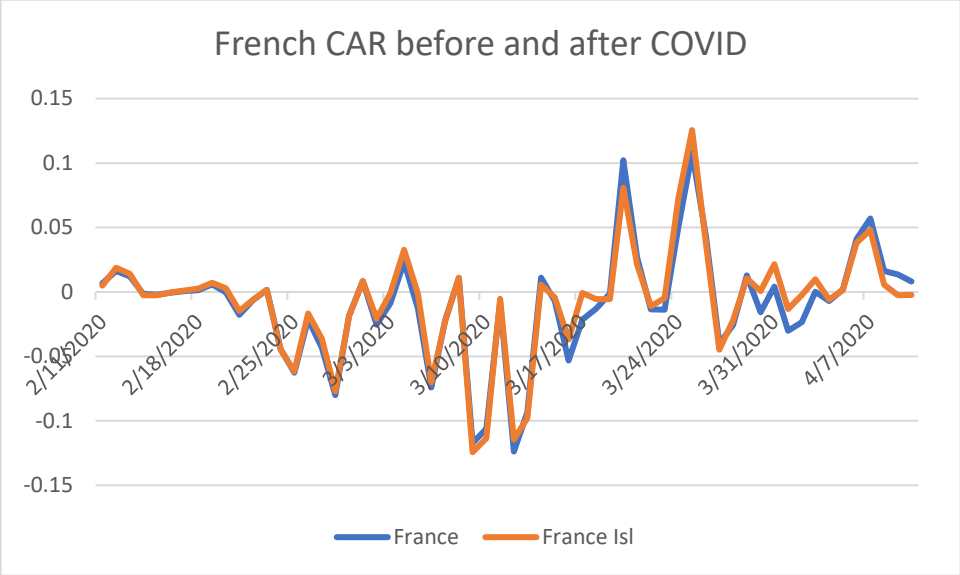

Figure 4.2: France Both Indexes Before and After the COVID

Source: Excel, 2016

The MSCI France conventional showed significance 11 times (negative 4 times) before the COVID and conventional MSCI France showed the significance 15 times (negative 7 times) after the COVID. The MSCI France Islamic showed significance 11 times (negative 7 times) before the COVID and MSCI Islamic showed the significance 14 times (negative 6 times) after the COVID. The conventional MSCI France shows the same pattern before

and after the event of COVID. The CAR of MSCI France Islamic shows same trend of Cumulative abnormal returns there is slight difference especially after the COVID event, but the difference is not much visible. Before the event of COVID both indices showed the same trend in terms of CAR. No significant difference. No diversification opportunities are there in between both indices. The French investors can seek opportunities in MSCI Canada Islamic. Both the indices provided more CAR after the COVID, but before COVID both the indices provided the low CAR. The movement of both the indices is the same, which represents the lack of diversification among these two indices.

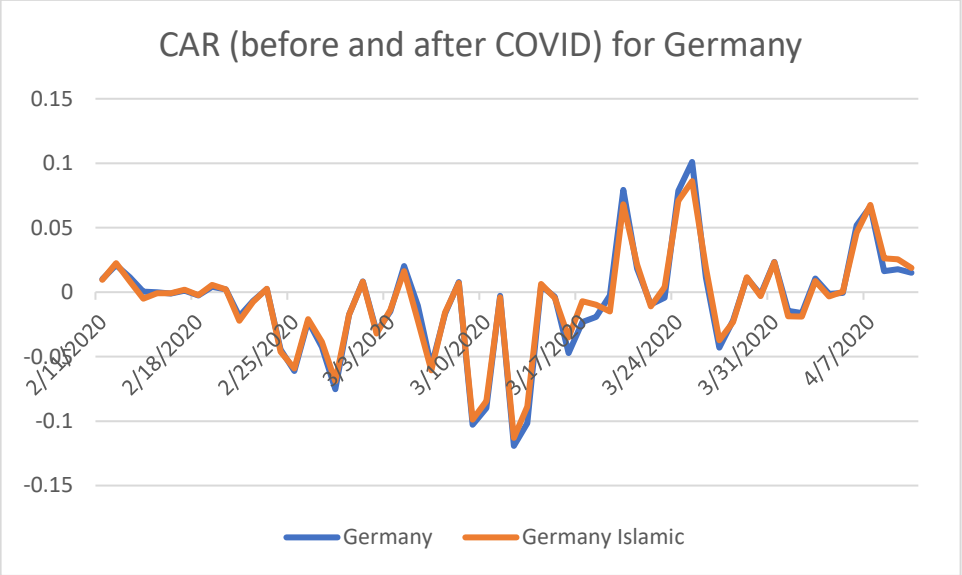

Figure 4.3: German Indexes Before and After the COVID

Source: Excel, 2016

The MSCI Germany conventional showed significance 12 times (negative 7 times) before the COVID and conventional MSCI Germany showed the significance 12 times (negative 5 times) after the COVID. The MSCI Germany Islamic showed significance 9 times (negative 7 times) before the COVID and MSCI Germany Islamic showed the significance 13 times (negative 6 times) after the COVID. The conventional MSCI Germany shows the same pattern before and after the event of COVID. The CAR of MSCI Islamic shows same trend of Cumulative abnormal returns there is slight difference especially after the COVID event, but the difference is not much visible. Before the event of COVID both indices showed the same trend in terms of CAR. No significant difference. No

diversification opportunities are there in between both indices. The German investors can seek opportunities in MSCI Canada Islamic also. Both the indices provided more CAR after the COVID, but before COVID both the indices provided the low CAR. Actually, the movement of both the indices is the same which represents the lack of diversification among these two indices. German investors cannot diversify in French market because the movement before and after the COVID is same in MSCI Germany and MSCI Germany Islamic.

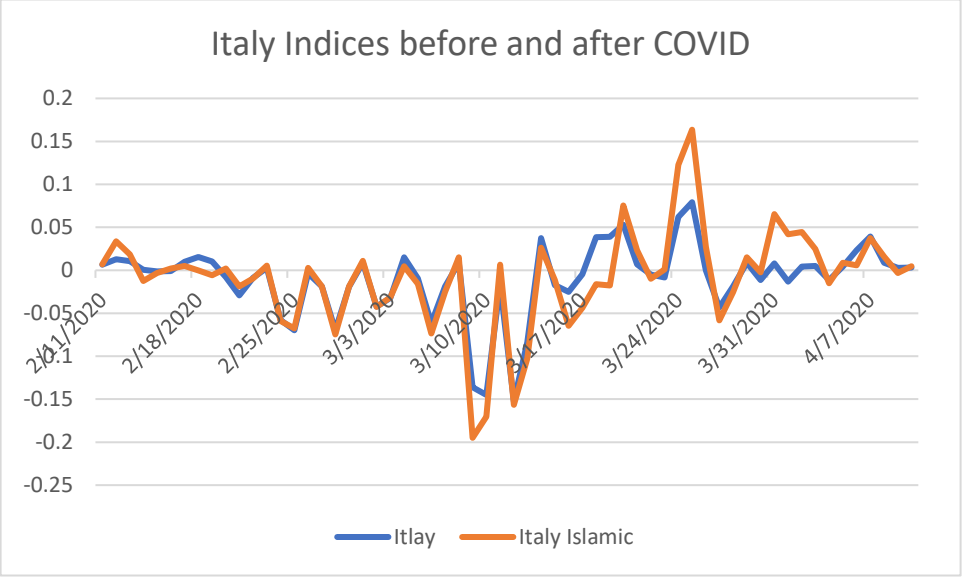

Figure 4.4: CAR of Italy's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Italy showed significance 12 times (negative 7 times) before the COVID and conventional MSCI Italy showed the significance 14 times (negative 6 times) after the COVID. The MSCI Italy Islamic showed significance 12 times (negative 6 times) before the COVID and MSCI Italy Islamic showed the significance 20 times (negative 12 times) after the COVID. The conventional MSCI Italy shows the same pattern before and after the event of COVID. The CAR of MSCI Islamic shows same trend of Cumulative abnormal returns. There is a slight difference, especially after the COVID event, but the difference is not very visible. Before the event of COVID both indices showed the same trend in terms of CAR. Islamic shows more CAR for some days. But mostly the effect is the same for both. No significant difference. diversification opportunities are there in the between both indices of Italy but MSCI Italy Islamic showed bit more CAR than

conventional MSCI Italy. The French and German investors can seek opportunities in MSCI Italy Islamic and Canada Islamic also. Conventional MSCI Italy index does not offer good returns before and after the COVID. Actually, the movement of both the indices is same but MSCI Italy Islamic provides better CAR after the COVIID, and its recovery is better.

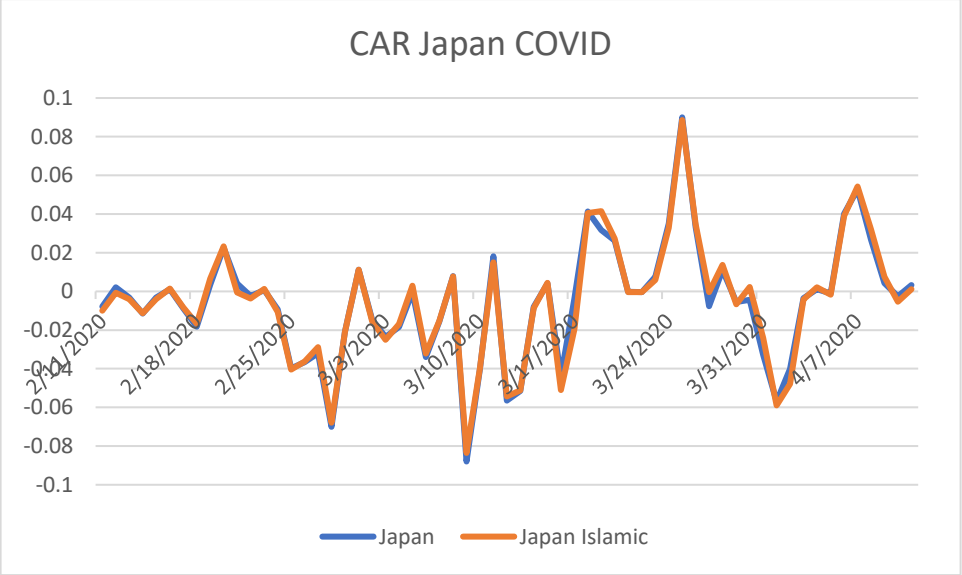

Figure 4.5: CAR of Japan's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Japan showed significance 9 times (negative 6 times) before the COVID and conventional MSCI Japan showed the significance 13 times (negative 7 times) after the COVID. The MSCI Japan Islamic showed significance 10 times (negative 6 times) before the COVID and MSCI Japan Islamic showed the significance 14 times (negative 7 times) after the COVID. The conventional MSCI Japan shows the same pattern before and after the event of COVID. The CAR of MSCI Islamic shows same trend of Cumulative abnormal returns. No significant difference. Before the WHO declared COVID as pandemic the markets started to react negatively because of COVID. diversification opportunities are not there in the between both indices of Japan. The French, German and Japanese investors can seek diversification opportunities in MSCI Italy Islamic and Canada Islamic also. The movement of both the indices is the same before and after the COVID-19 pandemic.

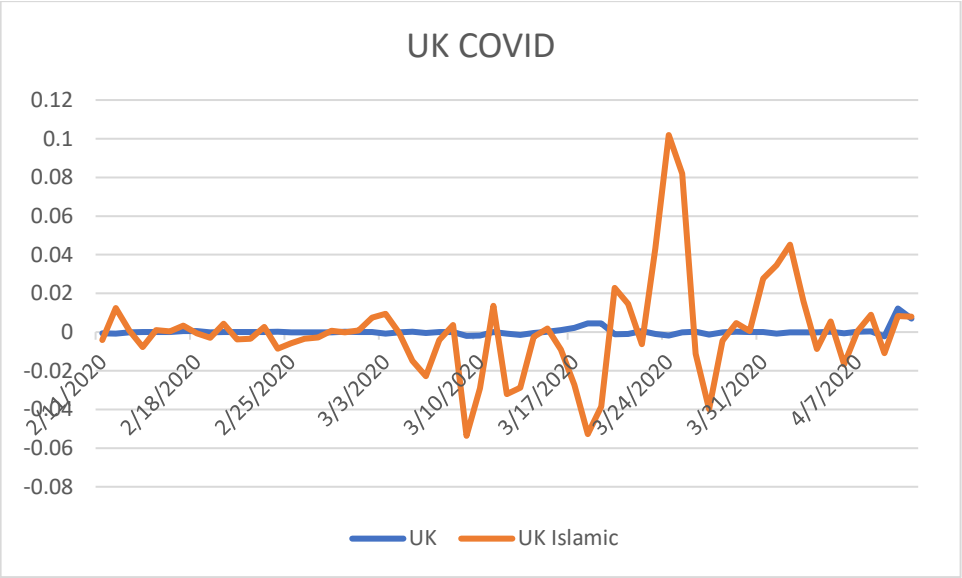

Figure 4.6: CAR of UK's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI UK showed significance 0 times (negative 0 times) before the COVID and conventional MSCI UK showed significance 3 times (negative 1 times) after the COVID. The MSCI UK Islamic showed significance 6 times (negative 4 times) before the COVID and MSCI UK Islamic showed the significance 19 times (negative 9 times) after the COVID. The conventional MSCI UK shows the same pattern before and after the event of COVID. The CAR of MSCI Islamic shows similar trend just before the COVID but difference is quite visible after the COVID. There is more volatility in Islamic index. Thus, it provides opportunity for the more CAR. The movement of both the indices is different before and after the COVID-19 pandemic. The conventional MSCI UK does not provide CAR before and after COVID. But MSCI UK Islamic show volatility and later provides more cumulative abnormal returns. The diversification opportunities are there in between both indices of the UK. The French, German, Italian Japanese and British investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic and MSCI UK Islamic.

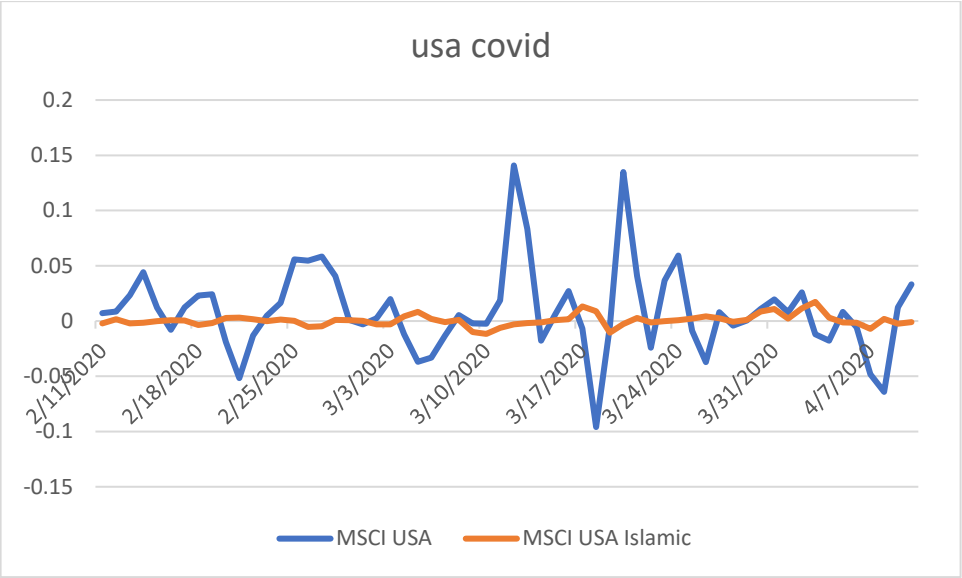

Figure 4.7: CAR of USA's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI USA showed significance 9 times (negative 4 times) before the COVID and conventional MSCI USA showed significance 16 times (negative 7 times) after the COVID. The MSCI USA Islamic showed significance 4 times (negative 3 times) before the COVID and MSCI USA Islamic showed the significance 10 times (negative 2 times) after the COVID. The conventional shows more volatility in case of USA as compared to Islamic index. Islamic index was dormant to COVID. The movement of both the indices is different before and after the COVID-19 pandemic. The conventional MSCI USA Islamic does not provide CAR before and after the COVID. But MSCI USA Conventional show volatility and provides more cumulative abnormal returns with risk as well. The diversification opportunities are there in the between both indices of the USA. The French, German, Italian Japanese, British and American investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

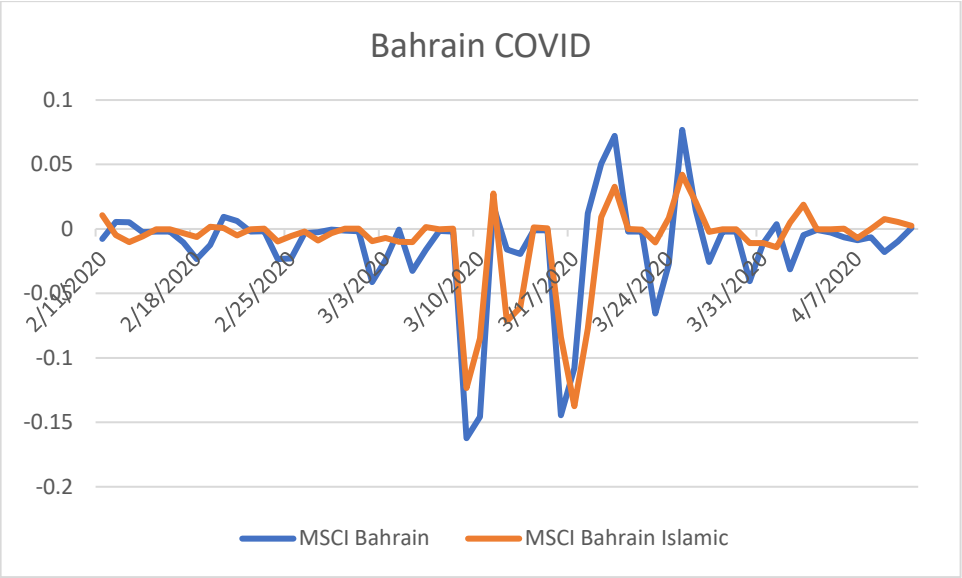

Figure 4.8: CAR of Bahrain's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Bahrain showed significance 4 times (negative 4 times) before the COVID and conventional MSCI Bahrain showed the significance 12 times (negative 7 times) after the COVID. The MSCI Bahrain Islamic showed significance 2 times (negative 2 times) before the COVID and MSCI Bahrain Islamic showed the significance 6 times (negative 3 times) after the COVID. The conventional MSCI Bahrain shows and Islamic show same trend in case of Bahrain. Differences are not very visible. The movement of both the indices is the same before and after the novel COVID epidemic. The mainstream MSCI Bahrain besides MSCI Bahrain Islamic does not provide better CAR before and after the COVID and behaved negatively. The diversification opportunities are not there in the between both indices of Bahrain. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

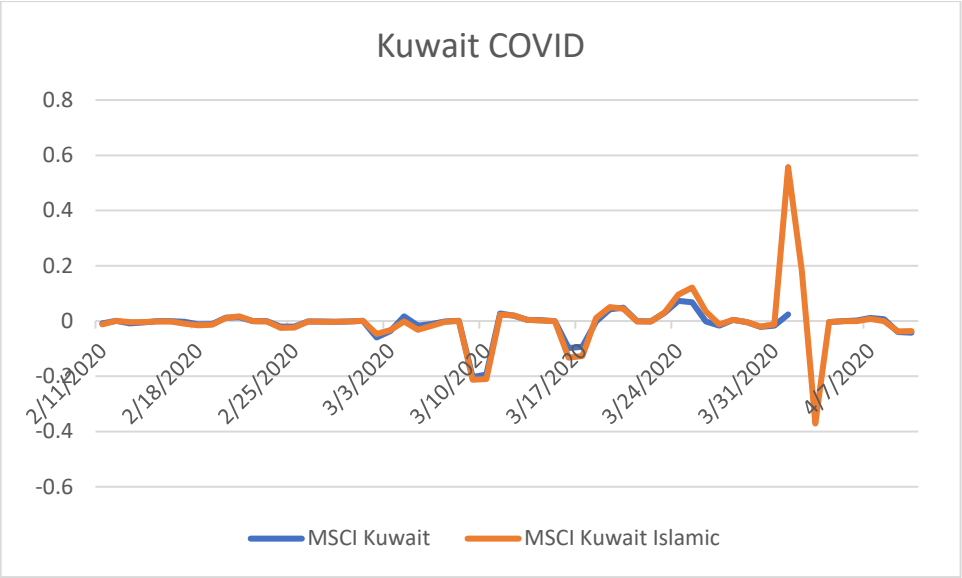

Figure 4.9: CAR of Kuwait's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Kuwait showed significance 4 times (negative 3 times) before the COVID and conventional MSCI Kuwait showed the significance 10 times (negative 4 times) after the COVID. The MSCI Kuwait Islamic showed significance 4 times (negative 3 times) before the COVID and MSCI Kuwait Islamic showed the significance 11 times (negative 5 times) after the COVID. The conventional shows and Islamic shows same without any difference. The movement of both the indices is the same before and after the novel COVID epidemic. The mainstream MSCI Kuwait besides MSCI Kuwait Islamic does not provide better CAR before and after the COVID and behaved stable without offering good returns. The diversification opportunities are not there in the between both indices of Kuwait. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

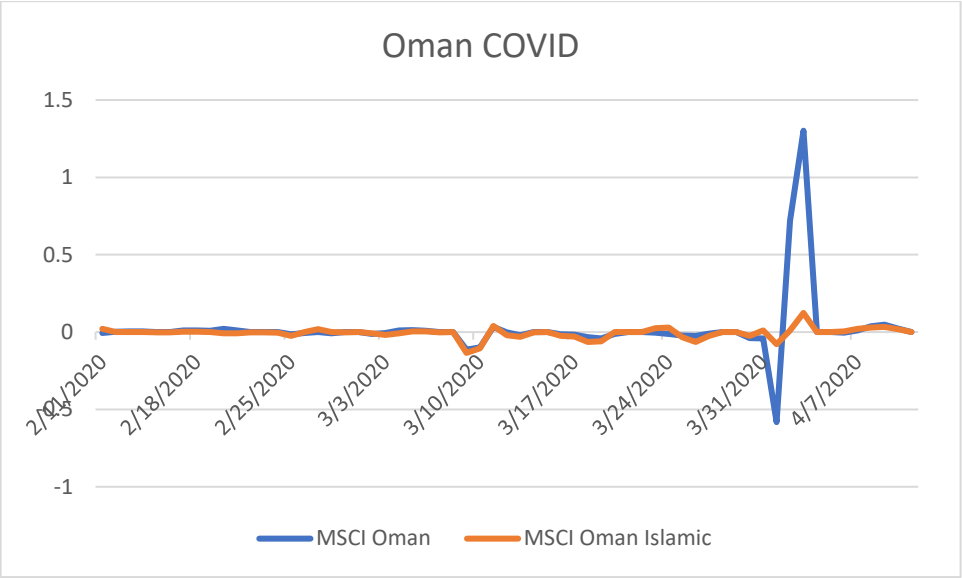

Figure 4.10: CAR of Oman's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Oman showed significance 4 times (negative 3 times) before the COVID and conventional MSCI Oman showed the significance 10 times (negative 7 times) after the COVID. The MSCI Oman Islamic showed significance 4 times (negative 2 times) before the COVID and MSCI Oman Islamic showed the significance 11 times (negative 4 times) after the COVID. The conventional shows and conventional shows show the same trend. There is just a difference of one spike only. The movement of both the indices is the same before and after the novel COVID epidemic. The mainstream MSCI Oman and MSCI Oman Islamic does not provide better CAR before and after the COVID and behaved stable without offering good returns. The diversification opportunities are not there in the between both indices of Oman. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

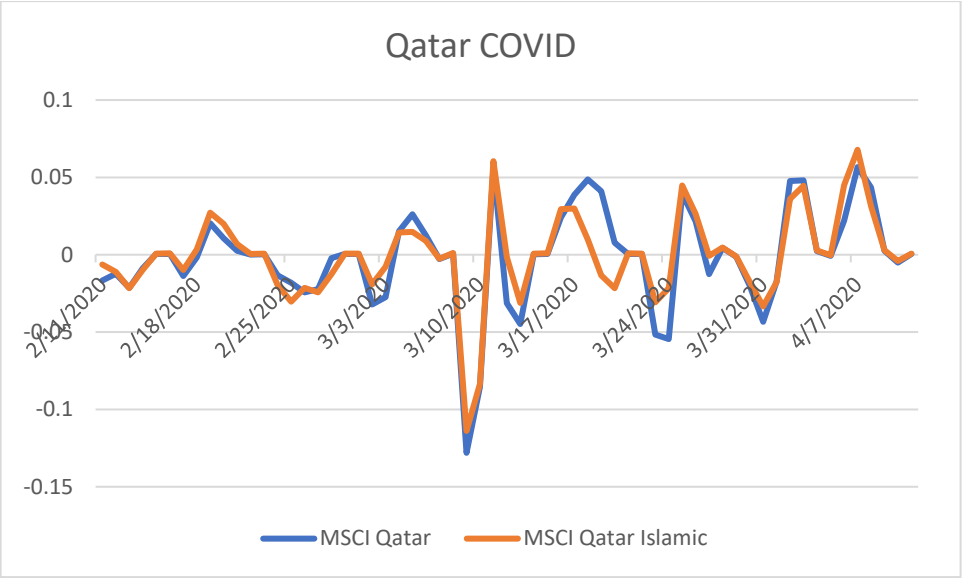

Figure 4.11: CAR of Qatar's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Qatar showed significance 4 times (negative 3 times) before the COVID and conventional MSCI Qatar showed the significance 11 times (negative 5 times) after the COVID. The MSCI Qatar Islamic showed significance 4 times (negative 3 times) before the COVID and MSCI Qatar Islamic showed the significance 9 times (negative 4 times) after the COVID. The conventional and Islamic depict almost same trend. The movement of both the indices is the same before and after the novel COVID epidemic. The mainstream MSCI Qatar and MSCI Qatar Islamic does not provide better CAR before and after the COVID and both improved after the COVID and offering good returns. The diversification opportunities are not there in the between both indices of Oman. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

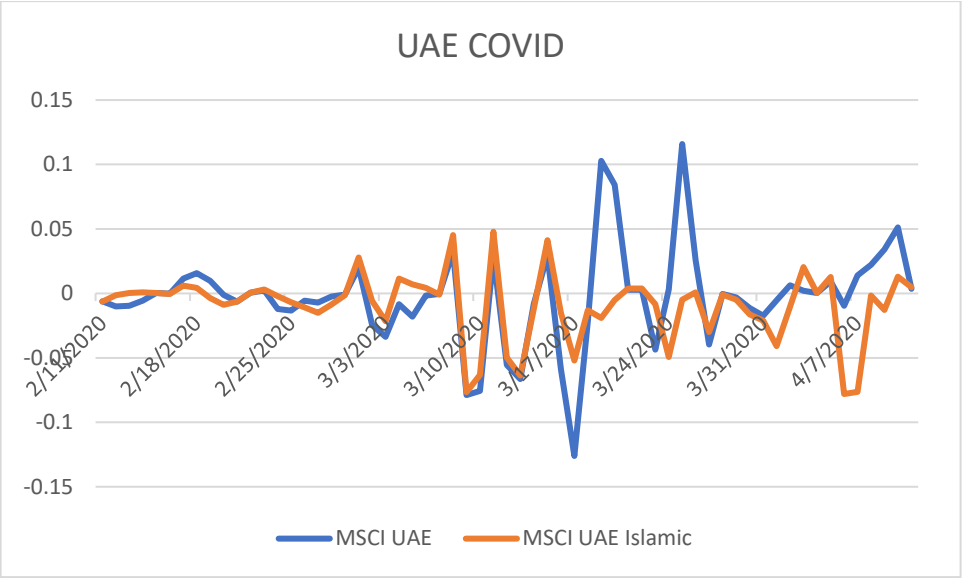

Figure 4.12: CAR of UAE's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI UAE showed significance 7 times (negative 4 times) before the COVID and conventional MSCI UAE showed the significance 14 times (negative 4 times) after the COVID. The MSCI UAE Islamic showed significance 5 times (negative 2 times) before the COVID and MSCI UAE Islamic showed the significance 13 times (negative 9 times) after the COVID. The conventional shows the more volatility and offers more CAR. The movement of both the indices is almost same before and after the COVID-19 pandemic. both do not provide better CAR before and after the COVID. The diversification opportunities are not there in both indices of UAE. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA conventional.

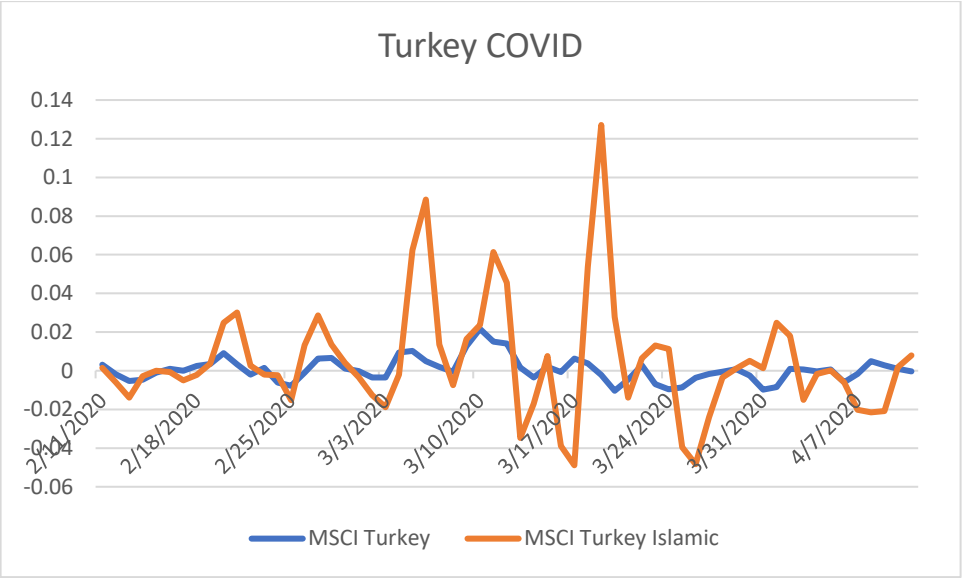

Figure 4.13: CAR of Türkiye's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Türkiye showed significance 8 times (negative 3 times) before the COVID and conventional MSCI Türkiye showed the significance 11 times (negative 6 times) after the COVID. The MSCI Türkiye Islamic showed significance 2 times (negative 0 times) before the COVID and MSCI Türkiye Islamic showed the significance 8 times (negative 4 times) after the COVID. The conventional shows same trend but Islamic index showed more CAR. The movement of both the indices is different before and after the COVID-19 pandemic. Conventional MSCI Türkiye depicted same pattern before and after the event of COVID and does not offer better CAR. But the MSCI Turkey Islamic shows more volatility and offers better chances of more CAR along with risk of negative returns. The diversification opportunities are not there in the between both indices of Türkiye. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic, MSCI Turkey Islamic and MSCI USA conventional.

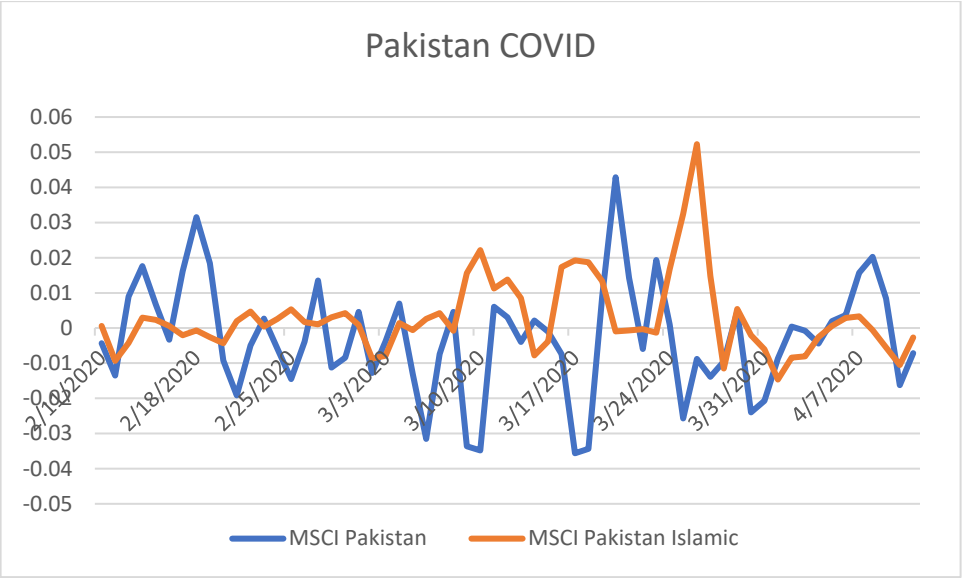

Figure 4.14: CAR of Pakistan's Both Indexes Before and After the COVID

Source: Excel, 2016

The conventional MSCI Pakistan showed significance 1 times (negative 0 times) before the COVID and conventional MSCI Pakistan showed the significance 8 times (negative 2 times) after the COVID. The MSCI Pakistan Islamic showed significance 6 times (negative 5 times) before the COVID and MSCI Pakistan Islamic showed the significance 7 times (negative 5 times) after the COVID. The conventional shows lower CAR as compared to Islamic index in Pakistan. The movement of both the indices is a bit different before and after the COVID-19 pandemic. Conventional MSCI Pakistan and MSCI Pakistan Islamic depicted same pattern before and after the event of COVID and does not offer better CAR. The diversification opportunities are not there in the between both indices of Pakistan. The French, German, Italian Japanese, British, American and GCC investors can seek diversification opportunities in MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic, MSCI Turkey Islamic and MSCI USA conventional.

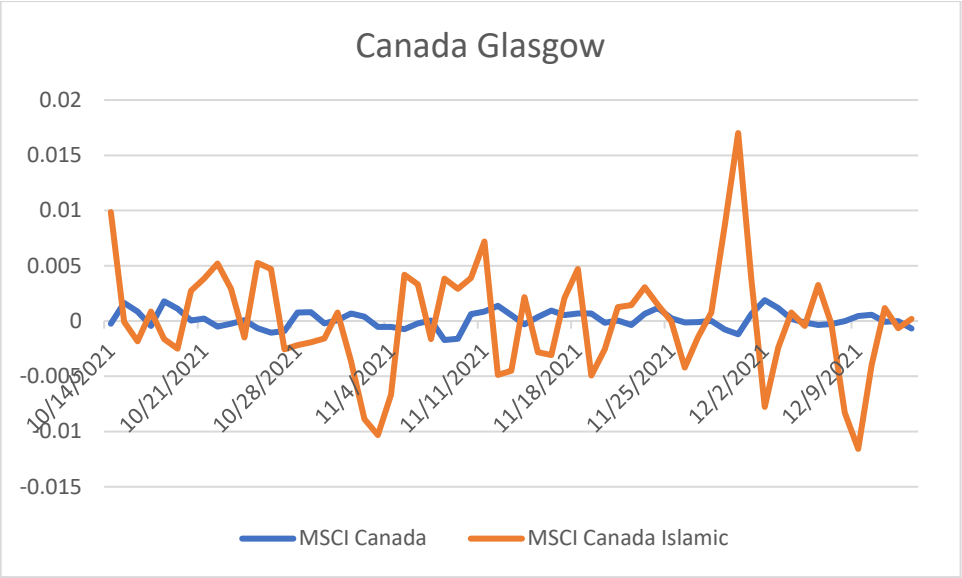

Figure 4.15: CAR of Canada's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Canada showed significance 1 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Canada showed the significance 0 times (negative 0 times) after Glasgow Climate Pact. The MSCI Canada Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Islamic showed the significance 0 times (negative 0 times) after Glasgow Climate Pact. The CAR of conventional is stable and showed the same pattern before and after the event of Glasgow climate pact. But the MSCI Canada Islamic showed the more CAR before and after the Glasgow. There was spike after the event in MSCI Canada Islamic, but it also showed negative cumulative abnormal returns before and after the event. We can conclude that there are more opportunities in the MSCI Canada Islamic along with the risk as well. The movement of both the indices is different before and after the Glassgow Climate Pact. Conventional MSCI Canada and MSCI Canada Islamic depicted different pattern before and after the event of Glassow Climate Pact. The conventional MSCI Canada showed the stable but with no cumulative abnormal returns. Whereas MSCI Canada Islamic show volatile behaviour with positive and negative abnormal returns. MSCI Canada Islamic provides the opportunity of abnormal returns but with the risk threat. The diversification opportunities are there in the between both indices of Canada.

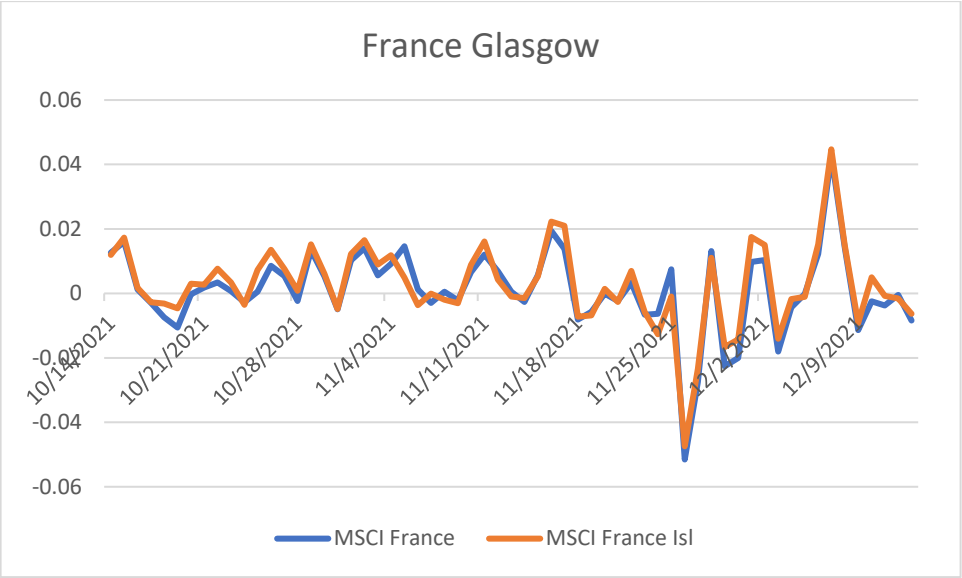

Figure 4.16: CAR of France's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI France showed significance 0 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI France showed the significance 4 times (negative 1 times) after Glasgow Climate Pact. The MSCI France Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI France Islamic showed the significance 6 times (negative 1 times) after Glasgow Climate Pact. The conventional and Islamic shows the same trend before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI France and MSCI France Islamic depicted same pattern before and after the event of Glassow Climate Pact. After the event both the indices offered a negative CAR with one spike of positive CAR. The diversification opportunities are not there in the between both indices of France.

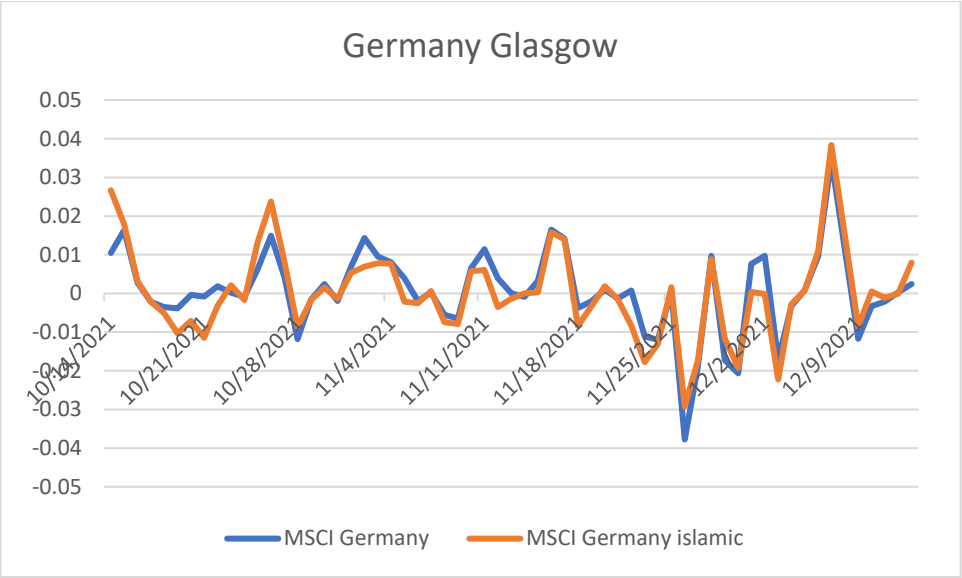

Figure 4.17: CAR of Germany's Both Indexes Before & After the GCP

Source: Excel, 2016

The conventional MSCI Germany showed significance 0 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Germany showed the significance 4 times (negative 1 times) after Glasgow Climate Pact. The MSCI Germany Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Germany Islamic showed the significance 6 times (negative 4 times) after Glasgow Climate Pact. The conventional and Islamic index shows the same pattern before and after the event of Glasgow Climate Pact. The CAR of MSCI Germany Islamic shows same trend of Cumulative abnormal returns there is slight difference especially after the Glasgow Climate Pact event, but the difference is not much visible. Before the event of Glasgow Climate Pact both indices showed the same trend in terms of CAR. Islamic shows more CAR for some days. But mostly the effect is the same for both. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI Germany and MSCI Germany Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in the between both indices of Germany.

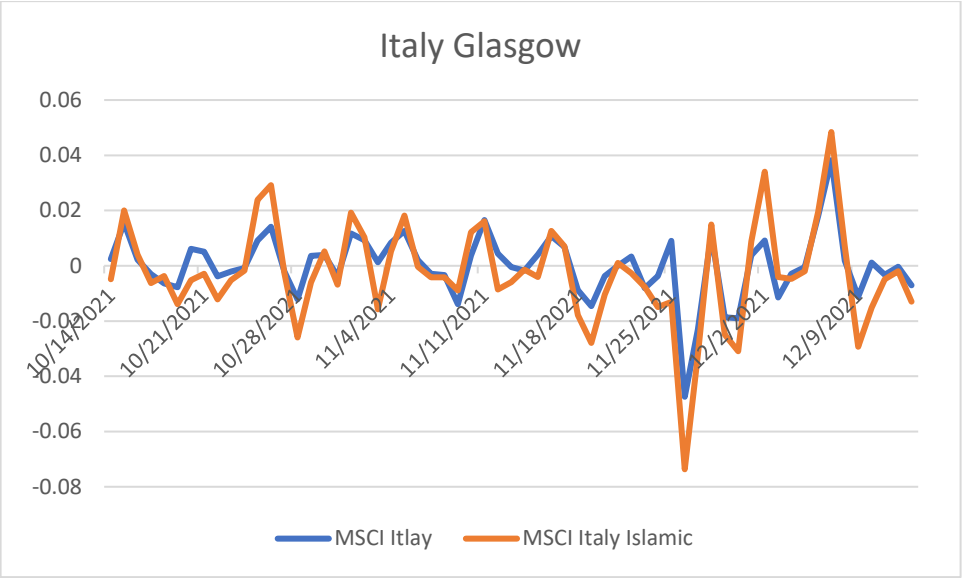

Figure 4.18: CAR of Italy's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Italy showed significance 0 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Italy showed the significance 6 times (negative 4 times) after Glasgow Climate Pact. The MSCI Italy Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Italy Islamic showed the significance 5 times (negative 2 times) after Glasgow Climate Pact. The conventional MSCI Italy and Islamic index shows the same pattern before and after the event of Glasgow Climate Pact. The CAR of MSCI Islamic shows same trend of Cumulative abnormal returns. There is a slight difference between both indices. A bit more activity is seen in Islamic index, but pattern is same among both. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI Italy and MSCI Italy Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in the between both indices of Italy.

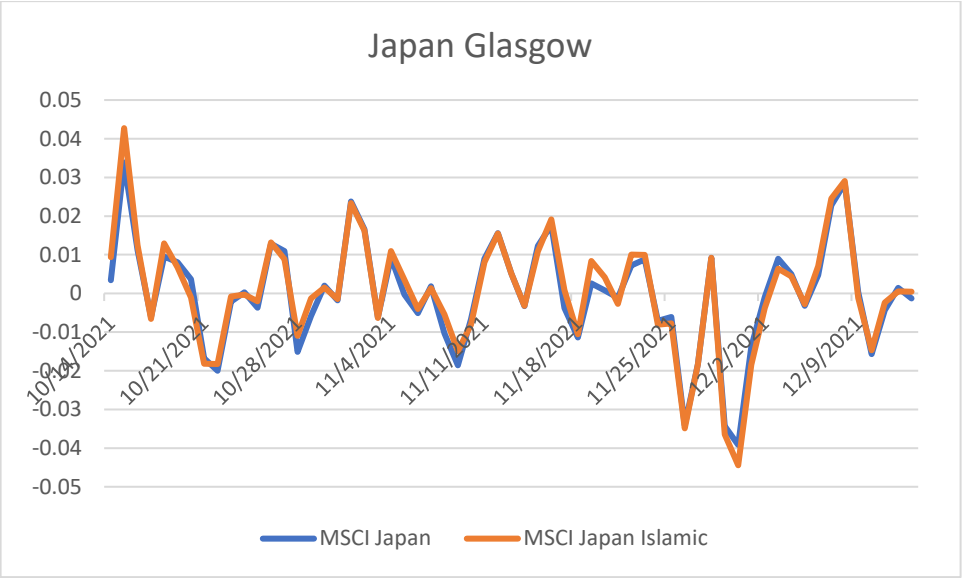

Figure 4.19: CAR of Japan's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Japan showed significance 2 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Japan showed the significance 4 times (negative 2 times) after Glasgow Climate Pact. The MSCI Japan Islamic showed significance 2 times (negative 0 times) before Glasgow Climate Pact and MSCI Japan Islamic showed the significance 3 times (negative 2 times) after Glasgow Climate Pact. The conventional and Islamic index of Japan shows same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI Japan and MSCI Japan Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in the between both indices of Japan.

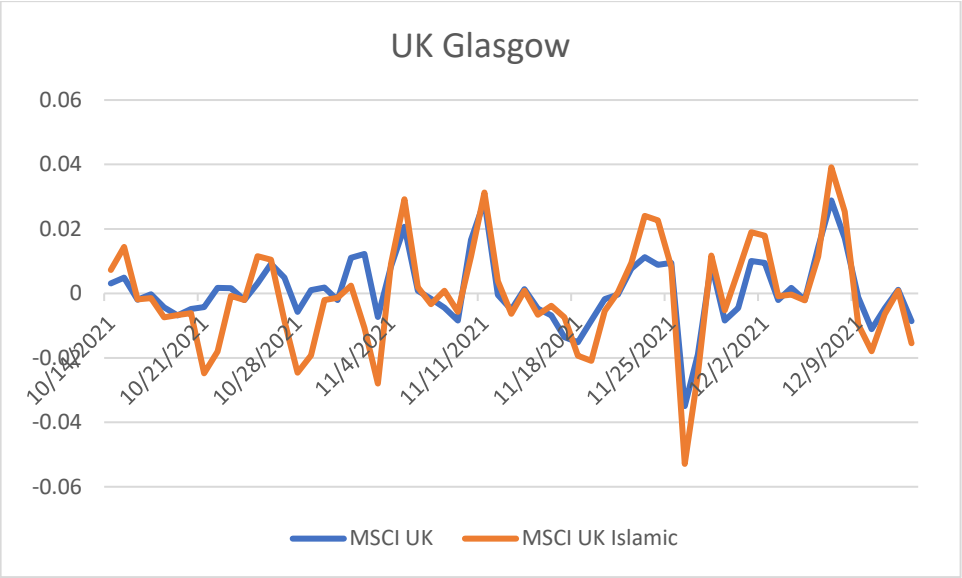

Figure 4.20: CAR of UK's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI UK showed significance 2 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI UK showed significance 2 times (negative 1 times) after Glasgow Climate Pact. The MSCI UK Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI UK Islamic showed the significance 3 times (negative 1 times) after Glasgow Climate Pact. The conventional and Islamic shows the same pattern before and after the event of Glasgow Climate Pact. The CAR of MSCI UK Islamic shows same trend of Cumulative abnormal returns but there is slight difference, but the difference is not much visible. Before the event of Glasgow Climate Pact both indices showed the same trend in terms of CAR. But mostly the effect is the same for both. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI UK and MSCI UK Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in the between indices of the UK.

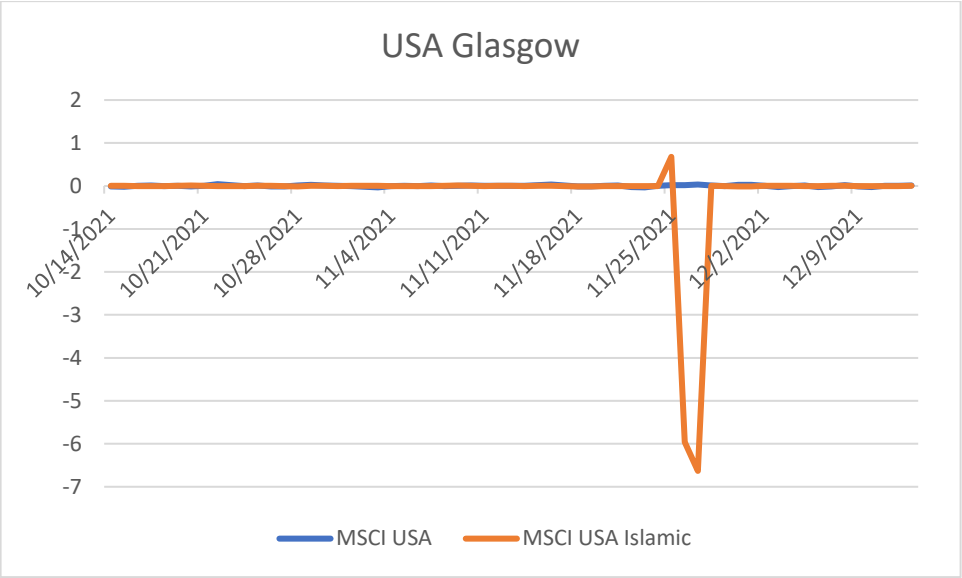

Figure 4.21: CAR of USA's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI USA showed significance 0 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI USA showed the significance 0 times (negative 0 times) after Glasgow Climate Pact. The MSCI USA Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI USA Islamic showed the significance 3 times (negative 2 times) after Glasgow Climate Pact. The conventional and Islamic USA index shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI USA and MSCI USA Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in between both indices of the USA.

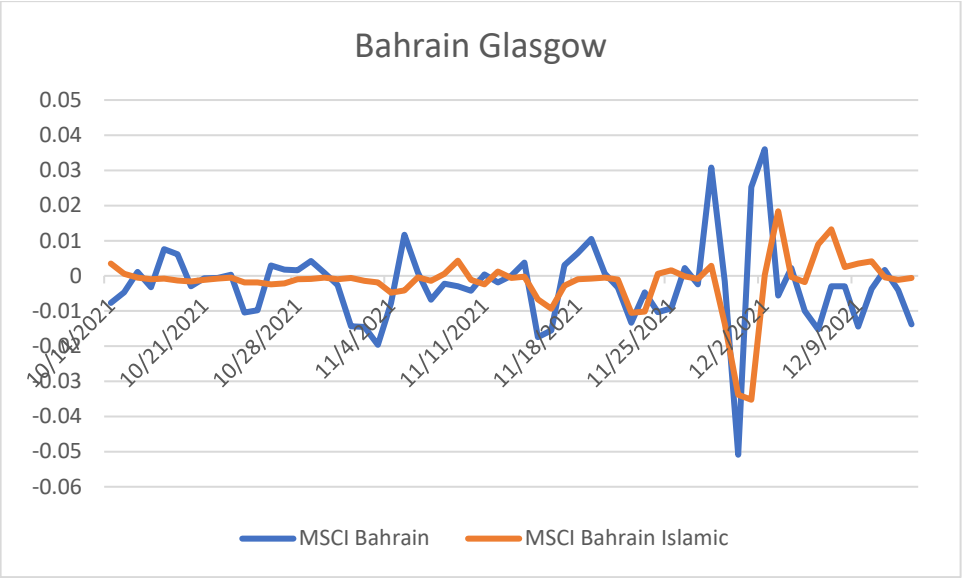

Figure 4.22: CAR of Bahrain's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Bahrain showed significance 1 times (negative 1 times) before the Glasgow Climate Pact and conventional MSCI Bahrain showed the significance 6 times (negative 4 times) after Glasgow Climate Pact. The MSCI Bahrain Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Bahrain Islamic showed the significance 4 times (negative 3 times) after Glasgow Climate Pact. The conventional MSCI Bahrain shows more volatility before the Glasgow climate pact and its volatility increased after the Glasgow climate pact. The movement of both the indices is different before and after the Glassgow Climate Pact. Conventional MSCI Bahrain and MSCI Bahrain Islamic depicted different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are there in the between both indices of Bahrain. Conventional MSCI Bahrain offers the diversification opportunities for the investors.

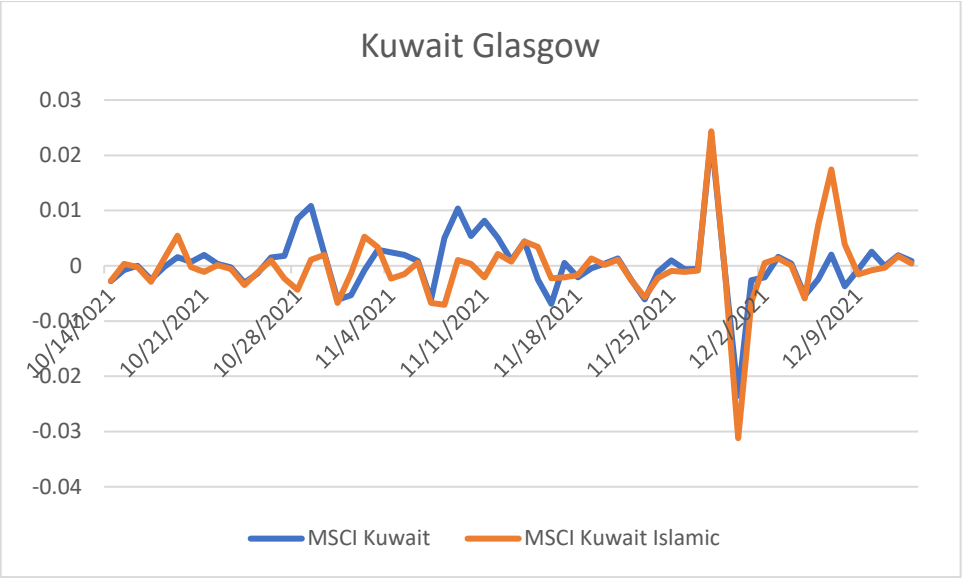

Figure 4.23: CAR of Kuwait's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Kuwait showed significance 1 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Kuwait showed the significance 3 times (negative 2 times) after Glasgow Climate Pact. The MSCI Kuwait Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Kuwait Islamic showed the significance 3 times (negative 1 times) after Glasgow Climate Pact. The conventional and Islamic index of Kuwait almost show the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is a bit different before and after the Glassgow Climate Pact. Conventional MSCI Kuwait and MSCI Kuwait Islamic depicted a bit different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in the between both indices of Kuwait. Conventional MSCI Bahrain offers the diversification opportunities for the investors of GCC during the Glasgow climate pact.

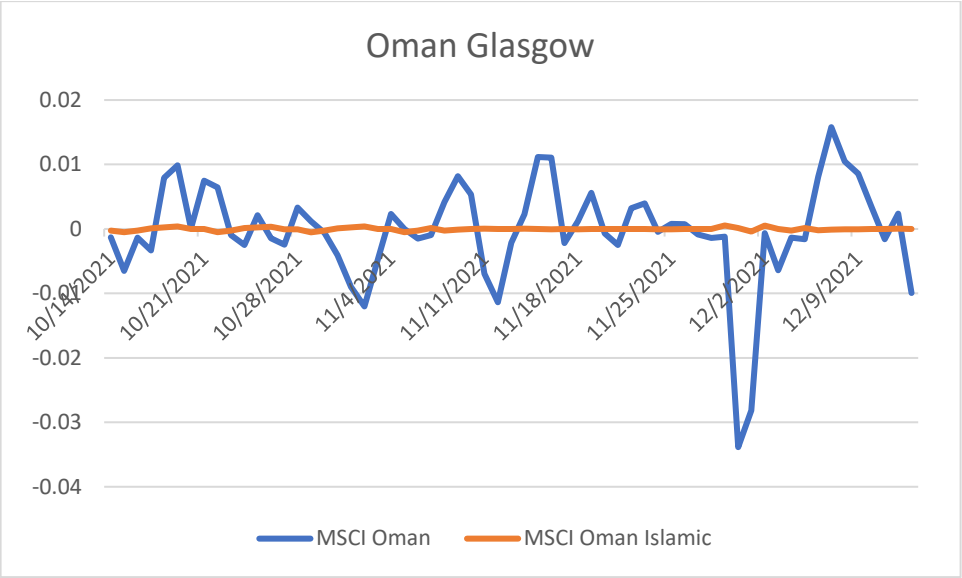

Figure 4.24: CAR of Oman's Both Indexes Before and After GCP

Source: Excel, 2016

The conventional MSCI Oman showed significance 1 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Oman showed the significance 2 times (negative 2 times) after Glasgow Climate Pact. The MSCI Oman Islamic showed significance 3 times (negative 2 times) before Glasgow Climate Pact and MSCI Oman Islamic showed the significance 8 times (negative 5 times) after Glasgow Climate Pact. The conventional MSCI Oman shows the more activity than the Islamic index before and after the event of Glasgow Climate Pact. The CAR of MSCI Islamic shows same trend of Cumulative abnormal returns. The conventional MSCI Oman provides more opportunity along with risk. The movement of both the indices is different before and after the Glassgow Climate Pact. Conventional MSCI Oman and MSCI Oman Islamic depicted different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are there in the between both indices of Oman. Conventional MSCI Oman and Conventional MSCI Oman offers the diversification opportunities for the investors of GCC during the Glasgow climate pact.

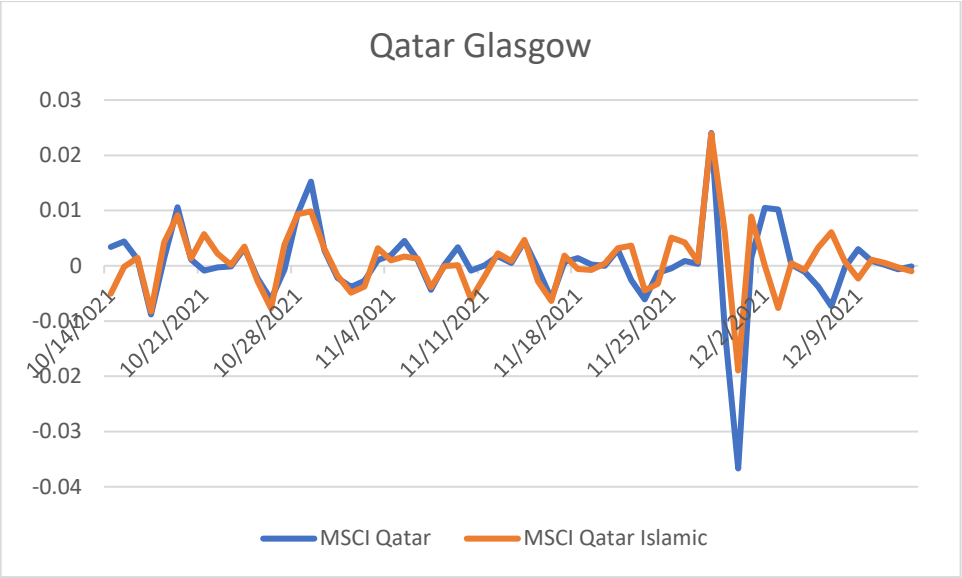

Figure 4.25: CAR of Qatar's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Qatar showed significance 3 times (negative 2 times) before the Glasgow Climate Pact and conventional MSCI Qatar showed the significance 3 times (negative 1 times) after Glasgow Climate Pact. The MSCI Qatar Islamic showed significance 1 times (negative 0 times) before Glasgow Climate Pact and MSCI Qatar Islamic showed the significance 4 times (negative 2 times) after Glasgow Climate Pact. The conventional MSCI Qatar and MSCI Qatar Islamic reacted same before and after the Glasgow Climate Pact. The movement of both the indices is different before and after the Glassgow Climate Pact. Conventional MSCI Qatar and MSCI Qatar Islamic depicted different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are there not in between both indices of Oman. Investors of GCC can diversify their portfolio with Conventional MSCI Oman and Conventional MSCI Oman during the Glasgow climate pact.

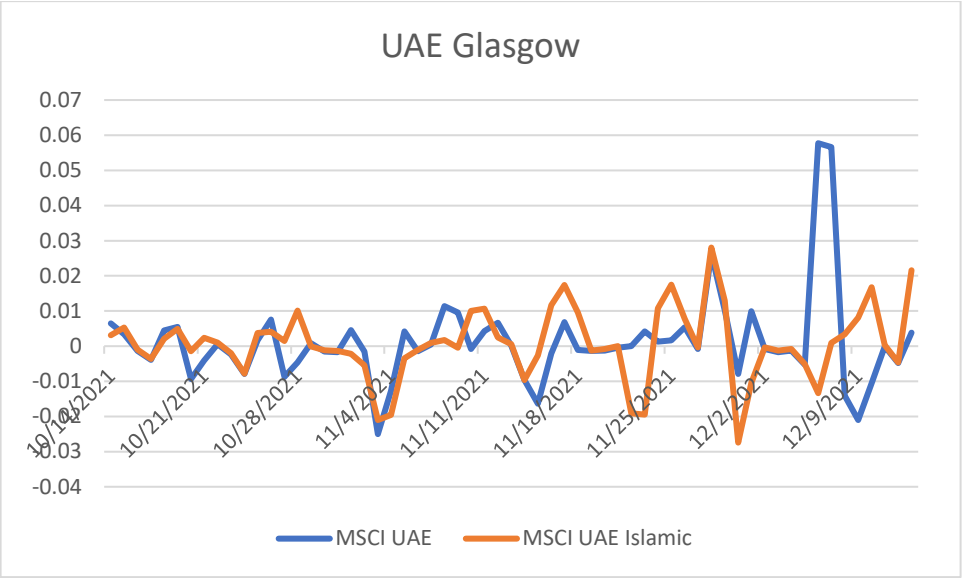

Figure 4.26: CAR of UAE's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI UAE showed significance 3 times (negative 1 times) before the Glasgow Climate Pact and conventional MSCI UAE showed the significance 4 times (negative 2 times) after Glasgow Climate Pact. The MSCI UAE Islamic showed significance 3 times (negative 1 times) before Glasgow Climate Pact and MSCI UAE Islamic showed the significance 7 times (negative 3 times) after Glasgow Climate Pact. The conventional and Islamic index of UAE shows the same pattern before the event of Glasgow Climate Pact. There is a difference after the event happens. The conventional provides more CAR for some days. The movement of both the indices is almost same before and after the Glassgow Climate Pact. Conventional MSCI UAE and MSCI Qatar UAE depicted different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not in between both indices of UAE. Investors of GCC can diversify their portfolio with Conventional MSCI Oman and Conventional MSCI Oman during the Glasgow climate pact.

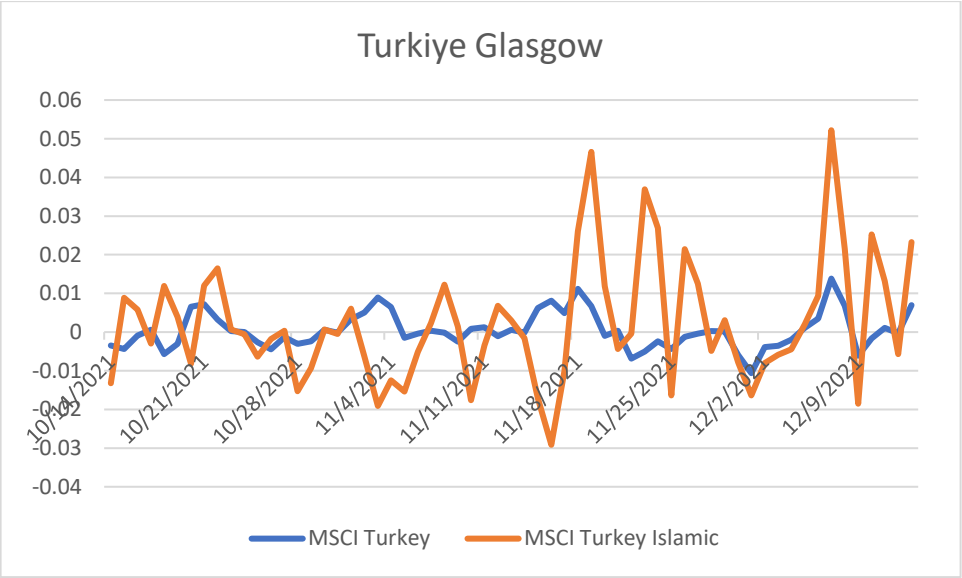

Figure 4.27: CAR of Türkiye's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Türkiye showed significance 0 times (negative 0 times) before the Glasgow Climate Pact and conventional MSCI Türkiye showed the significance 2 times (negative 1 times) after Glasgow Climate Pact. The MSCI Türkiye Islamic showed significance 0 times (negative 0 times) before Glasgow Climate Pact and MSCI Türkiye Islamic showed the significance 6 times (negative 0 times) after Glasgow Climate Pact. The conventional and Islamic index of Türkiye shows the same pattern before the Glasgow climate pact, but difference is quite visible after the happening of the event. Islamic MSCI Turkey Islamic provides more CAR after the event. The movement of both the indices is different before and after the Glassgow Climate Pact. Conventional MSCI Turkey and MSCI Turkey Islamic depicted different pattern before and after the event of Glassow Climate Pact. The diversification opportunities are there in between both indices of Turkey. Investors of Europe and GCC can diversify their portfolio with Conventional MSCI Oman, Conventional MSCI Oman and MSCI Turkey Islamic during the Glasgow climate pact. MSCI Turkey Islamic offered negative CAR before the Glasgow climate pact but after the event it provides positive cumulative abnormal returns.

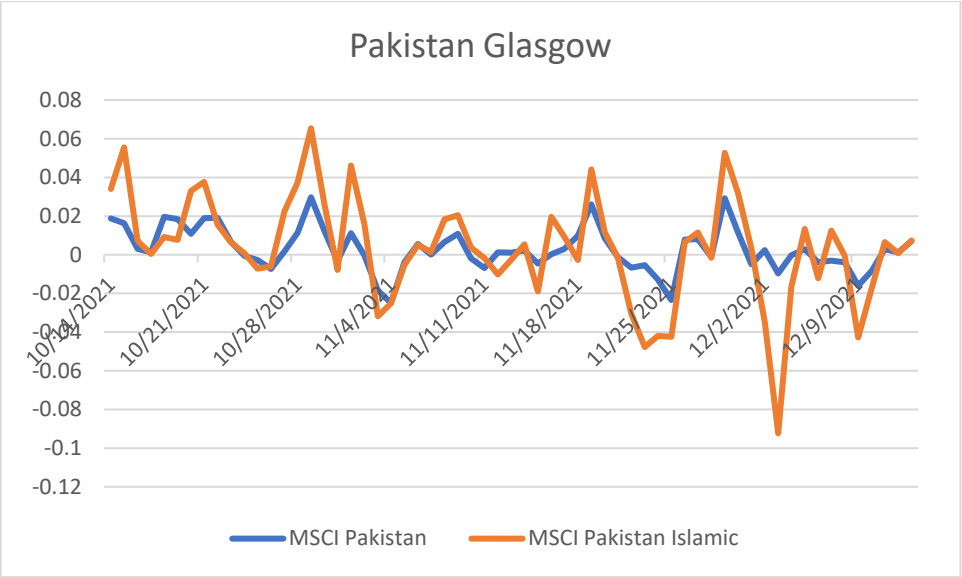

Figure 4.28: CAR of Pakistan's Both Indexes Before and After the GCP

Source: Excel, 2016

The conventional MSCI Pakistan showed significance 3 times (negative 1 times) before the Glasgow Climate Pact and conventional MSCI Pakistan showed the significance 5 times (negative 2 times) after Glasgow Climate Pact. The MSCI Pakistan Islamic showed significance 4 times (negative 0 times) before Glasgow Climate Pact and MSCI Pakistan Islamic showed the significance 9 times (negative 6 times) after Glasgow Climate Pact. The conventional and Islamic index of Pakistan shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the Glassgow Climate Pact. Conventional MSCI Pakistan and MSCI Pakistan Islamic depicted same pattern before and after the event of Glassow Climate Pact. The diversification opportunities are not there in between both indices of Pakistan. Investors of Europe and GCC can diversify their portfolio with Conventional MSCI Oman, Conventional MSCI Oman and MSCI Turkey Islamic during the Glasgow climate pact.

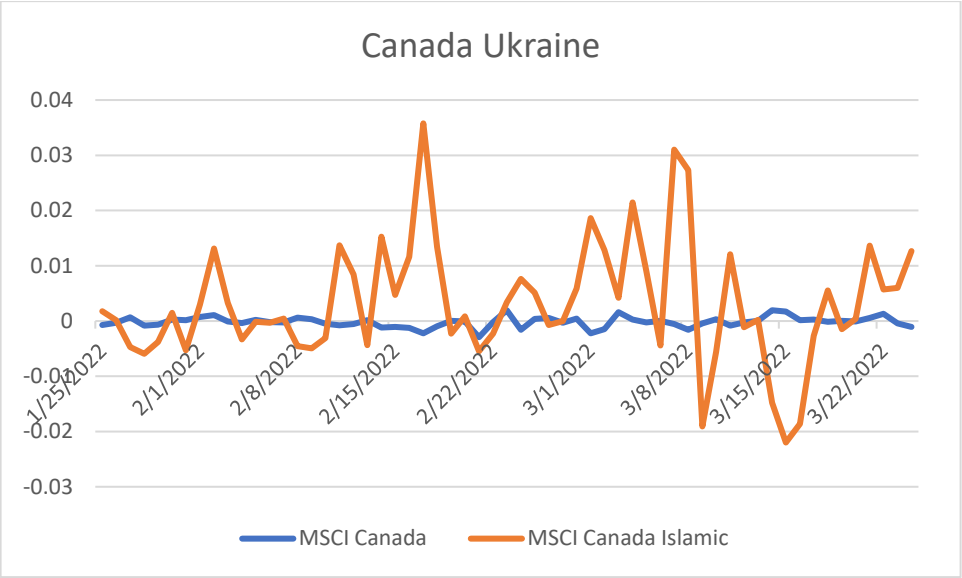

Figure 4.29: CAR of Canada's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI Canada showed significance 2 times (negative 1 times) before the Ukraine War and conventional MSCI Canada showed the significance 2 times (negative 1 times) after Ukraine War. The MSCI Canada Islamic showed significance 1 times (negative 0 times) before Ukraine War and MSCI Canada Islamic showed the significance 8 times (negative 2 times) after Ukraine War. Conventional index followed the previous trend before the Ukraine war. The MSCI Canada Islamic index provided the more CAR before and after the Ukraine war. There was trend of more results just after the Ukraine war on Feb 24. The movement of both the indices is different before and after the Ukraine war event. Conventional MSCI Canada and MSCI Canada Islamic depicted different pattern before and after the event of Ukraine War. The diversification opportunities are there in between both indices of Canada. Investors of Europe and GCC can diversify their portfolio with MSCI Canada Islamic during the Ukraine War.

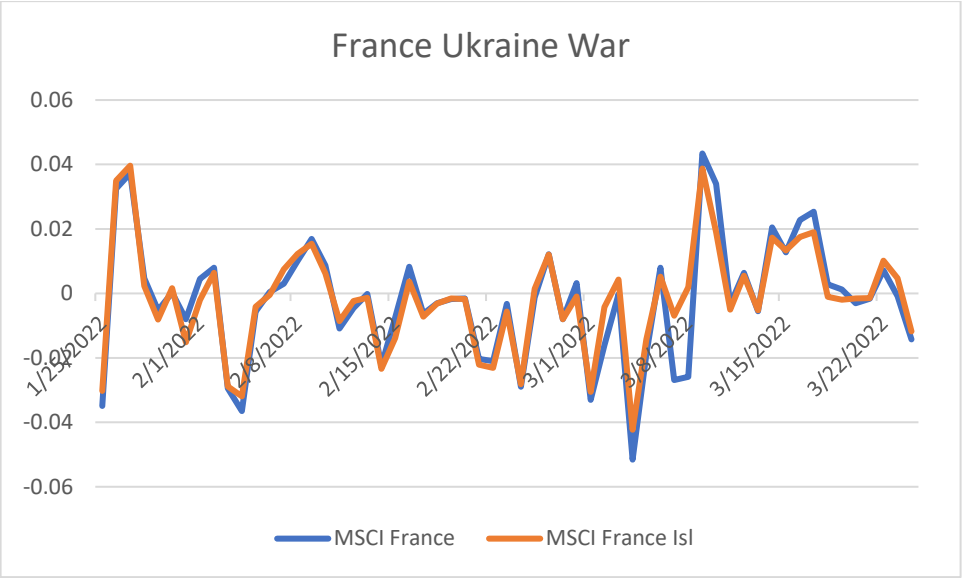

Figure 4.30: CAR of France's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI France showed significance 5 times (negative 4 times) before the Ukraine War and conventional MSCI France showed the significance 10 times (negative 5 times) after Ukraine War. The MSCI France Islamic showed significance 6 times (negative 4 times) before Ukraine War and MSCI France Islamic showed the significance 9 times (negative 5 times) after Ukraine War. The conventional and MSCI France Islamic shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI France and MSCI France Islamic depicted same pattern before and after the event of Ukraine War. After the event both the indices offered a negative CAR with one spike of positive CAR. The diversification opportunities are not there in the between both indices of France.

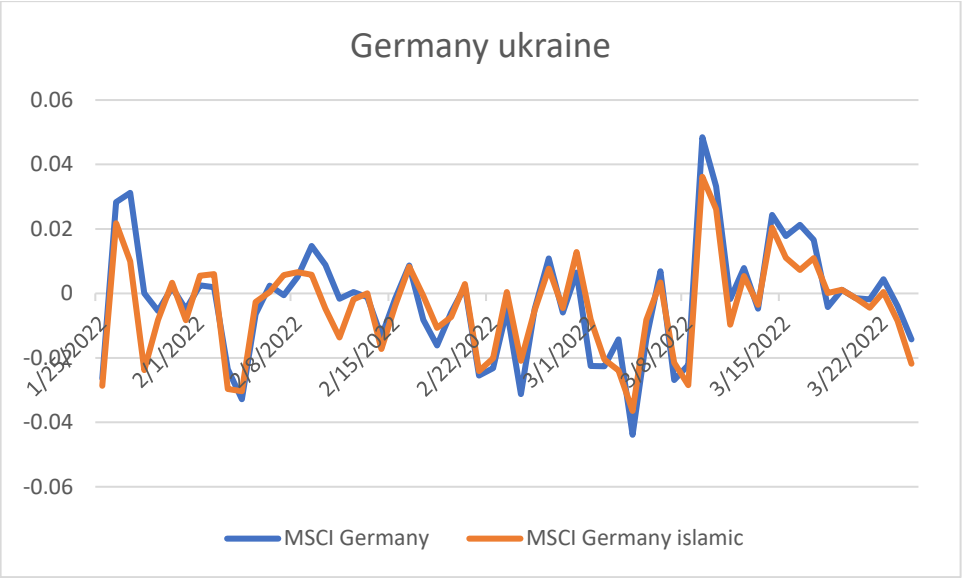

Figure 4.31: CAR of Germany's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI Germany showed significance 4 times (negative 3 times) before the Ukraine War and conventional MSCI Germany showed the significance 11 times (negative 4 times) after Ukraine War. The MSCI Germany Islamic showed significance 6 times (negative 2 times) before Ukraine War and MSCI Germany Islamic showed the significance 9 times (negative 4 times) after Ukraine War. The conventional and Islamic index of Germany shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI Germany and MSCI Germany Islamic depicted same pattern before and after the event of Ukraine War. After the event both the indices offered a negative CAR with one spike of positive CAR. The diversification opportunities are not there in the between both indices of France.

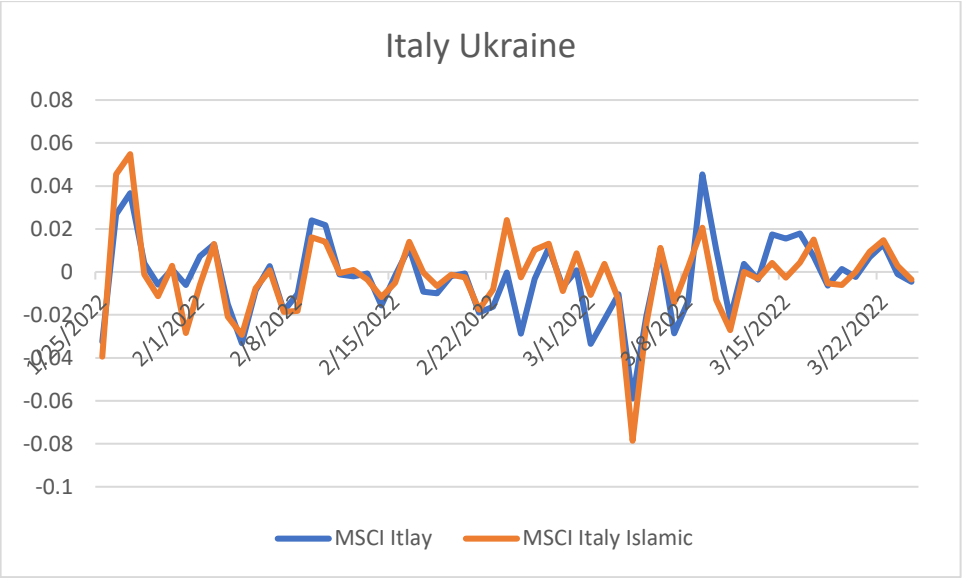

Figure 4.32: CAR of Italy's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI Italy showed significance 5 times (negative 3 times) before the Ukraine War and conventional MSCI Italy showed the significance 10 times (negative 4 times) after Ukraine War. The MSCI Italy Islamic showed significance 2 times (negative 1 times) before Ukraine War and MSCI Islamic showed the significance 5 times (negative 3 times) after Ukraine War. The conventional and Islamic index of Italy shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI Italy and MSCI Italy Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between both indices of France. Even both indices do not provide cumulative abnormal returns. It's not good with the perspective of investment.

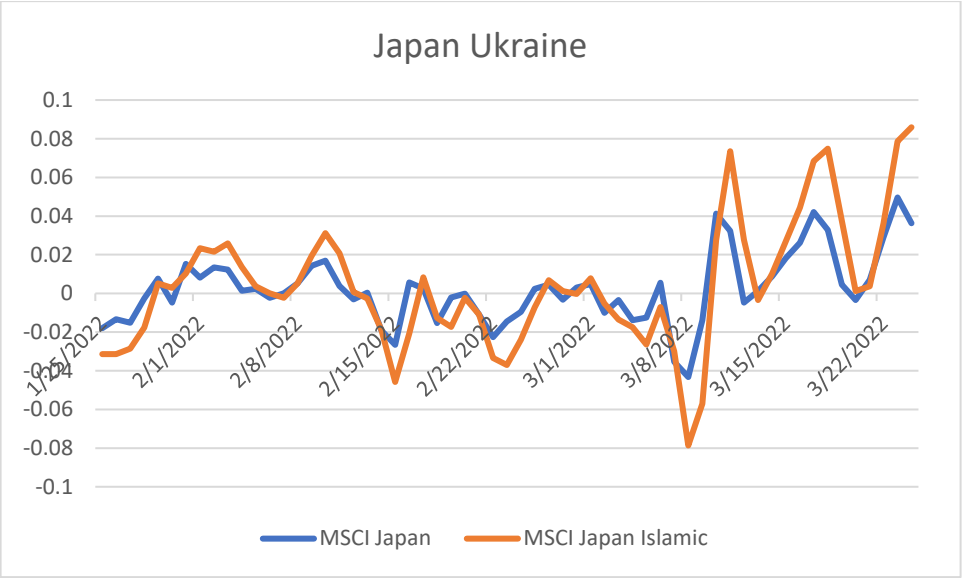

Figure 4.33: CAR of Japan's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI Japan showed significance 0 times (negative 0 times) before the Ukraine War and conventional MSCI Japan showed the significance 6 times (negative 2 times) after Ukraine War. The MSCI Japan Islamic showed significance 1 times (negative 0 times) before Ukraine War and MSCI Japan Islamic showed the significance 7 times (negative 2 times) after Ukraine War. The conventional and Islamic index of Japan shows the same pattern before and after the event of Ukraine War. But after the event Islamic offers more CAR. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI Japan and MSCI Japan Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between both indices of Japan. Initially there were negative CAR but later it converted to the positive CAR.

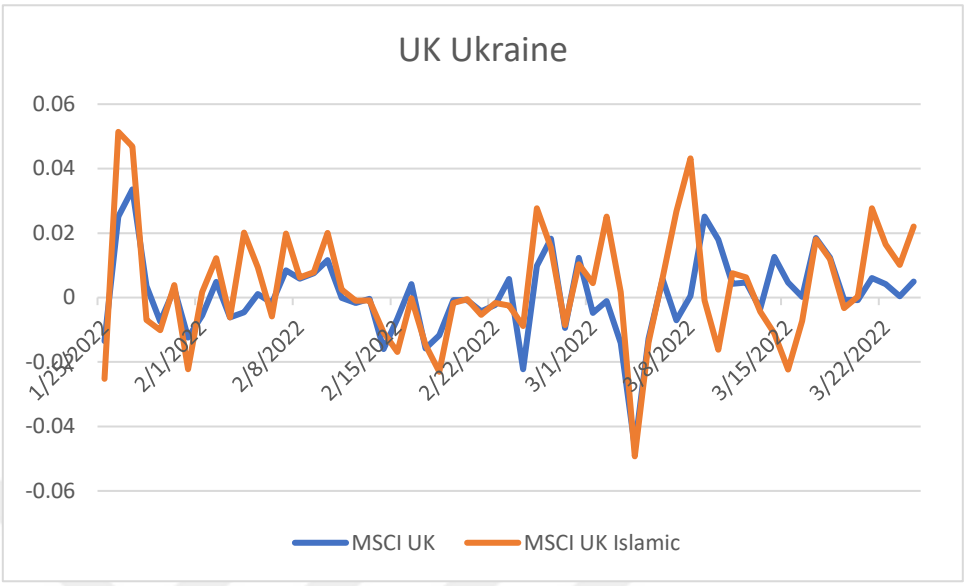

Figure 4.34: CAR of UK's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI UK showed significance 5 times (negative 3 times) before the Ukraine War and conventional MSCI UK showed the significance 6 times (negative 4 times) after Ukraine War. The MSCI UK Islamic showed significance 2 times (negative 1 times) before Ukraine War and MSCI UK Islamic showed the significance 7 times (negative 2 times) after Ukraine War. The conventional and Islamic index of UK shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI UK and MSCI UK Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between indices of the UK.

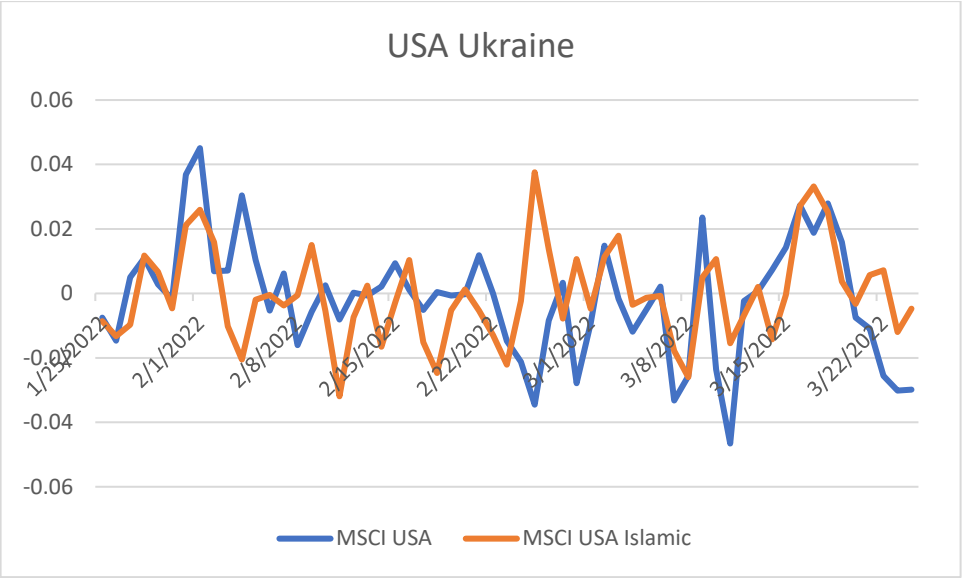

Figure 4.35: CAR of USA's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI USA showed significance 1 times (negative 0 times) before the Ukraine War and conventional MSCI USA showed the significance 5 times (negative 4 times) after Ukraine War. The MSCI USA Islamic showed significance 6 times (negative 4 times) before Ukraine War and MSCI USA Islamic showed the significance 8 times (negative 3 times) after Ukraine War. The conventional index of USA provides more CAR before the event, but Islamic index maintains trend of before. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI USA and MSCI USA Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in between both indices of the USA. Volatility is seen there in the US market.

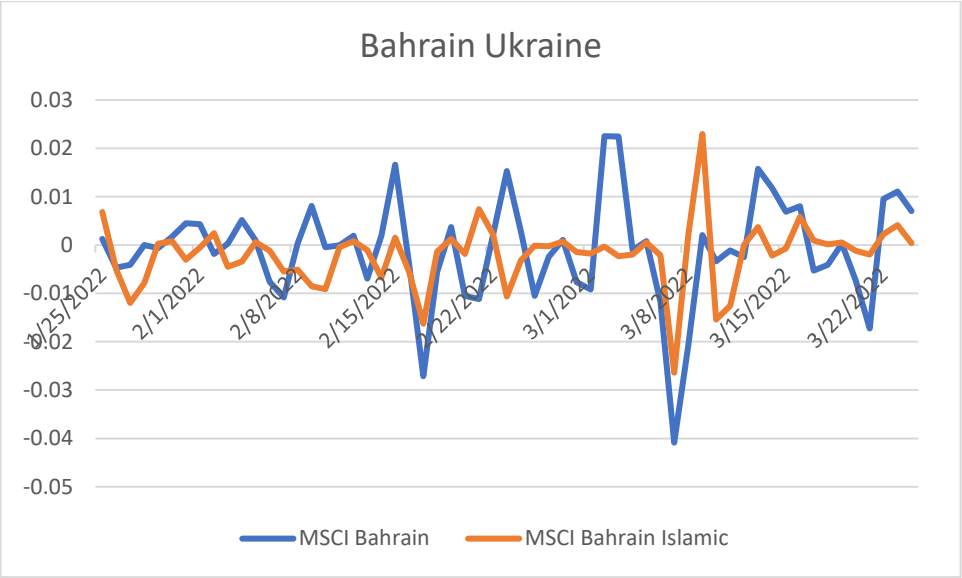

Figure 4.36: CAR of Bahrain's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI Bahrain showed significance 0 times (negative 0 times) before the Ukraine War and conventional MSCI Bahrain showed the significance 4 times (negative 1 times) after Ukraine War. The MSCI Bahrain Islamic showed significance 1 times (negative 1 times) before Ukraine War and MSCI Bahrain Islamic showed the significance 3 times (negative 2 times) after Ukraine War. The conventional index of Bahrain offers the CAR after the event. The movement of both the indices is different before and after the Ukraine War. Conventional MSCI Bahrain and MSCI Bahrain Islamic depicted different pattern before and after the event of Ukraine War. The diversification opportunities are there in the between both indices of Bahrain with risk. Investors of GCC can get diversification in the Bahrain market during Ukraine war.

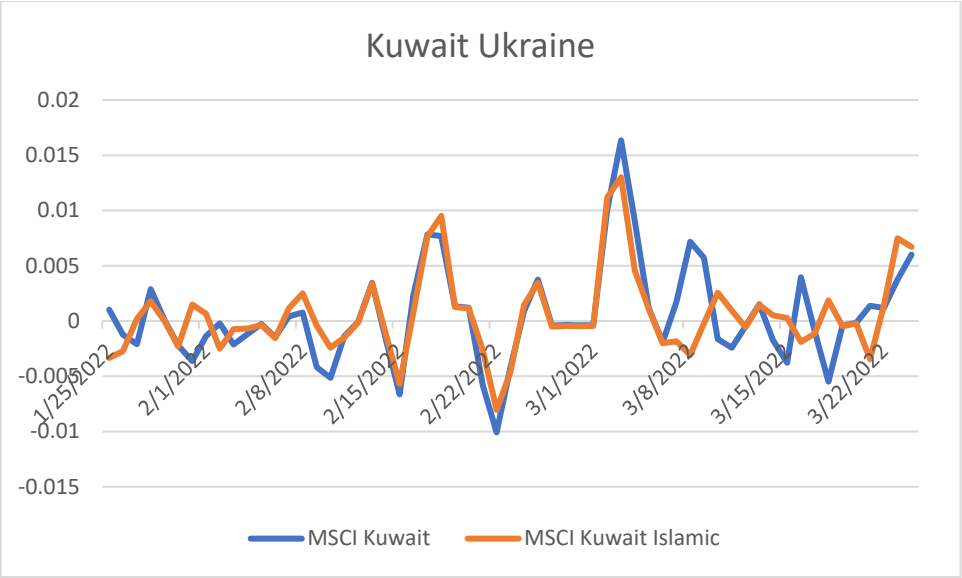

Figure 4.37: CAR of Kuwait's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI Kuwait showed significance 1 times (negative 1 times) before the Ukraine War and conventional MSCI Kuwait showed the significance 1 times (negative 0 times) after Ukraine War. The MSCI Kuwait Islamic showed significance 0 times (negative 0 times) before Ukraine War and MSCI Kuwait Islamic showed the significance 1 times (negative 0 times) after Ukraine War. The conventional and Islamic index of Kuwait shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI Kuwait and MSCI Kuwait Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between both indices of Kuwait. Investors of GCC can get diversification in the Bahrain market during Ukraine war.

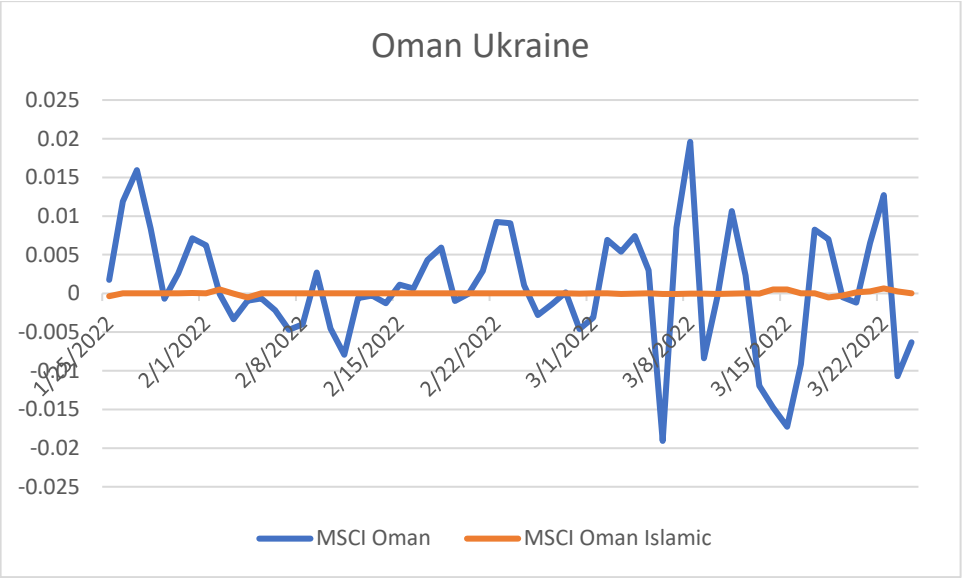

Figure 4.38: CAR of Oman's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI Oman showed significance 0 times (negative 0 times) before the Ukraine War and conventional MSCI Oman showed the significance 4 times (negative 3 times) after Ukraine War. The MSCI Oman Islamic showed significance 3 times (negative 1 times) before Ukraine War and MSCI Oman Islamic showed the significance 11 times (negative 3 times) after Ukraine War. There was issue of data in Oman index. Conventional index of Oman provides more CAR after the event. The movement of both the indices is different before and after the Ukraine War. Conventional MSCI Oman and MSCI Oman Islamic depicted different pattern before and after the event of Ukraine War. The diversification opportunities are there in the between both indices of Oman. Investors of GCC can get diversification in the Bahrain and Oman market during Ukraine war.

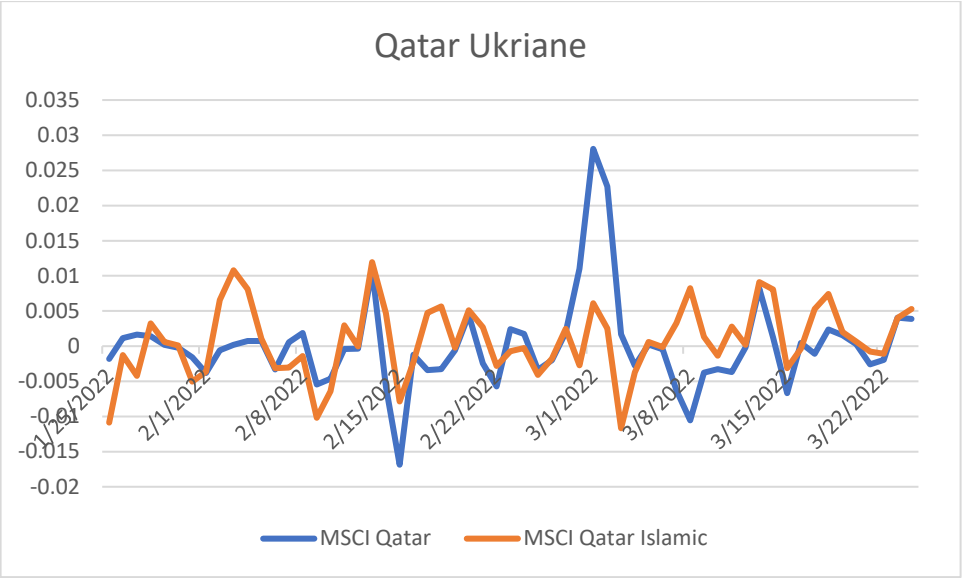

Figure 4.39: CAR of Qatar's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI Qatar showed significance 2 times (negative 1 times) before the Ukraine War and conventional MSCI Qatar showed the significance 3 times (negative 0 times) after Ukraine War. The MSCI Qatar Islamic showed significance 3 times (negative 2 times) before Ukraine War and MSCI Qatar Islamic showed the significance 2 times (negative 0 times) after Ukraine War. The conventional and Islamic index of Ukraine shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same before and after the Ukraine War. Conventional MSCI Qatar and MSCI Qatar Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between both indices of Qatar. Investors of GCC can get diversification in the Bahrain and Oman market during Ukraine war.

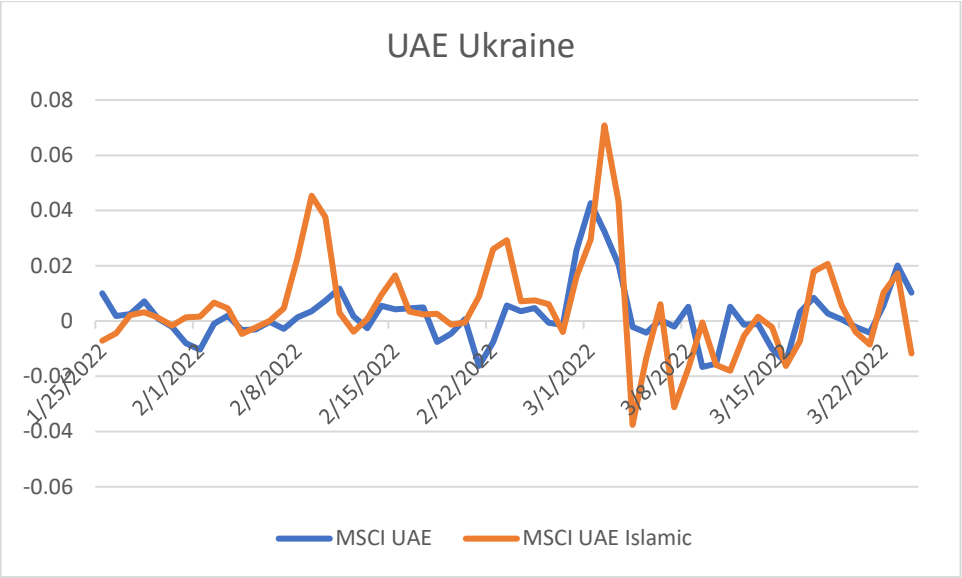

Figure 4.40: CAR of UAE's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI UAE showed significance 1 times (negative 1 times) before the Ukraine War and conventional MSCI UAE showed the significance 4 times (negative 1 times) after Ukraine War. The MSCI UAE Islamic showed significance 4 times (negative 0 times) before Ukraine War and MSCI UAE Islamic showed the significance 10 times (negative 3 times) after Ukraine War. The conventional and Islamic index of UAE shows the same pattern before and after the event of Ukraine War. The movement of both the indices is same and different before and after the Ukraine War. Conventional MSCI UAE and MSCI UAE Islamic depicted same pattern before and after the event of Ukraine War. The diversification opportunities are there in both indices of UAE. Investors of GCC can get diversification in the Bahrain, Oman and UAE market during Ukraine war.

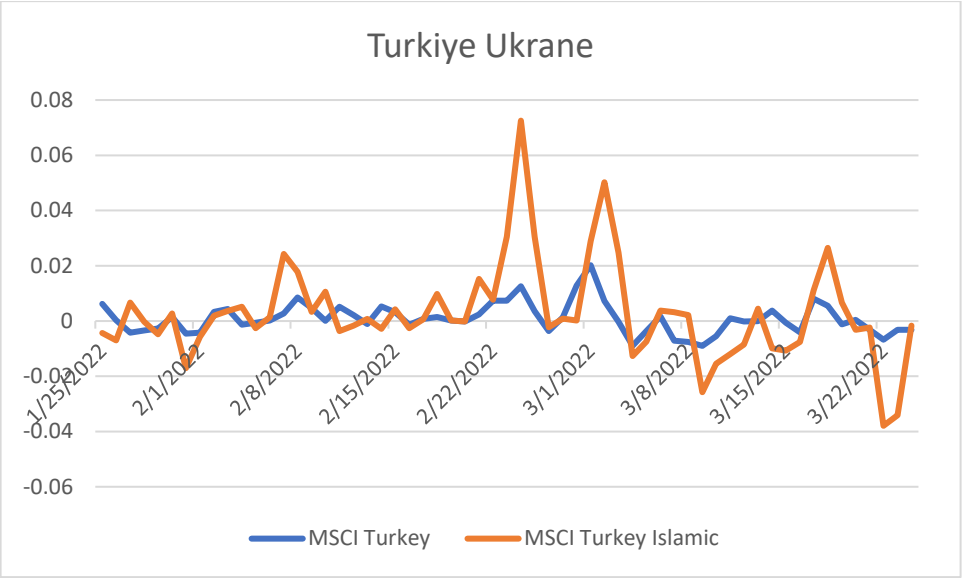

Figure 4.41: CAR of Türkiye's Both Indexes Before and After the Ukraine War

Source: Excel, 2016

The conventional MSCI Türkiye showed significance 1 times (negative 0 times) before the Ukraine War and conventional MSCI Türkiye showed the significance 3 times (negative 0 times) after Ukraine War. The MSCI Türkiye Islamic showed significance 2 times (negative 1 times) before Ukraine War and MSCI Türkiye Islamic showed the significance 5 times (negative 2 times) after Ukraine War. The conventional and Islamic of Türkiye shows the same pattern before and after the event of Ukraine War. The Islamic index provides more CAR for some days. The movement of both the indices is different before and after the Ukraine War. Conventional MSCI Turkey and MSCI Turkey Islamic depicted different pattern before and after the event of Ukraine War. The diversification opportunities are there in the between both indices of Turkey. Investors of Europe and GCC can get diversification in the Bahrain, Oman, UAE and Turkish market during Ukraine war.

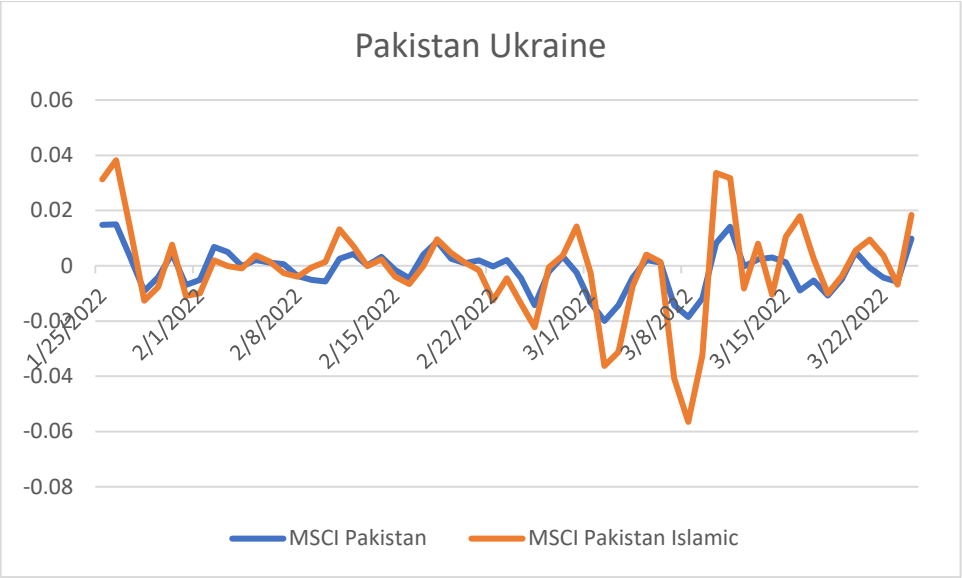

Figure 4.42: CAR of Pakistan's Both Indexes Before and After Ukraine War

Source: Excel, 2016

The conventional MSCI Pakistan showed significance 1 times (negative 0 times) before the Ukraine War and conventional MSCI Pakistan showed the significance 2 times (negative 1 times) after Ukraine War. The MSCI Pakistan Islamic showed significance 1 times (negative 0 times) before Ukraine War and MSCI Pakistan Islamic showed the significance 2 times (negative 1 times) after Ukraine War. The conventional and Islamic index of Pakistan shows the same pattern before and after the event of Ukraine War. The movement of both the indices is different before and after the Ukraine War. Conventional MSCI Pakistan and MSCI Pakistan Islamic depicted different pattern before and after the event of Ukraine War. The diversification opportunities are not there in the between both indices of Pakistan.

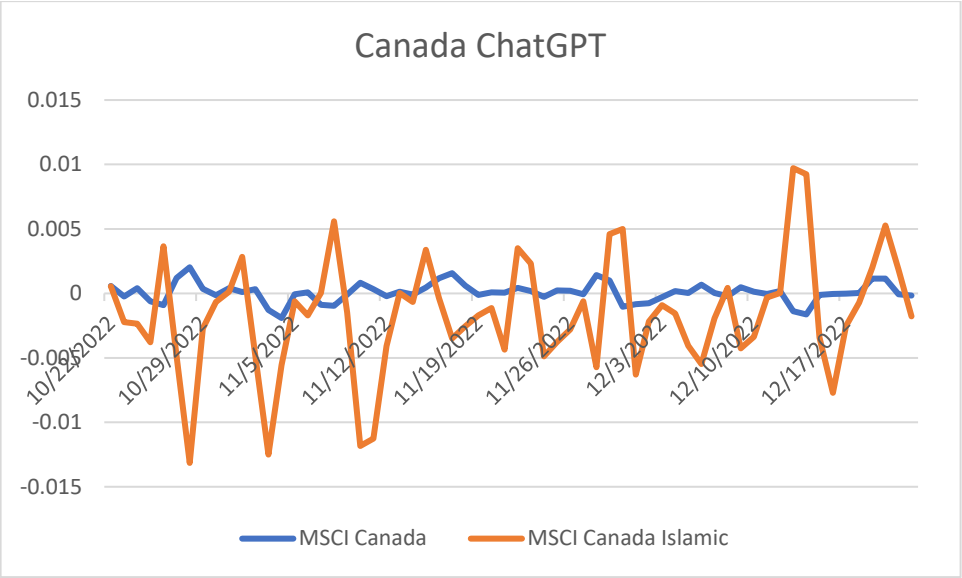

Figure 4.43: CAR of Canada's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Canada showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Canada showed the significance 0 times (negative 0 times) after launch of ChatGPT. The MSCI Canada Islamic showed significance 0 times (negative 0 times) before launch of ChatGPT and MSCI Canada Islamic showed the significance 0 times (negative 0 times) after launch of ChatGPT. The conventional stock index showed its previous trend after the introduction of the ChatGPT. But the trend of the Islamic index is quite different in this case. The Islamic index of Canada showed negative CAR before and after the ChatGPT. The movement of both the indices is different before and after the ChatGPT event. Conventional MSCI Canada and MSCI Canada Islamic depicted different pattern before and after the event of ChatGPT launch. The diversification opportunities are there in between both indices of Canada. Conventional index was stable but with no CAR, but MSCI Canada Islamic reacted negatively to the new technological innovation (ChatGPT). Mostly MSCI Canada Islamic showed the negative returns after during the ChatGPT launch. We can say that MSCI Canada was resistant to other events but prone to technological events. Investors of that region may be cautious to see the outcomes of this new launch.

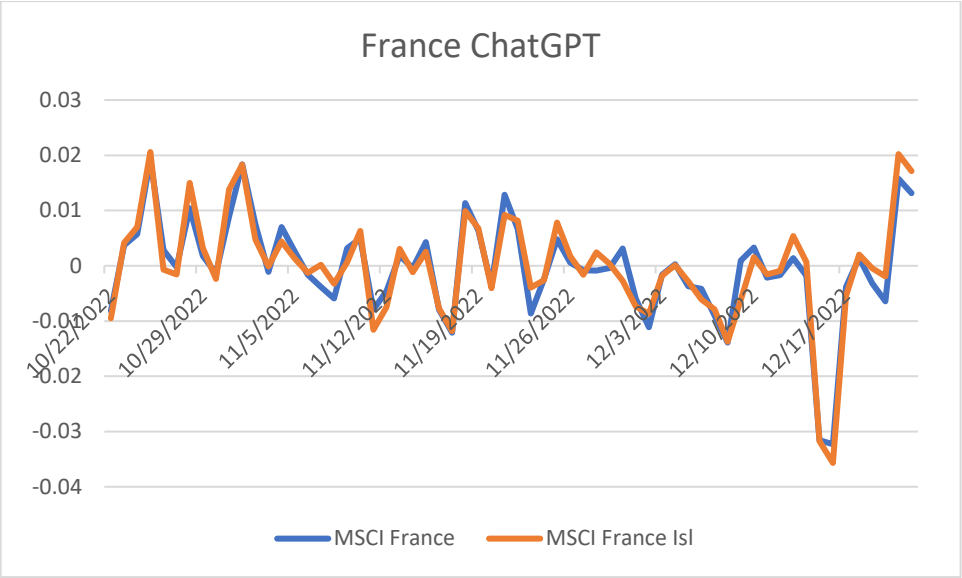

Figure 4.44: CAR of France's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI France showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI France showed the significance 1 times (negative 1 times) after launch of ChatGPT. The MSCI France Islamic showed significance 0 times (negative 0 times) before launch of ChatGPT and MSCI France Islamic showed the significance 2 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic index of France shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI France and MSCI France Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of France. But the CAR were positive in both at this time.

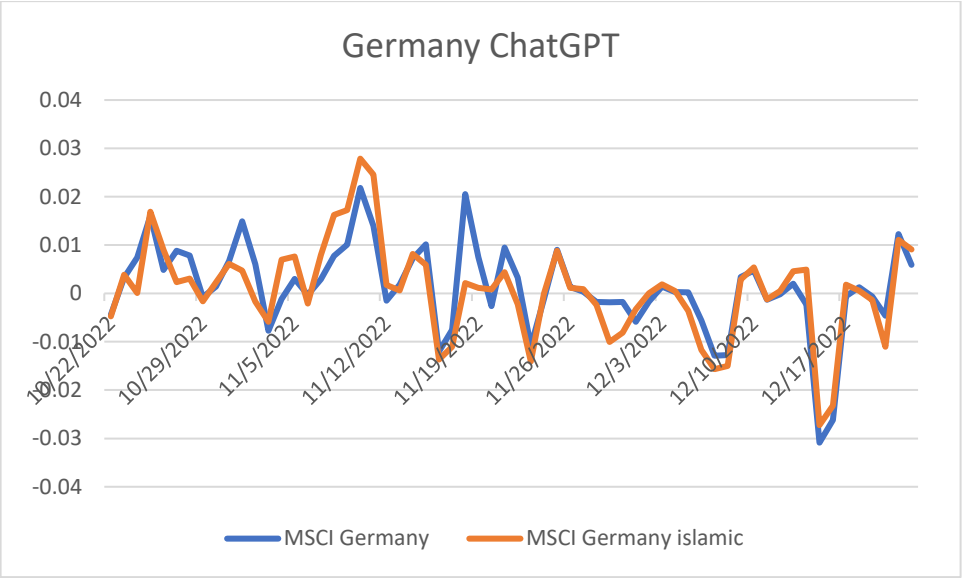

Figure 4.45 CAR of Germany's Both Indexes Before & After Launch of ChatGPT:

Source: Excel, 2016

The conventional MSCI Germany showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Germany showed the significance 1 times (negative 1 times) after launch of ChatGPT. The MSCI Germany Islamic showed significance 1 times (negative 0 times) before launch of ChatGPT and MSCI Germany Islamic showed the significance 1 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic index of Germany shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Germany and MSCI Germany Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of France. But the CAR were positive in both at this time.

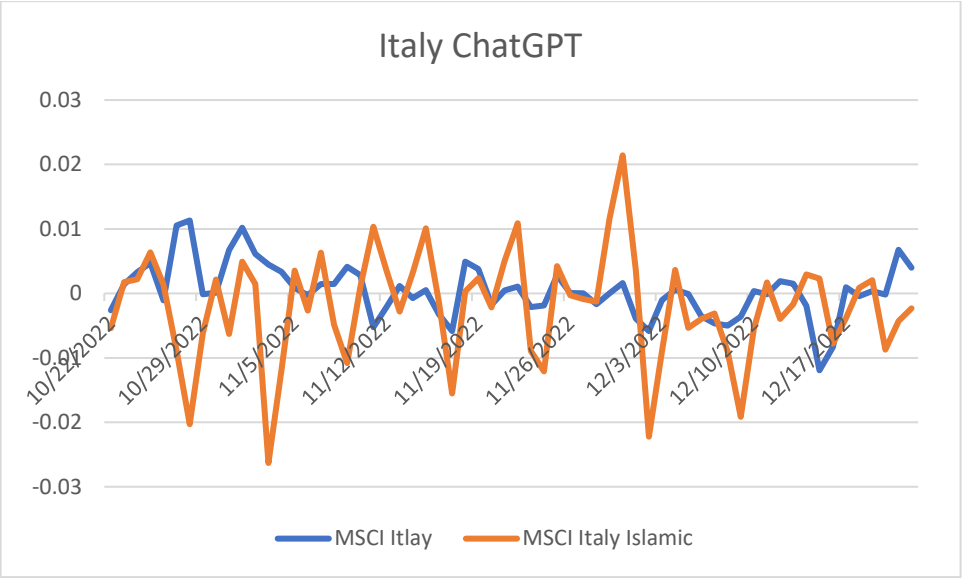

Figure 4.46: CAR of Italy's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Italy showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Italy showed the significance 0 times (negative 0 times) after launch of ChatGPT. The MSCI Italy Islamic showed significance 0 times (negative 0 times) before launch of ChatGPT and MSCI Italy Islamic showed the significance 0 times (negative 0 times) after launch of ChatGPT. The conventional index of Italy reacts same before and after the event. But Islamic shows more volatility. The movement of both the indices is the same but the difference is in intensity before and after the ChatGPT event. Conventional MSCI Italy and MSCI Italy Islamic depicted the different pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Itay.

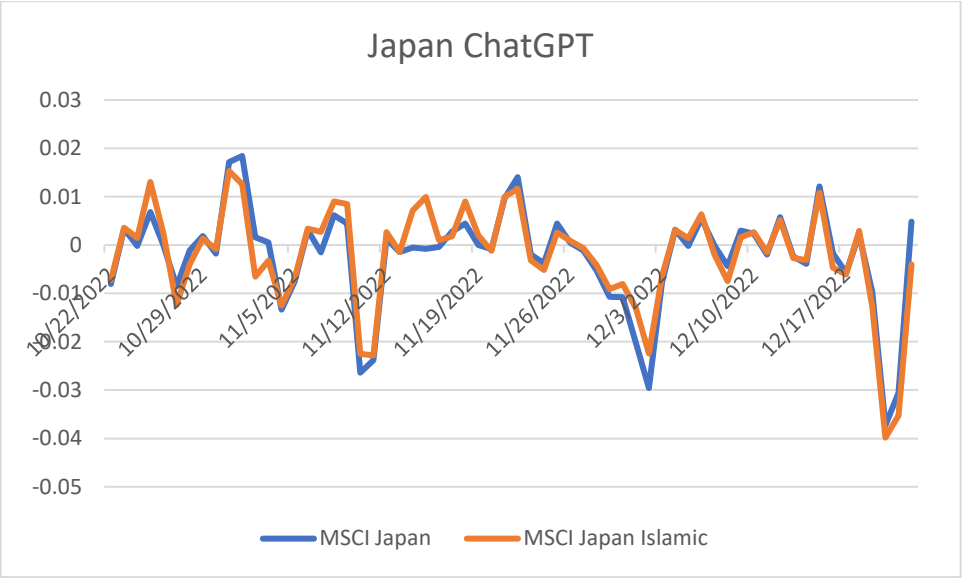

Figure 4.47: CAR of Japan's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Japan showed significance 1 times (negative 1 times) before the launch of ChatGPT and conventional MSCI Japan showed the significance 1 times (negative 1 times) after launch of ChatGPT. The MSCI Japan Islamic showed significance 1 times (negative times) before launch of ChatGPT and MSCI Japan Islamic showed the significance 1 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic index of Japan shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Japan and MSCI Japan Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Japan.

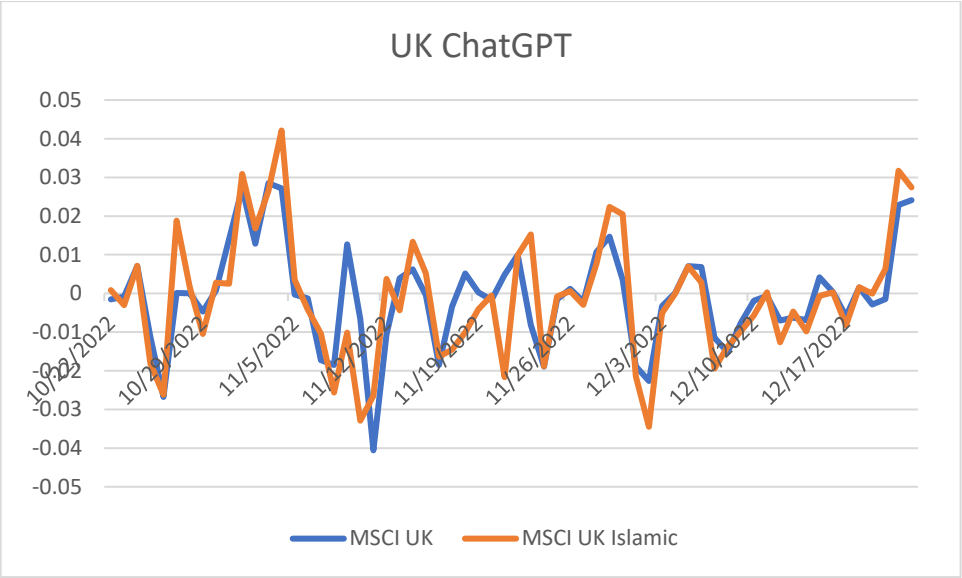

Figure 4.48: CAR of UK's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI UK showed significance 4 times (negative 3 times) before the launch of ChatGPT and conventional MSCI UK showed significance 1 times (negative 0 times) after launch of ChatGPT. The MSCI UK Islamic showed significance 2 times (negative 1 times) before launch of ChatGPT and MSCI UK, Islamic showed the significance 3 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic index of UK shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI UK and MSCI UK Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Japan.

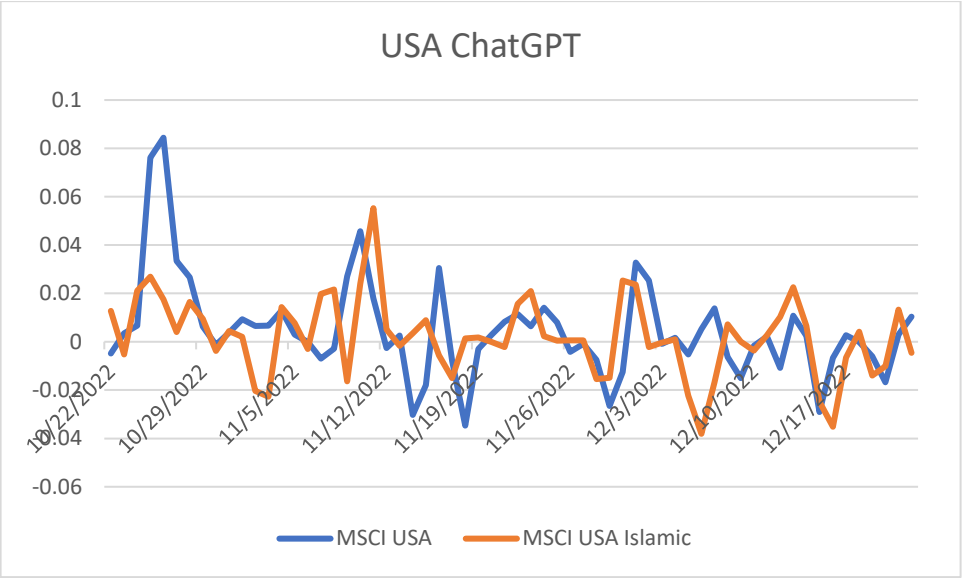

Figure 4.49: CAR of USA's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI USA showed significance 4 times (negative 2 times) before the launch of ChatGPT and conventional MSCI USA showed the significance 1 times (negative 0 times) after launch of ChatGPT. The MSCI USA Islamic showed significance 3 times (negative 2 times) before launch of ChatGPT and MSCI USA Islamic showed the significance 3 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic shows the same pattern before and after the event of Glasgow Climate Pact. Conventional index of USA provides more before the event but for some days. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI USA and MSCI USA Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of the USA.

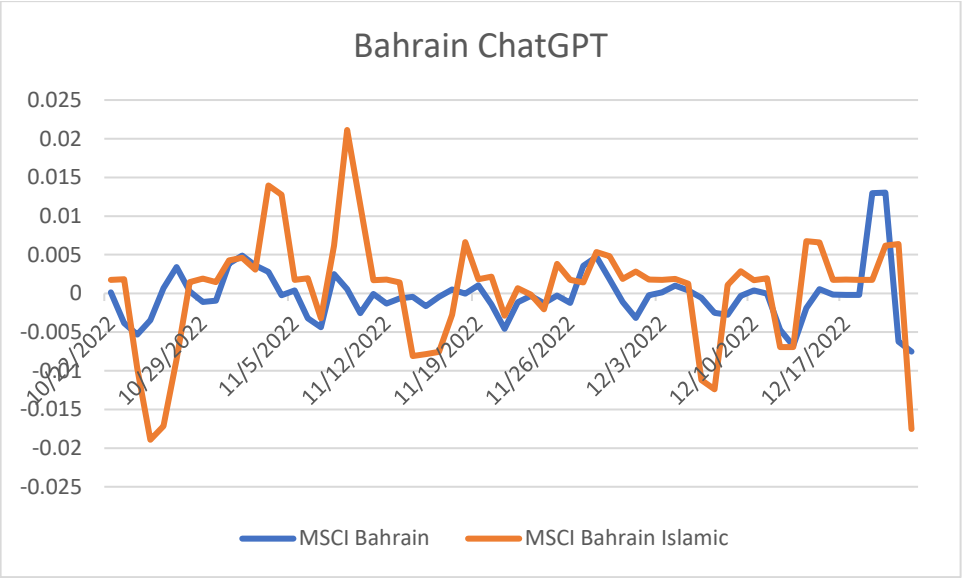

Figure 4.50: CAR of Bahrain's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Bahrain showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Bahrain showed the significance 0 times (negative 0 times) after launch of ChatGPT. The MSCI Bahrain Islamic showed significance 0 times (negative 0 times) before launch of ChatGPT and MSCI Bahrain Islamic showed the significance 1 times (negative 1 times) after launch of ChatGPT. The conventional shows the same pattern before and after the launch of ChatGPT. The CAR of MSCI Bahrain Islamic shows more CAR especially before the event as compared to post event. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Bahrain and MSCI Bahrain Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Bahrain.

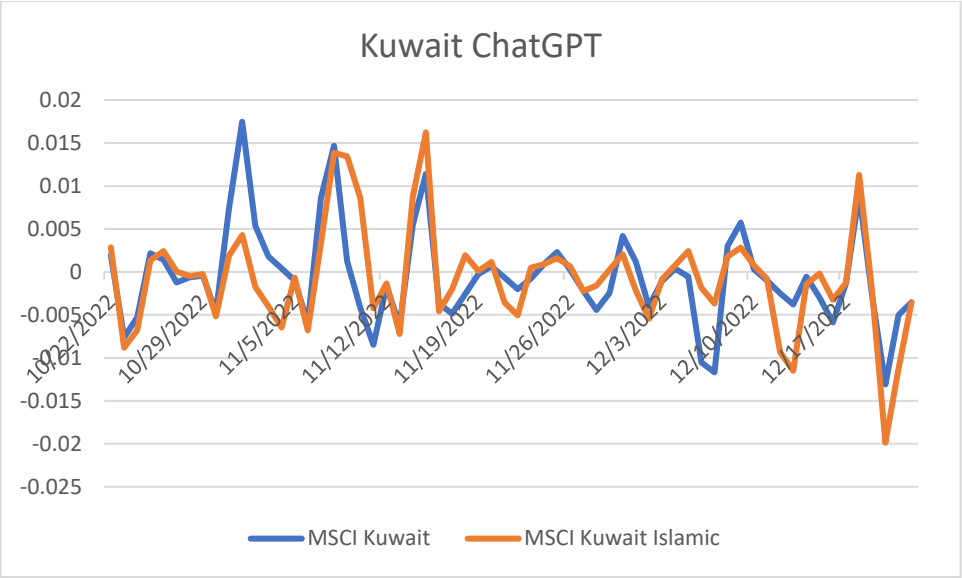

Figure 4.51: CAR of Kuwait's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Kuwait showed significance 3 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Kuwait showed the significance 1 times (negative 1 times) after launch of ChatGPT. The MSCI Kuwait Islamic showed significance 1 times (negative 0 times) before launch of ChatGPT and MSCI Kuwait Islamic showed the significance 0 times (negative 0 times) after launch of ChatGPT. The conventional and Islamic index of Kuwait shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Kuwait and MSCI Kuwait Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Kuwait.

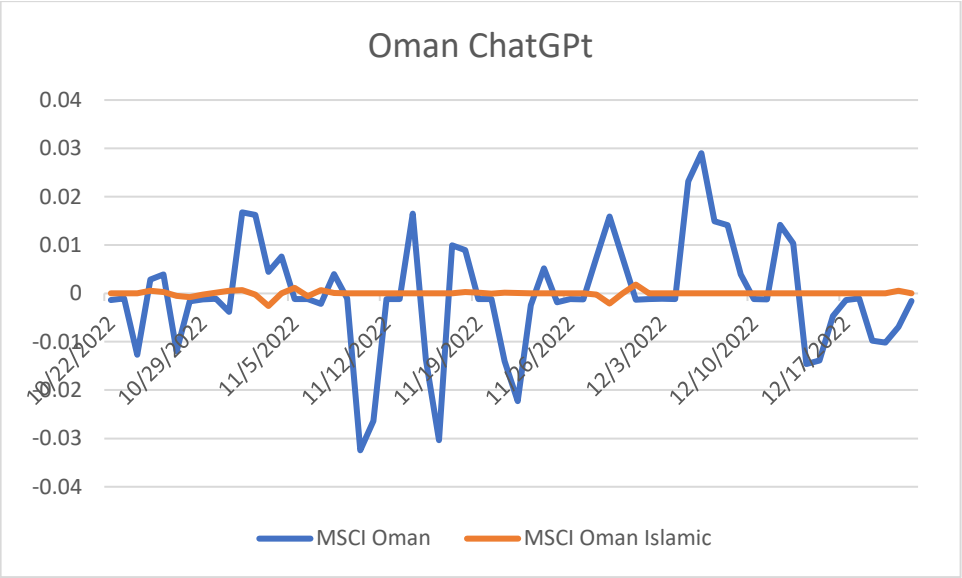

Figure 4.52: CAR of Oman's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Oman showed significance 3 times (negative 1 times) before the launch of ChatGPT and conventional MSCI Oman showed the significance 1 times (negative 0 times) after launch of ChatGPT. The MSCI Oman Islamic showed significance 3 times (negative 1 times) before launch of ChatGPT and MSCI Oman Islamic showed the significance 2 times (negative 1 times) after launch of ChatGPT. The conventional index shows more volatility than Islamic index. MSCI Oman Islamic has constant index value over two years. The movement of both the indices is different before and after the ChatGPT event. Conventional MSCI Oman and MSCI Oman Islamic depicted the different pattern before and after the event of ChatGPT launch. The diversification opportunities are there in between both indices of Oman. GCC investors can diversify the portfolio with conventional MSCI Oman.

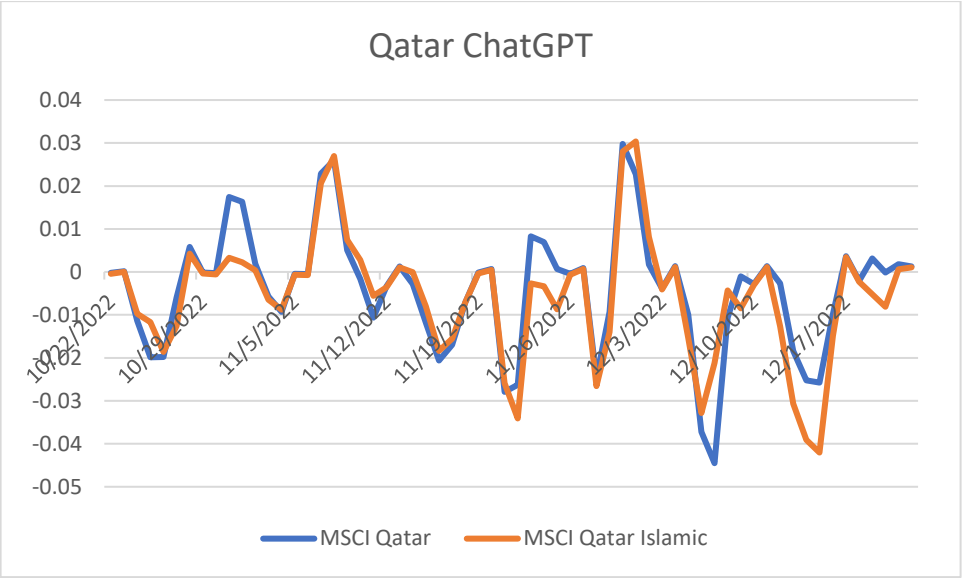

Figure 4.53: CAR of Qatar's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Qatar showed significance 1 times (negative 1 times) before the launch of ChatGPT and conventional MSCI Qatar showed the significance 2 times (negative 2 times) after launch of ChatGPT. The MSCI Qatar Islamic showed significance 2 times (negative 1 times) before launch of ChatGPT and MSCI Qatar Islamic showed the significance 2 times (negative 2 times) after launch of ChatGPT. The conventional and Islamic index of Qatar shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Qatar and MSCI Qatar Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Qatar. GCC investors can diversify the portfolio with conventional MSCI Oman.

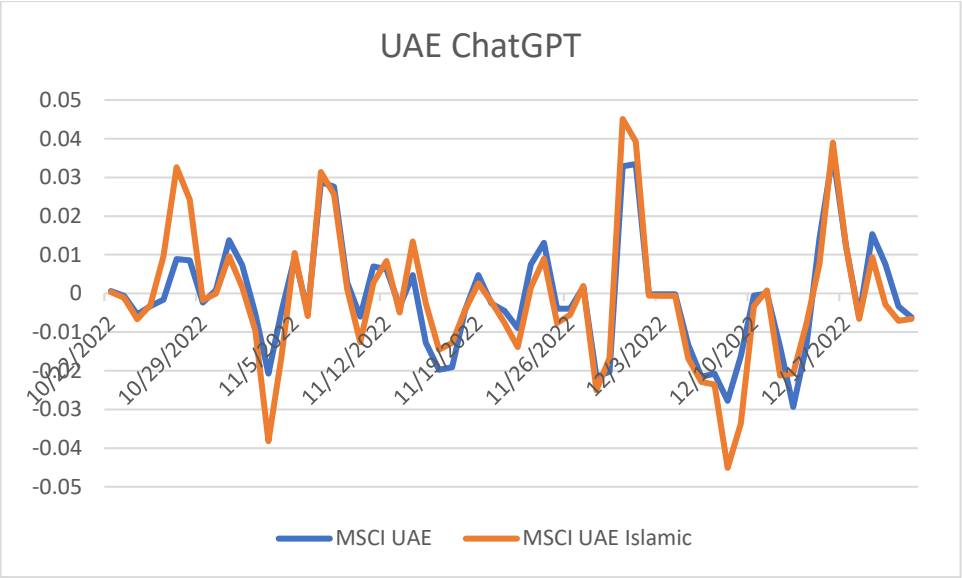

Figure 4.54: CAR of UAE's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI UAE showed significance 2 times (negative 1 times) before the launch of ChatGPT and conventional MSCI UAE showed the significance 2 times (negative 0 times) after launch of ChatGPT. The MSCI UAE Islamic showed significance 4 times (negative 1 times) before launch of ChatGPT and MSCI UAE Islamic showed the significance 2 times (negative 1 times) after launch of ChatGPT. The conventional and Islamic index of UAE shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI UAE and MSCI UAE Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of UAE. GCC investors can diversify the portfolio with conventional MSCI Oman.

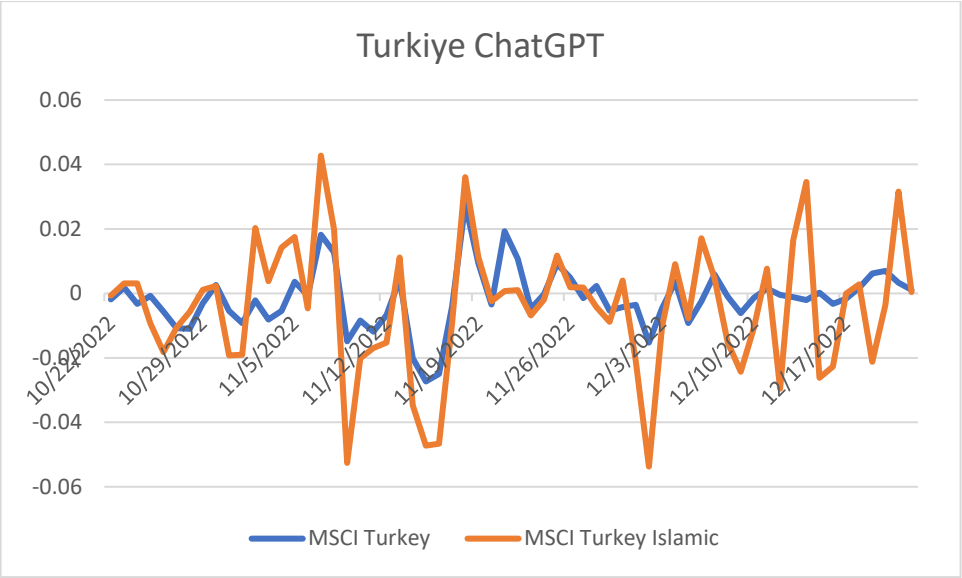

Figure 4.55: CAR of Türkiye's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Türkiye showed significance 8 times (negative 5 times) before the launch of ChatGPT and conventional MSCI Türkiye showed significance 2 times (negative 0 times) after launch of ChatGPT. The MSCI Türkiye Islamic showed significance 7 times (negative 4 times) before launch of ChatGPT and MSCI Türkiye Islamic showed the significance 6 times (negative 5 times) after launch of ChatGPT. The conventional and Islamic index of Türkiye shows the same pattern before and after the event of Glasgow Climate Pact. But Islamic shows more activity. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Turkey and MSCI Turkey Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Turkey. GCC investors can diversify the portfolio with conventional MSCI Oman.

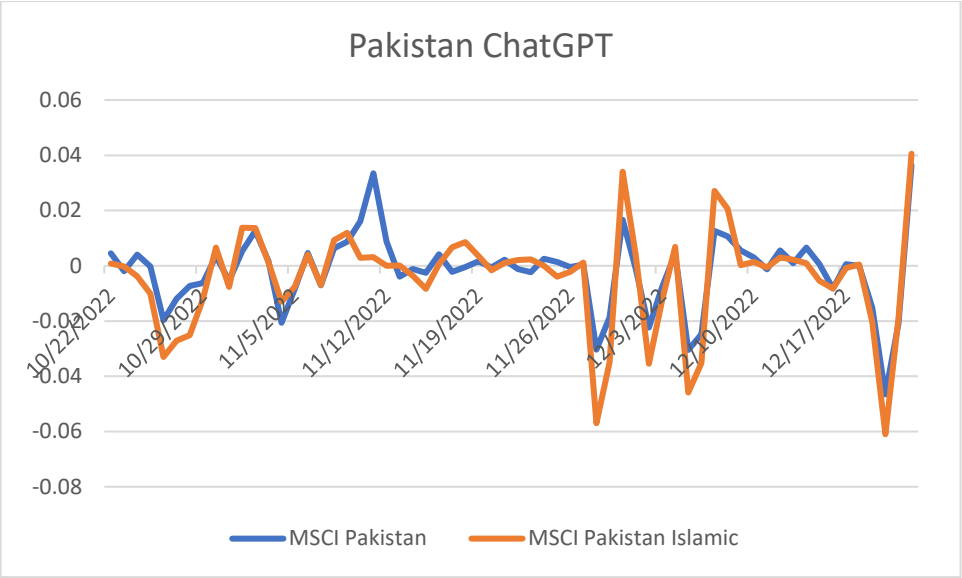

Figure 4.56: CAR of Pakistan's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

The conventional MSCI Pakistan showed significance 0 times (negative 0 times) before the launch of ChatGPT and conventional MSCI Pakistan showed the significance 4 times (negative 3 times) after launch of ChatGPT. The MSCI Pakistan Islamic showed significance 0 times (negative 0 times) before launch of ChatGPT and MSCI Pakistan Islamic showed the significance 3 times (negative 3 times) after launch of ChatGPT. The conventional and Islamic index of Pakistan shows the same pattern before and after the event of Glasgow Climate Pact. The movement of both the indices is the same before and after the ChatGPT event. Conventional MSCI Pakistan and MSCI Pakistan Islamic depicted the same pattern before and after the event of ChatGPT launch. The diversification opportunities are not there in between both indices of Pakistan.

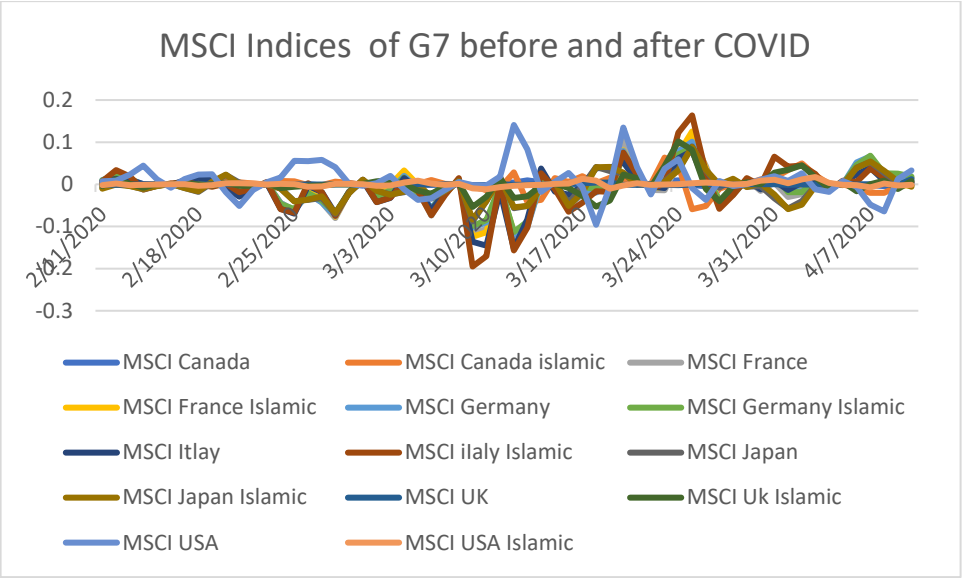

Figure 4.57: CAR of G7's Both Indexes Before & After Launch of COVID

Source: Excel, 2016

MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA Conventional provides better cumulative abnormal returns and diversification opportunities while comparing their counterparts. Overall G7 markets were negative before the event but G7 markets improved after the event. It may be because of Govt measurements.

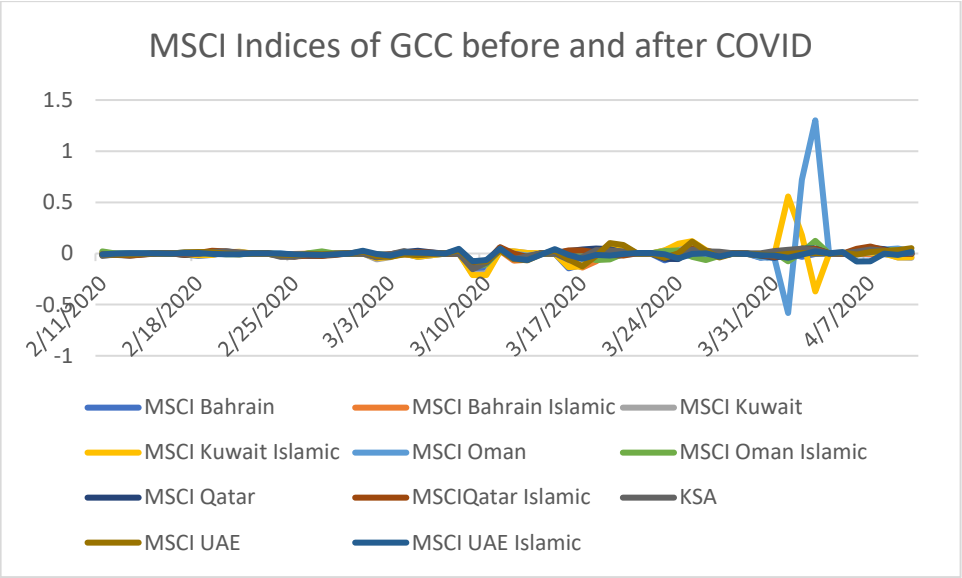

Figure 4.58: CAR of GCC's Both Indexes Before & After Launch of COVID

Source: Excel, 2016

Conventional MSCI UAE shows more volatility and offers more CAR. Mostly GCC indices were stable before the event. Mostly provide a bit more CAR after the event. KSA was negative before and after the event but later improved. There is no diversification opportunity among GCC conventional and Islamic stock indices. Hypothesis is accepted for one index but rejected for the other.

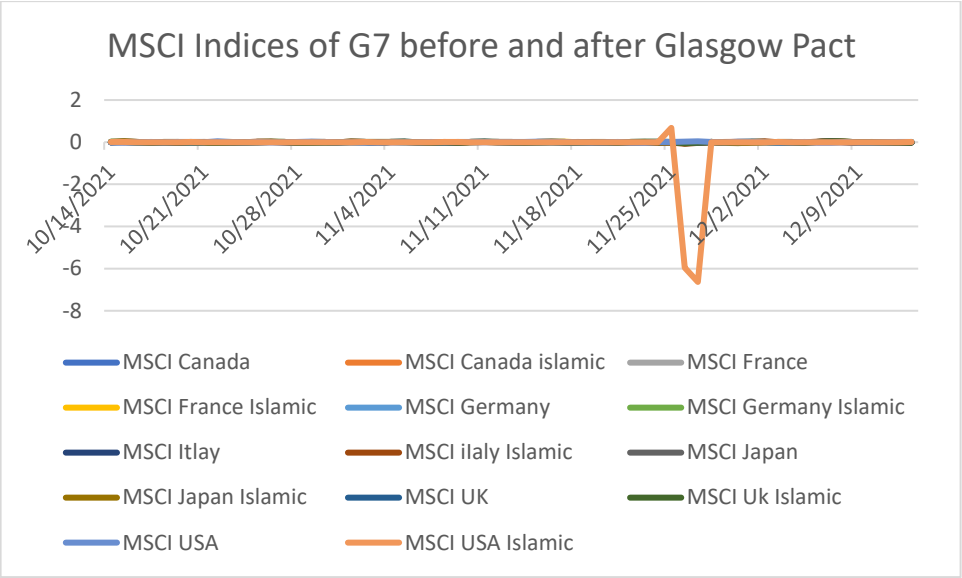

Figure 4.59: CAR of G7's Both Indexes Before & After GCP

Source: Excel, 2016

MSCI Canada Islamic offers higher CAR and diversification opportunities while comparing with counterpart. German, French, Italian and Japanese provides negative CAR after the event. Trend was same in German, French and Italy. Uk was negative to the event. USA did not show any reaction to the event. Hypothesis accepted for Canada Islamic and rejected for other.

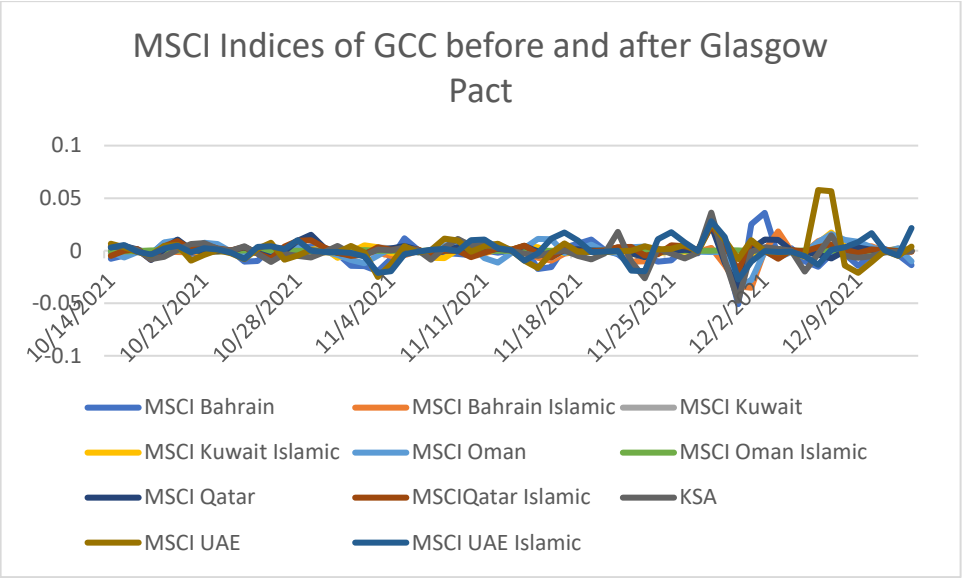

Figure 4.60: CAR of GCC's Both Indexes Before & After GCP

Source: Excel, 2016

The conventional MSCI Oman shows more CAR and diversification opportunities to the event. Bahrain Islamic offers diversification comparing the conventional. Both Kuwait was stable with same movements. Both Qatar was negative before and after the event. Both UAE were negative before and after the event. KSA was volatile before and after the event. Hypothesis is accepted for two and rejected for the other.

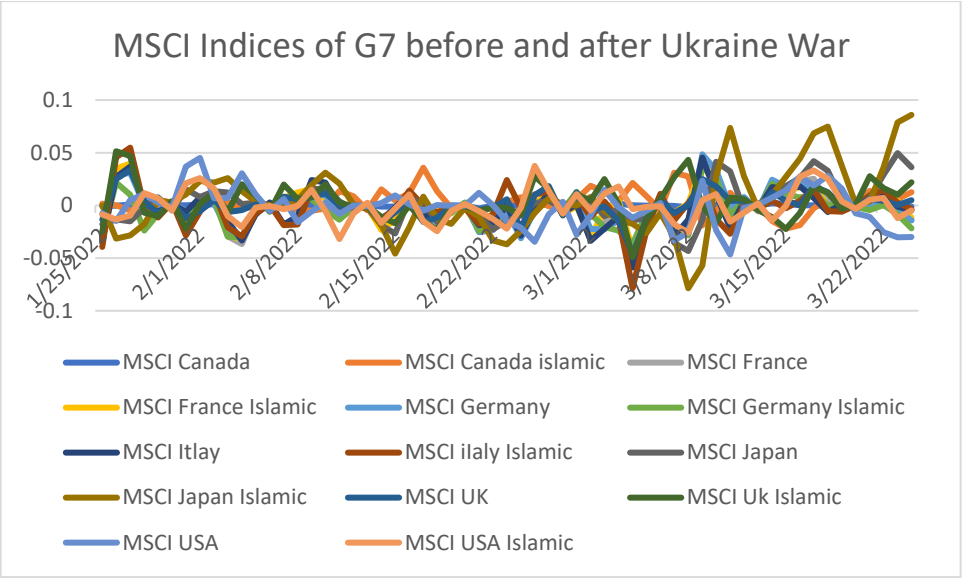

Figure 4.61: CAR of G7's Both Indexes Before & After Ukraine War

Source: Excel, 2016

MSCI Canada Islamic offer higher CAR and diversification than its counterpart but counterpart was stable too. German, French, Italian and Japanese were negative before and after the event as evidenced by the literature. Both UK indices showed higher volatility (mixture of positive and negative). Both USA were negative before and after the event. Results are consistent with Boungou and Yatié (2022) Boubaker et al. (2022) Umar et al. (2022) Nerlinger and Utz (2022) Yousaf, Patel and Yarovaya (2022).

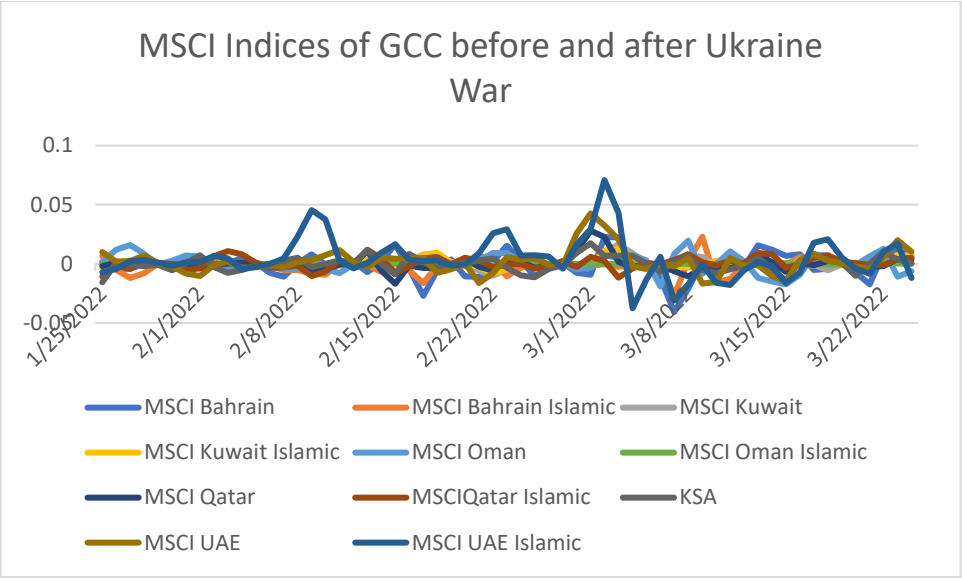

Figure 4.62: CAR of GCC's Both Indexes Before & After Ukraine War

Source: Excel, 2016

MSCI Bahrain, MSCI Oman and MSCI UAE Islamic offer more cumulative abnormal returns and offer diversification. Both UAE was negative to the event. Both Kuwait was negative to the event. Qatar showed more volatility (Ups and down). KSA was volatile to the Ukraine war. Hypothesis is accepted for 3 indices and rejected for others. Results are partially the same and different.

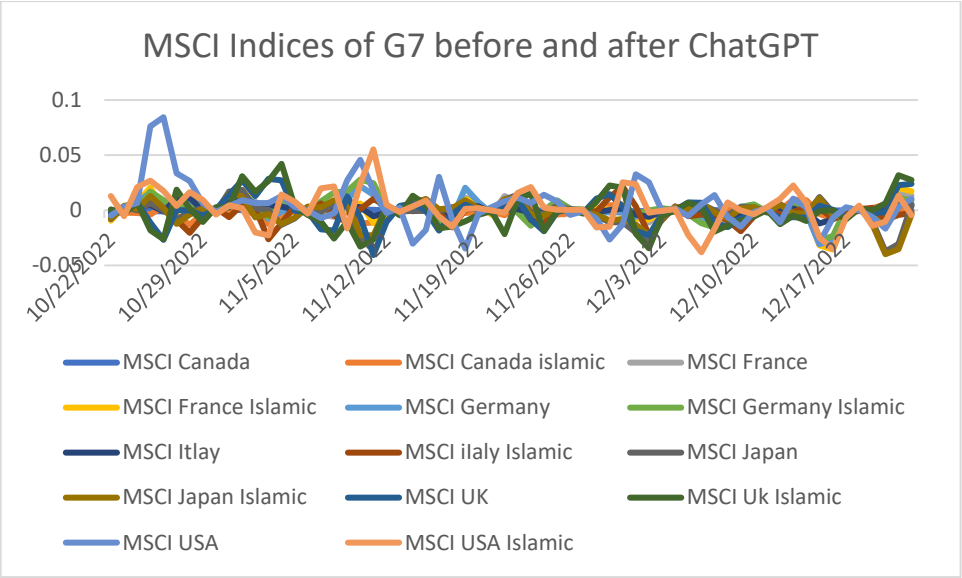

Figure 4.63: G7's CAR of Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

MSCI Canada Islamic was negative before and after the event, but MSCI Canada is stable but without CAR. German, French, Italian and Japanese indices were volatile without diversification. UK was volatile and No diversification. USA was negative after the event. Conventional index of USA provides more before the event but for some days.

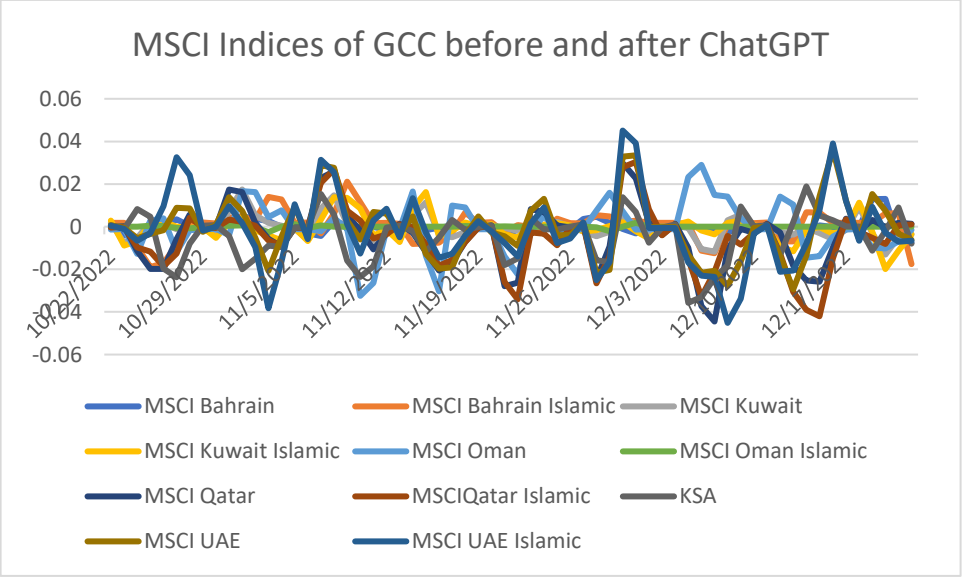

Figure 4.64: CAR of GCC's Both Indexes Before & After Launch of ChatGPT

Source: Excel, 2016

MSCI Bahrain Islamic shows more CAR especially before the event as compared to post event. MSCI Oman provide opportunity for abnormal returns and diversification. Kuwait negatives after the event. Both Qatar was negative after event. Both UAE was negative. KSA was negative before and after the event. Hypothesis is accepted for 2 indices and rejected for others.

4.2 DCC MGARCH Estimation:

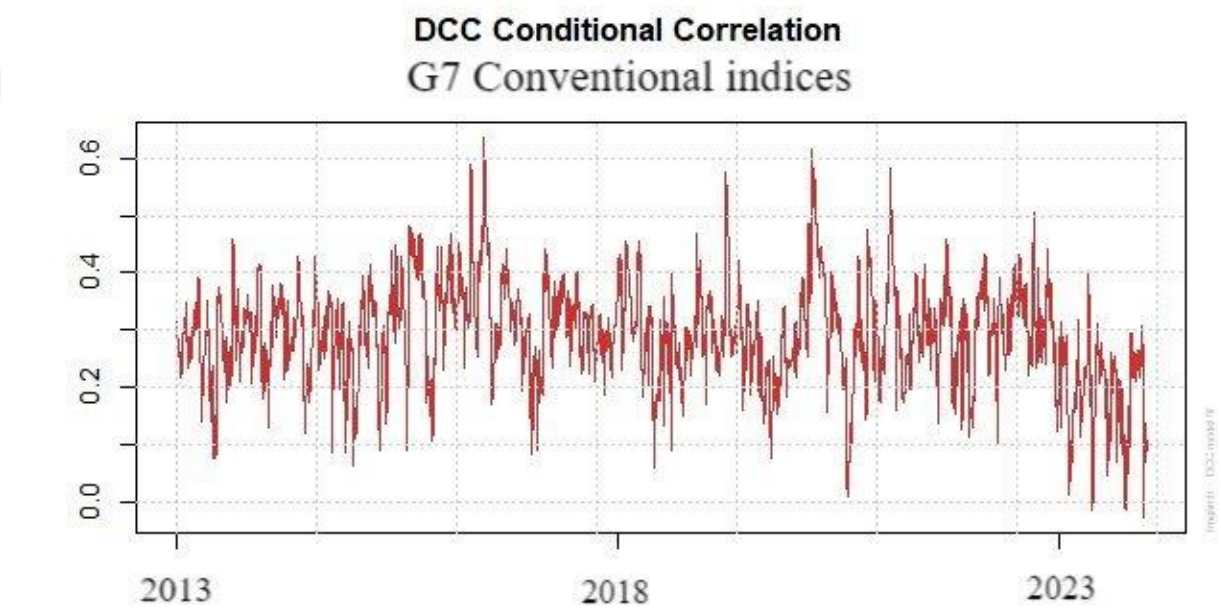

Figure 4.65: DCC MGARCH Among G7 Conventional Indices

Source: R studio, 2024

The graph depicts the dynamic conditional correlation In between the G7 countries. Dynamic conditional correlation is employed to check the time varying correlations between the stock indices or financial assets. The graph shows the dynamic conditional correlation between the G7 countries from 2013 to 2023. The fluctuation in the graph shows how the relationship between G7 countries changes over time. The higher value means that the indices of the countries are highly correlated during that time period. But the lower value means that countries are less likely to be correlated during that period. Closer to 0 means that weak or less correlation. But closer to 0.6 as mentioned above in the graph means that correlation among the countries is more. During 2016 and 2018, the

graph spiked many times. It means that G7 countries moved together or were correlated at that time. It means that during that time. There were no diversification opportunities. It may be because of global macroeconomic developments e.g. recovery from 2008 financial crises and Brexit (Jan 31, 2020) etc. During 2020 to 2023 conditional correlation observed a slight decrease in trend. It may be because of COVID or other issues. It means that countries started to act independently rather than moving together. It may be due to different responses from countries to the global pandemic. We can conclude that the correlation changes among the G7 countries are not static but changes over time. The period of the same movement may show the recovery or growth in the economy, so the indices moved in the same direction but during the crises time, indices were independent to move in either direction.

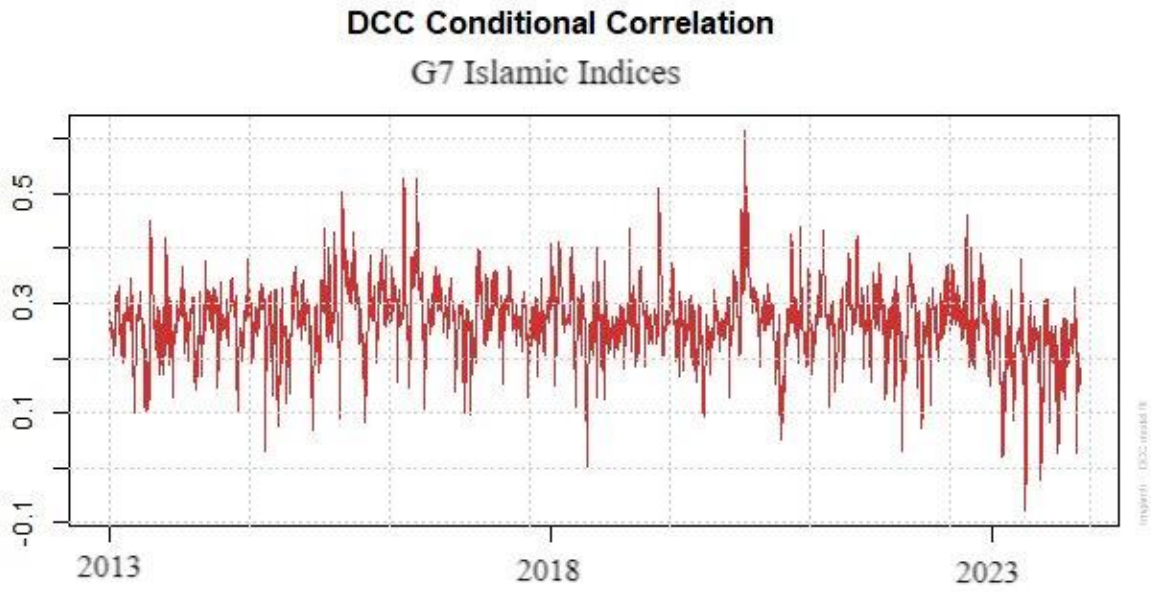

Figure 4.66: DCC MGARCH Among G7 Islamic Indices

Source: R studio, 2024

Positive values represent the positive correlation, but negative values represent the negative correlation between the variables. 0 represents that there is no linear relationship between the stock indices. The graph depicts how the relationship/ correlation between the variables during the 10 years. There was a significant spike during 2018 to 2021. It

shows that there is more correlation between the indices. High spikes means that strong correlations. It means no diversification.

Above 0.5 = Significant Spike= Strong Correlations= No Diversification. The time with less/lower or no correlations means that indices are less likely to move together and provides opportunities for diversification. 0.2 to 0.3 represents the average correlation between the variables over the time. The DCC MGARCH model provides the results for volatility and evolving relationship(correlations) among the G7 Islamic indices.

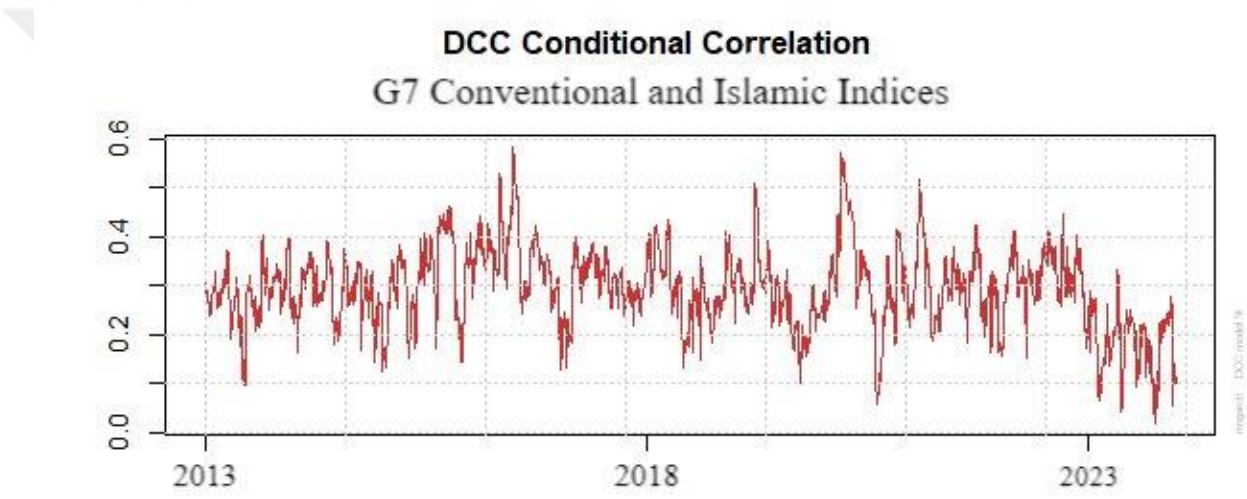

Figure 4.67: DCC MGARCH Among G7 Conventional and Islamic Indices

Source: R studio, 2024

This graph shows that the correlation between the indices is not stable but changes with time. There was peak during 2018 to 2019. During this time correlation reaches to the 0.6. after till 2023 the correlation among conventional and Islamic stock indices declined among the indices. There is no particular trend of increasing and decreasing, rather it may be because of short term conditions rather than long term effect.

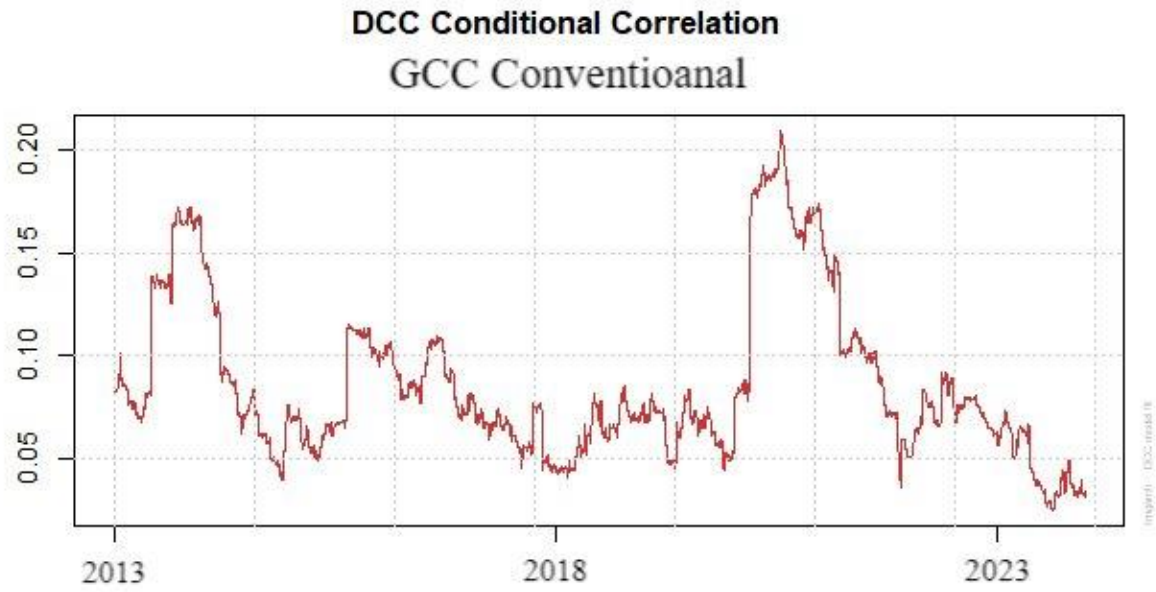

Figure 4.68: DCC MGARCH Among GCC Stock Indices

Source: R studio, 2024

We can divide the fluctuations in different time horizons. There is rise in correlation starting from 2013 to 2015. The correlation during 2016-2019 was quite stable and moderate. There is fast increase in the correlation during 2019-2021. It may be because of global issues. There is a decrease in the correlation during 2022-2023.

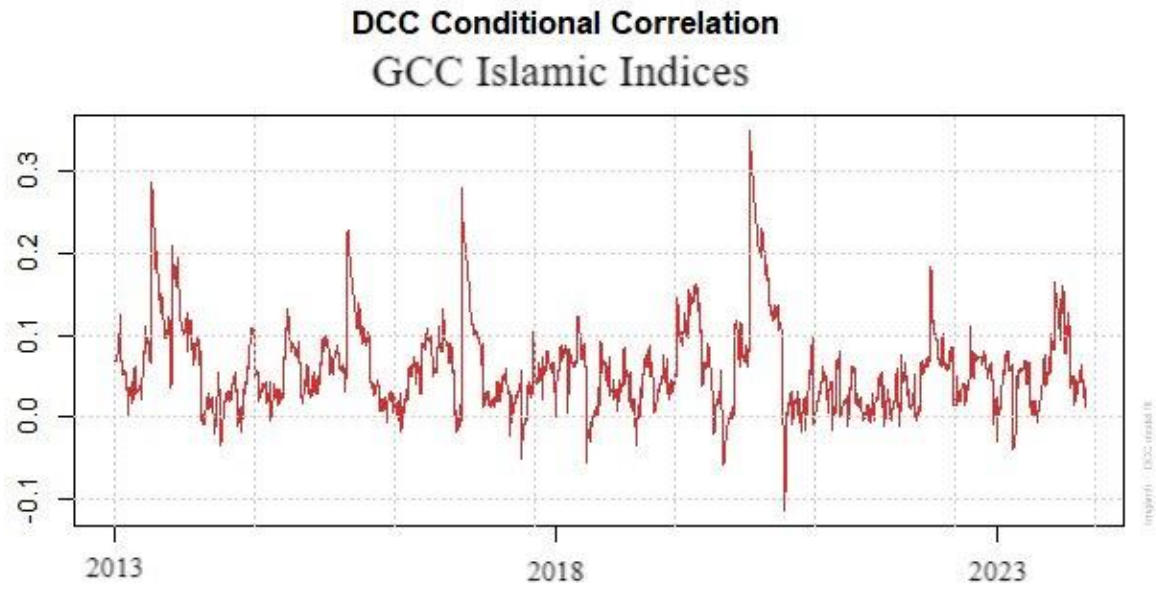

Figure 4.69: DCC MGARCH Among GCC Islamic Stock Indices

Source: R studio, 2024

The graph shows the conditional correlation among the Islamic stock indices of the GCC countries. The are some peaks of correlation but still the correlation is stable and moderate over the time period.

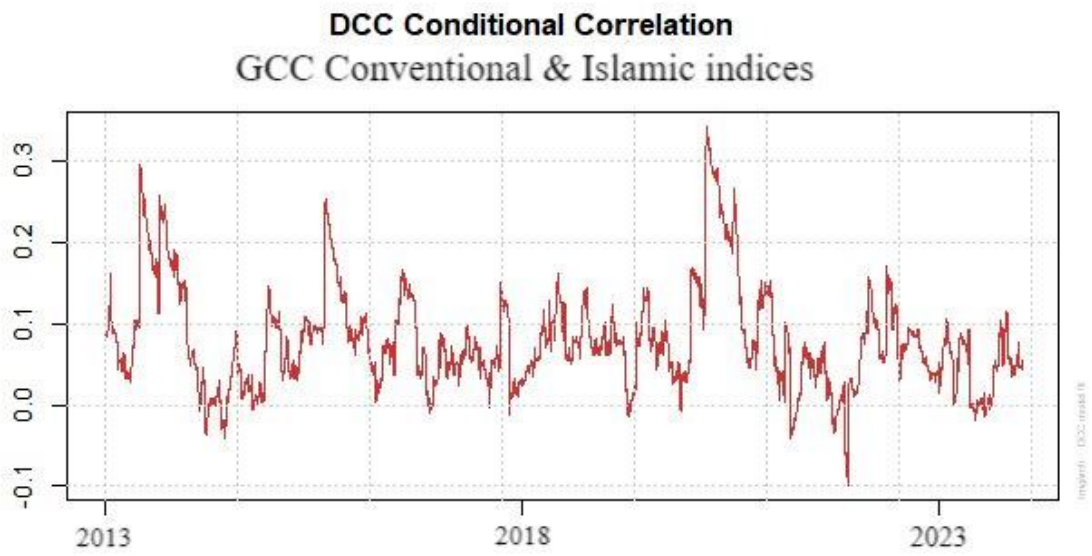

Figure 4.70: DCC MGARCH Among GCC Conventional and Islamic Indices

Source: R Studio, 2024

The graph shows dynamic conditional correlation among the conventional & Islamic stock indices of GCC countries. The relationship is not quite stable and fluctuates with time.

Table 4.1: DCC GARCH Fit for G7 and GCC (Islamic and Conventional)

Distribution	Mvnorm
Model	DCC(1,1)
No. Parameters	296
[VAR GARCH DCC UncQ]	[0+84+2+210]
No. Series	21
No. Obs.	4014
Log-Likelihood	308774
Av.Log-Likelihood	76.92

Source: R Studio, 2024

Another table for the Optimal parameter regarding the G7 and GCC (conventional and Islamic Stock indices is given below. It represents the overall table for both types of indices.

Table 4.2: Optimal Parameters for G7 and GCC (Conventional and Islamic)

	Estimate	**Std. Error**	**t value**	**Pr(>|t|)**
[rbist].mu	0.000188	0.000268	7.02E-01	0.482955
[rbist].omega	0.000013	0	2.73E+01	0.000
[rbist].alpha1	0.054826	0.003966	1.38E+01	0.000
[rbist].beta1	0.906012	0.007784	1.16E+02	0.000
[rca].mu	0.000285	0.00012	2.38E+00	0.017375
[rca].omega	0.000001	0.000002	8.21E-01	0.411622
[rca].alpha1	0.098963	0.036104	2.74E+00	0.006124
[rca].beta1	0.890361	0.033409	2.67E+01	0.000
[rcai].mu	0.000156	0.000142	1.10E+00	0.271812

[rcai].omega	0.000001	0.00002	5.32E-02	0.957543
[rcai].alpha1	0.066468	0.237319	2.80E-01	0.779417
[rcai].beta1	0.929552	0.234602	3.96E+00	0.000074
[rfr].mu	0.000261	0.000142	1.84E+00	0.06562
[rfr].omega	0.000003	0.000007	4.07E-01	0.684284
[rfr].alpha1	0.097653	0.01288	7.58E+00	0
[rfr].beta1	0.878252	0.046936	1.87E+01	0
[rfri].mu	0.000278	0.000257	1.08E+00	0.278682
[rfri].omega	0.000003	0.000034	8.87E-02	0.929326
[rfri].alpha1	0.094406	0.022195	4.25E+00	0.000021
[rfri].beta1	0.879288	0.241802	3.64E+00	0.000276
[rger].mu	0.000222	0.000139	1.60E+00	0.10908
[rger].omega	0.000002	0.000005	4.96E-01	0.619677
[rger].alpha1	0.070773	0.016906	4.19E+00	0.000028
[rger].beta1	0.909399	0.033814	2.69E+01	0
[rgeri].mu	0.000227	0.000148	1.53E+00	0.125621
[rgeri].omega	0.000002	0.000002	8.26E-01	0.408848
[rgeri].alpha1	0.058412	0.017292	3.38E+00	0.00073
[rgeri].beta1	0.92529	0.022284	4.15E+01	0
[ritly].mu	0.000308	0.000167	1.84E+00	0.065332
[ritly].omega	0.000004	0.000004	1.08E+00	0.27869
[ritly].alpha1	0.081802	0.010961	7.46E+00	0
[ritly].beta1	0.894026	0.022901	3.90E+01	0
[ritlyi].mu	0.000147	0.000187	7.86E-01	0.432131

[ritlyi].omega	0.000002	0.000006	3.59E-01	0.71944
[ritlyi].alpha1	0.051979	0.045633	1.14E+00	0.254678
[ritlyi].beta1	0.938062	0.051867	1.81E+01	0
[rjpi].mu	0.000485	0.000138	3.51E+00	0.000444
[rjpi].omega	0.000003	0.000029	9.15E-02	0.927122
[rjpi].alpha1	0.076425	0.052682	1.45E+00	0.146867
[rjpi].beta1	0.899159	0.213201	4.22E+00	0.000025
[ruk].mu	0.000153	0.000116	1.31E+00	0.188992
[ruk].omega	0.000003	0.000008	3.57E-01	0.721112
[ruk].alpha1	0.099601	0.015257	6.53E+00	0
[ruk].beta1	0.869741	0.06039	1.44E+01	0
[ruki].mu	0.000181	0.000185	9.76E-01	0.32906
[ruki].omega	0.000001	0.000012	9.73E-02	0.922501
[ruki].alpha1	0.072542	0.149926	4.84E-01	0.628492
[ruki].beta1	0.923764	0.145299	6.36E+00	0
[rusa].mu	0.000935	0.000202	4.62E+00	0.000004
[rusa].omega	0.000006	0.000001	4.09E+00	0.000043
[rusa].alpha1	0.056289	0.010762	5.23E+00	0
[rusa].beta1	0.918207	0.018921	4.85E+01	0
[rusai].mu	0.0004	0.000104	3.85E+00	0.000119
[rusai].omega	0.000002	0.000002	9.29E-01	0.353056
[rusai].alpha1	0.120943	0.014842	8.15E+00	0
[rusai].beta1	0.85316	0.022977	3.71E+01	0
[rbah].mu	0.000086	0.000127	6.75E-01	0.499906

[rbah].omega	0.000004	0.000001	4.90E+00	0.000001
[rbah].alpha1	0.067804	0.014294	4.74E+00	0.000002
[rbah].beta1	0.899231	0.016631	5.41E+01	0
[rbahi].mu	-0.002087	0.000001	-1.41E+03	0
[rbahi].omega	0	0.000002	4.81E-02	0.961607
[rbahi].alpha1	0.051426	0.000027	1.94E+03	0
[rbahi].beta1	0.90188	0.001298	6.95E+02	0
[rkwt].mu	0.000235	0.000104	2.26E+00	0.023921
[rkwt].omega	0.000002	0.000004	5.16E-01	0.605699
[rkwt].alpha1	0.077756	0.02138	3.64E+00	0.000276
[rkwt].beta1	0.899749	0.037546	2.40E+01	0
[rkwti].mu	0.000271	0.000129	2.10E+00	0.03592
[rkwti].omega	0.000002	0.000002	7.49E-01	0.453627
[rkwti].alpha1	0.095337	0.031379	3.04E+00	0.00238
[rkwti].beta1	0.898003	0.02107	4.26E+01	0
[rom].mu	-0.000039	0.000122	-3.19E-01	0.749634
[rom].omega	0.000003	0.000001	4.56E+00	0.000005
[rom].alpha1	0.084008	0.012562	6.69E+00	0
[rom].beta1	0.872963	0.013974	6.25E+01	0
[ruae].mu	0.000364	0.000157	2.32E+00	0.020188
[ruae].omega	0.000003	0.000003	1.01E+00	0.312311
[ruae].alpha1	0.08015	0.012875	6.23E+00	0
[ruae].beta1	0.898686	0.02371	3.79E+01	0
[ruaei].mu	0.000389	0.000216	1.81E+00	0.070992

[ruaei].omega	0.000005	0.000001	8.00E+00	0
[ruaei].alpha1	0.056765	0.004756	1.19E+01	0
[ruaei].beta1	0.914641	0.010701	8.55E+01	0
[Joint]dcca1	0.007848	0.001082	7.26E+00	0
[Joint]dccb1	0.97664	0.004773	2.05E+02	0

Source: R Studio, 2024

Here on the table, rbist stands for Türkiye, rca for Canada conventional, rcai for Canada Islamic, rfr for France conventional, rfri for France Islamic, rger for Germany, rgeri for Germany Islamic, ritly for Italy conventional, ritlyi for Italy Islamic, rjp for Japan conventional, rjpi Japan Islamic, ruk for UK, ruki for UK Islamic, r usa for USA, rusai for USA Islamic, rksa for KSA, rbah for Bahrain, rbahi for Bahrain Islamic, rkwt for Kuwait Conventional, rkwti for Kuwait Islamic, rom for Oman, romi for Oman Islamic, ruae for UAE and ruaei for UAE Islamic.

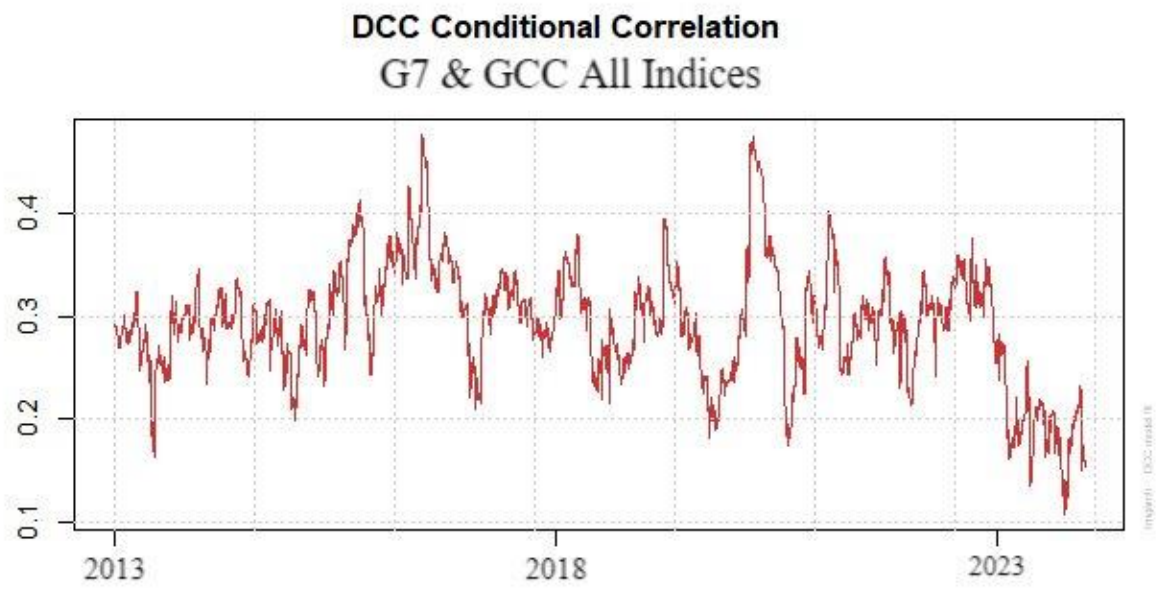

Figure 4.71: G7 and GCC All Indices

Source: R Studio, 2024

The graph depicts the dynamic conditional correlation among the conventional and Islamic stock indices of G7 and GCC countries. The conditional correlation between the G7 and GCC fluctuates between 0.1 and 0.4. There are peaks and lows at different time period for the selected stock indices. There is a lower conditional correlation before 2018 among the indices but after 2018 the conditional correlation increased and represents the movements among the indices. After 2020 DCC started to decline. The DCC MGARCH model depicts that the conditional correlation among the stock indices is not static but evolved with span of time.

Summary of the Chapter:

Some of the Islamic indices provide higher CAR. G7 stock indices are responsive to the event with higher CAR. GCC stock indices are stable over time but with less CAR. G7 and GCC may provide diversification to each other.

CONCLUSION

Islamic Capital Market has the fastest growth rate of 23.5% in last year among other facets of Islamic finance. Its share is 26.5% in Islamic financial institutions. The USA and the European countries also introduced Shari'ah compliant stocks and indices due to its demand, importance and diversification opportunities for investors. The research intends to investigate and compare the impact of COVID, Glasgow Climate Pact, Ukraine War and ChatGPT Launch on the conventional and Islamic stock indices of G7 countries, GCC, Türkiye and Pakistan. The researcher used event study methodology for investigating the impact of the mentioned four events and DCC MGARCH model for the diversification opportunities. According to the writer's horizon, this is the novel research that combined these 4 events together to see the impact. The COVID-19 results show that MSCI Canada Islamic, MSCI Italy Islamic, MSCI UK Islamic and MSCI USA Conventional, MSCI Turkey Islamic provides better cumulative abnormal returns and opportunity for diversification. The COVID results with respect to GCC shows that conventional MSCI UAE shows more volatility and offers more CAR. MSCI Türkiye Islamic and MSCI Pakistan Islamic showed more cumulative abnormal returns. Results are consistent with Khan et al. (2020), Singh et al. (2020) Yan and Qian (2020). Glasgow Climate Pact results show that MSCI Canada Islamic, MSCI Turkey Islamic offer more cumulative abnormal returns and opportunity for the diversification. There are more opportunities in the MSCI Canada Islamic along with the risk as well. The conventional MSCI Bahrain shows more volatility before the Glasgow climate pact and its volatility increased after the Glasgow climate pact. The conventional MSCI Oman shows the more activity than the Islamic index before and after the event of Glasgow Climate Pact. Results are consistent with Rogova and Aprelkova (2020), Pandey, Kumar and Kumari (2022), Phama, Ramiah and Moosa (2020). Ukraine War results show that MSCI Canada Islamic, MSCI Bahrain, MSCI Oman, MSCI UAE Islamic, MSCI Turkey Islamic, MSCI Pakistan Islamic offer more cumulative abnormal returns and offer diversification. The MSCI Canada Islamic index provided the more CAR before and after the Ukraine war. The conventional index of Bahrain and Oman offers the CAR after the event. Results are consistent with Boungou and Yatié (2022) Boubaker et al. (2022) Umar et al. (2022) Nerlinger and Utz (2022) Yousaf, Patel and Yarovaya (2022). ChatGPT results show that MSCI Canada is stable

but without CAR. MSCI Italy and MSCI Oman provide opportunity for abnormal returns and diversification. ChatGPT results show that the Islamic index of Canada showed negative CAR before and after the ChatGPT. Conventional index of USA provides more before the event but for some days. The CAR of MSCI Bahrain Islamic shows more CAR especially before the event as compared to post event. Results are mainly different with Zheng and Feng (2024). Researchers investigated the impact of ChatGPT release on the NVIDIA. DCC MGARCH results explain that during 2016 and 2018, DCC graph of G7 spiked many times. It indicates that G7 countries moved together or were correlated at that time and representing no diversification opportunities. We can conclude that the correlation changes among the G7 countries are not static but changes over time. The period of the same movement may show the recovery or growth in the economy, so the indices moved in the same direction but during the crises time, indices were independent to move in either direction. dcca1 value is 0.0322 that is positive, and it means that past shocks or events have an impact on current correlations. dccb1 is 0.90 that shows that past or previous correlations strongly impact the recent correlations. So, researchers can conclude that the dcc is present among the series. It is also reactive to the shocks but moderately because dcc alpha is less. G7 Islamic indices showed significant spike during 2018 to 2021. It shows that there is more co-relationship between the indices. This graph shows that the correlation between the indices is not stable but changes with time. There was peak during 2018 to 2019. During this time correlation reaches to the 0.6. after till 2023 the correlation among conventional and Islamic stock indices declined among the indices. There is no trend of increasing and decreasing, rather it may be because of short term conditions rather than long term effects. Graph of GCC conventional indices shows rise in correlation starting from 2013 to 2015. The correlation during 2016-2019 was quite stable and moderate. There is fast increase in the correlation during 2019-2021. It may be because of global issues. There is a decrease in the correlation during 2022-2023. Graph of GCC Islamic indices shows the conditional correlation among the Islamic stock indices of the GCC countries. The are some peaks of correlation but still the correlation is stable and moderate over time. DCC graph between G7 and GCC fluctuates between 0.1 and 0.4. There are peaks and lows at different times for the selected stock indices. The DCC MGARCH model depicts that the conditional correlation among the stock indices is not

static but evolved with span of time. dcca1 is 0.0078 along with significant t value means that it is showing strong impact on dynamic correlations. dccb1 is 0.9766 along with the significant t value means that once there is rise or fall in the correlation the trend will remain for a while. MSCI Canada, MSCI France, MSCI France Islamic, MSCI Germany, MSCI Italy, MSCI UK, MSCI UK Islamic, MSCI USA Islamic, MSCI Japan Islamic, MSCI Kuwait, MSCI Kuwait Islamic and MSCI Bahrain Oman offers diversification.

5.1 Basic Conclusion:

Islamic indices provide higher cumulative abnormal returns than market average and offer better diversification for some countries. Islamic indices are stable over the time. These are not more volatile evidenced by literature.

5.2 Implications:

The findings show that Islamic stock indices provide cumulative abnormal returns in case of Canada, Italy Turkey and UAE based on event-based analysis. Investors can seek diversification among MSCI Canada, MSCI France, MSCI France Islamic, MSCI Germany, MSCI Italy, MSCI UK, MSCI USA Islamic, MSCI Japan Islamic, MSCI Kuwait, MSCI Kuwait Islamic, MSCI Bahrain, MSCI Oman provides the diversification opportunities. The study contributed to the existing literature by investigating and comparing the G7 and GCC stock markets.

5.3 Future Studies:

The study did not have any specific limitations. All the data is evaluated to the best of authors' efforts. The idea of research can be extended to other countries. E.g. G20 Countries. It can also be extended to the emerging economies.

REFERENCE

Aamir, M., & Shah, S. Z. A. (2011). Dividend Announcements and the Abnormal Stock Returns for the Event Firm and its Rivals. *Australian Journal of Business and Management Research*, *1*(8): 72-76.

Abbassi, W., Kumari, V., & Pandey, D. K. (2022). What Makes Firms Vulnerable to the Russia–Ukraine Crisis. *The Journal of Risk Finance*, *24*(1): 24-39.

Abdullah, A. M., et.al. (2022) The Dynamics of Australian Stock Indices and Commodity Based on MGARCH-DCC and Wavelet Techniques. *Cogent Business & Management*, *9*(1): 2152154.

Abdullah, A. M., et.al. (2023). The Co-movement of China and US Stock Indices: A Portfolio Diversification Analysis. *Journal of International Studies*, *19*(1): 1-35.

Abdulkarim, F. M., et.al. (2020). The Nexus Between Oil Price and Islamic Stock Markets in Africa: A Wavelet and Multivariate-GARCH Approach. *Borsa Istanbul Review*, *20*(2): 108-120.

Abdullahi, S. I. (2021). Islamic Equities and COVID-19 Pandemic: Measuring Islamic Stock Indices Correlation and Volatility in Period of Crisis. *Islamic Economic Studies*, *29*(1): 50-66.

Abro, A. A., et.al. (2021). Does Ramzan Affect the Returns and Volatility? Evidence From GCC Share Market. *The Journal of Asian Finance, Economics and Business*, *8*(7): 11-19.

Adekoya, O. B., et.al. (2022). Does Oil Connect Differently with Prominent Assets During War? Analysis of Intra-day Data During the Russia-Ukraine Saga. *Resources Policy*, *77*(12): 102-218.

Ahmed, S., Hasan, M. M., & Kamal, M. R. (2023). Russia–Ukraine Crisis: The Effects on the European Stock Market. *European Financial Management*, *29*(4): 1078-1118.

Ahmed, W. M. (2019). Islamic and Conventional Equity Markets: Two Sides of the Same Coin, or not. *The Quarterly Review of Economics and Finance*, *72*(6): 191-205.

Alshurafat, H. (2023). The Usefulness and Challenges of Chatbots for Accounting Professionals. *Innovations in AI*, *18*(2): 513-525.

Al Refai, H., Zeitun, R., & Eissa, M. A. A. (2022). Impact of Global Health Crisis and Oil Price Shocks on Stock Markets in GCC. *Finance Research Letters*, *45*(6): 102-130.

Alfreedi, A. A. (2019). Shocks and Volatility Spillover Between Stock Markets of Developed Countries and GCC Stock Markets. *Journal of Taibah University for Science*, *13*(1): 112-120.

Al-Hajieh, H. (2023). Predictive Directional Measurement Volatility Spillovers Between the US and Selected Asian Pacific Countries. *Cogent Economics & Finance*, *11*(1): 124-136.

Aliani, K., Al-kayed, L., & Boujlil, R. (2022). COVID-19 Effect on Islamic vs. Conventional Banks' Stock Prices: Case of GCC Countries. *The Journal of Economic Asymmetries*, *26*(6): 250-263.

Alkhatib, K., et.al. (2022). Regional Analytics and Forecasting for Most Affected Stock Markets: The Case of GCC Stock Markets During the COVID-19 Pandemic. *International Journal of System Assurance Engineering and Management*, 16(2):1-11.

Allam, Z., Bibri, S. E., & Sharpe, S. A. (2022). The Rising Impacts of the COVID-19 Pandemic and the Russia–Ukraine War. *Climate Justice, 11*(11): 99-109.

Al-Maadid, A., Alhazbi, S., & Al-Thelaya, K. (2022). Using Machine Learning to Analyze the Impact of Coronavirus Pandemic News on the Stock Markets in GCC Countries. *Research in International Business and Finance*, *61*(2): 101-117.

Alotaibi, T. A., & Morales, L. (2022). Financial Uncertainty from a Dual Shock at Global Level– Insights from Kuwait. *International Journal of Financial Studies*, *10*(4), 101.

Aloui, C., Al-Kayed, L., Asadov, A., & Danila, N. (2023). Geopolitical Risk and Stock-Bond Insights from Kuwait. *International Journal of Financial Studies*, *10*(4): 101-115.

Al Rahahleh, N., Akguc, S., & Abalala, T. (2021). Dow Jones Islamic Index Firms: How Profitable are They. *International Journal of Islamic and Middle Eastern Finance and Management*, *14*(3): 463-481.

Alshubiri, F. (2021). Portfolio Returns of Islamic Indices and Stock Prices in GCC Countries: Empirical Evidence from the ARDL Model. *Sage Open*, *11*(2): 215-235.

Aloui, C., Jammazi, R., & Hamida, H. B. (2018). Multivariate Co-movement Between Islamic Stock and Bond Markets Among the GCC: A Wavelet-based View. *Computational Economics*, *52*(7): 603-626.

Amanda, S. T., Akhyar, C., & Ilham, R. N. (2023). The Effect of Inflation, Exchange, Interest Rate on Stock Price in Transportation Sub-sector. *Journal of Accounting Research, Utility Finance and Digital Assets*, *1*(4): 342-352.

Amin, M. R., et.al. (2022). Quantifying the Connectedness and Portfolio Implications Between Islamic and Conventional Bonds: Evidence from Global and GCC Regions. *Journal of Economic Analysis*, *1*(2): 1-16.

Ampountolas, A. (2023). The Effect of COVID-19 on Cryptocurrencies and the Stock Market Volatility: A Two-Stage DCC-EGARCH Model Analysis. *Journal of Risk and Financial Management*, *16*(1): 25-39.

Anggraini, P. G., Utami, E. R., & Wulandari, E. (2022). What Happens to the Stock Market During the COVID-19 Pandemic? A Systematic Literature Review. *Pacific Accounting Review*, *34*(3): 406-425.

Arshed, N., et.al. (2019). Are Karachi Stock Exchange Firms' Investment Promoting? Evidence of Efficient Market Hypothesis Using Panel Cointegration. *Asian Development Policy Review, 7*(2): 52-65.

Assaf, R., Gupta, D., & Kumar, R. (2023). The Price of War: Effect of the Russia-Ukraine War on the Global Financial Market. *The Journal of Economic Asymmetries*, *28*(3): 328-339.

Asutay, M., & Marzban, S. (2015). Alternative Ways of Developing the GCC Islamic Funds Industry: Entrepreneurial Development. *Islamic Finance: Political Economy Perspectives*, 6(2):1-15.

Attia, E. F., Aly, S. M., & Awad, E. O. (2023). Portfolio Diversification Benefits Before and During the Times of COVID-19: Evidence From USA. *Future Business Journal*, *9*(1): 1-15.

Aysan, A. F., Batten, J. A., Gozgor, G., Khalfaoui, R., & Nanaeva, Z. (2023). Twitter Matters for Metaverse Stocks Amid Economic Uncertainty. *Finance Research Letters*, *56*(5): 104-116.

Azrak, T., Saiti, B., Kutan, A., & Engku Ali, E. R. A. (2021). Does Information Disclosure Reduce Stock Price Volatility? A Comparison of Islamic and Conventional Banks in Gulf Countries. *International Journal of Emerging Markets*, *16*(8): 1769-1792.

Baek, S., & Lee, K. Y. (2021). The Risk Transmission of COVID-19 in US Stock Market. *Applied Economics*, *53*(17): 1976-1990.

Bahmani-Oskooee, M., Halicioglu, F., & Mohammadian, A. (2018). On the Asymmetric Effects of Exchange Rate Changes on Domestic Production in Turkey. *Economic Change and Restructuring*, *51*(3): 97-112.

Bahmani-Oskooee, M., Usman, A., & Ullah, S. (2023). Asymmetric Impact of Exchange Rate Volatility on Commodity Trade Between Pakistan and China. *Global Business Review*, *24*(3): 510-534.

Baker, S. R., et.al. (2020). The Unprecedented Stock Market Reaction to COVID-19. *The Review of Asset Pricing Studies, 10*(4):742-758.

Beraich, M., et.al. (2022). Volatility Spillover Effects of the US, European and Chinese Financial Markets in the Context of the Russia–Ukraine Conflict. *International Journal of Financial Studies*, *10*(4): 95-113.

Bernardo, M. R., Campani, C. H., & Roquete, R. M. (2023). Brazilian REITs: Are There Opportunity for Diversification and Performance. *Journal of Real Estate Portfolio Management*, 8(3):1-13.

Boungou, W., & Yatié, A. (2022). The Impact of the Ukraine–Russia War on World Stock Market Returns. *Economics Letters*, *215*(4): 110-126.

Boubaker, S., et.al. (2023). Market Reaction to the Russian Ukrainian War: A Global Analysis of the Banking Industry. *Review of Accounting and Finance*, *22*(1): 123-153.

Boubaker, S., Goodell, J. W., Pandey, D. K., & Kumari, V. (2022). Heterogeneous Impacts of Wars on Global Equity Markets: Evidence from the Invasion of Ukraine. *Finance Research Letters*, *48*(1) 102-124.

Boubaker, H., & Rezgui, H. (2020). Co-movement Between Some Commodities and the Dow Jones Islamic Index: A Wavelet Analysis. *Economics Bulletin*, *40*(1): 574-586.

Bossman, A., & Gubareva, M. (2023). Asymmetric Impacts of Geopolitical Risk on Stock Markets: A Comparative Analysis of the E7 and G7 Equities During the Russian-Ukrainian Conflict. *Heliyon*, *9*(2): 46-59.

Buriev, A. A., et.al. (2018). Portfolio Diversification Benefits at Different Investment Horizons During the Arab Uprisings: Turkish Perspectives Based on MGARCH–DCC and Wavelet Approaches. *Emerging Markets Finance and Trade*, *54*(14): 3272-3293.

Cai, X. J., Tian, S., & Hamori, S. (2016). Dynamic Correlation and Equicorrelation Analysis of Global Financial Turmoil: Evidence from Emerging East Asian Stock Markets. *Applied Economics*, *48*(40): 3789-3803.

Castro, P., Gutiérrez-López, C., Tascón, M. T., & Castaño, F. J. (2021). The Impact of Environmental Performance on Stock Prices in the Green and Innovative Context. *Journal of Cleaner Production*, *320*(3): 128-168.

Chang, H. W., & Chang, T. (2023). How Oil Price and Exchange Rate Affect Stock Price in China Using Bayesian Quantile on Quantile with GARCH Approach. *The North American Journal of Economics and Finance*, *64*(3): 101-123.

Chaffai, M., & Medhioub, I. (2018). Herding Behavior in Islamic GCC Stock Market: A Daily Analysis. *International Journal of Islamic and Middle Eastern Finance and Management*, *11*(2): 182-193.

Chancharat, S., & Sinlapates, P. (2023). Dependences and Dynamic Spillovers Across the Crude Oil and Stock Markets Throughout the COVID-19 Pandemic and Russia-

Ukraine Conflict: Evidence from the ASEAN+ 6. *Finance Research Letters*, *57*(5): 104-139.

Chien, F., et.al. (2021). Co- movement of Energy Prices and Stock Market Return: Environmental Wavelet Nexus of COVID-19 Pandemic from the USA, Europe, and China. *Environmental Science and Pollution Research*, *28*(6): 323-343.

Chopra, R., & Sharma, G. D. (2021). Application of Artificial Intelligence in Stock Market Forecasting: A Critique, Review, and Research Agenda. *Journal of Risk and Financial Management*, *14*(11): 526-539.

Ciocîrlan, C., & Nițoi, M. (2023). Geopolitical Risk and Contagion: Evidence from European Stock Markets During the Ukrainian Crisis. *Eastern European Economics*, 8(5): 1-33.

de Souza Cunha, et.al. (2021). Do Low-carbon Investments in Emerging Economies Pay off? Evidence from the Brazilian Stock Market. *International Review of Financial Analysis*, *74*(7): 101-125.

Das, S., & Roy, S. S. (2023). Following the Leaders? A Study of Co-movement and Volatility Spillover in BRICS Currencies. *Economic Systems*, *47*(2): 100-123.

El Alaoui, A. O., et.al. (2015). Linkages and Co-movement Between International Stock Market Returns: Case of Dow Jones Islamic Dubai Financial Market Index. *Journal of International Financial Markets, Institutions and Money*, *36*(2): 53-70.

Elshqirat, M. (2021). Performance of Islamic and Conventional Equity Indices in GCC Countries During COVID-19. *PalArch's Journal of Archaeology of Egypt, 18*(08): 2627-2647.

El Ouadghiri, I., et.al. (2021). Public Attention to Environmental Issues and Stock Market Returns. *Ecological economics*, *180*(3): 106-136.

Elhassan, T. (2021). Impact of Covid-19 Pandemic on Stock Market Returns Volatility of Gulf Cooperation Council Countries. *Investment Management and Financial Innovations*, *18*(4): 45-56.

Essayem, A., Gormus, S., & Guven, M. (2023). The GCC's Regional Roller Coaster: Do Regional Factors Affect Stock Market Dynamics in the GCC Region? Evidence from Non-parametric Quantile Regression. *Borsa Istanbul Review*, *23*(2): 473-494.

Farag, A. A. (2019). The Story of NEOM City: Opportunities and Challenges. *New cities and community extensions in Egypt and the Middle East: Visions and challenges*, 5(3): 35-49.

Fernández-Cuesta, C., et.al. (2019). The Effect of Environmental Performance on Financial Debt. European Evidence. *Journal of Cleaner Production*, *207*(4): 379-390.

Fortin, A. P., Simonato, J. G., & Dionne, G. (2023). Forecasting Expected Shortfall: Should We Use a Multivariate Model for Stock Market Factors. *International Journal of Forecasting*, *39*(1): 314-331.

Frikha, W., et.al. (2023). COVID-19, Russia-Ukraine War and Interconnectedness Between Stock and Crypto Markets: A Wavelet-based Analysis. *Journal of Business Analytics*, 2(3): 1-21.

Gaio, L. E., Stefanelli, N. O., Júnior, T. P., Bonacim, C. A. G., & Gatsios, R. C. (2022). The Impact of the Russia-Ukraine Conflict on Market Efficiency: Evidence for the Developed Stock Market. *Finance Research Letters*, *50*(5): 103-133.

Geyikçi, U. B. (2017). The Impact of the July 15 Coup D'etat Attempt on the Participation 30 Index in Istanbul Stock Exchange (ISE). *International Journal of Business and Management Studies, 8*(3): 2158-1479.

Geyikci, U. B., & Tepeci, M. (2017). The Impacts of the Russian Plane Crisis, the July 15th Coup d'etat Attempt and Terrorist Attacks on the Market Values of the Istanbul Stock Exchange (ISE) Tourism Index. *International Journal of Arts & Sciences*, *10*(01): 109-120.

George, A. S., & George, A. H. (2023). A Review of ChatGPT AI's Impact on Several Business Sectors. *Partners Universal International Innovation*, *1*(1): 9-23.

Ghouse, G., et.al. (2023). Asymmetric Spillover Effects of Covid-19 on the Performance of the Islamic Finance Industry: A Wave Analysis and Forecasting. *The Journal of Economic Asymmetries*, *27*(3): 280-302.

Gil-Alana, L. A., Infante, J., & Martín-Valmayor, M. A. (2023). Persistence and Long run Co-movements Across Stock Market Prices. *The Quarterly Review of Economics and Finance*, *89*(5): 347-357.

Gonzales, R. M. D., & Hargreaves, C. A. (2022). How Can We Use Artificial Intelligence for Stock Recommendation and Risk Management? A Proposed Decision Support System. *International Journal of Information Management Data Insights*, *2*(2): 100-130.

Griffin, P., Lont, D., & Lubberink, M. (2019). Extreme High Surface Temperature Events and Equity-related Physical Climate Risk. *Weather and Climate Extremes*, *26*(6): 200-220.

Guo, M., Kuai, Y., & Liu, X. (2020). Stock Market Response to Environmental Policies: Evidence From Heavily Polluting Firms in China. *Economic Modelling*, *86*(3):

306-316.

Gunay, S. (2019). An Analysis Through Credit Default Swap, Asset Swap and Zero-Volatility Spreads: Coup Attempt and Bist 100 Volatility. *Borsa Istanbul Review*, *19*(2): 158-170.

Guru, B. K., Pradhan, A. K., & Bandaru, R. (2023). Volatility Contagion Between Oil and the Stock Markets of G7 Countries Plus India and China. *Resources Policy*, *81*(7): 103-137.

Haddad, H. B., Mezghani, I., & Al Dohaiman, M. (2020). Common Shocks, Common Transmission Mechanisms and Time-varying Connectedness Among Dow Jones Islamic Stock Market Indices and Global Risk Factors. *Economic Systems*, *44*(2): 760-774.

Hadi, D. M., Karim, S., Naeem, M. A., & Lucey, B. M. (2023). Turkish Lira Crisis and Its Impact on Sector Returns. *Finance Research Letters*, *52*(5): 479-598.

Hassan, A. (2022). Does Clean Energy Financial Market Reflect Carbon Transition Risks? Evidence from the NASDAQ Clean Energy Stock Volatility. *Journal of Sustainable Finance & Investment*, *7*(4):1-19.

He, X., et.al. (2023). Co-movement of Foreign Exchange Rate Returns and Stock Market Returns in an Emerging Market: Evidence from the Wavelet Coherence Approach. *International Journal of Finance & Economics*, *28*(2): 1994-2005.

He, P., et.al (2020). COVID–19's Impact on Stock Prices Across Different Sectors—An Event Study Based on the Chinese Stock Market. *Emerging Markets Finance and Trade, 56*(10): 2198-2212.

Hidayat, S. E., Al-Hadrami, A., & Sakti, M. R. P. (2023). Testing the Conditional Correlations and Volatility Spillovers Between US and ASEAN Islamic Stock

Markets: A Multivariate GARCH Analysis. *Global Review of Islamic Economics and Business*, *10*(1): 432-438.

Hoque, M. E., et.al. (2023). Connectedness and Spillover Effects of US Climate Policy Uncertainty on Energy Stock, Alternative Energy Stock, and Carbon Future. *Environmental Science and Pollution Research*, *30*(7): 18956-18972.

Horvath, R., & Petrovski, D. (2013). International Stock Market Integration: Central and South-Eastern Europe Compared. *Economic Systems*, *37*(1): 81-91.

Hussain, M., Bashir, U., & Rehman, R. U. (2023). Exchange Rate and Stock Prices Volatility Connectedness and Spillover during Pandemic Induced-Crises: Evidence from BRICS Countries. *Asia-Pacific Financial Markets*, 8(2): 1-21.

Jaffar, Y., Dewandaru, G., & Masih, M. (2018). Exploring Portfolio Diversification Opportunities Through Venture Capital Financing: Evidence from MGARCH-DCC, Markov Switching, and Wavelet Approaches. *Emerging Markets Finance and Trade*, *54*(6): 1320-1336.

Jain, S. (2021). Betas in the Time of Corona: A Conditional CAPM Approach Using Multivariate GARCH Model for India. *Managerial Finance*, *48*(2): 243-257.

Jawad kadhim Murshedi, H., & Al Zubaidi, H. H. (2019). The Impact of the Devaluation of the Turkish Lira on Investment and Trade and Its Impact on Tourism.

Joshi, P., Wang, J., & Busler, M. (2022). A Study of the Machine Learning Approach and the MGARCH-BEKK Model in Volatility Transmission. *Journal of Risk and Financial Management*, *15*(3): 116-132.

Joyo, A. S., & Lefen, L. (2019). Stock Market Integration of Pakistan With its Trading Partners: A Multivariate DCC-GARCH Model Approach. *Sustainability*, *11*(2): 303-317.

Karime, S., & Sayilir, Ö. (2019). Political News and Stock Market Reactions: Evidence from Turkey Over the Period 2008–2017. *International Journal of Management and Economics*, *55*(2): 83-98.

Karim, M. M., Chowdhury, M. A. F., & Masih, M. (2022). Re-examining Oil and BRICS' Stock Markets: New Evidence from Wavelet and MGARCH-DCC. *Macroeconomics and Finance in Emerging Market Economies*, *15*(2): 196-214.

Kartsonakis-Mademlis, D., & Dritsakis, N. (2020). Does the Choice of the Multivariate GARCH Model on Volatility Spillovers Matter? Evidence from Oil Prices and Stock Markets in G7 Countries. *International Journal of Energy Economics and Policy*, *10*(5): 164-182.

Kassouri, Y., & Altıntaş, H. (2020). Threshold Cointegration, Nonlinearity, and Frequency Domain Causality Relationship Between Stock Price and Turkish Lira. *Research in International Business and Finance*, *52*(3): 101-116.

Katyoka, M., & Stevenson, S. (2023). Volatility Transmission: Evidence from UK REIT & Stock Market Implied Volatility. *Journal of Real Estate Portfolio Management*, *7*(4): 1-16.

Khalfaoui, R., Gozgor, G., & Goodell, J. W. (2023). Impact of Russia-Ukraine War Attention on Cryptocurrency: Evidence from Quantile Dependence Analysis. *Finance Research Letters*, 9(6): 103-165.

Khan, I. (2023). An Analysis of Stock Markets Integration and Dynamics of Volatility Spillover in Emerging Nations. *Journal of Economic and Administrative Sciences*, *25*(1): 42-53.

Kılıç, N., Uluyol, B., & Hassan, K. (2022). Diversification Benefits of Turkey-based Investors: Evidence from Top Trading Partners Based on a Multivariate-GARCH

Approach. *Journal of Economic and Administrative Sciences*, *75*(2): 230-241.

Ko, H., & Lee, J. (2023). Can ChatGPT Improve Investment Decision? From a Portfolio Management Perspective. *From a Portfolio Management Perspective*, *8*(1): 107-119.

Kumar, S., Kumar, A., & Singh, G. (2023). Causal Relationship Among International Crude Oil, Gold, Exchange Rate, and Stock Market: Fresh Evidence from NARDL Testing Approach. *International Journal of Finance & Economics*, *28*(1): 47-57.

Kumari, V., Assaf, R., Moussa, F., & Pandey, D. K. (2023). Impacts of Climate Pact on Global Oil & Gas Sector Stocks. *Studies in Economics and Finance*, 3(9): 15-29.

Kumah, S. P., & Odei-Mensah, J. (2021). Are Cryptocurrencies and African Stock Markets Integrated. *The Quarterly Review of Economics and Finance*, *81*(3): 330-341.

Kumari, V., Kumar, G., & Pandey, D. K. (2023). Are the European Union Stock Markets Vulnerable to the Russia–Ukraine War. *Journal of Behavioral and Experimental Finance*, *37*(4): 100-113.

Kyriazis, N. A., & Economou, E. M. (2022). The Impacts of Geopolitical Uncertainty on Turkish Lira During the Erdoğan Administration. *Defense and Peace Economics*, *33*(6): 731-750.

Izzeldin, M., Muradoğlu, Y. G., Pappas, V., Petropoulou, A., & Sivaprasad, S. (2023). The Impact of the Russian Ukrainian War on Global Financial Markets. *International Review of Financial Analysis*, *87*(8): 102-132.

Labidi, C., Laribi, D., & Ureche-Rangau, L. (2022). Price and Volume Effects Around Islamic Index Revisions: The Case of DJIM-GCC. *Managerial Finance*, *48*(2): 222-242.

La Torre, M., Mango, F., Cafaro, A., & Leo, S. (2020). Does the ESG Index Affect Stock Return? Evidence From the Euro Stoxx 50. *Sustainability*, *12*(16): 63-87.

Lee, S., & Baek, C. (2023). Volatility Changes in Cryptocurrencies: Evidence from Sparse VHAR-MGARCH Model. *Applied Economics Letters*, *30*(11): 1496-1504.

Liang, Y., Galiano, J. C., & Zhou, H. (2023). The Environmental Impact of Stock Market Capitalization and Energy Transition: Natural Resource Dynamics and International Trade. *Utilities Policy*, *82*(3): 101-117.

Liu, C., Li, J., Sun, X., & Chen, J. (2021). Multi-scale Interactions Between Turkish Lira Exchange Rates and Sovereign CDS in Europe and Asia. *Applied Economics Letters*, *28*(7): 599-607.

Loang, O. K., & Ahmad, Z. (2023). Economic and Political Factors on Herding in Islamic GCC Stock Markets During COVID-19 Pandemic. *International Journal of Islamic and Middle Eastern Finance and Management*, *16*(4): 819-834.

Mahran, H. A. (2022). The Impact of the Russia–Ukraine Conflict (2022) on Volatility Connectedness Between Egyptian Stock Market Sectors: Evidence from the DCC-GARCH Connectedness Approach. *The Journal of Risk Finance, 24(1): 105-121.*

Majdoub, J., & Mansour, W. (2014). Islamic Equity Market Integration and Volatility Spillover Between Emerging and US Stock Markets. *The North American Journal of Economics and Finance*, *29*(1): 452-470.

Maurya, P. K., Bansal, R., & Mishra, A. K. (2023). Russia–Ukraine Conflict and its Impact on Global Inflation: An Event Study-based Approach. *Journal of Economic Studies*,*3*(8): 72-76.

Melki, A., & Ghorbel, A. (2023). Which Commodity Sectors Effectively Hedge Emerging Eastern European Stock Markets? Evidence from MGARCH Models. *Commodities*, *2*(3): 261-279.

Mensi, W., Hamdi, A., & Yoon, S. M. (2018). Modelling Multifractality and Efficiency of GCC Stock Markets Using the MF-DFA Approach: A Comparative Analysis of Global, Regional and Islamic Markets. *Physica A: Statistical Mechanics and its Applications*, *503*(7): 1107-1116.

Mezghani, T., & Boujelbène, M. (2018). The Contagion Effect Between the Oil Market, and the Islamic and Conventional Stock Markets of the GCC Country: Behavioral Explanation. *International Journal of Islamic and Middle Eastern Finance and Management*, *11*(2): 157-181.

Miniaoui, H., Sayani, H., & Chaibi, A. (2015). The Impact of Financial Crisis on Islamic and Conventional Indices of the GCC Countries. *Journal of Applied Business Research (JABR)*, *31*(2): 357-370.

Morea, D., et.al. (2022). Circular Economic Impact Analysis on Stock Performances: An Empirical Comparison with the Euro Stoxx 50 ESG Index. *Sustainability*, *14*(2): 843-856.

Najaf, K., Joshipura, M., & Alshater, M. M. (2023). War Build-up and Stock Returns: Evidence from Russian and Ukrainian Stock Markets. *The Journal of Risk Finance*, *24*(3): 354-370.

Naifar, N., & Hammoudeh, S. (2016). Do Global Financial Distress and Uncertainties Impact GCC and Global Sukuk Return Dynamics. *Pacific-Basin Finance Journal*, *39*(80): 57-69.

Nerger, G. L., Huynh, T. L. D., & Wang, M. (2021). Which Industries Benefited from Trump Environmental Policy News? Evidence from Industrial Stock Market Reactions. *Research in International Business and Finance*, *57*(2): 101-118.

Nerlinger, M., & Utz, S. (2022). The Impact of the Russia-Ukraine Conflict on Energy Firms: A Capital Market Perspective. *Finance Research Letters*, *50*(8): 103-143.

Ngwakwe, C. C. (2023). Effect of Climate Action on Renewable Energy Stock Price. *International Journal of Social Science Research and Review*, *6*(8): 128-133.

Nicola, M., et.al. (2020). The Socio-economic Implications of the Coronavirus Pandemic (COVID). *International Journal of Surgery*, 78(20): 185-193.

Noman, A. H. M., Karim, M. M., Hassan, M. K., Khan, M. A., & Pervin, S. (2023). COVID-19 Pandemic and the Dynamics of Major Investable Assets: What Gives Shelter to Investors. *International Review of Economics & Finance*, *86*(1): 14-30.

Nwosa, P. I. (2021). Oil Price, Exchange Rate and Stock Market Performance During the COVID-19 Pandemic: Implications for TNCs and FDI Inflow in Nigeria. *Transnational Corporations Review*, *13*(1): 125-137.

Patro, D. K., Wald, J. K., & Wu, Y. (2014). Currency Devaluation and Stock Market Response: Empirical Analysis. *Journal of International Money and Finance*, *40*(9): 79-94.

Patro, D. K., Wald, J. K., & Wu, Y. (2014). Currency Devaluation and Stock Market Response: Empirical Analysis. *Journal of International Money and Finance*, *40*(3): 79-94.

Pham, H. N. A., Ramiah, V., & Moosa, I. (2020). The Effects of Environmental Regulation on the Stock Market: The French Experience. *Accounting & Finance*, *60*(4): 3279-3304.

Osmani, N. M., & Abdullah, M. F. (2009). Towards an Islamic Stock Market: A Review of Classical and Modern Literature. *International Review of Business Research*

Papers, 5(5): 121-130.

Pandey, D. K., Kumar, R., & Kumari, V. (2023). Glasgow Climate Pact and the Global Clean Energy Index Constituent Stocks. *International Journal of Emerging Markets*, *22*(1): 23-153.

Prandi, S., & Colecchia, D. (2023). A Market Timing Strategy for The GCC Conventional and Shariah Stock Indices. *Saudi Journal of Economics and Finance*, *7*(4): 67-81.

Qureshi, S., Rehman, I. U., & Qureshi, F. (2018). Does Gold Act as a Safe Haven Against Exchange Rate Fluctuations. The Case of Pakistan Rupee. *Journal of Policy Modeling*, *40*(4): 685-708.

Rafiuddin, A., et.al. (2021). Trend of Oil Prices, Gold, GCC Stocks Market During Covid-19 Pandemic: A Wavelet Approach. *International Journal of Energy Economics and Policy*, *11*(4): 560-572.

Rahim, A. M., & Masih, M. (2016). Portfolio Diversification Benefits of Islamic Investors with Major Trading Partners: Evidence from Malaysia Based on MGARCH-DCC and Wavelet Approaches. *Economic Modelling*, *54*(4): 425-438.

Rehman, S., Khilji, J. A., Kashif, M., & Rehan, R. (2018). The Impact of Major Terrorist Attacks on Stock Prices: The Case of Karachi Stock Exchange. *Asian Economic and Financial Review, 8*(3): 394-412.

Rehman, M. Z. (2023). Black Swan Events and Stock Market Behavior in Gulf Countries: Comparative Analysis of Financial Crisis (2008) and COVID-19 Pandemic. *Arab Gulf Journal of Scientific Research*, *19*(2): 158-170.

Rusmita, S. A., et.al. (2020). Capital Market Volatility MGARCH Analysis: Evidence from Southeast Asia. *The Journal of Asian Finance, Economics and Business (JAFEB)*, *7*(11): 117-126.

Ramelli, S., Ossola, E., & Rancan, M. (2021). Stock Price Effects of Climate Activism: Evidence from the First Global Climate Strike. *Journal of Corporate Finance*, *69*(2):102-118.

Rogova, E., & Aprelkova, G. (2020). The Effect of IPCC Reports and Regulatory Announcements on the Stock Market. *Sustainability*, *12*(8): 31-42.

Saadat, S., Rawtani, D., & Hussain, C. M. (2020). Environmental Perspective of COVID-19. *Science of the Total Environment*, *72*(8): 138-170.

Sadaf, R., & Andleeb, S. (2014). Islamic Capital Asset Pricing Model (ICAPM). *Journal of Islamic Banking and Finance, 2*(1): 187-195.

Saggu, A., & Ante, L. (2023). The Influence of ChatGPT on Artificial Intelligence Related Crypto Assets: Evidence from a Synthetic Control Analysis. *Finance Research Letters*, 2(4): 103-143.

Sghaier, N., Kouki, M., & Messaoud, S. B. (2023). Further Evidence of Contagion Effect Between the Chinese and the G20 Stock Markets During the COVID-19 Pandemic: A Time-varying Copula Approach. *Cogent Economics & Finance*, *11*(1): 221-263.

Shahateet, M. (2019). Testing the Linkages of Arab Stock Markets: Multivariate GARCH Approach. *Investment Management & Financial Innovations*, *16*(4): 192-211.

Shaik, M., Jamil, S. A., Hawaldar, I. T., Sahabuddin, M., Rabbani, M. R., & Atif, M. (2023). Impact of Geo-Political Risk on Stocks, Oil, and Gold Returns During GFC, COVID-19, and Russian–Ukraine War. *Cogent Economics & Finance*, *11*(1): 219-233.

Shamsudheen, S. V., Khattak, M. A., Muneeza, A., & Huda, M. (2022). COVID-19 and GCC Stock Market Performance: An Analysis of the Boon (Financial Stimulus

Package) and Curse (Oil Price Plunge) Effects. *International Journal of Islamic and Middle Eastern Finance and Management*, *15*(2): 223-235.

Sharma, R., Shahbaz, M., Sinha, A., & Vo, X. V. (2021). Examining the Temporal Impact of Stock Market Development on Carbon Intensity: Evidence from South Asian Countries. *Journal of Environmental Management*, *8*(4)*:* 113-148.

Shi, Y., Feng, Y., Zhang, Q., Shuai, J., & Niu, J. (2023). Does China's New Energy Vehicles Supply Chain Stock Market Have Risk Spillovers. Evidence from Raw Material Price Effect on Lithium Batteries. *Energy*, *26(2*): 125-142.

Sakti, M. R. P., Masih, M., Saiti, B., & Tareq, M. A. (2018). Unveiling the Diversification Benefits of Islamic Equities and Commodities: Evidence from Multivariate-GARCH and Continuous Wavelet Analysis. *Managerial Finance*, *44*(6): 830-850.

Saiti, B. (2015). Cointegration of Islamic Stock Indices: Evidence from Five ASEAN Countries. *International Journal of Scientific & Engineering Research, 6*(7): 1392-1405.

Saiti, B., Bacha, O. I., & Masih, M. (2014). The Diversification Benefits from Islamic Investment During Financial Turmoil: The Case for the US-based Equity Investors. *Borsa Istanbul Review*, *14*(4): 196-211.

Saiti, B., & Noordin, N. H. (2018). Does Islamic Equity Investment Provide Diversification Benefits to Conventional Investors? Evidence from the Multivariate Analysis. *International Journal of Emerging Markets*, *13*(1): 267-289.

Saiti, B., Ma, Y., Nagayev, R., & Yumusak, İ. G. (2020). The Diversification Benefits of Islamic Investment to Chinese Conventional Equity Investors: Evidence from the Multivariate GARCH Analysis. *International Journal of Islamic and Middle Eastern Finance and Management*, *13*(1): 1-23.

Sayani, H., & Balakrishnan, M. S. (2013). Marketing an Islamic Index: Perceived Value of KMI 30 Index. *Management Research Review, 36*(4): 326-358.

Seth, N., & Singhania, M. (2019). Volatility in Frontier Markets: A Multivariate GARCH Analysis. *Journal of Advances in Management Research*, *16*(3): 294-312.

Shafi, M., Liu, J., & Ren, W. (2020). Impact of COVID-19 Pandemic on Micro, Small, and Medium-sized Enterprises Operating in Pakistan. *Research in Globalization, 2(1):* 100-118.

Shamsudheen, S. V., Khattak, M. A., Muneeza, A., & Huda, M. (2022). COVID-19 and GCC Stock Market Performance: Analysis of the Boon (Financial Stimulus Package) and Curse (Oil Price Plunge) Effects. *International Journal of Islamic and Middle Eastern Finance and Management*, *15*(2): 223-235.

Silva, T. C., Wilhelm, P. V. B., & Tabak, B. M. (2023). Trade Matters Except War Neighbors: The International Stock Market Reaction to 2022 Russia's Invasion of Ukraine. *Research in International Business and Finance*, *65*(2): 101-135.

Sinlapates, P., Sriwong, T., & Chancharat, S. (2023). Risk Spillovers Between Bitcoin and ASEAN+ 6 Stock Markets Before and After COVID-19 Outbreak: A Comparative Analysis With Gold. *Journal of Risk and Financial Management*, *16*(2): 103-123.

Song, G. H., & Jain, A. (2022). Can Artificial Intelligence Beat the Stock Market. *Studies in Economics and Finance*, *39*(5): 772-785.

Sreenu, N. (2023). Effect of Exchange Rate Volatility and Inflation on Stock Market Returns Dynamics- Evidence from India. *International Journal of System Assurance Engineering and Management*, 3(2): 1-8.

Sundarasen, S., Kamaludin, K., & Ibrahim, I. (2023). The Impact of COVID-19 Pandemic on the Volatility of Conventional and Islamic Stock Indexes: A Comparative Study

on ASEAN and GCC Countries. *Journal of Islamic Accounting and Business Research*, *14*(4): 519-537.

Thorbecke, W., & Sengonul, A. (2023). The Impact of Exchange Rates on Turkish Imports and Exports. *International Economics*, *17(4)*: 231-249.

Umar, Z., Polat, O., Choi, S. Y., & Teplova, T. (2022). The Impact of the Russia-Ukraine Conflict on the Connectedness of Financial Markets. *Finance Research Letters*, *48*(2): 102976.

Ürkmez, E., & BÖLÜKBAŞI, Ö. F. (2021). The Impact of Exchange Rates on Stock Prices for Turkey: Asymmetric Non-Linear Cointegration Analysis. *Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi*, *43*(1): 42-56.

Waheed, R., et.al. (2020). The Impact of COVID-19 on Karachi Stock Exchange: Quantile on Quantile Approach Using Secondary and Predicted Data. *Journal of Public Affairs, 20*(4): 22-40.

Wai Kong Cheung, A. (2011). Do Stock Investors Value Corporate Sustainability? Evidence from an Event Study. *Journal of business ethics*, *99*(5): 145-165.

Wen, J. (2023). An LSTM-Based Approach for Stock Price Prediction in the Metaverse. *Highlights in Science, Engineering and Technology*, *57*(6): 121-125.

Wen, J. (2023). An LSTM-Based Approach for Stock Price Prediction in the Metaverse. *Highlights in Science, Engineering and Technology*, *57*(2): 121-125.

Wu, F. L., et.al. (2023). Stock Market Volatility and Russia–Ukraine Conflict. *Finance Research Letters*, *55*(3): 103-119.

Xu, X., et.al. (2023). The Impacts of Climate Policy Uncertainty on Markets: Comparison Between China and the US. *International Review of Financial Analysis*, *88*(5): 671-692.

Yan, L., & Qian, Y. (2020). The Impact of COVID-19 on the Chinese Stock Market: An Event Study Based on the Consumer Industry. *Asian Economics Letters, 1*(3): 180-198.

Yousaf, I., et.al. (2022). Do Volatility Spillover and Hedging Among GCC Stock Markets and Global Factors Vary from Normal to Turbulent Periods? Evidence from the Global Financial Crisis and Covid-19 Pandemic Crisis. *Pacific-Basin Finance Journal*, *739*(6):764-776.

Yousaf, I., Patel, R., & Yarovaya, L. (2022). The Reaction of G20 Stock Markets to the Russia–Ukraine Conflict "Black Swan" Event: Evidence from Event Study Approach. *Journal of Behavioral and Experimental Finance*, *35*(4): 100-123.

Zhang, J., & Shang, Y. (2022). The Influence and Mechanism of Digital Economy on the Development of the Tourism Service Analysis of the Mediating Effect of Carbon Emissions Under the Background of COP26. *Sustainability*, *14*(20): 134-144.

CV

ABDUL BASIT SOHAIL

Best Paper Award Holder in Turin, Italy

100% Merit Scholarship Holder, Istanbul, Türkiye

Ph.D. in Islamic Economics and Finance

Istanbul Sabahattin Zaim University, Istanbul, Turkey
CGPA: 3.50 | Expected Completion: March 2025

MS in Islamic Banking and Finance
University of Management and Technology Lahore Pakistan
CGPA: 3.89

Bachelor of Commerce (Scholarship Holder)
University of the Punjab, Lahore, Pakistan
CGPA: 3.40 | Specialization: Finance