

MARKET REACTION TO GREEN SUKUK ISSUANCE
ANNOUNCEMENT: AN EVENT STUDY ON SUSTAINABLE
FINANCE IN GCC COUNTRIES

BY

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Dedication

This thesis is dedicated to my family and friends, whose love and encouragement have been a constant source of strength throughout my academic journey. Their belief in me has been invaluable, and this achievement would not have been possible without them. I also want to express my deepest gratitude to my mentors for their thoughtful guidance, which has profoundly shaped my academic journey. A heartfelt thank you to my advisor, whose expert advice, unwavering support, and dedication to my success have played a pivotal role in helping me bring this work to completion.

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TABLE OF CONTENT

ACKNOWLEDGEMENT.....	V
TABLE OF CONTENT.....	VII
LIST OF TABLES	IX
LIST OF FIGURES	X
LIST OF ABBREVIATIONS	XI
ABSTRACT.....	XII
ملخص الرسالة.....	XIII
CHAPTER 1. INTRODUCTION	1
1.1 An Overview of Sustainable Finance.....	1
1.2 Financial Benefits of Investing in Green Sukuk: Insights from Sustainable Finance in GCC Countries.	6
1.3 Environmental Benefits of Green Sukuk: Perspective from GCC Countries.	7
1.4 Background	9
1.4.1 Green Sukuk Issuance Trend and Market Capitalization	13
1.4.2 Industry Adoption and Sectoral Analysis	15
1.4.3 Theoretical Framework: Market Efficiency and ESG Investing	16
CHAPTER 2 LITERATURE REVIEW.....	19
2.1 Theoretical Framework	19
2.1.1 Contribution to Literature	23
2.1.2 Behavioral Variable in the GCC Region	24
2.2 Research Methodology.....	25

2.2.1 Asset Pricing Model.....	25
2.2.2. Empirical Model	28
2.2.3 Data Section	31
CHAPTER 3 RESULTS AND CONCLUSION.....	32
3.1 Empirical Analysis	32
3.2 Discussion of Results	62
3.3 Conclusion.....	66
3.4 Future Research Directions, Policy Implications, and Limitations.....	68
3.4.1 Future Research Directions.....	68
3.4.2 Policy Significance	69
3.4.3 Limitations of the Study.....	69
REFERENCES.....	71
APPENDIX.....	75
Appendix A: Type of Sukuk Products	75
Appendix B: Empirical results.....	77
VITAE.....	84

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LIST OF TABLES

Table 1.1 Green Sukuk Investment Area.....	5
Table 3.1 Descriptive Statistics.....	33
Table 3.2 Summary statistics of green sukuk characteristics.....	36
Table 3.3 Jacqua-Bera Test for Normality.....	38
Table 3.4 Augmented Dickey-Fuller Test for Stationarity.....	40
Table 3.5 Single Factor CAPM Model.....	43
Table 3.6 Single Factor CAPM Model Abnormal and Cumulative Abnormal Return.....	47
Table 3.7 Capturing the COP28 as a dummy variable.....	53
Table 3.8 Cumulative Abnormal Return for COP28_dummy.....	55
Table 3.9 Overview of Recent Sustainable Sukuk Issued in GCC's Key Sectors.....	60

LIST OF FIGURES

Figure 1.1 Lead Green and Sustainability Sukuk Issuance.....	4
Figure 1.2 Challenges related to investing in Green Sukuk.....	8
Figure 1.3 The annual sukuk issuance from 2014 to 2020 in billions.....	12
Figure 1.4 Number of Green Sukuk issued by industry.....	13
Figure 1.5 Market Capitalization.....	14
Figure 3.1 Event 2.....	50
Figure 3.2 Event 7.....	50
Figure 3.3 Event 8.....	50
Figure 3.4 Event 13.....	50
Figure 3.5 Event 14.....	51
Figure 3.6 Event 3 Dubai Islamic Bank.....	57
Figure 3.7 Event 5 AL Rahji Bank.....	57
Figure 3.8 Event 6 Saudi National Bank.....	57
Figure 3.9 Event 8 Riyadh Bank Ltd.....	57
Figure 3.10 Event 11 Saudi Electrical Company.....	58
Figure 3.11 Event 12 Abu Dhabi International Bank.....	58
Figure 3.12 Event 13 Alder.....	58
Figure 3.13 Event 14 Dubai Islamic Bank Ltd.....	58

LIST OF ABBREVIATIONS

GCC	:	Gulf Cooperation Council Countries
CAPM	:	Capital Asset Pricing Model
AR	:	Abnormal Returns
CAR	:	Cumulative Abnormal Return
ESG	:	Environmental, Social, and Governance

ABSTRACT

Full Name : OMAR JASSEY

Thesis Title : Market Reaction to Green Sukuk Issuance Announcement: An Event Study on Sustainable Finance in GCC Countries.

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This research examines the market reaction to the launch of Green Sukuk in the Gulf Cooperation Council (GCC) region, with a focus on its impact on stock returns and investor sentiment. Utilizing an event study methodology, the research analyzes the stock price movements of publicly traded firms following Green Sukuk announcements from 2015 to 2024. A 31-day event window (-15 to +15 days around issuance announcements) is used to assess market reactions, applying the one-factor Capital Asset Pricing Model (CAPM) to evaluate Abnormal Returns (ARs) and Cumulative Abnormal Returns (CARs). Findings reveal that market reactions to Green Sukuk issuance are mixed, with some events resulting in positive abnormal stock returns, while others show negative responses. However, cumulative abnormal returns (CARs) indicate that, in certain cases, investors respond favorably to Green Sukuk, reflecting confidence in sustainable finance initiatives within the GCC region. Notably, the findings suggest that green sukuk issuances that occurred around the time of COP28 (held in the UAE in 2023) do not affect stock returns., this mean such conferences does not significantly impact market confidence in Green sukuk Therefore, we can conclude that bond investors are rational and are not influenced by such events or conferences in their bond portfolio choices.

Keywords: ***Green Sukuk, Abnormal Return, Cumulative Abnormal Return***

ملخص الرسالة

الاسم الكامل عمر جاسي

عنوان الرسالة

رد فعل السوق على إعلان إصدار الصكوك الخضراء: دراسة حدث حول التمويل المستدام في دول مجلس التعاون الخليجي

التخصص الأكاديمي: ماجستير في الدراسات التجارية - مسار التمويل
تاريخ الدرجة العلمية: تاريخ الحصول على الدرجة: ٢٠٢٥ مايو

تبحث هذه الدراسة في ردّة فعل السوق تجاه إصدار الصكوك الخضراء في دول مجلس التعاون الخليجي، مع التركيز على تأثيرها على عوائد الأسهم ومعنويات المستثمرين. باستخدام منهجية دراسة الحدث، تحلل الدراسة تحركات أسعار أسهم الشركات المدرجة في البورصة بعد إعلانات إصدار الصكوك الخضراء خلال الفترة من 2015 إلى تم استخدام نافذة حدث مدتها 31 يومًا (من -15 إلى +15 يومًا حول تاريخ الإعلان) لتقييم ردود فعل 2024. أحادي العامل لقياس العوائد غير العادية (CAPM) السوق، وذلك من خلال تطبيق نموذج تسعير الأصول الرأسمالية تكشف النتائج أن ردود فعل السوق تجاه إصدار الصكوك (CARs) والعوائد غير العادية التراكمية (ARs) الخضراء متباينة، حيث تؤدي بعض الأحداث إلى تحقيق عوائد غير عادية إيجابية على الأسهم، بينما تسفر أخرى عن إلى أن المستثمرين يتجاوبون بشكل (CARs) ردود فعل سلبية. ومع ذلك، تشير العوائد غير العادية التراكمية إيجابي مع بعض إصدارات الصكوك الخضراء، مما يعكس الثقة في مبادرات التمويل المستدام في منطقة الخليج الذي) COP28 ومن الجدير بالذكر أن النتائج تشير إلى أن إصدارات الصكوك الخضراء التي تزامنت مع مؤتمر عقد في الإمارات عام 2023) لم تؤثر على عوائد الأسهم، مما يعني أن مثل هذه المؤتمرات لا تؤثر بشكل كبير على ثقة السوق في الصكوك الخضراء. وبالتالي، يمكننا الاستنتاج أن مستثمري السندات يتصرفون بعقلانية ولا يتأثرون بمثل هذه الأحداث أو المؤتمرات عند اتخاذ قراراتهم الاستثمارية. وهذا يشير إلى أن المؤتمرات المناخية الكبرى لا تُشكّل بالضرورة تصورات المستثمرين تجاه أدوات التمويل الإسلامي المستدام.

الكلمات المفتاحية: الصكوك الخضراء، العائد غير العادي، العائد غير العادي التراكمي

CHAPTER 1.

INTRODUCTION

1.1 An Overview of Sustainable Finance.

Sustainable finance has recently emerged as a critical focus area as global economies face the difficulties of climate change, diminishing resources, and growing social inequities (T. Hersary, 2021) (A. Komijani., 2022). Most financial decisions include sustainability elements like ESG to enhance economic sustainability and resilience (Migliorelli, M., 2021). Green Sukuk has become a crucial financial tool in this comprehensive framework, particularly in Islamic finance, aligning Sharia-compliant investment principles with sustainability goals (Azhgaliyeva, D., 2022). Environmental factors that are considered in making financial decisions may include activities that are geared toward addressing climate change, adapting to its effects, and protecting ecosystems, such as preserving biodiversity, reducing pollution, and promoting circular economy practices (European Commission, n.d.).

In recent years, the global financial landscape has witnessed a profound shift toward sustainability, driven by the increasing urgency of climate action and responsible investment practices. As part of this transformation, financial markets have embraced green financial instruments that align capital allocation with environmental objectives. Among these innovations, green sukuk has emerged as a pivotal tool for financing sustainable Initiatives that align with Shariah-compliant financial guidelines (Rahman & Abbas, 2023). An Islamic Financial instrument called green sukuk is meant to finance environmentally sustainable activities such as sustainable energy, sustainable agriculture practices, and

infrastructures that enhance energy efficiency. This financial instrument is a key element in enhancing Islamic finance and sustainability, providing investors with a way to back environmentally beneficial initiatives while remaining aligned with Islamic ethical standards (Alam, N., 2021). **Green Bonds** a debt instrument that is designed to support green investment projects to combat climate change. **Green Sukuk** is a bond that adheres to Sharia law, specifically created to fund projects promoting environmental sustainability, merging Islamic financial principles with environmental goals. **Social Impact bonds** are a financial arrangement in which private investors contribute to funding public projects aimed at achieving social benefits, with financial returns tied to the fulfillment of predefined social goals. Each of these financial instruments plays a vital role in channeling funds into projects that support environmental and social sustainability goals.

Green Sukuk has become a key tool for financing projects aimed at environmental sustainability, particularly in industries like energy, infrastructure, and transportation. It merges Islamic finance principles with environmental protection objectives, offering Sharia-compliant financial products designed to support renewable energy initiatives, sustainable infrastructure, and clean transport systems. The inaugural green sukuk was launched in 2017, and it has since been utilized for major projects across the Middle East and Southeast Asia. This financing tool has facilitated investments in low-carbon development, promoting green economic growth in these regions. By capitalizing on sukuk's alignment with Islamic law, it attracts a growing community of ethical and environmentally focused investors, contributing to global sustainability goals while respecting local financial practices and cultural norms.(Pioneering the Green Sukuk, n.d.). A recent survey shows that 55% of investors are planning to invest in green and sustainable

Sukuk over the next three years. However, there are some challenges on the supply side. Almost 45% of investors point to a lack of available options as a major barrier, while 60% admit they only have a basic understanding of Sukuk and sustainability principles. This highlights the importance of increasing education and raising awareness to close the knowledge gap and help grow the market(Sukuk Report 2024).

These instruments enable issuers to generate funds for eco-friendly initiatives while complying with Shariah law, making them particularly relevant in regions where Islamic finance plays a dominant role, such as the Gulf Cooperation Council (GCC) countries. With GCC economies actively pursuing sustainability commitments exemplified by Saudi Arabia's reach net-zero greenhouse gas emissions by 2060 and the UAE's ambitious Net Zero 2050 initiative strategy, green sukuk represents a crucial mechanism to fund the shift toward a sustainable, low-carbon economy (Alam et al., 2022).

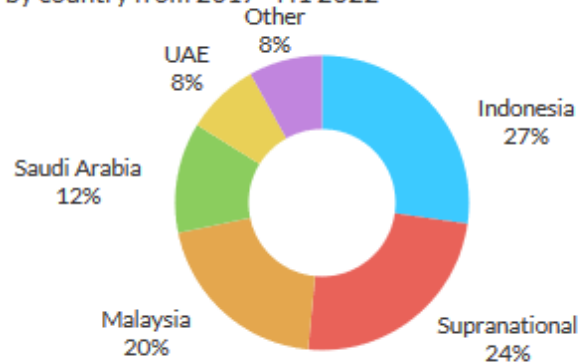
Additionally, given that investor sentiment is a key factor in the success of financial instruments, it is crucial to analyze market responses to green sukuk issuance and whether they generate abnormal returns compared to traditional sukuk offerings (Boehmer et al., 2022). Bonds are crucial financial instruments that serve as essential financial tools that enable governments, businesses, and global institutions to generate funding. Sovereign bonds, like U.S. Treasury bonds and U.K. Gilts, are low-risk investments issued to fund public expenditures (Fabozzi, 2012). Local government bonds, which are released by local authorities, are utilized to finance infrastructure developments like roads and schools and often provide tax benefits. They include General Obligation Bonds, backed by taxation, and Revenue Bonds, repaid from project earnings (Mishkin, 2019). Corporate bonds help

businesses expand or refinance debt and carry a higher risk than government bonds. They vary from investment-grade bonds, issued by stable companies, to high-risk (junk) bonds with higher returns, which provide higher returns but come with greater risk. Certain corporate bonds, such as convertible bonds, offer additional features, that allow conversion into shares, while callable bonds enable early repayment (Bodie, Kane, & Marcus, 2018). Bonds issued by international organizations, such as the World Bank, are known as supranational bonds that fund global projects and are low-risk due to multinational backing (World Bank, 2020). Bonds play a key role in financial markets, balancing risk and return to suit diverse investor needs.

Figure 1.1 Lead Green and Sustainability Sukuk Issuance

Indonesia & Malaysia Lead Green and Sustainability Sukuk Issuance

Cumulative issuance by country from 2017 - H1 2022



Source: Sustainable Fitch, Refinitiv

(Malaysia, Indonesia Lead Green and Sustainability Sukuk Issuance, Says Sustainable Fitch, n.d.)

The chart illustrates the cumulative issuance of green and sustainability sukuk by country from 2017 to the first half of 2022, highlighting Indonesia and Malaysia as the leading contributors. Indonesia accounts for the largest share at 27%, followed closely by

supranational entities at 24%, indicating strong regional and international participation in sustainable financing. Malaysia represents 20% of the total issuance, reinforcing its position as a key player in the Islamic finance market. Saudi Arabia and the UAE contribute 12% and 8%, respectively, while other countries collectively make up the remaining 8%. The data underscores the growing prominence of Southeast Asian and Middle Eastern nations in driving sustainable investments through sukuk, reflecting their commitment to environmental and socially responsible financing. These trends suggest an increasing global interest in integrating sustainability principles into Islamic finance instruments, positioning sukuk as a viable tool for funding green projects

Table 1.1 Green Sukuk investment Area



(Lebih Jauh Menenal Green Sukuk Dan Mengapa Penjualannya Begitu Laris Halaman All - Kompas.Com, n.d.)

Green Sukuk is a vital financial instrument that funds environmentally sustainable projects, aligning with global sustainability goals. The proceeds from these Islamic bonds are

directed towards key sectors, including Renewable energy, improved energy efficiency, and environmentally friendly agricultural practices, all of which contribute to reducing reliance on fossil fuels and promote food security. Additionally, Green Sukuk supports eco-friendly infrastructure, such as green buildings and public transportation, contributing to lower carbon emissions. Investments in waste management, climate resilience, and marine conservation further enhance environmental sustainability by preserving natural resources and mitigating climate change effects. By financing these critical initiatives, Green Sukuk plays a pivotal role in fostering a greener, more resilient economy while supporting sustainable development frameworks.

1.2 Financial Benefits of Investing in Green Sukuk: Insights from Sustainable Finance in GCC Countries.

Green sukuk are characterized by tangible assets that generate a stable stream of income. The adherence to Islamic financial principles, which guarantees compliance and investor trust, further supports this predictability. For instance, most risk-averse investors find green sukuk-backed renewable energy projects attractive due to their steady long-term profits (ISLAMIC GREEN FINANCE, 2019). The stable nature of its profitability can positively influence market reactions because most conservative investors look forward to reliable Sharia-compliant investment. Green sukuk contributes to portfolio diversification by opening investment avenues in renewable energy, sustainable transport, and eco-friendly infrastructure. Investors are exposed to new green industries because these sectors are often under-represented within conventional portfolios. This diversification improves the marketability of green sukuk in the GCC by supporting government initiatives to reduce dependency on hydrocarbons and promote economic sustainability and marketability of

green sukuk. (Climate Bonds Initiative, 2020). Green sukuk investments in sustainable projects help address environmental risks, making them attractive to socially responsible investors. Projects like waste management plans and solar power plants help to slow down environmental deterioration, which lowers the long-term dangers of climate change. Because of their alleged lower risk profile, green sukuk are more in demand in the market and are, therefore, seen as a feasible investment option in the GCC (Ahmed, 2010).

The demand for green sukuk has grown dramatically due to the growing interest in ESG investments around the world, which has improved their liquidity and attractiveness in the secondary market. The sustainability objectives in the GCC, such as Saudi Vision 2030 and the UAE Green Agenda, are supported by green sukuk that adheres to ESG principles. Green sukuk's increasing marketability guarantees that it will always be a competitive option for investors, which further influences positive market reaction to its issuance (Adam & Thomas, 2004).

1.3 Environmental Benefits of Green Sukuk: Perspective from GCC Countries.

The green sukuk announcement in the GCC region is an important milestone in enhancing sustainable finance practices in tackling environmental issues. Below are several environmental advantages of investing in green sukuk instruments. Green sukuk are an essential source of finance for climate change mitigation programs like waste management, clean mobility, renewable energy, and sustainable agriculture. By directing investments into these projects, green sukuk reduces carbon emissions and promotes the region's shift to a low-carbon economy. Green sukuk-financed renewable energy projects, for instance, support investor confidence and the sustainability objectives of GCC countries, which in turn leads to positive market reactions (ISLAMIC GREEN FINANCE n.d.). Green sukuk

issuance encourages governments and businesses to embrace sustainable business practices. Green sukuk promotes accountability and openness in environmental governance by mandating adherence to green standards. Due to investors' growing preference for instruments that support ESG standards, such a shift toward sustainability results in a favorable impact on market reactions. Green sukuk issuance supports a wider sustainability agenda, and the GCC's growing green finance sector reflects this trend (Climate Bonds Initiative, 2020). Green sukuk sometimes funds initiatives that have major social benefits in addition to environmental ones, like rural electrification and water management systems. These initiatives raise the social value of investments by promoting community development and improving local living conditions. Socially conscious investors find green sukuk to be more attractive due to its dual emphasis on environmental and social effects, which also improves its market performance (Ahmed, 2010).

See Appendix A for the different types of sukuk products that investors can invest in:

Figure 1.2 Challenges related to investing in Green Sukuk



(Bashar Al Nattoor, n.d.

The diagram highlights key challenges associated with Green Sukuk while also emphasizing its prospects. Four main factors influence the development of Green Sukuk: investor awareness, demand for energy supply, demand for energy financing, and government support. Limited investor awareness can hinder market growth, as potential stakeholders may not fully understand the benefits of Green Sukuk. Additionally, the increasing demand for energy supply and financing underscores the need for sustainable investment solutions. Government support plays a crucial role in fostering a conducive environment for Green Sukuk issuance through policies and incentives. Despite these challenges, Green Sukuk holds significant potential in driving sustainable financing and supporting the global transition toward renewable energy.

1.4 Background

The evolution of sustainable finance has driven the emergence of green sukuk, which is a key financial tool for supporting eco-friendly projects while complying with Islamic finance principles. Building on the foundation of conventional sukuk, green sukuk adheres to Sharia-compliant financing and supports projects like renewable energy, sustainable infrastructure, and clean technology transportation (Rahman & Abbas, 2023). Given the increasing global emphasis on Sustainable investments, including Environmental, Social, and Governance (ESG) initiatives and green sukuk has garnered attention from policymakers, investors, and financial institutions seeking to balance financial returns with sustainability goals. The GCC countries' economies have traditionally relied heavily on hydrocarbon resources as the backbone of their economies. However, the volatility of oil prices, coupled with global commitments to reduce carbon emissions, has necessitated a shift toward more diversified and sustainable economic models (T. Hersary, 2021). GCC

countries have been at the forefront of Green Sukuk issuance, leveraging their financial markets to support national and regional sustainability agendas.

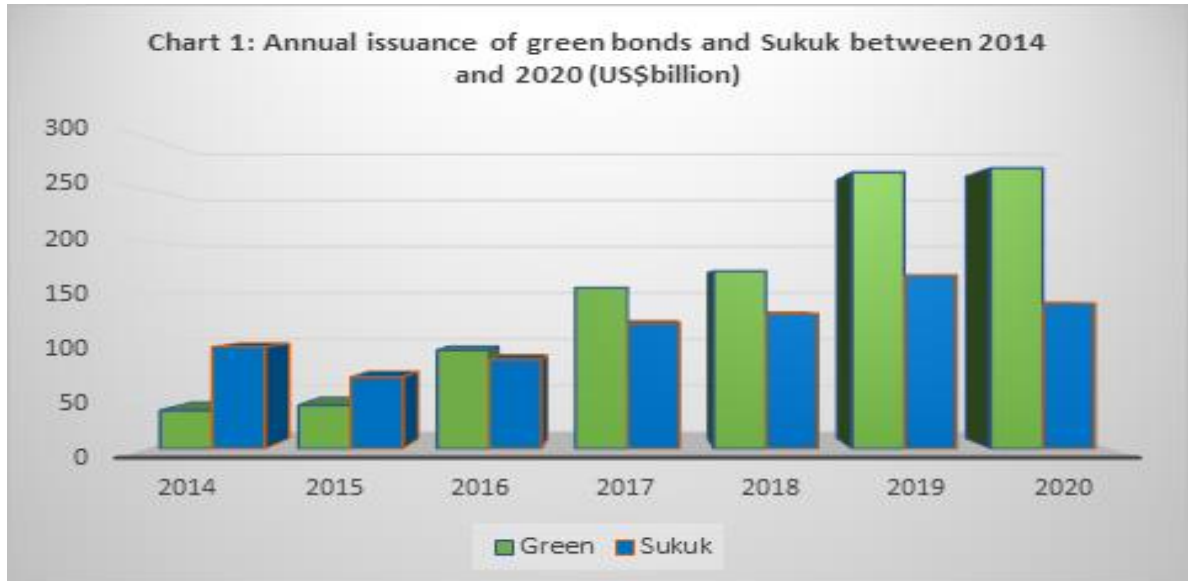
Sukuk, commonly known as Sharia-compliant bonds, have long been a cornerstone of Islamic finance, offering a means for issuers to raise capital without violating Shariah principles that prohibit interest (riba) and speculative transactions (gharar). Traditionally, sukuk structures rely on asset-backed transactions, ensuring that investments are linked to tangible assets or services. The concept of green sukuk emerged as an innovative extension of this financial model, designed to facilitate investments in projects with positive environmental impacts (Alam et al., 2022). The inaugural issuance of green sukuk took place in Malaysia in 2017, setting a precedent for other Islamic finance markets to follow. Since then, the green sukuk market has grown, with nations like Indonesia, the UAE, and Saudi Arabia playing significant roles. (Kamboj et al., 2024) As part of the Saudi Green Initiative, Saudi Arabia has set an ambitious goal to reach net-zero greenhouse gas emissions by 2060 (Kamboj et al., 2024). This commitment highlights the country's strong determination to combat climate change and transition toward a more sustainable future, as well as the UAE's Net Zero 2050 initiative. However, despite this progress, the overall adoption of green sukuk remains limited compared to conventional sukuk, raising important questions about their financial performance, investor perception, and regulatory frameworks.

The introduction of Vision 2030 in Saudi Arabia, for example, underscores the importance of sustainable development as a core component of the nation's long-term economic strategy (Alam, N., 2021). Similarly, other GCC countries have incorporated sustainable

finance into their economic diversification plans, recognizing the potential of Green Sukuk to attract foreign investment and support sustainable infrastructure projects (A. Komijani., 2022). In this context, the adoption of Green Sukuk by GCC countries represents a strategic move towards achieving these objectives while maintaining their commitment to Islamic finance principles (Azhgaliyeva, D., 2022). Global investors are increasingly prioritizing sustainable investment strategies, particularly those focusing on ESG assets. There is a projection that ESG-related assets will rise from USD 18.4 trillion in 2021 to USD 33.9 trillion in 2026, with an annual growth rate of 12.7%. ESG sukuk, in particular, has gained significant interest in the Gulf region. It allows investors to align with both Islamic principles and ESG standards, attracting a broad range of investors, including those who prioritize Shariah compliance, conventional investments, and ESG principles. These green sukuk provide an extra level of governance through Islamic principle compliance, directing funds toward projects that meet both Islamic and ESG criteria. The combination of these two frameworks has expanded financing opportunities, as religious investors focused on Islamic principles are increasingly drawn to investments that align with ESG guidelines (MENA, n.d.).

Figure 1.3: The annual sukuk issuance from 2014 to 2020 in billions.

(World Bank Treasury, n.d.)

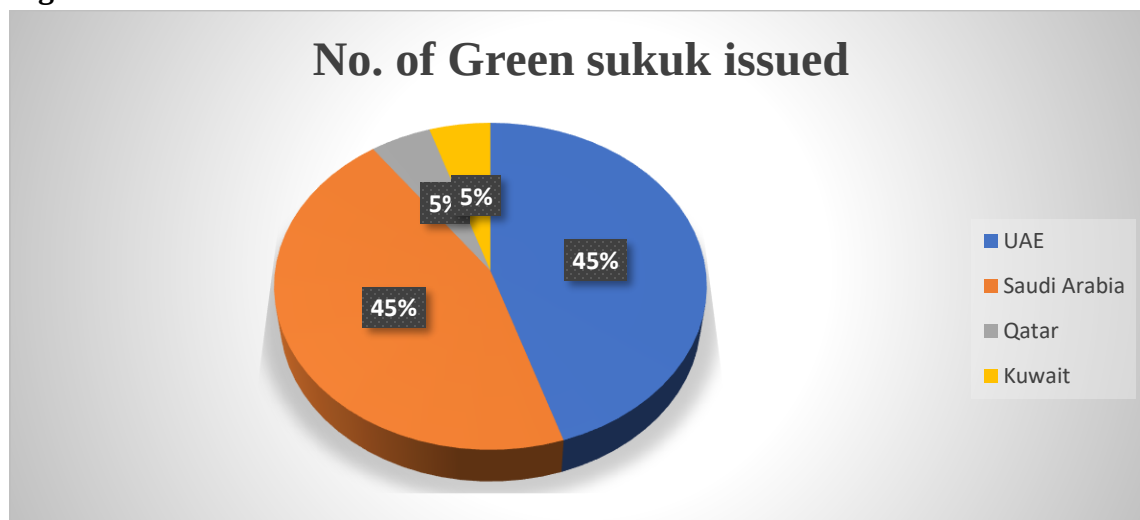


Sustainable sukuk financing has recently emerged and has important potential for sustainable growth. However, this prospect can be realized when funds are raised through the issuance of green sukuk that are allocated to important issues that require attention. (Rahman et al., 2024). According to a new projection from the rating agency Moody's, Saudi Arabia will top the GCC regarding sustainable sukuk issuances in the first half of 2024, trailing only the UAE. The GCC countries contributed 82% of global sustainable sukuk issuance in the first half of 2024, a 21% increase year-on-year to \$6.8 billion. Saudi Arabia led the area in issuances with 42%, followed by the UAE with 33%, according to the survey. However, entities in the UAE were the most active in branding their sukuk as "sustainable"(Sustainable Sukuk Issuances, n.d.).

1.4.1 Green Sukuk Issuance Trend and Market Capitalization

Green sukuk issuance across GCC countries

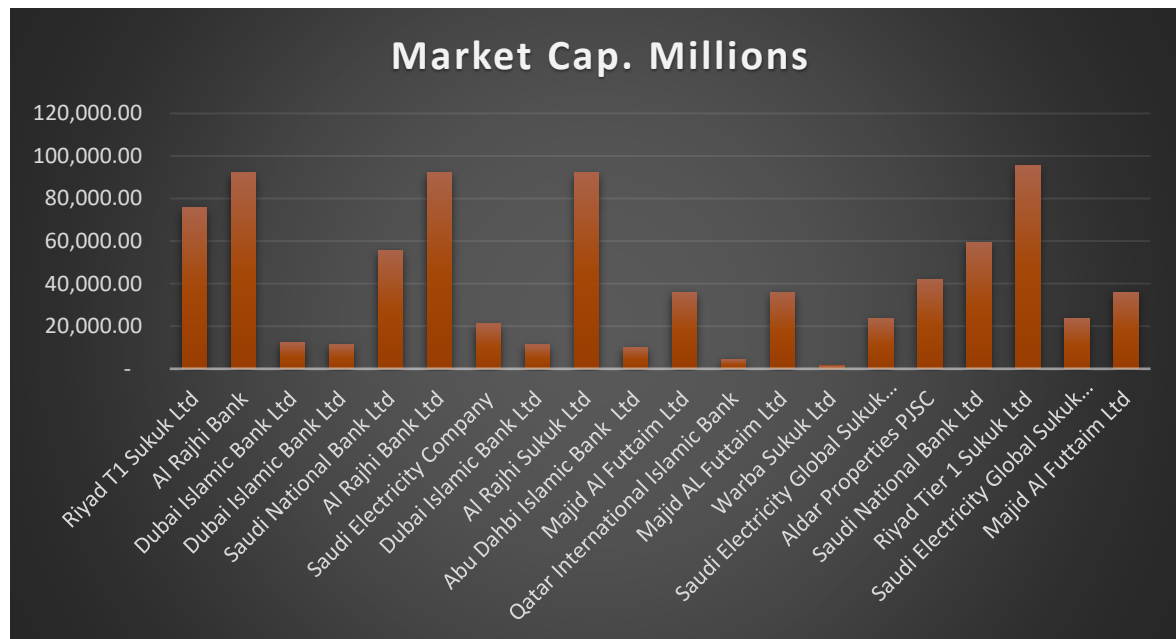
Figure 1.4: Number of Green Sukuk Issued



The pie chart provides an overview of Green Sukuk issuances among four GCC nations. Both the UAE and the Kingdom of Saudi Arabia lead in issuing Green Sukuk, each contributing 45% of the total. Meanwhile, Qatar and Kuwait have much smaller shares, each accounting for just 5%. This shows that the UAE and Saudi Arabia are at the forefront of Green Sukuk issuances, demonstrating their strong commitment to sustainable finance, while Qatar and Kuwait have a relatively minimal presence in this sector, possibly due to a lower market emphasis or a growing but still nascent interest in green investments. Nevertheless, even with the growing issuance of green sukuk, their market performance and investor perception remain underexplored. The adaptation of green sukuk differs across the GCC region, with Saudi Arabia and the UAE accounting for the majority of issuances, while countries like Qatar and Kuwait exhibit minimal participation. This disparity raises questions about the factors influencing market adoption and whether

investors perceive green sukuk as financially attractive or merely as compliance-driven instruments. Unlike conventional sukuk, green sukuk involves additional environmental certification requirements, potentially affecting their risk-return profile and liquidity.

Figure 1.5: Market Capitalization



The bar chart illustrates the market capitalization (in millions) of various financial institutions and corporate entities. Market capitalization, commonly referred to as "market cap," measures the overall value of a company's outstanding shares and is a crucial indicator of its financial stability and market standing. Among the leading firms, Al Rajhi Bank Ltd stands out with one of the highest market capitalizations, exceeding 80,000 million, indicating its strong market presence. Similarly, Dubai Islamic Bank Ltd and Saudi Electricity Global Sukuk Ltd exhibit significant market valuations, reflecting robust investor confidence. Several entities, such as Saudi National Bank Ltd, Dubai Islamic Company, and Aldar Properties PJSC, fall into the moderate market capitalization range,

typically between 30,000 to 60,000 million, suggesting a well-established but slightly less dominant position. On the other hand, companies like Abu Dhabi Islamic Bank Ltd, Warba Sukuk Ltd, and Qatar International Islamic Bank have relatively lower market capitalizations, indicating either a smaller market footprint or lower investor demand.

A general trend observed in the data is the dominance of banks and financial institutions, particularly Islamic banks, underscoring the growing influence of Islamic finance in the region. Additionally, the presence of Sukuk (Islamic bonds) highlights their increasing role in corporate financing. The variations in market capitalization among these institutions suggest differing levels of investor confidence, asset valuation, and financial stability. Overall, the analysis provides insights into the relative financial strength of leading banks, Sukuk issuers, and corporations. The prominence of Al Rajhi Bank Ltd, Dubai Islamic Bank Ltd, and Saudi Electricity Global Sukuk Ltd suggests they play a significant role in the financial landscape, while entities with lower market capitalization may be emerging players or operating in niche markets. This data is particularly useful for investors, policymakers, and financial analysts in assessing market dynamics and identifying investment opportunities in the Islamic finance sector.

1.4.2 Industry Adoption and Sectoral Analysis

Green sukuk issuances are not uniformly distributed across industries, with certain sectors demonstrating greater enthusiasm for sustainable financing. The banking and financial services sector leads to green sukuk issuance, reflecting the critical role of financial institutions in promoting ESG-focused investments (Ho et al., 2023). The real estate and retail sectors also show significant participation, driven by the increasing demand for green

urban development and eco-friendly commercial projects. In contrast, the energy and utility sector, which is directly aligned with sustainability objectives, has a lower-than-expected issuance rate of green sukuk (Boehmer et al., 2022). This suggests that despite the potential for renewable energy and infrastructure financing, companies in this sector may still rely on alternative funding mechanisms or face regulatory and structural challenges. Other industries, such as transportation, have limited engagement with green sukuk, possibly due to the nascent stage of green financing in their business model.

1.4.3 Theoretical Framework: Market Efficiency and ESG Investing

The analysis of green sukuk issuance and investor sentiment is rooted in financial market theories that explain how sustainability-linked instruments perform in capital markets. According to the Efficient Market Hypothesis (EMH), asset prices in financial markets reflect all available information. However, event study results often reveal deviations from this hypothesis, indicating that sustainability-related announcements may generate abnormal returns, reflecting shifts in investor sentiment. Furthermore, an additional analysis incorporating COP28 as a dummy variable examines the impact of global climate policy discussions on financial market reactions, revealing that investor sentiment toward sustainable finance is influenced by international environmental policies (Alam et al., 2022).

Additionally, the ESG investment framework highlights the growing role of non-financial factors in shaping investor decisions. As climate change and sustainability concerns gain traction, institutional investors and asset managers are increasingly integrating ESG metrics into their investment strategies. The performance of green sukuk in the stock

market can provide empirical evidence on whether ESG-focused financial instruments are rewarded or penalized by investors. Green sukuk represents a promising yet underexplored segment of the Islamic finance market. While they offer Shariah-compliant solutions for sustainable investments, their financial characteristics, industry adoption, and market reception remain subjects of ongoing research. Additionally, investor sentiment, market performance, and risk-return characteristics of these sukuk remain underexplored. The GCC region, as a prominent center for Islamic finance, presents a valuable case study for examining the viability and impact of green sukuk. By investigating how markets react to these issuances, this study aims to offer data-driven insights into the changing role of green sukuk in sustainable finance.

Additionally, while GCC countries like Saudi Arabia and the UAE have demonstrated interest in green sukuk as part of their green gas emissions 2060 and Net Zero 2050 initiatives, there is still uncertainty regarding whether these financial instruments generate abnormal returns or simply serve as compliance-driven tools. This research aims to bridge the gap by examining market reactions, stock price movements, and investor sentiment around green sukuk issuance announcements, using event study methodology and statistical analysis. The study also evaluates whether global sustainability discussions, such as COP28, have a significant influence on investor confidence and market perception of green sukuk in the GCC region.

Although there is increasing interest in Green Sukuk, few empirical studies have been conducted to analyze how financial markets in the GCC react to the issuance of these bonds. Gaining an understanding of market responses to Green Sukuk is essential for

several reasons. Firstly, it sheds light on how investors assess both the financial returns and environmental benefits of these instruments (Azhgaliyeva, D., 2022). Secondly, it offers important elements for policymakers and financial institutions regarding the potential market success of sustainable finance products in the region (Migliorelli, M., 2021).

By addressing the research question "How do stock markets react to green sukuk issuances, and what factors influence investor sentiment toward these sustainable financial instruments in the GCC region?", This research adds to the expanding literature on sustainable finance by offering empirical evidence on the risk-adjusted performance of green sukuk and their potential role in shaping the future of Islamic financial markets. The research will unveil how the financial market reacts to the green sukuk announcement and its valuable contribution to fostering sustainable finance within the GCC (T. Hersary, 2021). This research is structured as follows: the literature review provides an overview of existing studies on green sukuk, sustainable finance, and market efficiency; the methodology section outlines the empirical framework and data sources; the data section presents key descriptive statistics on green sukuk issuances in the GCC; the empirical results analyze investor reactions and stock price behavior following sukuk announcements; and the conclusion discusses the implications of the findings for investors, policymakers, and financial institutions.

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical Framework

Sustainable financing in emerging nations is crucial for promoting long-term economic growth and lowering environmental damage. It emphasizes financial products such as eco-friendly bonds, community-focused bonds, and loans tied to sustainability outcomes to fund activities that enhance renewable energy, infrastructure resilience, and social well-being. Sustainable finance facilitates a shift from fossil fuels to more sustainable energy solutions by directing investments toward environmental and social objectives. It also attracts international investors who appreciate ESG objectives, resulting in cost-effective financing for green enterprises. Furthermore, these investments promote economic diversity, create jobs in sustainable businesses, and reduce the negative environmental effects of traditional industrial growth. In recent years, green sukuk has gained increasing attraction as a financial tool, triggered by the sudden rise in climate financing globally. However, research on GS remains scattered and lacks comprehensive reviews. This paper seeks to address this gap by clarifying existing knowledge about green sukuk into different factors, offering thorough details on the topic, and suggesting directions for future studies. The findings indicate that past research has mainly concentrated on GS benefits, key drivers, market growth, and potential sectors, as well as challenges and suggestions for improving the market. On the other hand, other elements like pricing, performance, and purchasing decisions of green sukuk need to be explored. (Alkadi, 2024).

The shift from conventional investments to sustainable finance is currently taking place in various markets, with varying degrees of implementation. This research aimed to evaluate

sustainability-focused stock market indices in both the Indian and global contexts by analyzing stock returns. The findings indicated a significant rise in the use of sustainable finance within the Indian market (Vellaiyan et al., 1 C.E.). As Agliardi (2019) highlighted, enhancing credit quality may ultimately reduce the capital costs for green bond issuers. According to Agliardi 2019, investors' awareness of environmental concerns and government tax incentives plays a vital role in the rapid surge in green sukuk. (Agliardi & Agliardi, 2019). According to Husain 2024, suggests a valuable recommendation for investors navigating complex financial markets, particularly during times of financial crisis. A strong approach involves creating a diversified portfolio of bonds that will include both Islamic and sustainable financial instruments. (Husain et al., 2024). Therefore, it is advised to include both sukuk and green bond instruments in the investment portfolio. This results in the rise of various types of sustainable debt instruments to achieve Sustainable Development Goals (SDGs), and sustainability adaptation and controls are especially important for successful implementation. Models such as CAPM and Fama-French Three-Factor. The study will use different asset pricing models to assess the impact of the event announcement on stock returns, such as the Capital Asset Pricing Model (Ahmed et al., 2024).

According to Rahman 2024, the findings highlight areas that have not been fully explored and require urgent focus on where Green Sukuk (GS) could be applied. The study suggests utilizing GS for sectors such as agriculture, forestry, water management, animal conservation, infrastructure like roads, and other relevant fields (Rahman et al., 2024). Green Sukuk, on the other hand, can aid in the implementation of climate policies by funding rigorous campaigns and allocating cash efficiently to low-carbon and climate-

resilient projects. Companies that prioritize sustainability tend to have more transparent reporting processes (Fernandez-Feijoo et al., 2014). The green label impact assures investors that a second party has externally certified the firm's green and sustainable initiatives. The findings show that announcements related to green bond issuances are associated with significantly positive abnormal stock returns, indicating favorable investor reactions (Ahmed, Yusuf, & Ishaque, 2023). The profitability of financial instruments to investors is the most essential factor in investment decisions. Numerous studies indicate that shareholders react positively to the news of green sukuk issuance. This results in the first hypothesis:

H1: green sukuk announcements have a positive abnormal stock return.

However, assuming this is true, we can conclude that green sukuk can be useful financial tool for funding sustainable projects. As stated in previous studies, the green bond issuance resulting in abnormal returns (i.e., following the green sukuk announcement) demonstrates how corporations and investors are dedicated to financing sustainable climate projects. From the shareholder or agency viewpoint, engaging in social and environmental initiatives leads to added costs, which could negatively impact profitability, as the returns from ESG efforts may not outweigh their expenses. This perspective suggests that a company's primary obligation is to maximize profits, and engaging in ethical and sustainable practices could potentially lower a company's value (Friedman, n.d.; Harjoto & Laksmana, 2018; Milton Friedman, 1970). The green bond issue announcement suggests that issuing corporations will invest more in sustainable business methods, leading to lower revenue generation. When a company makes such a statement, its stock price may fall. The institutional theory of Corporate Social Responsibility (CSR) suggests that managers may

engage in social and charitable activities primarily to serve their interests, enhancing their image at the cost of shareholders. Additionally, several studies have observed that a firm's performance and social responsibility commitment are inversely related. (Barnea & Rubin, 2010). The shift of funds to ensure a world with low carbon emissions aligns with the objective of the Paris Agreement, particularly considering the substantial financial resources needed to turn discussions into concrete actions. We argue that green bonds offer greater financial benefits compared to traditional bonds (Gianfrate & Peri, 2019).

Critics of social and environmental investments argue that these initiatives negatively impact corporate performance, putting companies engaged in them at a competitive disadvantage compared to traditional firms. According to neoclassical theory, empirical studies show that adherence to ESG principles results in low financial performance for firms (Gillan 2021). On the other hand, scholars continue to debate whether environmental investments diminish corporate value or enhance financial outcomes. Lowering the emission rate often results in an unfavorable impact on maximizing a company's value. This posed a challenge for companies that introduced voluntary actions to combat climate change, as such decisions could reduce firm value. (Fisher-Vanden & Thorburn, 2011). This suggests that green sukuk may not consistently outperform conventional green bonds in the stock market, with instances of negative or lower-than-anticipated stock returns following announcements.

As ethical financial instruments, sukuks are not designed to finance unlawful activities, such as gambling, tobacco production, or weapons manufacturing. Additionally, sukuk is designed to limit excessive leverage and speculative behavior, fostering a more stable and

sustainable financial system. (M. Bennet's 2024). Therefore, it can be concluded that investors might penalize companies for their dedication to sustainability, leading to negative excess returns on stocks following the green bond issuance. Investors in the secondary market benefit a lot from issuing sukuk instruments. (Gianfrate & Peri, 2019). This highlights the significant potential for green sukuk in the secondary market. The hypothesis proposes that companies with robust environmental and social practices do not exhibit significant differences in performance and returns when compared to traditional investments.(Gianfrate & Peri, 2019).

2.1.1 Contribution to Literature

Contextual Focus: Assessing the Investor's Sentiments through the Climate Change Conference (COP28) in the UAE.

The Global Climate Change conferences will be utilized to gauge investor sentiment toward Green Sukuk announcements within the Gulf Cooperation Council (GCC) region. Events like the UN Climate Change Conference (COP28) and regional climate summits often introduce major policy changes, global pledges, or trends in sustainability. These conferences can significantly shape investor attitudes, especially in markets focused on green finance and sustainability, such as Green Sukuk. COP28, held in the UAE from November 30 to December 13, 2023, attracted many members, including national representatives, civil society groups, indigenous leaders, youth activists, philanthropic organizations, and global institutions. The event saw around 85,000 participants, including over 150 global leaders (UN Climate Change Conference.). COP28 serves as the inaugural 'world stocktake' of worldwide to handle climate change, as outlined by the Paris Agreement. The development in areas like cutting greenhouse gas emissions, enhancing

climate resilience, and offering technological and financial support to vulnerable countries, nations collectively agreed on measures to accelerate climate action by 2030. This includes urging nations to push a change in the energy source from fossil fuels to sustainable energy like solar power, wind, and many more as a climate change pledge (UN Climate Change Conference, n.d.).

Additionally, this event can have a substantial impact on investor sentiment towards Green Sukuk by emphasizing sustainability, announcing new climate regulations, and encouraging green investment programs, particularly in the GCC region. These events frequently increase interest in environmentally sustainable investments and influence market perceptions about the viability of green finance products such as Sukuk. For GCC economies that rely largely on oil, discussions about transitioning to green energy could trigger mixed reactions, either increasing interest in green initiatives or raising concerns about economic shifts. Furthermore, because Islamic finance principles correlate with Environmental, Social, and Governance (ESG) goals, these climate disasters have a greater impact, signaling shifts in perceptions of Islamic financing products. However, the strong emphasis on climate resilience efforts, global climate policy, and promises made during the COP 28 conference in UAE may influence investor sentiment toward green assets such as Green Sukuk in the GCC.

2.1.2 Behavioral Variable in the GCC Region

The study utilized Climate Change conferences to analyze investor sentiment regarding Green Sukuk research in the Gulf region. Events like the United Nations Climate Change Conference (COP28) have introduced major policy changes, global commitments, and emerging sustainability trends. These events have the potential to influence investor

sentiments, particularly in markets involving green finance and sustainability, such as Green Sukuk.

Evaluating investor sentiment during climate events, such as COP28, is an important consideration, as is analyzing how specific financial instruments respond to climate-related developments. These conferences are important in reshaping the perceptions of green financial products, including Sukuk.

2.2 Research Methodology

In the field of financial economics, a large body of research on event studies has emerged in recent decades. From a corporate perspective, the significance of event studies is highlighted when abnormal stock performance affects the wealth of a company's shareholders or claimholders. Most of these researches look at the short-term impacts of an event announcement, which might shed light on corporate decision-making strategies. In capital markets, event studies are critical in assessing market efficiency since abnormal returns following corporate events may indicate deviations from efficient market behavior.

2.2.1 Asset Pricing Model

Many statistical models have constraints in economic theories, thus limiting the number of abnormal return models that can be used to assess abnormal returns. The Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT) are the most commonly used constrained models in event study analysis. According to Lintner and Sharpe, CAPM is widely adopted because the equilibrium theory determines an asset's expected return by assessing how it correlates with the investment portfolio (Lintner, 1965; Sharpe, 1964). The CAPM is commonly applied in event studies, but there are ongoing debates about its

limitations, especially in determining the market return. This model can be used to determine the extra return using the regression equation below.

$$E[R_i - rf] = \alpha_i + \beta_i(RM - rf) + \epsilon_{i,t}$$

$E R_i$ = expected return on the asset i

rf = risk-free rate (often represented by government bond yields).

α_i = The intercept term, representing the asset's alpha, or excess return not explained by market movements. It captures how much the asset outperforms or underperforms compared to the entire market after considering the risk.

β_i = The beta of an asset indicates how much its price moves in the overall market. A beta value exceeding 1 indicates that the asset is more volatile than the market, whereas a beta value under 1 signifies lower volatility compared to the market.

RM = The expected return of the market.

$\epsilon_{i,t}$ = Capture elements that may affect the return but are not captured in the model. The error term (residual), represents the unsystematic risk, or the part of the return that cannot be explained by the market's performance.

The (CAPM) determines its parameters by performing a time-series regression using observed returns.

An event study approach was utilized to examine the effects of green sukuk issuance announcements on stock prices. The study defines an estimation window of 120 trading days before each announcement to calculate expected returns and an event window of (−15, +15) days surrounding the announcement to capture market reactions. In this study, a 30-

day event window (−15, +15) is used to ensure a more comprehensive capture of market reactions both before and after the green sukuk announcements. While many event studies use shorter windows like (−3, +3) or (−5, +5) to isolate immediate reactions, the extended shorter window has potential information leakage before the announcement and delayed investor responses afterward, both of which are common in emerging markets like those in the GCC.

Additionally, shorter windows, such as (−3, +3) and (−5, +5), were tested, and it was found that the general pattern of results remained consistent, though the effects were sometimes less pronounced. This reinforced my confidence that the 30-day window was appropriate for capturing both immediate and slightly delayed market responses without introducing excessive noise.

Stock returns are computed using natural log differences to normalize distributions and capture compounding effects. To estimate expected returns, the study employs the Single-Factor Capital Asset Pricing Model (CAPM), a widely used approach in financial research that accounts for systematic market risk(Li, 2023)(Ridwan & Barokah, 2023). The single-factor CAPM model is specified as follows:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

$E(R_i)$: represents the expected return on stock i , R_f is the risk-free rate, β_i is the stock beta (sensitivity to market movements), $E(R_m)$ the market return.

This approach allows the study to compute abnormal returns (ARs) and cumulative abnormal returns (CARs), quantifying the extent to which green sukuk issuances impact stock prices. To ensure the reliability of the results, the study applies several statistical tests. The Jacque-Bera Normality Test evaluates whether return distributions follow normality assumptions, while the Augmented Dickey-Fuller (ADF) Test checks for stationarity in time series data to ensure that results are not affected by trends. Additionally, T-tests are conducted to assess the statistical significance of abnormal returns. These robustness checks help validate the findings and ensure that the methodology produces meaningful insights into investor sentiment toward green sukuk issuances.

2.2.2. Empirical Model

Model Estimation

The model estimation followed the event study approach in which the first step involved computing the daily returns for the stock prices of listed firms and their respective market indices. This is achieved by retrieving the closing stock prices and the corresponding closing values of the indices. Daily stock returns in day t will for each stock based on log returns. using continuously compounded returns(Ederington et al., 2015).

$$r_{it} = \ln(1 + R_{i,t}) = \ln(P_{i,t}) - \ln(P_{i,t-1})$$

The i index and t represent the day

r_{it} = daily stock return log form

R_{it} = stock daily return

$P_{i,t}$ = stock closing price

$(P_{i,t-1})$ = (stock closingprice)

The study used models based on continuously compounded returns to determine abnormal returns, which are key in examining the effect of an event. The main objective of this approach is to distinguish the impact of the event from regular market fluctuations. Abnormal or excess returns for each stock and the related index will be calculated daily using the following formula (Andersen, 1998).

$$AR_{i,t} = R_{i,t} - E[R_{i,t} | \Omega_{i,t}]$$

This equation represents *abnormal returns (AR)* in an event study:

i represents asset i and t day t

$AR_{i,t}$ = Abnormal returns

$R_{i,t}$ = Actual return

$E[R_{i,t} | \Omega_{i,t}]$: Expected returns

$\Omega_{i,t}$. Given the information available

In simple terms, the difference between the actual and expected returns for specific assets is the abnormal return. The difference shown by the expected and actual returns indicates the effect of an event (e.g., green sukuk announcement) on the asset's performance.

Cumulative Abnormal Return (CAR)

To calculate the total sum of the abnormal returns over the window period, the CAR will be ideal. Thus, this will evaluate how the overall market reacts to green sukuk issuance:

$$CAR_{t1,t2} = \sum_{t=1}^{t2} AR_{it}$$

AR_{it} : The mean of abnormal returns across N events on a specific day, denoted as day t .

CAR_T : The cumulative abnormal returns are calculated over the event window ranging from $t=1$ to $T=2$.

To calculate the cumulative abnormal return (CAR) for each stock, abnormal returns are accumulated throughout the event window. The start and end periods are denoted by $t1$

and t_2 , respectively (e.g., -15 days to +15 days for the short-term window). This will allow the research to determine if the market impact persists over several days or fades quickly.

On the contrary to examining the abnormal returns statistically usually requires cross-sectional average metrics for each. The cross-sectional average is given by:

$$CAAR_{t1,t2} = 1/N \sum_{t=1}^n CAR_{i(t1,t2)}$$

Estimating the Behavioral Variable

The climate change conference COP28 in the UAE was used as a behavioral variable to assess the effect on sukuk prices during this conference period. To model the impact of *COP28* on sukuk prices using the *CAPM* framework, we can incorporate the conference as a behavioral dummy variable within the *CAPM* model.

Modeling Behavioral Variables in the GCC Region: Incorporating COP28 as a Behavioral (Dummy) Variable. The COP28 conference impact was assessed by creating a dummy variable $COP28t$, which is set to 1 during the COP28 period and 0 at other times. This variable can help capture any unique impact on sukuk prices due to the conference.

$$rit - rft = \alpha_i + \beta_i mkt(MKTt) + \delta \cdot COP28t + \epsilon_i$$

δ : the coefficient representing the effect of COP28 on sukuk prices

$COP28t$: the dummy variable for the COP28 period (1 during the conference, 0 otherwise).

2.2.3 Data Section

The dataset spans from 2015 to 2024 and includes publicly traded firms engaged in sustainable finance initiatives. Data was sourced from Bloomberg, a leading financial database, to ensure accuracy in stock price and market index values. The study focuses on green sukuk announcements, with an emphasis on firms that exhibit sufficient trading activity to provide reliable price reactions. To ensure data quality, the sample includes 20 actively traded firms, prioritizing those with significant market activity. This approach aligns with prior studies, such as that of Boehmer et al. (2022), which highlight the importance of liquidity in event studies.

The study establishes an estimation window of 120 trading days before each announcement to determine the expected returns. However, out of the 20 firms analyzed, 15 showed a statistically significant beta coefficient, indicating a reliable relationship with market movements. However, the remaining 5 firms had beta values that weren't statistically significant, suggesting their stock returns didn't consistently respond to market changes. To improve the reliability of the beta estimates for the 5 firms with insignificant results, I extended the rolling estimation window from 90 to 120 days. However, even with the longer window, their beta coefficients remained statistically insignificant. This suggests that these firms' stock returns may not have a stable or strong enough relationship with overall market movements, possibly due to low trading activity, firm-specific noise, or external factors unrelated to market trends. This limitation suggests that only a subset of firms can be effectively analyzed for abnormal returns, which may impact the study's findings. Additionally, the study defines an estimation window of 120 trading days before each announcement to calculate expected returns.

CHAPTER 3

RESULTS AND CONCLUSION

3.1 Empirical Analysis

A descriptive analysis was performed to examine the average values, volatilities, and the minimum and maximum ranges of each variable across different event periods, providing insights into overall trends and fluctuations. Additionally, to ensure the reliability of the data, the Jarque-Bera test was conducted to assess whether the variables follow a normal distribution, which is crucial for the validity of statistical models used in financial research. Since financial data often exhibits non-normality, identifying deviations from normality helps in determining whether alternative statistical methods should be applied. Furthermore, the Augmented Dickey-Fuller (ADF) test was utilized to evaluate the stationarity of the variables, ensuring that their statistical properties, such as mean and variance, remain stable over time. Stationarity is particularly important in event studies, as non-stationary data can lead to misleading inferences and affect the accuracy of return estimations. Together, these tests help understand the dataset's characteristics and guide appropriate methodological adjustments for robust empirical analysis.

Descriptive Statistics
Table 3.1

Events	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Count (N)															
Mean															
Stock Price	21.80 937	1.574 9	1.579	10.18 47	20.89 57	6.363 9	20.91 998	2.900 808	0.57897	4.2977 71	12.56 298	7.767 869	1.286 516	1.5935 53	2.753 336
Stock Return	-0.000 829	-18	0.000 7	-0.001 2	0.000 7	0.000 05	0.000 164	0.000 494	-0.00069	-0.0000 7	-0.001 05	-0.002 3	-0.001 22	0.0007 57	-0.000 82
Market Index	3190. 07	1109	918	3186. 24	2883. 65	2882. 28	3091. 247	2618. 495	23220.0 4	1941.5 4	3043. 765	3095. 692	2705. 283	909.83 17	2808. 062
Market Return	-0.000 73	-0.000 41	0.000 17	-0.000 85	0.000 26	0.000 12	-0.000 7	0.000 035	-0.00057	-0.0000 9	-0.000 65	-0.000 93	0.000 736	0.0006 43	0.000 128
Risk free	0.000 156		0.000 13	0.000 156	0.000 156	0.000 156	0.000 157	0.000 132	0.00915 3	0.0001 57	0.000 157	0.000 157	0.000 132	0.0001 32	0.000 166
Excess Market Return	-0.000 817	-0.000 558	-0.000 28	-0.000 94	0.000 098	-0.000 05	-0.000 79	-0.000 11	-0.00972	-0.0002 5	-0.000 81	-0.001 07	0.000 6	0.0005 09	-0.000 01
Excess Stock Return	-0.001 1	-0.003 078	0.000 57	-0.001 32	0.000 5	-0.000 104	-0.000 86	0.000 363	-0.00984	-0.0002 1	-0.001 21	-0.002 45	-0.001 35	0.0006 26	-0.001
Standard Deviation															
Stock Price	1.682 781	0.090 9	0.042 6	0.866 4	1.237 7	0.390 164	2.380 204	0.097 865	0.01472 5	0.1874 61	0.988 274	0.766 964	0.089 299	0.0447 66	0.115 459
Stock Return	0.013 89	0.013 02	0.009 71	0.017 56	0.014 42	0.013 475	0.014 7	0.015 489	0.00866 4	0.0194 09	0.013 39	0.015 724	0.017 95	0.0134 3	0.012 065
Market Index	167.0 251	33.82 59	13.68 72	173.3 5	139.1 65	137.4 144	188.8 603	45.21 538	667.471 5	162.91 83	106.0 96	123.6 443	101.1 625	23.763 04	91.39 028
Market Return	0.006 732	0.006 99	0.006 18	0.006 8	0.009 42	0.009 216	0.006 999	0.004 731	0.00512 4	0.0177 38	0.007 849	0.008 297	0.006 265	0.0101 87	0.008 839
Excess Market Return	0.006 776	0.007	0.006 18	0.006 86	0.009 4	0.009 217	0.014 228	0.004 727	0.00512 4	0.0177 39	0.007 849	0.008 3	0.006 267	0.0101 87	0.008 844
Excess Stock Return	0.013 906	0.013	0.009 71	0.017 56	0.014 42	0.013 477	0.006 965	0.015 489	0.00866 4	0.0194 12	0.013 39	0.015 724	0.017 95	0.0134 3	0.012 069
Minimum															
Stock Price	17.11 27	1.421 2	1.489 3	8.264	18.62 5	5.623 67	16.92 747	2.673 64	0.5391	3.8488 2	10.74 392	6.984 43	1.143 48	1.4565 8	2.467 78
Stock Return	-0.044 142	-0.074 2	-0.021 39	-0.066 5	-0.039 78	-0.031 478	-0.044 14	-0.035 79	-0.03722	-0.0655	-0.034 13	-0.053 03	-0.049 56	-0.0370 1	-0.039 41
Market Index	2774. 533	1015. 5	895	2743. 89	2656. 05	2656. 049	2743. 899	2514. 797	21478.4 9	1586.2 9	2849. 54	2868. 36	2547. 573	833.59 65	2554. 983

Market Return	-0.017991	-0.0263	-0.01782	-0.01799	-0.0233	-0.023261	-0.01799	-0.01672	-0.01452	-0.06951	-0.02355	-0.02355	-0.02184	-0.02728	-0.02896
Risk free	0.000156	0	0.000132	0.00016	0.00016	0.000157	0.000157	0.000132	0.009153	0.000157	0.000157	0.000157	0.000132	0.000132	0.000166
Excess Market Return	-0.018147	-0.0264	-0.0215	-0.01815	-0.0234	-0.023418	-0.0443	-0.01685	-0.02367	-0.06967	-0.02371	-0.02371	-0.02197	-0.02741	-0.02913
Excess Stock Return	-0.044297	-0.0743	-0.01795	-0.0666	-0.0234	-0.031635	-0.01815	-0.03593	-0.04637	-0.06566	-0.03429	-0.05319	-0.04969	-0.03714	-0.03958
Maximum															
Stock Price	24.39935	1.7778	1.6744	11.652	23.4402	7.18486	24.39935	3.14185	0.61124	4.75619	14.90023	9.83554	1.49233	1.72883	2.99523
Stock Return	0.047656	0.0838	0.03016	0.0363	0.0505	0.044479	0.047656	0.065786	0.022649	0.079489	0.052633	0.045782	0.03908	0.074111	0.03116
Market Index	3422.566	1186.15	952.32	3422.57	3212.79	3212.79	3422.566	2719.804	24324.79	2230.027	3276.837	3400.141	2894.024	979.548	3048.299
Market Return	0.022019	0.0264	0.01773	0.022	0.0292	0.029233	0.022019	0.017116	0.026069	0.087059	0.046286	0.046286	0.026624	0.05894	0.030563
Risk free	0.000156	0	0.000132	0.00016	0.000156	0.000157	0.000157	0.000132	0.009153	0.000157	0.000157	0.000157	0.000132	0.000132	0.000166
Excess Market Return	0.021863	0.0264	0.0176	0.02186	0.02907	0.029077	0.047499	0.016985	0.016916	0.086902	0.046129	0.046129	0.026493	0.058808	0.030397
Excess Stock Return	0.047501	0.0837	0.03004	0.03612	0.050345	0.044323	0.021862	0.065654	0.013497	0.079333	0.052476	0.045626	0.038949	0.073979	0.030994

The table presents descriptive statistics for various financial indicators across multiple event periods, offering insights into stock prices, stock returns, market indices, market returns, risk-free rates, excess market returns, and excess stock returns. Various statistical measures, such as the average, level of dispersion, lowest value, and highest value, offer insights into trends and fluctuations in these variables over time. The table's mean values represent each variable's average level across the observed event periods. The stock price fluctuates across events, with notable variations such as 21.89 in Event 1, 20.89 in Event 5, and 24.39 in Event 15. The stock return remains relatively low in most cases, with slight fluctuations across events, indicating modest gains or losses over time. The market index displays significant variation, ranging from 1,110 in Event 1 to 3,242 in Event 15, reflecting changes in market performance. The market return remains close to zero,

signifying relatively stable market conditions. The risk-free rate, which represents the return on a safe investment, remains at a consistent level of 0.00016 across most events. The excess market return and excess stock return values, which measure the additional returns over the risk-free rate, also show minimal variations, suggesting that stock movements are closely aligned with market trends.

The standard deviation values highlight the volatility of stock prices, returns, and market indices across events. Higher standard deviations indicate greater price fluctuations and uncertainty. For instance, the market index has a high standard deviation across all events, particularly in Event 6 (137.14) and Event 15 (321.79), suggesting greater market turbulence during these periods. Similarly, stock prices exhibit higher volatility in Events 5 (1.23) and 6 (2.38), implying heightened market activity. In contrast, risk-free rates have negligible standard deviations, reinforcing their stability. The excess market return and excess stock return values have relatively low standard deviations, implying that risk-adjusted returns remain stable across different event periods.

The minimum and maximum values provide insights into the range of fluctuations across different financial indicators. The stock price varies significantly, with the lowest recorded value of 1.41 in Event 2 and the highest reaching 24.39 in Event 15, indicating substantial changes in market valuation over time. The market index exhibits a wide range, from 774 in Event 1 to 3,242 in Event 15, showing significant market performance differences between event periods. The market return fluctuates between negative and positive values, indicating both declines and growth in the overall market. The risk-free rate remains nearly constant, reinforcing its role as a stable benchmark for comparison. The excess market

return and excess stock return show some negative values, indicating periods where returns underperformed relative to the risk-free rate.

The data suggests that financial markets exhibit varying levels of volatility across event periods, with certain events experiencing higher fluctuations in stock prices and market indices. Events 6 and 15 show the most significant variations in market behavior, possibly indicating the impact of external elements, including economic shifts, regulatory updates, policy adjustments, or investor sentiment. The risk-free rate remains stable, a reliable benchmark for evaluating excess returns. Additionally, while stock returns and excess returns remain relatively low on average, their fluctuations highlight the dynamic nature of market movements. This analysis provides valuable insights into financial market behavior, helping investors, analysts, and policymakers understand how different event periods impact stock prices, returns, and overall market trends. By evaluating mean, standard deviation, and minimum-maximum ranges, stakeholders can better assess market risk, return potential, and investment opportunities across various timeframes.

Table 3.2 Summary statistics of green sukuk characteristics

All green sukuk	Mean	Median	Standard Deviation	N. Obs.
Coupon (percent)	4.79	5	1.05	20
Maturity (years)	4.35	4	2.35	20
Amount Issued (millions)	769	750	221	20

The table provides an overview of key financial features of Green Sukuk, and investment trends, focusing on coupon rates, maturity periods, and issuance amounts. On average, the coupon rate is 4.79%, with a median of 5%, suggesting that most sukuk offer returns around this range, while a standard deviation of 1.05% indicates moderate differences across issuances. The average maturity stands at 4.35 years, with a median of 4 years, implying that these sukuk generally have short to medium-term durations, though some variation exists as shown by the 2.35-year standard deviation. Regarding issuance size, the average amount issued is \$769 million, with a median of \$750 million, meaning that half of the sukuk are issued at or below this level. However, the relatively high standard deviation of \$221 million suggests significant differences in issuance sizes. With 20 sukuk analyzed, this dataset provides meaningful insights into the structure and characteristics of Green Sukuk in the market. These variations raise questions about the risk-return tradeoff and the attractiveness of green sukuk for investors seeking both financial stability and sustainability.

Table 3.3 Jacqua-Bera Test for Normality

Events	Obs.	Normality Decision	Prob > chi2
Events 1	151	Not Normal (All variables)	**
Events 2	151	Not Normal (All variables except Market index)	**
Events 3	151	Not Normal (stock price & Market index)	**
Events 4	151	Not Normal (All variables)	**
Events 5	151	Normal (except market index and stock price)	**
Events 6	151	Not Normal (except market return and excess market return)	**
Events 7	151	Not Normal (All variables)	**
Events 8	151	Not Normal (except stock price)	**
Events 9	151	Not Normal (All variables)	**
Events 10	151	Not Normal (except stock price)	**
Events 11	151	Not Normal (All variables)	**
Events 12	151	Not Normal (All variables except excess stock return)	**
Events 13	151	Not Normal (All variables except stock return & excess stock return)	**
Events 14	151	Not Normal (All variables except stock price)	**
Events 15	151	Not Normal (All variables stock price & market index)	**

****Denotation of **:** Statistical significance at the 5% level based on the p-value ($p < 0.05$).

Null Hypothesis (H_0): The data follows a normal distribution (i.e., skewness = 0 and kurtosis = 3).

Alternative Hypothesis (H_1): The data does not follow a normal distribution.

The results of the Jacque-Bera normality test offer valuable insights into the distributional properties of stock returns across different event windows in this study. The test, conducted on fifteen (15) event periods containing 151 observations, determines normality based on statistical significance at the 5% level ($p < 0.05$). The findings suggest that most event windows deviate from normality, with statistical significance confirming these deviations. Events 1, 4, 7, 9, and 11 display non-normality across all tested variables, whereas other windows exhibit normality in select variables. For instance, in Event 2, all variables except for the market index are non-normally distributed, while Event 3 shows deviations in stock price and the market index. Similarly, Event 5 follows a different trend, where all variables except the market index and stock price follow a normal distribution. Event 6 presents non-normality across most variables, excluding market return and excess market return. In contrast, Events 8, 10, and 14 retain normality only in stock prices, suggesting that stock price data may occasionally exhibit a closer approximation to a normal distribution. Events 12 and 13 reveal mixed patterns, with Event 12 showing normality only in excess stock return and Event 13 demonstrating normality in both stock return and excess stock return. Lastly, Event 15 exhibits non-normality across all variables except for stock price and the market index.

Despite these deviations from normality, the results do not pose a major concern within the context of event studies, particularly in stock market research. Financial return data often

exhibit skewness, heavy tails, and volatility clustering, making normality violations a well-documented phenomenon. Both parametric and non-parametric event study methodologies remain reliable despite these deviations. Additionally, the central limit theorem suggests that when working with sufficiently large sample sizes, the sampling distribution of test statistics approximates normality, reducing the effects of non-normal data. The statistical significance of the test results, marked by "**," confirms that these deviations are systematic rather than incidental. However, given that event studies rely on measures such as abnormal returns and cumulative abnormal returns (CARs), researchers should interpret these findings cautiously. Alternative techniques such as bootstrapping or employing generalized error distributions may offer robustness when dealing with extreme deviations. Nevertheless, non-normality does not inherently undermine the credibility of the study, as widely accepted methodologies in finance research account for such distributional patterns.

Table 3.4 Augmented Dickey-Fuller Test for Stationarity (No. lags 1)

Events	5% Critical Value	Stationarity Test
Events 1-2	-2.9	Stationary (All variables except stock price & Market index)
Event 3	-2.89	Stationary (All variables except stock price & Market index & Risk-Free)
Event 4-13	-2.89	Stationary (All variables, except stock price & Market index & Risk-Free)
Event 14	-2.9	Stationary (All variables risk-free)
Event 15	-2.9	Stationary (stock price, market index & risk-free)

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

***Null Hypothesis (H_0):** The time series has a **unit root** (i.e., it is **non-stationary**).*

***Alternative Hypothesis (H_1):** The time series does **not** have a unit root (i.e., it is **stationary**).*

The Augmented Dickey-Fuller (ADF) test is a fundamental statistical tool used to assess whether a time series variable exhibits stationarity or contains a unit root, indicating non-stationarity. In financial and economic research, stationarity is crucial because it ensures that the statistical properties of a dataset, such as mean and variance, remain consistent over time, allowing for meaningful inferences. In the context of this event study, the table presents ADF test results for different financial variables across multiple event periods, with a 5% critical value used as the threshold for determining stationarity. The test was conducted with a lag length of one to account for potential autocorrelation in the time series data. The findings suggest that in most event windows, stock prices and market indices exhibit non-stationary behavior, while other variables tend to be stationary. For example, in Events 1 and 2, all variables except stock price and market index were stationary, and for Events 3, 4, and 13, the risk-free rate also exhibited non-stationarity. This indicates that stock prices and market indices are highly susceptible to external shocks and fluctuations, consistent with financial market theories such as the Efficient Market Hypothesis (EMH), which states that stock prices follow a random walk. On the other hand, risk-free financial instruments, which are typically more stable, exhibit stationarity in most cases, suggesting that their statistical properties remain relatively unchanged over time.

A notable finding in the results is observed in Event 15, where stock prices, market indices, and risk-free rates are found to be stationary. This deviation from previous findings suggests that a structural change, policy intervention, or external market condition may

have influenced the stability of these financial variables. The results imply that researchers conducting event studies should account for the stationarity properties of their variables to avoid spurious regressions, which can lead to misleading interpretations. Since non-stationary variables can produce unreliable results when used in regression models, appropriate transformations such as first-differencing or cointegration techniques should be applied to correct unit root issues. Additionally, further investigation into the specific economic or financial events surrounding event 15 could help explain why stationarity was observed during this period. Overall, these ADF test results highlight the importance of understanding the dynamic nature of financial data in event studies, reinforcing the need for rigorous econometric techniques to ensure robust and reliable conclusions.

Table 3.5 Single Factor CAPM Model

Events	(β) Coefficient	Std. Error	T- statistic	Con. Interval	R- squared	F (1, 118)	Obs.
1	1.83**	(0.1217)	15.01	(1.59, 2.07)	0.65	225.34**	120
2	1.00196**	(0.12128)	8.26	(0.76, 1.24)	0.366	68.25**	120
3	0.509**	(0.1129)	7.53	(0.62, 1.07)	0.324	56.76**	120
4	1.67**	(0.1824)	9.19	(1.31, 2.04)	0.42	84.45**	120
5	1.28**	(0.0788)	16.22	(1.12, 1.43)	0.69	263.22**	120
6	0.68**	(0.1217)	5.60	(0.44, 0.92)	0.21	31.32**	120
7	1.52**	(0.1014)	15.03	(1.32, 1.72)	0.65	225.89**	120
8	1.37**	(0.2639)	5.22	(0.85, 1.90)	0.18	27.23**	120
9	0.78**	(0.1354)	5.76	(0.51, 1.04)	0.22	33.20**	120
10	0.79**	(0.0655)	12.11	(0.66, 0.92)	0.55	146.68**	120
11	1.12**	(0.1104)	10.18	(0.90, 1.34)	0.47	103.58**	120
12	1.08**	(0.1364)	7.97	(0.82, 1.36)	0.35	63.60**	120
13	1.49**	(0.2092)	7.13	(1.08, 1.90)	0.30	50.77**	120
14	0.99**	(0.0737)	13.49	(0.85, 1.14)	0.61	181.85**	120
15	0.73**	(0.0961)	7.67	(0.55, 0.93)	0.33	58.81	120

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

This table presents the findings from a Single-factor capital Asset Pricing Model (CAPM) analysis, which examines how stock returns are influenced by market movements across

different events. The key statistical indicators in the table include the (β) Coefficient, Standard Error, T-statistic, Confidence Interval, R-squared, F-statistic, and the total number of observations per event. The A double asterisk (**) marks results that are statistically significant at the 5% level, meaning there is a strong likelihood that the outcome is not random ($p < 0.05$). The β Coefficients in the Single-Factor CAPM Model help us understand how much stock returns react to changes in the overall market during different events. A β value greater than 1 means the stock is more volatile than the market, meaning it experiences larger swings when the market moves. On the other hand, a β value below 1 suggests the stock is less sensitive to market fluctuations, making it relatively more stable.

In this dataset, the (β) Coefficients for all 15 events show a significant positive relationship between the market return and stock return, but with a varying magnitude of impact for each event. The standard error, shown in parentheses, represents the uncertainty in β estimates, with smaller values implying more precise estimates and larger values indicating greater variability. The β values range from 0.509 (Event 3) to 1.83 (Event 1), showing varying levels of stock market sensitivity. The highest β value of 1.83 (Event 1) suggests that stock returns in this event were highly responsive to market trends, indicating significant volatility. Similarly, Event 7 ($\beta = 1.52$) and Event 8 ($\beta = 1.37$) also exhibit strong reactions to market movements. In contrast, lower β values like 0.509 (Event 3) and 0.68 (Event 6) indicate that these stocks experienced much smaller price changes in response to shifts in the market. Overall, the magnitude of β coefficients highlights that some stocks are more affected by market conditions while others remain more stable. This is an important factor for investors, as it helps in assessing risk exposure when investing in

green sukuk-related assets. Additionally, all β values are statistically significant at the 5% level, meaning these relationships are not random. This confirms that market movements play a key role in influencing stock returns across the different events analyzed in this study.

The t-statistic assesses whether the β coefficient is significantly different from zero, helping determine whether the relationship between stock returns and market trends is meaningful. A higher absolute t-statistic suggests a stronger relationship. The confidence interval shows the range where the true β value is most likely to fall, giving an idea of how precise the estimate is. For example, Event 1 ($\beta = 1.83$) has a confidence interval of (1.59, 2.07), indicating a strong positive relationship between stock returns and market trends with a high degree of confidence. The R-squared value measures how much of the variation in stock returns can be attributed to market fluctuations. A higher R-squared suggests that market trends play a dominant role in explaining stock movements. In this dataset, Event 5 has the highest R-squared value (0.69), implying that 69% of its stock return variation is explained by market changes. Conversely, Event 8 has the lowest R-squared value (0.18), suggesting that other factors besides market trends play a larger role in determining stock price movements.

The F-statistic evaluates the overall strength of the CAPM model for each event. A higher F-statistic indicates that the model is more effective in explaining stock return variations. Event 5 records the highest F-statistic (263.22), demonstrating a strong connection between market movements and stock performance. On the other hand, Event 8, with an F-statistic of 27.23, indicates statistical significance but suggests that additional influences may be

affecting stock price behavior. Each event in this analysis is based on 120 observations, ensuring a consistent sample size across the dataset. The results highlight that stock returns are significantly influenced by market fluctuations, though the extent of this impact varies across different events. Stocks with higher β values, such as those in Event 1 (1.83) and Event 7 (1.52), exhibit greater sensitivity to market changes, making them more volatile. In contrast, stocks with lower β values, such as Event 3 (0.509) and Event 15 (0.73), show less positive responsiveness to market fluctuations. Differences in R-squared and F-statistic values suggest that while CAPM is a useful tool in analyzing stock behavior, other external factors may also contribute to variations in stock returns. The consistency of these results suggests that event-related shocks play a substantial role in influencing stock returns, although the degree of impact varies based on the specific nature of each event.

Table 3.6 Single Factor CAPM Model Abnormal and Cumulative Abnormal Return

Events	Abnormal Return CAPM	Cumulative Abnormal Return	Event window
1	-0.0040253** (0.0021795)	-0.05015** (0.00884)	[-15 +15]
2	0.0044 (0.00297)	0.05529** 0.0098	[-15 +15]
3	-0.00115 (0.0018)	-0.0185** (0.0024)	[-15 +15]
4	-0.0018 (0.0027)	0.0135** (0.0034)	[-15 +15]
5	0.0013 (0.0014)	0.0241** (0.0040)	[-15 +15]
6	-0.0010 (0.0018)	-0.0087** (0.0023)	[-15 +15]
7	0.0066** (0.0020)	0.1027** (0.0104)	[-15 +15]
8	0.0034 (0.0024)	0.0587** (0.0045)	[-15 +15]
9	-0.0005 (0.0011)	-0.0101** (0.0017)	[-15 +15]
10	-0.0043** (0.0021)	-0.0396** (0.0064)	[-15 +15]
11	-0.0004 (0.0018)	-0.0301** (0.0029)	[-15 +15]
12	-0.0016 (0.0022)	-0.0394 (0.0029)	[-15 +15]
13	0.0038	0.0705**	[-15 +15]

	(0.0026)	(0.0056)	
14	0.0019 (0.0014)	0.0154** (0.0029)	[-15 +15]
15	-0.0034 (0.0022)	-0.0396** (0.0037)	[-15 +15]

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table presents findings from an event study utilizing the single-factor CAPM Model analysis, which examines abnormal stock returns in response to different events over a specified event window (-15, +15 days). The key metrics in the table include Abnormal Return CAPM, Cumulative Abnormal Return (CAR), and standard errors (in parentheses), with statistically significant results marked by a double asterisk (**) at the 5% level ($p < 0.05$). The Abnormal Return CAPM column represents the excess return of stock beyond what is predicted by the market model. Positive abnormal returns suggest that the stock outperformed expectations, whereas negative values indicate underperformance. The significance of these returns is determined using p-values, with statistically significant results suggesting that the observed abnormal returns are unlikely to be due to chance. The result shows that Event 1 (-0.0040253) and Event 10 (-0.0043) show negative and statistically significant abnormal returns, implying that the events associated with these observations may have negatively impacted stock performance. In contrast, Event 7 (0.0066) reports a statistically significant positive AR (Abnormal Return), suggesting a favorable market reaction.

The Cumulative Abnormal Return (CAR) column aggregates abnormal returns over the event window, providing a broader view of how the event influenced stock performance

over time. A significantly negative CAR, such as Event 1 (-0.05015) or Event 10 (-0.0396), indicates a sustained negative impact, while a significantly positive CAR, such as Event 7 (0.1027), suggests a prolonged positive effect on stock returns. This metric helps assess whether the market reaction to an event is temporary or persists over time. Each standard error (in parentheses) measures the level of uncertainty associated with the abnormal and cumulative abnormal return estimates. Lower standard errors indicate more precise estimates, while higher values suggest greater variability. Event 1's standard error (0.0021795) is relatively small, indicating a more reliable estimate of abnormal returns, while Event 7 (0.0020) also maintains a low margin of error, supporting the significance of the positive return. The event window [-15, +15] signifies that the analysis captures stock performance 15 days before and 15 days after the event, allowing for a more comprehensive understanding of market reactions. This timeframe helps determine whether the effects of an event are immediate or extend beyond the announcement date.

The results indicate varying market reactions to different events. Statistically significant negative abnormal returns, such as those seen in Events 1, 3, 6, 9, 10, and 15, suggest that these events triggered investor concerns, leading to a decline in stock prices. In contrast, significantly positive abnormal returns in Events 2, 5, 7, 8, and 13 highlight instances where the market responded favorably. The cumulative abnormal returns reinforce these patterns, showing whether the impact was short-lived or sustained over time. Overall, the findings suggest that event-driven stock movements can be substantial, with certain events leading to extended periods of outperformance or underperformance. The presence of statistical significance in multiple cases strengthens the reliability of the conclusions,

providing valuable insights for investors and policymakers assessing market reactions to specific events.

The graphs show the absolute cumulative abnormal returns over time.

Figure 3.1 Event 2

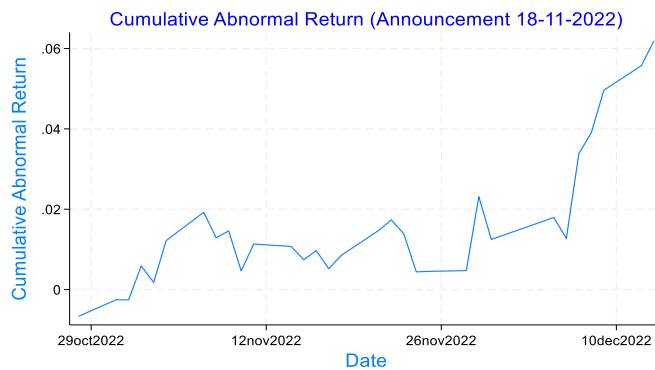


Figure 3.2. Event 7

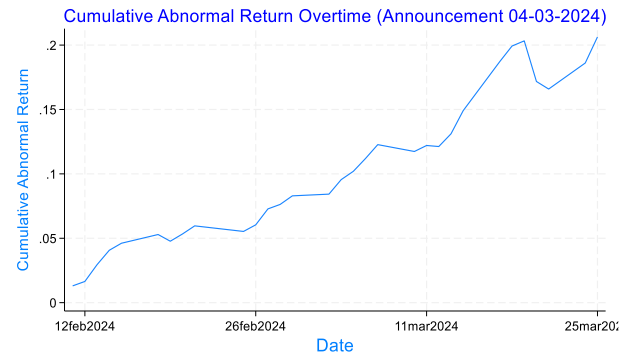


Figure 3.3 Event 8

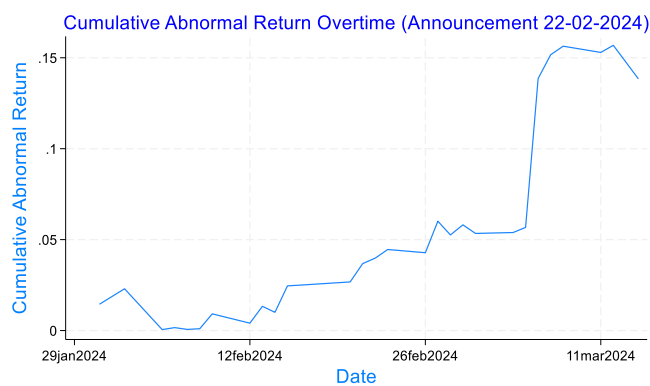


Figure 3.4 Event 13

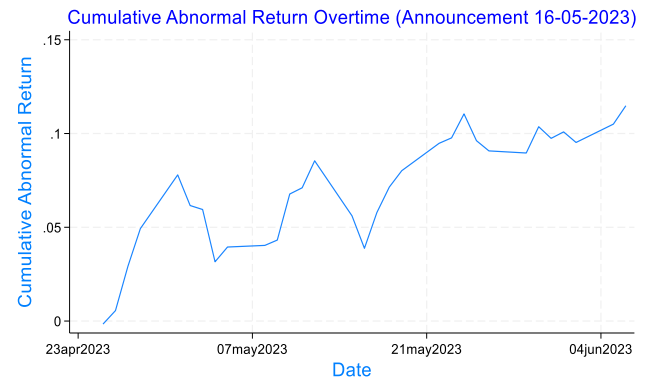
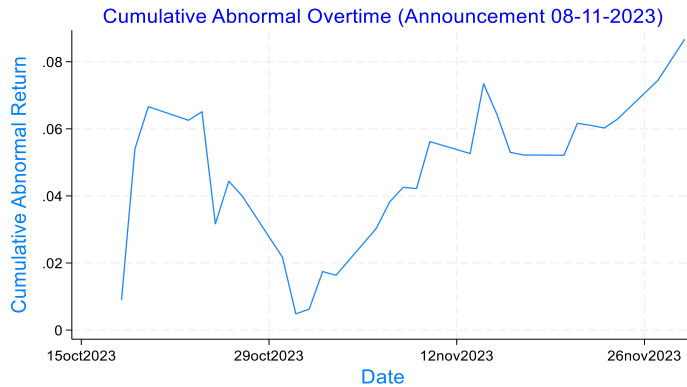


Figure 3.5 Event 14



The graphs presented illustrate the absolute cumulative abnormal returns (CAR) over time for different event announcements. Each figure represents the cumulative impact of a specific event on stock performance, with the x-axis labeled as Date representing the timeline, and the y-axis labeled as "cumulative abnormal return," indicating the aggregated deviation of stock returns from the expected performance under normal market conditions. The analysis of these graphs provides insights into how stock prices react to significant announcements and how these reactions evolve. In Figure 3.1.0 (Event 2: February 22, 2024), the CAR starts at a low level and exhibits a steady upward trend, with a notable sharp increase toward the later dates. This suggests that the market positively responded to the event, leading to a persistent rise in abnormal returns. Similarly, Figure 3.1.1 (Event 7: March 4, 2024) shows a gradual increase in CAR with some fluctuations, reflecting an overall positive market reaction with minor corrections along the way. Figure 3.1.2 (Event 8: November 8, 2023) displays more volatility in the cumulative abnormal returns, with periods of sharp increases and corrections, indicating a mixed market reaction where initial uncertainty or skepticism may have been followed by a more positive reassessment of the event's impact. Figure 3.1.3 (Event 13: May 16, 2023) also exhibits significant

fluctuations, suggesting that investors had varied responses over time, possibly influenced by external market factors or new information that emerged after the initial announcement.

In contrast, Figure 3.1.4 (Event 14: November 18, 2022) shows an erratic pattern with notable fluctuations before a sharp upward movement toward the end of the period. This indicates that the market may have initially reacted with uncertainty but later reassessed the event positively, leading to a surge in CAR. Overall, these graphs highlight how different events lead to varying patterns in cumulative abnormal returns, reflecting the complexities of market reactions. Some events result in a clear and sustained increase in CAR, while others experience volatility due to investor sentiment, external market conditions, or new developments after the announcement. These findings emphasize the importance of event studies in financial research, providing valuable insights into how stock prices incorporate new information over time.

Table 3.7 Capturing the COP28 as a dummy variable

Events	Market Return (β)	cop28_dumm y (β_1)	Intercep t	R- square	F (2, 156)	Obs.
3	0.77** (0.1104)	0.0002 (0.0030)	0.0008 (0.0007)	0.24	24.76**	159
5	1.28** (0.0714)	0.0033 (0.0028)	0.00032 (0.0007)	0.67	162.65* *	159
6	0.66 (0.1055)	0.0006 (0.004)	- 0.00003 (0.0009)	0.19	19.54**	159
8	1.58** (0.2297)	0.0018 (0.0049)	0.0004 (0.0011)	0.23	23.92**	159
10	0.78** (0.0620)	0.0006 (0.0046)	1.530 (0.0010)	0.50	78.92**	160
11	1.18** (0.0988)	0.0018 (0.0033)	0.0003 (0.0008)	0.48	73.37**	160
12	1.16** (0.1210)	0.0063 (0.0043)	-0.0012 (0.0010)	0.38	49.26**	160
13	1.65** (0.1870)	-0.0050 (0.0053)	-0.0024 (0.0012)	0.34	40.19**	159
14	1.0** (0.0690)	0.0013 (0.0031)	0.0001 (0.0007)	0.57	106.00* *	159

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table provides an in-depth analysis of stock market reactions to COP28, treating it as a dummy variable in an event study framework. The regression model incorporates market

return (β), the COP28_dummy variable (β_1), and an intercept to evaluate the influence of COP28-related events on stock performance. Additionally, R-squared values, F-statistics, and the number of observations offer insights into the strength and validity of the model across different event windows. The market return (β) coefficients indicate that broader market movements significantly impact stock returns during these events. The output reveals that in Event 3, the estimated market return is 0.77 with a standard error of 0.1104, showing statistical significance. Event 5 reflects an even stronger market effect, with a coefficient of 1.28 (standard error: 0.0714), while Event 8 shows 1.58 (SE = 0.2297). The strongest market response is observed during Event 13, where the coefficient reaches 1.65 (SE = 0.1870), reinforcing the notion that overall market trends play a crucial role in stock price behavior during COP28-related events.

The COP28_dummy variable (β_1) coefficients fluctuate across different event windows, suggesting that market responses to COP28 news are not uniform. The coefficients for the COP28 for all 8 Events are positive but not statistically significant, as observed in Event 5 (0.0033, SE = 0.0028) and Event 12 (0.0063, SE = 0.0043), suggesting that the COP28 event had no significant effect on stock returns. Conversely, in Event 13, the coefficient is negative (-0.0050, SE = 0.0053), indicating that investor sentiment may have been adversely affected during that period. The intercept values remain relatively small across most events, except for Event 10, which shows a sharp increase (1.530, SE = 0.0010).

The R-squared values vary significantly, indicating different levels of explanatory power for the regression models. The highest R-squared value (0.67) occurs during Event 5, implying that 67% of stock return variations can be attributed to market return. Conversely,

Event 6 has a lower R-squared value (0.19), suggesting that other market forces may be at play beyond the factors included in the model. The F-statistics further validate the significance of the regression models, with consistently high values across all event windows. The Event 5 exhibits an F-statistic of 162.65, while Event 14 shows 106.00, both of which indicate a strong model fit.

Overall, the findings suggest that while broader market trends predominantly influence stock returns, COP28-related events exhibit mixed effects, with both positive and negative impacts across different event windows, but not statistically significant.

Table 3.8 Cumulative Abnormal Return for COP28_dummy

Events	Cumulative Abnormal Return COP28_dummy	Obs.
3	0.01125** (0.0023)	8
5	0.01519** (0.0062)	9
6	0.0097** (0.0031)	8
8	0.0101** (0.0030)	8
10	0.0685** (0.0042)	9
11	-0.0053 (0.0039)	9
12	0.0206	9

	(0.0053)	
13	-0.0245 (0.0046)	8
14	0.0186 (0.0027)	8

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table presents the Cumulative Abnormal Return (CAR) for COP28_dummy, which measures the impact of the COP28 event on stock returns across different event periods. The table consists of three columns: Events, which represents the specific event number; Cumulative Abnormal Return (Cop28_dummy), which quantifies the abnormal returns along with standard errors in parentheses; and Observations, indicating the number of observations associated with each event. The results show that several events experienced statistically significant positive abnormal returns at the 5% significance level ($p < 0.05$), as indicated by the double asterisk (**) next to the CAR values. Event 3 recorded a CAR of 0.01125 with a standard error of 0.0023, based on 8 observations. Similarly, Event 5 had a CAR of 0.01519 with a standard error of 0.0062, supported by 9 observations. Other notable positive and statistically significant CAR values include Event 6 (0.0097), Event 8 (0.0101), and Event 10 (0.0685), all of which suggest that stock returns were significantly impacted during these periods.

On the other hand, some events exhibited negative CAR values, such as Event 11 (-0.0053) and Event 13 (-0.0245), indicating that during these periods, stocks experienced cumulative losses relative to expected returns. However, these values are not marked as statistically significant, suggesting that they may not be strong enough to infer a meaningful impact.

Additionally, Event 12 (0.0206) and Event 14 (0.0186) demonstrate positive CAR values but lack statistical significance indicators, suggesting some level of impact, though not strong enough to confirm a consistent trend. Overall, the findings highlight that events linked to the COP28_dummy variable had no impact on stock returns. Therefore, we can conclude that there is no effect of this variable on cumulative abnormal return.

Graph showing Investors' Sentiment to the COP28 period.

Figure 3.6 Dubai Islamic Bank

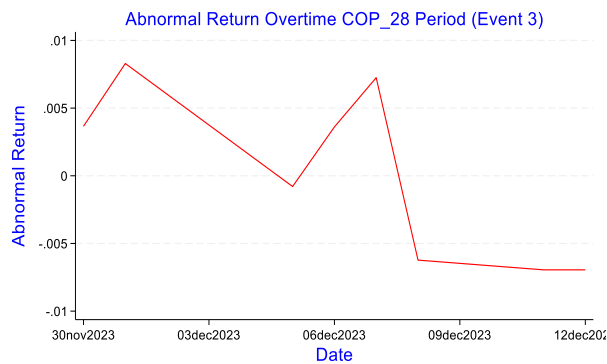


Figure 3.7 AL Rahji Bank

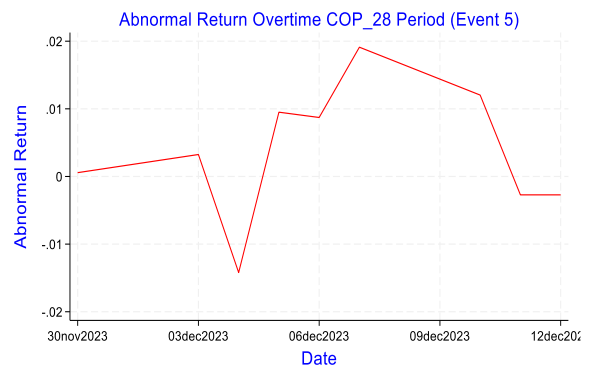


Figure 3.8 Saudi National Bank

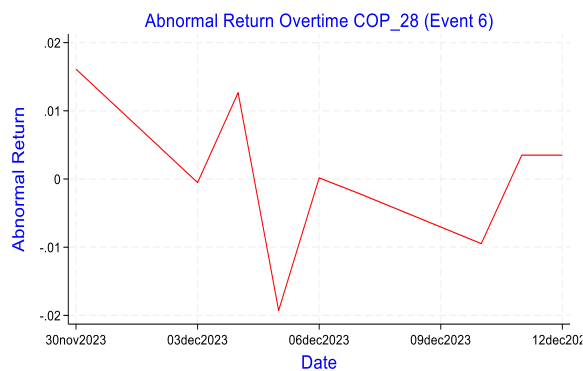


Figure 3.9 Riyadh Bank Ltd

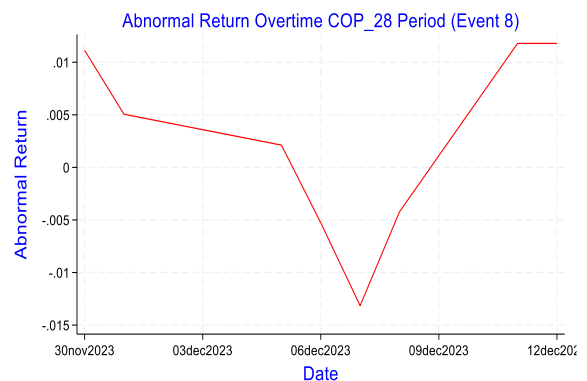


Figure 3.10 Saudi Electrical Company

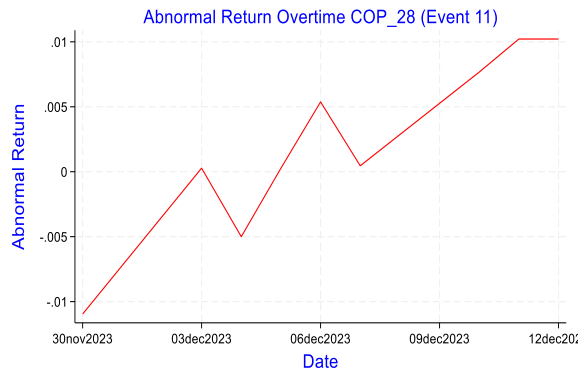


Figure 3.11 Abu Dhabi Inter. Bank

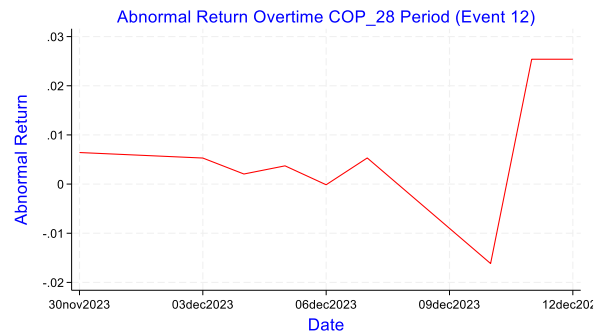


Figure 3.12 Alder

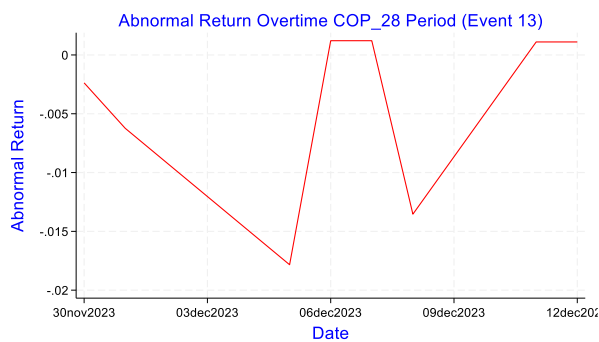
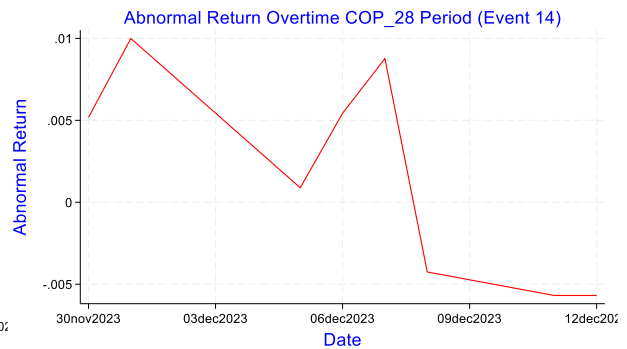


Figure 3.13 Dubai Islamic Bank Ltd



The graphs illustrate investor sentiment in response to the COP28 period, showcasing the variations in abnormal returns across different financial institutions and companies. Events categorize the data, each corresponding to a specific company or bank, reflecting how investor sentiment fluctuated over time in reaction to developments during the COP28 period. The y-axis in each graph represents abnormal returns, indicating the deviation of actual returns from expected returns, and the x-axis represents the timeline in date format, covering days around the event. The graphs use a red line plot to visualize investor sentiment fluctuations, helping identify potential patterns in stock market behavior.

A closer analysis of the graphs reveals diverse investor reactions across different firms. For example, Dubai International Bank (Event 3) exhibits an initial rise in abnormal returns, followed by a downward trend, indicating that while initial investor sentiment was positive, market confidence declined in the subsequent days. Similarly, Al Rajhi Bank (Event 5) experiences fluctuations, with a sharp drop in returns midway through the observed period before stabilizing again, suggesting a period of uncertainty or reaction to external market factors.

In contrast, Saudi Electric Company (Event 6) and Abu Dhabi International Bank (Event 8) display more volatile trends, where abnormal returns show sharp declines followed by recoveries, indicative of fluctuating investor confidence. Saudi National Bank (Event 11) and Riyadh Bank (Event 12) demonstrate a relatively stable trend, with moderate fluctuations but no extreme spikes or drops, suggesting a more controlled market reaction. However, Alder (Event 13) shows highly volatile movements, where abnormal returns fluctuate significantly over the period, possibly reflecting increased uncertainty or speculative trading activity.

The graphs provide valuable insights into how investors reacted to COP28-related developments, with some financial institutions experiencing stronger volatility than others. While certain companies showed a steady or slightly declining trend in abnormal returns, others demonstrated sharp declines followed by recoveries, suggesting market uncertainty or reactions to specific announcements. The mixed patterns across institutions indicate that the COP28 event had varying levels of impact depending on company-specific factors, investor expectations, and broader market conditions. These findings suggest that while

environmental and sustainability-related events can influence stock market behavior, the magnitude and direction of the impact depend on company performance, investor sentiment, and external market forces.

Table 3.9 Overview of Recent Sustainable Sukuk Issued in GCC's Key Sectors

Event	Company	Industry	Type of Sukuk	Size of Sukuk (\$M)	Country	Date Issued
1	Al Rahji Bank	Banking & Financial Services	Sustainable	1,000.00	Saudi Arabia	5/8/2024
2	Dubai Islamic Bank	Banking & Financial Services	Sustainable	1,000.00	United Arab Emirates	2/22/2024
3	Dubai Islamic Bank	Banking & Financial Services	Sustainable	1,000.00	United Arab Emirates	2/9/2023
4	Saudi National Bank	Banking & Financial Services	Sustainable	850.00	Saudi Arabia	5/7/2024
5	Al Rahji Bank	Banking & Financial Services	Sustainable	1,130.00	Saudi Arabia	3/29/2023
6	Saudi Electrical Company	Energy and Utility	Sustainable	1,200.00	Saudi Arabia	4/3/2023
7	Al Rahji Bank	Banking & Financial Services	Sustainable	1,000.00	Saudi Arabia	3/4/2024
8	Abu Dhabi Inter. Bank	Banking & Financial Services	Sustainable	500.00	United Arab Emirates	11/8/2023
9	Warbaban Ltd	Banking & Financial Services	Sustainable	500.00	Kuwait	7/1/2024
10	Saudi Electrical Company	Energy and Utility	Sustainable	650.00	Saudi Arabia	9/10/2020
11	Saudi National Bank	Banking & Financial Services	Sustainable	750.00	Saudi Arabia	1/12/2022

12	Riyad Bank Ltd	Banking & Financial Services	Sustainable	750.00	Saudi Arabia	2/9/2022
13	Alder Abu Dhabi	Real Estate and Investment	Sustainable	500.00	United Arab Emirates	5/16/2023
14	Dubai Islamic Bank	Banking & Financial Services	Sustainable	750.00	United Arab Emirates	11/18/2022
15	Qatar International Islamic Bank	Banking & Financial Services	Sustainable	750.00	Qatar	1/17/2024

This table presents a summary of selected Sustainable Sukuk issuances from 2020 to 2024 across the Gulf Cooperation Council (GCC) region, with a focus on key industries, including banking and financial services, energy and utilities, and real estate. The data captures major players, including Al Rajhi Bank, Dubai Islamic Bank, Saudi National Bank, and others, reflecting the growing interest in ethical and environmentally aligned financing mechanisms. Each entry outlines the event number, issuing company, industry sector, type of Sukuk (all labeled as sustainable), size of the Sukuk in USD millions, country of issuance, and the exact issuance date. The amounts vary, with the largest issuance being \$1.2 billion by Saudi Electrical Company. Several banks have repeatedly participated in the sustainable finance space, indicating both institutional demand and regulatory support.

The countries represented feature countries like Saudi Arabia, the UAE, Kuwait, and Qatar, showcasing a regional trend toward leveraging Islamic finance instruments to support green and sustainable development goals. This shift reflects the increasing alignment of financial systems in the GCC with broader ESG (Environmental, Social, and Governance) principles and the UN Sustainable Development Goals.

3.2 Discussion of Results

The results of this study indicate that market reactions to green sukuk issuances in the GCC region are mixed. While some announcements led to positive abnormal stock returns, others resulted in negative reactions. The cumulative abnormal returns (CARs) measured over a 31-day event window (-15 to +15 days) suggest that, in many cases, investors responded favorably to green sukuk issuances. This demonstrates growing confidence in sustainable financial instruments, particularly in a region where Islamic finance is deeply integrated with economic policy and investment decisions. These findings align with previous research on sustainable finance, where market reactions to green bonds and ESG-linked financial products have also shown variability (Baker et al., 2018; Flammer, 2021). Flammer (2021) suggests that while sustainable financial instruments tend to attract positive investor sentiment, their market performance depends on multiple factors, including issuer credibility, transparency, and alignment with global ESG trends. Similarly, a study by Gianfrate & Peri (2019) on green bonds found that positive abnormal returns typically occur when investors perceive the issuance as genuine and backed by firm sustainability commitments.

In the context of the GCC, the finding that green sukuk issuances from larger, well-established firms tend to generate stronger positive stock market reactions is consistent with industry-specific dynamics. Banks and Financial services, in particular, appear to receive more favorable market responses compared to energy and utility companies. This observation aligns with signaling theory, which posits that investor confidence is influenced by the credibility and past performance of the issuer (Spence, 1973).

Investors may be more inclined to respond positively to issuances from government-backed entities or well-known financial institutions, as these issuers are perceived as more stable and committed to sustainable finance. This aligns with previous research, which suggests that institutional backing and clear regulatory alignment play a significant role in determining investor confidence in sustainable finance instruments (Azhar et al., 2023). Additionally, this aligns with prior research, which indicates that banks and institutional investors play a key role in the adoption of ESG-focused financial instruments (Nadwi et al., 2024).

In addition, banks and financial institutions often have stronger credit ratings, greater market visibility, and well-established reputations for transparency and governance, and these are factors that increase investor confidence. For example, a green sukuk valued at \$500 million was issued by Abu Dhabi Islamic Bank as part of its sustainable finance initiative, which was listed on the London Stock Exchange and rated A+ by Fitch, reflecting this strong market positioning and the growing global interest in sustainable finance (Aletihad, 2023). In contrast, although energy and utility companies are increasingly entering the green finance space, their issuances may be met with more cautious optimism. Given that green sukuk are often used to fund renewable energy and infrastructure projects, one might expect a stronger positive response. However, the findings suggest that investors may still view traditional energy firms as riskier, possibly due to regulatory uncertainties, high transition costs, and concerns over long-term profitability. This aligns with findings from climate finance research, which indicates that firms in carbon-intensive industries face greater investor scrutiny when issuing sustainable financial instruments (Busch et al., 2022).

A case in point is the Saudi Electricity Company launched a green sukuk offering worth \$1.3 billion to support its sustainability effort which attracted substantial investor interest with an order book surpassing \$5.2 billion; however, the stock market response was more subdued—possibly due to the sector's historical association with fossil fuels and the complex transition to cleaner energy models (Global Ethical Banking, 2023). These observations suggest that investor sentiment is not only shaped by the nature of the green instrument but also by the issuing firm's industry, credibility, and alignment with broader sustainability narratives.

However, the Single-Factor Capital Asset Pricing Model CAPM results indicate that stock prices react to market movements following green sukuk issuance. The variation in β coefficients across events suggests that the magnitude and consistency of market reactions to these issuances are not uniform. This implies that green sukuk issuance does not always produce significant abnormal stock price movements. This raises questions about market efficiency in the GCC financial markets. According to Fama's Efficient Market Hypothesis (EMH), financial markets should fully reflect all publicly available information (Fama, 1970). However, the inconsistent variance in abnormal returns suggests that green sukuk information is not always fully priced in by the market immediately.

This finding is in line with prior empirical studies, which argue that markets for sustainable financial products in emerging regions (such as the GCC) may exhibit semi-strong or weak-form efficiency (Ho et al., 2023). The results of this study indicate that, in some cases, green sukuk issuances lead to positive abnormal returns, suggesting that investors view these instruments as financially and environmentally valuable. In other cases, stock prices

remain relatively negative, implying that investors may have already priced in the sustainability commitment or may lack confidence in the financial returns of green sukuk. This combination of positive and negative market reactions suggests that while green sukuk are gaining traction, investor perception remains inconsistent across different sectors and firms.

A key insight from this research is the impact of COP28 on investor sentiment toward green sukuk. The findings indicate that for green sukuk issued before COP28, the study evaluates whether this event influenced their stock returns, providing insights into investor sentiment during this period. The findings suggest that COP28 (held in the UAE in 2023) does not affect stock returns for firms that issued green sukuk before the event. Therefore, we can conclude that bond investors are rational and are not influenced by such events or conferences in their bond portfolio choices. This indicates that the COP28_dummy variable does not significantly influence abnormal returns.

The mixed market reaction to green sukuk issuances provides valuable insights for investors, policymakers, and financial institutions. First, issuer credibility and transparency are crucial, as green sukuk issuances by state-backed institutions and well-known financial firms generate stronger positive abnormal returns, highlighting the importance of credibility and regulatory alignment. In addition, global climate policies influence GCC financial markets. Additionally, industry-specific factors matter; the banking sector exhibited strong interest in green sukuk, while the energy sector showed more cautious investor sentiment, indicating that sectoral differences must be considered when evaluating green sukuk potential. Finally, regulatory clarity could enhance investor confidence.

Policymakers should focus on developing clear frameworks and incentives for green sukuk issuance to further strengthen market participation.

In summary, this research adds to the expanding literature on Islamic finance and sustainable investing by analyzing market reactions to green sukuk issuances in the GCC region. The findings suggest that green sukuk have the potential to enhance investor confidence in sustainable finance, but their market impact remains heterogeneous and depends on issuer credibility, sectoral dynamics, and global sustainability trends. As the GCC continues its transition toward a sustainable economy, green sukuk could play a crucial role in bridging Islamic finance with ESG-focused investment strategies, supporting the region's long-term sustainability goals

3.3 Conclusion

Green sukuk has emerged as a crucial instrument in the transition to sustainable finance, aligning Islamic financial principles with environmental and social responsibility. The findings of this study suggest that green sukuk issuances can generate positive abnormal stock returns, particularly when backed by strong institutional credibility and clear sustainability commitments. However, market reactions remain heterogeneous, influenced by sectoral differences, investor sentiment, and global climate policy developments, such as COP28. While green sukuk are gaining traction, challenges persist, including regulatory uncertainties, investor skepticism, and the potential trade-off between profitability and sustainability commitments. Nonetheless, the increasing demand for ESG-compliant investments, coupled with government support for green finance, provides a solid foundation for the continued growth of the green sukuk market. As the GCC and other

regions strengthen their commitment to sustainable finance, green sukuk are likely to play an integral role in funding climate-resilient projects and bridging the gap between Islamic finance and ESG investment principles.

For corporations aiming to optimize market reactions to green sukuk issuances, strategic planning is essential. Transparency plays a crucial role in building investor confidence, and companies should ensure compliance with international green finance standards, such as the Green Bond Principles and Climate Bonds Standard. Obtaining third-party verification from organizations like the Climate Bonds Initiative further enhances credibility. Additionally, timing is critical aligning sukuk issuances with major global climate events, such as UN Climate Change Conferences, can attract greater investor interest. Targeting the right investor base, including Sharia-compliant investors, ESG-focused funds, and institutional investors with sustainability mandates, can also improve market reception. Moreover, firms should focus on industries that have demonstrated positive responses to green sukuk, such as banking, real estate, and financial services. In contrast, sectors like energy and utilities should ensure that their projects align with global sustainability trends, such as renewable energy and carbon reduction, to bolster investor confidence.

Beyond investor targeting, corporations should leverage regulatory and policy support to make green sukuk more attractive. Governments play a significant role in providing incentives like tax benefits, subsidies, and preferential regulatory treatment, which can encourage more issuances. Companies must actively engage with policymakers to align their sukuk offerings with national sustainability agendas, such as Saudi Arabia's long-term economic transformation agenda and the UAE's commitment to achieving carbon

neutrality by 2050. Furthermore, maintaining a strong commitment to ESG principles through transparent reporting, sustainability initiatives, and clear carbon reduction goals can enhance long-term investor trust. However, corporations must also manage market expectations carefully, ensuring that they communicate the financial viability of green sukuk and effectively address cost-benefit concerns. By strategically positioning green sukuk within a well-defined sustainability framework, corporations can not only contribute to global climate goals but also secure financial benefits and long-term market stability.

3.4 Future Research Directions, Policy Implications, and Limitations

3.4.1 Future Research Directions

Based on these findings, multiple possible options exist for upcoming research directions. Future research should consider examining alternative asset pricing models beyond the Single-Factor CAPM, including the Fama-French Multi-Factor Model or Behavioral Finance Models, to assess whether additional risk factors influence stock market reactions to green sukuk issuances (Ahmed et al., 2024). In addition, incorporating a longer time horizon and a broader sample size across multiple financial markets, including non-GCC countries, could provide deeper insights into how green sukuk performs in different economic and regulatory environments. Additionally, future research could investigate the role of investor sentiment, macroeconomic indicators, and ESG (Environmental, Social, and Governance) factors in shaping stock price reactions to green sukuk announcements.

Additionally, this study focuses primarily on stock price reactions, whereas future research could explore the long-term risk-return profile, investor retention, and portfolio diversification benefits of green sukuk. Another area for future exploration is the

behavioral aspect of investor sentiment toward green sukuk. Future studies could incorporate surveys, sentiment analysis, or textual analysis of market reactions to gain qualitative insights into investor perceptions of green sukuk and sustainable finance.

3.4.2 Policy Significance

The results of this study hold significant relevance for policymakers, regulators, and financial institutions. First, the variation in abnormal returns and market reactions suggests that investor confidence in green sukuk remains inconsistent, highlighting the need for greater transparency, standardization, and regulatory oversight in green sukuk issuance. Governments and financial regulators should consider harmonizing sustainability reporting standards to enhance investor trust and reduce information asymmetry. Additionally, policymakers should encourage incentive mechanisms such as tax benefits, subsidies, or lower issuance costs to promote green sukuk adoption. The findings also suggest that global climate policies, such as COP28, do not influence bond investors' portfolio choices, reinforcing the need for policymakers to actively integrate sustainability considerations into financial regulations. Furthermore, financial institutions should enhance investor education and awareness on the financial and environmental benefits of green sukuk to boost market confidence and demand.

3.4.3 Limitations of the Study

Despite its contributions, this study has certain limitations. While this study provides valuable insights into the market reaction to green sukuk issuance in the GCC, it also has limitations. The sample size of green sukuk issuances remains relatively small as the market is still developing. Therefore, the limited availability of data on green sukuk

issuances in the GCC region may have constrained the depth of analysis and generalizability of the findings. Additionally, the study relies on the Single-Factor CAPM model, which, while widely used, does not capture additional risk factors that may influence stock price reactions. Another limitation is that the event study methodology assumes that market reactions occur immediately after an announcement, whereas investor sentiment may evolve due to delayed responses, external economic shocks, or regulatory changes.

Moreover, while this study considers COP28 as a behavioral factor, it does not isolate the effects of other global sustainability initiatives or policy shifts, which may also influence market confidence. Future studies should overcome these limitations by including more diverse datasets, alternative financial models, and additional behavioral variables to enhance the robustness of findings. By addressing these future research directions, policy implications, and limitations, this study contributes to the growing discourse on sustainable finance and Islamic capital markets, offering valuable insights for investors, regulators, and financial institutions in advancing green sukuk as a viable investment option

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APPENDIX

Appendix A: Type of Sukuk Products

Green Sukuk provides a unique opportunity for investors to earn financial returns while contributing to environmental and social well-being. These Sukuk structures help fund projects that reduce carbon emissions, promote clean energy, and support ethical economic growth. By choosing Green Sukuk, investors align their portfolios with sustainability goals, making a meaningful impact while securing stable, Sharia-compliant returns.

Sukuk Al-Ijarah

Sukuk Al-Ijarah works like a lease agreement. Investors buy an asset and lease it back to the issuer, who makes rental payments. These payments serve as returns for the investors. This model is widely used to finance green infrastructure projects such as renewable energy plants, electric buses, and eco-friendly public transport systems. It ensures a stable return while supporting environmentally sustainable initiatives.

Sukuk Al-Murabaha

This type of Sukuk follows a cost-plus financing model. Here, the issuer purchases an asset and then sells it to investors at a profit margin, with payments made over time. It is commonly used for financing green projects such as solar panels, water conservation systems, and energy-efficient equipment. This model provides transparency in pricing while ensuring ethical and sustainable financial practices.

Sukuk Al-Mudarabah

Sukuk Al-Mudarabah is based on a profit-sharing arrangement. Investors provide capital to a business venture, and profits are distributed based on a pre-agreed ratio. This structure is ideal for financing green startups, sustainable farming initiatives, and recycling businesses. It allows investors to support environmentally friendly enterprises while earning financial returns.

Sukuk Al-Musharakah

This type of Sukuk follows a partnership model, where both investors and issuers contribute capital and share profits and losses. It is often used for financing large-scale sustainable projects such as green real estate developments, environmentally responsible manufacturing plants, and renewable energy initiatives. It promotes shared responsibility and risk while ensuring ethical investment in impactful projects.

Sukuk Al-Istisna

Sukuk Al-Istisna is a construction-based financing model. Investors fund the construction or manufacturing of an asset, and returns are generated once the project is completed. This structure is well-suited for financing eco-friendly infrastructure such as green buildings, sustainable transportation networks, and water treatment facilities. It plays a key role in developing long-term environmentally responsible projects.

Sukuk Al-Wakalah

Sukuk Al-Wakalah operates on an agency model, where investors appoint a Wakeel (agent) to manage their funds in Shariah-compliant investments. This model is commonly used for climate-related projects, carbon credit financing, and other sustainable investment portfolios. It allows investors to participate in green initiatives without directly managing the funds themselves.

Appendix B: Empirical results

Jacque-Bera Test for Normality

Events	Obs.	Normality Decision	Prob > chi2
Events 1	151	Normal (except stock price & market index)	**
Events 2	151	Not Normal (All variables)	**
Events 3	151	Not Normal (All variables)	**
Events 4	151	Not Normal (All variables)	**
Events 5	151	Not Normal (except stock return & excess stock return)	**

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table presents the results of the Jacque-Bera (JB) test for normality, which assesses whether a dataset follows a normal distribution by evaluating skewness and kurtosis. It includes five different event periods, each based on 151 observations. The normality decision column reveals that for Event 1, most variables follow a normal distribution

except for stock price and the market index. However, for Events 2, 3, and 4, none of the variables meet the normality assumption, indicating significant deviations. In Event 5, while most variables remain non-normal, stock and excess returns appear to exhibit normal characteristics. The last column, labeled "Prob > Chi²," suggests that all results are statistically significant, as indicated by the "***" symbol conventional 5% level, providing strong evidence against normality. This finding is critical in financial analysis, as many statistical models assume normally distributed data. The widespread presence of non-normality implies potential issues such as skewness, heavy tails, or other anomalies that may require transformations or alternative statistical approaches. The few exceptions, such as stock return in Event 5, indicate instances where normality assumptions may still hold.

Augmented Dickey-Fuller Test for Stationarity (No. lags 1)

Events	5% Critical Value	Stationarity (Unit root)
Event 1	-2.9	Stationary (stock price, market index & risk-free)
Event 2	-2.89	Stationary (stock price, market index & risk-free)
Event 3	-2.89	Stationary (stock price, market index & risk-free)
Event 4	-2.9	Stationary (stock price, market index & risk-free)
Event 5	-2.9	Stationary (stock price, market index & risk-free)

***Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table presents the results of the **Augmented Dickey-Fuller (ADF) test** for stationarity, with a lag length of one. The ADF test is a widely used statistical approach to determine whether a time series dataset exhibits stationarity by testing for the presence of a **unit root**.

The test compares the computed test statistic against a critical value, with stationarity confirmed if the test statistic is more negative than the critical value. In this analysis, the **5% critical value** serves as the benchmark for assessing stationarity. The results across **all five events** indicate that stock price, market index, and risk-free rate are **stationary**, meaning their statistical properties such as mean and variance remain constant over time. This suggests that these variables do not exhibit persistent trends and revert to their mean, making them suitable for further time series analysis. Each event has a reported **critical value ranging from -2.89 to -2.9**, consistent across the dataset. Since the test confirms stationarity, it implies that shocks or disturbances in these variables are temporary rather than having long-term effects. Additionally, the notation "***" signifies that the results are statistically significant at the **5% level ($p < 0.05$)**, reinforcing the reliability of these findings.

Overall, these results suggest that the examined financial variables do not contain unit roots, making them well-suited for economic modeling and forecasting. If non-stationary variables had been detected, transformation techniques such as differencing would be required before proceeding with further statistical analysis.

Single Factor CAPM Model

Events	(β) Coefficient	Std. Error	T- statistic	Con. Interval	R- squared	F (1, 118)	Obs.
1	0.27	(0.2041)	1.32	(-0.14, 0.67)	0.015	1.74	120
2	0.042	(0.026)	1.63	(-0.009, 0.094)	0.022	2.65	120

3	-0.13	(0.1495)	-0.86	(-0.42, 0.17)	0.006	0.73	120
4	-0.11	(0.1487)	-0.77	(-0.41, 0.18)	0.005	0.59	120
5	0.09	(0.1639)	0.59	(-0.23, 0.42)	0.003	0.35	120

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table outlines the findings of a **single-factor capital Asset Pricing Model (CAPM)** analysis, assessing the relationship between specific events and the **beta (β) coefficient**, which reflects how sensitive an asset's returns are to overall market movements. Each row represents a different event, accompanied by key statistical indicators such as standard error, t-statistic, confidence interval, R-squared value, F-statistic, and the total number of observations. The **β coefficient** determines whether an asset moves in tandem with the market or in the opposite direction. A **positive β** suggests alignment with market trends, while a **negative β** indicates an inverse relationship. The values in the table range from **0.27** (Event 1) to **-0.13** (Event 3), but none of these figures appear to be statistically significant. The **standard error**, which measures the reliability of these estimates, varies across events, with Event 2 having the lowest (**0.026**) and Event 1 the highest (**0.2041**). A higher standard error implies greater uncertainty in the β estimate.

The **t-statistic** is used to assess whether β differs significantly from zero. A typical threshold for statistical significance is a t-statistic greater than ± 1.96 at the **5% confidence level**. However, none of the reported values meet this criterion, indicating that the β estimates are not significantly different from zero. This conclusion is further supported by the **confidence intervals**, as all ranges include zero, suggesting that the events under

analysis do not have a definitive impact on returns. The **R-squared values** represent the proportion of variability in asset returns that can be explained by market fluctuations. With values between **0.003** and **0.022**, the explanatory power of the model is minimal, suggesting that external factors beyond market trends influence returns. Similarly, the **F-statistic**, which tests the overall strength of the model, remains low across all events, with Event 2 displaying the highest value at **2.65**, reinforcing the weak explanatory power of the CAPM model in this case. Each event analysis is based on a **sample of 120 observations**, maintaining consistency throughout the dataset. The table also includes a note stating that statistical significance is marked at the **5% level** (denoted by ******), but none of the results meet this threshold.

In conclusion, the findings suggest that the examined events do not have a meaningful effect on asset returns within this **single-factor CAPM framework**. The low β values, wide confidence intervals, and weak R-squared values indicate that market movements alone do not sufficiently explain return variations. This highlights the potential need for incorporating additional variables beyond CAPM to better understand the factors influencing asset performance.

Events	Abnormal CAPM	Return	Cumulative Abnormal Return	Event window
1	-0.00005 (0.0019)		-0.00005 (0.0019)	[-15 +15]
2	0.00094** (0.00052)		0.00055 (0.0014)	[-15 +15]
3	-0.0125**		-0.2181	[-15 +15]

	(0.0037)	(0.0193)	
4	-0.0079	-0.1473**	[-15 +15]
	(0.0050)	(0.0172)	
5	-0.0036	-0.0166	[-15 +15]
	(0.0042)	(0.0051)	

**Denotation of **: Statistical significance at the 5% level based on the p-value ($p < 0.05$).

The table provides insights from an event study analysis based on the Capital Asset Pricing Model (CAPM), assessing the influence of specific events on abnormal stock returns. It includes three main components: Abnormal Return CAPM, Cumulative Abnormal Return (CAR), and the event window, which spans 15 days before and 15 days after each event (-15 to +15). The abnormal return measures the difference between actual stock returns and expected returns under CAPM, while cumulative abnormal return aggregates these deviations over the event window to evaluate the long-term effect. Statistical significance at the 5% level ($p < 0.05$) is denoted by double asterisks (**).

In the Abnormal Return CAPM column, the results indicate whether an event had an immediate impact on stock returns. Among the five events, Event 2 (0.00094) and Event 3 (-0.0125) exhibit statistically significant abnormal returns. Event 2 shows a small but significant positive AR, suggesting a slight increase in stock value beyond market expectations. Conversely, Event 3 has a significant negative abnormal return (-0.0125), implying that the event led to a decline in stock prices. The remaining events, Events 1, 4, and 5, do not show statistically significant abnormal returns, indicating that their effects were not strong enough to differ from typical market fluctuations.

The Cumulative Abnormal Return (CAR) column helps assess the extended impact of each event by summing abnormal returns across the 31-day event window. Event 3 stands out with a cumulative abnormal return of -0.2181, suggesting a prolonged negative effect on stock prices. Similarly, Event 4 shows a significant negative cumulative abnormal return (-0.1473), even though its single-day abnormal return was not statistically significant. This suggests that while the immediate reaction to Event 4 was unclear, its impact led to a downward trend over time. In contrast, Event 2, despite having a significant one-day abnormal return, records only a small cumulative abnormal return (0.00055), indicating that its effect did not persist. Events 1 and 5 exhibit no meaningful cumulative abnormal returns, confirming their limited influence on stock performance. In summary, the findings indicate that Event 3 had the most significant and sustained negative impact on stock prices, both in the short term and over time. Event 4 also contributed to a prolonged decline, despite its immediate effect being less apparent. Meanwhile, Event 2 had a brief positive effect, but it was not sustained. The remaining events appear to have had little to no impact. These results emphasize the importance of considering both immediate abnormal returns and cumulative effects when evaluating how specific events affect the financial market.

Vitae

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Academic Background

2025:	King Fahd University of Petroleum and Minerals (KFUPM). Daharan, KSA. M.Sc. Business Studies Concentration in Finance; CGPA: 3.77/4.0
2016-2020	University of The Gambia; BSc Economics (Magna Cum laude)
2008-2009	Management Development Institute (MDI); Diploma in Management Studies (Distinction) Main subject: Management

Work Experience

2023 to date	Graduate Assistant KFUPM, Saudi Arabia
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Duties and Responsibilities

- Provide administrative support.
- Proctored examinations and supported exam logistics to ensure academic integrity.
- Support classroom and research activities per the College of Business mandate.

2021-2023

Auditor, Gambia National Petroleum Corporation, Turntable Roundabout, Brusubi, Banjul, The Gambia.

Duties and Responsibilities

- **Conduct Pre-Audit Exercise:**
Review financial records and operations to identify issues early and prepare the organization for a smooth, successful audit.
- **Ensure Good Governance:**
Promote transparency, accountability, and ethical conduct by ensuring compliance with policies and regulatory standards.
- **Risk Management:**
Identify and evaluate risks, then develop strategies to minimize their impact on the organization's operations and reputation.
- **Strengthen Internal Controls:**
Implement and monitor control systems to protect assets, enhance efficiency, and ensure compliance with internal policies.

2014 to 2021

Accountant, Banjanba Construction Company Ltd, Brusubi, Turntable Roundabout.

Duties and Responsibilities

- **Prepare Project Budgets:**
Develop detailed financial plans to allocate resources effectively and control project costs.
- **Maintain Construction Management Systems:**
Oversee and update digital systems to track project timelines, resources, and progress in real-time.
- **Conduct Routine Accounting Entries:**
Record daily financial transactions accurately to ensure up-to-date and reliable accounting records.

Additional Skills

➤ Advanced verbal and written communication skills ➤ Good research and analytical skills ➤ Proficiency in Microsoft Excel, PowerPoint, Word,	➤ Good interpersonal skills ➤ Good presentation skills ➤ Good report writing skills ➤ I have a solid knowledge of the following software packages. • R Programming • E-Views
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	• SPSS • Stata. • Microsoft Word and Excel.
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AWARDS

- Awarded for representing my faculty in the inter-faculty research competition.
- Awarded for successfully training students on Research Methodologies and applying basic theories in an Econometrics course using STATA software.
- Awarded as the Assistant Education and Research Minister for the Economics and Management Science Student Association.
- Awarded for publishing a research paper.
- Awarded for conducting tutorial classes for students

INTEREST

- Due to my undiluted passion for research, I had research engagements with different government institutions such as:
- 2021, Gambia Bureau of Statistics (GBOS) during the Social Registry Survey.
- 2019, National Population Secretariat.
- 2018, Management Development Institute, Covid-19 impact survey,
- In 2021, the Center for Policy Research and Strategic Studies (CEPRASS) was launched by the School of Business and Public Administration (SBPA)

RESEARCH PUBLICATIONS

In Progress

Omar Jassey, Muhammad Imran Chaudhry, **Market Reaction to Green Sukuk Issuance Announcement: An event study on Sustainable Finance within GCC.**

Published Papers

“The Effect of Personal Remittance on Economic Growth in The Gambia, Published on Google Scholar by Global Press Hub. Date: July 30, 2019. Issue 2019 volume 1.

“Economic Development through Rice and Cashew Production: Insight towards Sustainable Development of Cashew in the Gambia”. Published by Global Scientific Journals (GSJ: Volume 8, Issue 5, May 2020, online: ISSN 2320-9186).

I wrote my undergraduate thesis paper on the topic ***“The Effect of External Debt on Economic Growth: Empirical Evidence on the Gambia”***