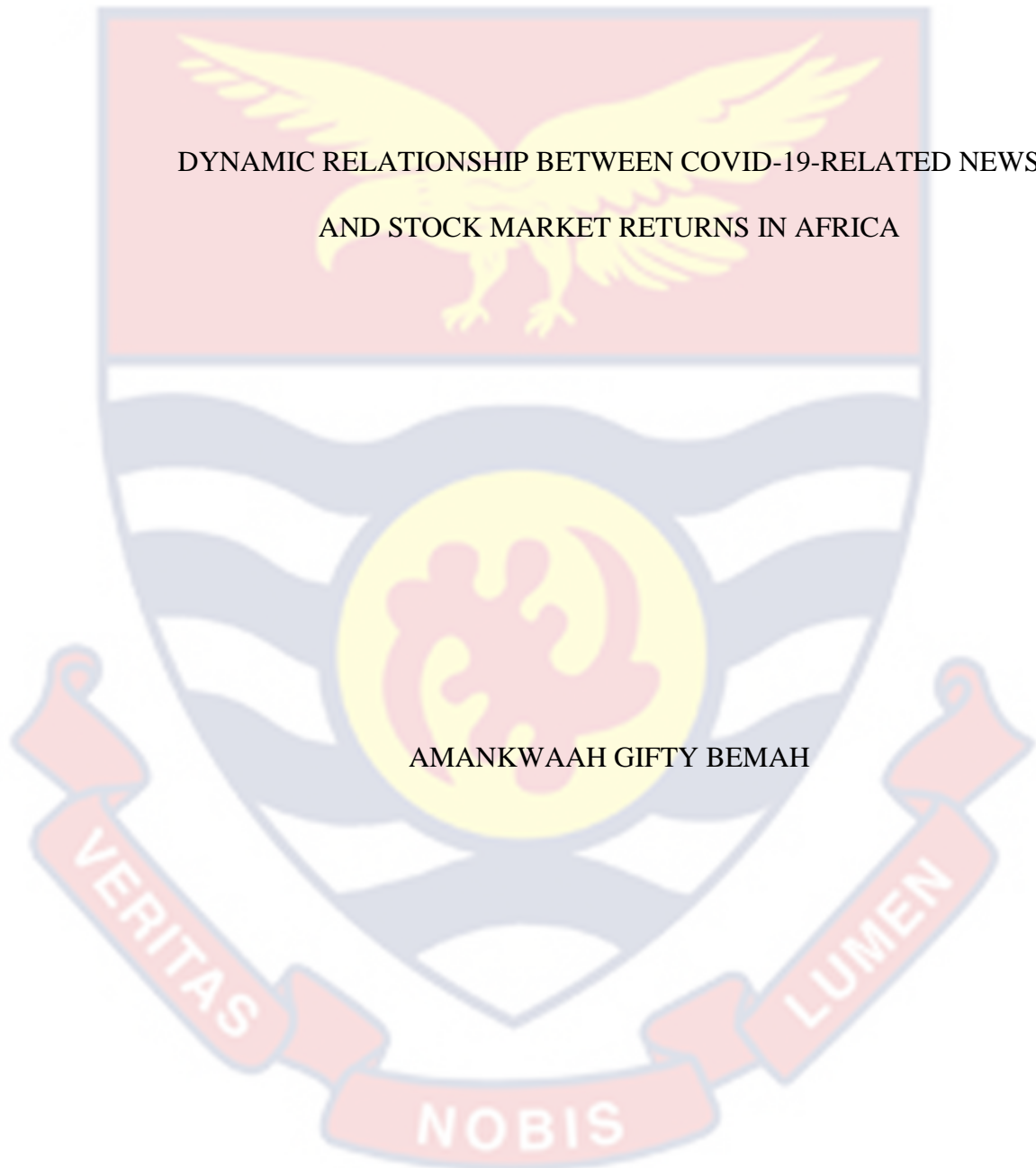UNIVERSITY OF CAPE COAST

DYNAMIC RELATIONSHIP BETWEEN COVID-19-RELATED NEWS

AND STOCK MARKET RETURNS IN AFRICA

AMANKWAAH GIFTY BEMAH

2023

UNIVERSITY OF CAPE COAST

DYNAMIC RELATIONSHIP BETWEEN COVID-19-RELATED NEWS

AND STOCK MARKET RETURNS IN AFRICA

BY

AMANKWAAH GIFTY BEMAH

Thesis submitted to the Department of Finance of the School of Business,

College of Humanities and Legal Studies, University of Cape Coast, in partial

fulfilment of the requirements for the Award of Master of Commerce in

Finance

JUNE 2023

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research

and that no part of it has been presented for another degree in this university or

elsewhere.

Candidate's Signature: ……………………………. Date: ……………………

Name: Amankwaah Gifty Bemah.

Supervisors' Declaration

We hereby declare that the preparation and presentation of the dissertation

were supervised in accordance with the guidelines on the supervision of the

dissertation laid down by the University of Cape Coast.

Supervisor's Signature: ………………………. Date: ……………………….

Name: Prof. Anokye Mohammed Adam.

Co-Supervisor's signature: ………………… Date: ………………………..

Name: Dr. Michael Owusu Appiah.

ii

ABSTRACT

The upsurge of the COVID-19 pandemic has had a devastating impact on financial markets as well as social and political repercussions around the world. Investors' decisions were impacted by the widespread that media coverage of the pandemic brought on by the disease's spread. Between 1st February 2020 and 28th February 2022 is the specific focus period of this research. The study's goal is to evaluate and analyse how Africa's stock markets responded dynamically to COVID-19-related news utilizing quantile-in-quantile regression and quantile regression as its methods of estimate. In relation to the aim of this research, the findings indicated that the panic index has a positive and significant impact on the stock returns in a bearish market and a significant and adverse influence on a bullish market in Nigeria, Morocco, Egypt, South Africa, Ghana, and Mauritius. The results also show that a decrease in fake news produces a rise in stock returns in Ghana, Mauritius, Egypt, and South Africa, and vice versa in extreme market conditions. However, Fake news has no impact on the returns of the indices when the market is either bullish or bearish in Morocco and Nigeria. Also, the media coverage index has an adverse and significant impact on both the lower and upper quantiles for Ghana, Morocco, and South Africa, as well as all quantiles for Nigeria and Mauritius. This study suggests that more intensive use of proper communication channels is required to mitigate COVID-19-related financial turbulence. The government may adopt accurate and reliable dissemination of information or news about the COVID-19 outbreak through proper channels of communication.

KEYWORDS

African stock market returns

Media coverage index

Fake news index

Media hype index

Panic index

ACKNOWLEDGEMENT

I want to convey my profound gratitude to my supervisors at the Department of Finance, Prof. Anokye Mohammed Adam and Dr Michael Owusu Appiah, for their professional direction, counsel, inspiration, and compassion in guiding this effort. I am really appreciative.

I also want to express my appreciation to Dr Peterson Owusu Junior. for his kind assistance in improving this work and his unwavering support throughout my time as a graduate student on the University of Cape Coast campus. Finally, I want to thank my family and close friends, especially my mother Janet Amankwaah, my sister Akosuah Serwaah Amankwaah, and my dear friend Kyei Baffour Collins for their constant support.
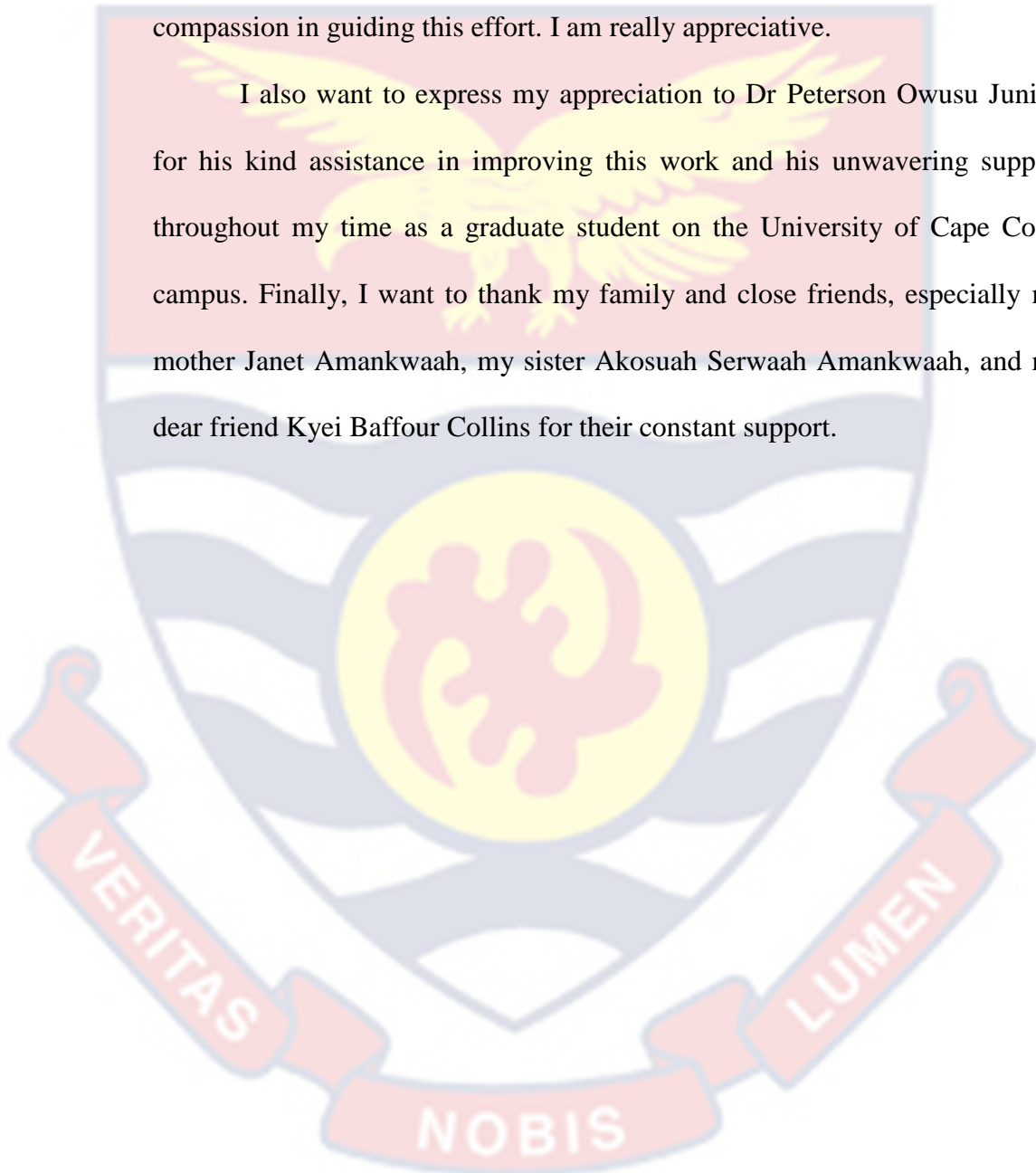
DEDICATION

To my brothers: Issifu Acheampong, Kwame Amankwaah and Emmanuel

Kofi Amankwaah

vi

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF FIGURES

LIST OF ACRONYMS

COVID-19	Coronavirus Disease 2019
NASDAQ	National Association of Securities Dealers Automated Quotation
DJIA	Dow Jones Industrial Average
VIX	Volatility Index
DAX	Deutscher Aktien Index
FTSE	Financial Times Stock Exchange 100 Index
S&P 500	Standard and Poor's 500
GARCH	Generalized AutoRegressive Conditional Heteroskedasticity
KOSPI	Korea Composite Stock Price Index
SSE	Shanghai Stock Exchange
G-20	Group of twenty
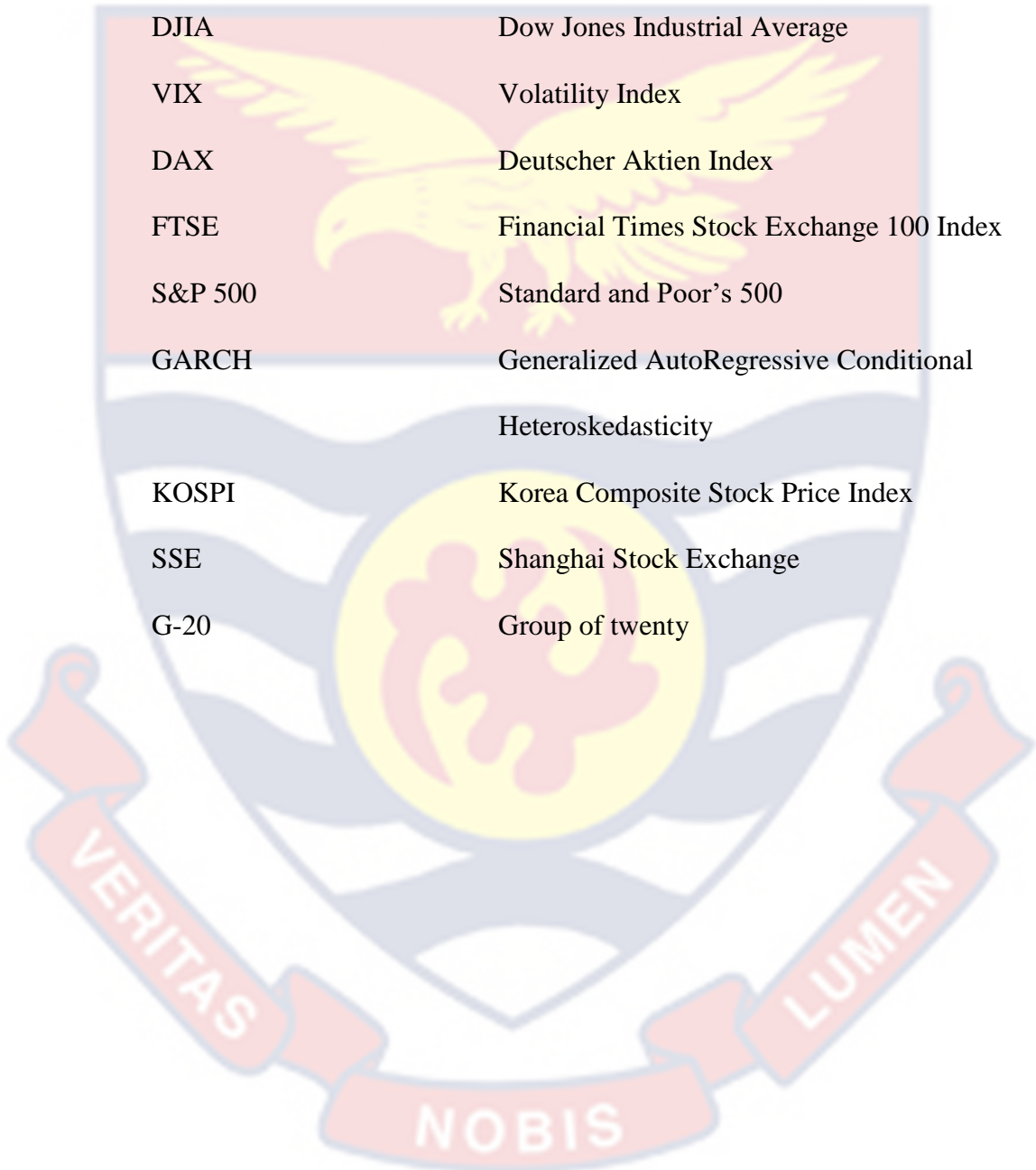
CHAPTER ONE

INTRODUCTION

The consensus in the academic literature is that financial markets and economic activity move in tandem. Hence, conditions that stifle global economic performance are believed to influence the performance of stock markets worldwide (Boateng et al, 2020). There are several empirical discussions on how the Black Swan events have affected and influenced international economies and investors' decisions. These studies revealed that terrorist attacks, earthquakes, and other natural disasters cause panic reactions in stock markets (see, Zeckhauser 1996; Horwich 2000; Skidmore & Toya 2002; Albala-Bertrand 2000; Worthington & Valadkhani, 2004; Eldor & Melnick 2004 etc.). The concept of the Black Swan can be applied to the outbreak of the coronavirus, which spread over the world because of its novelty. The health and mortality rates around the world significantly increased during the pandemic (Popescu, 2019; Teitler-Regev, & Tavor, 2019). Furthermore, a related strand of studies also reveals that the pandemic affects financial markets, especially markets that were severely affected by the pandemic (He et al. 2020). Thus, it is not surprising that a copious amount of recent finance literature has sought to examine how the new-fangled coronavirus pandemic has impacted financial markets around the world.

Background of the study

The COVID-19 virus became a pandemic and spread to many parts of the world in the hundred days that followed its emergence in Wuhan in December 2019, infecting over a million individuals and killing over 60,000 people worldwide (Global Economic Prospects, 2020). The 1918 Spanish flu

pandemic is the one that most closely resembles the scope and impact of COVID-19. However, there are significant distinctions between COVID-19 and the 1918 Spanish flu in terms of the world economy. People did not travel as much for employment back then as they do now since the world was not as globally interconnected as it is now. The World Health Organization Report, 2020 first designated COVID-19 an emergency on February 20, 2020, and later a pandemic on March 11, 2020. There was a great deal of anxiety and fear due to the rapid expansion of the coronavirus and the general inadequate health readiness in most countries (Lyócsa & Molnár, 2020). More than a hundred nations declared partial to total lockdown by the end of March 2020. (Global Economic Prospects, 2020).

The coronavirus was discovered for the first time in Africa on February 14th, 2020 in Cairo, Egypt, and within three months, the virus had expanded throughout the entire continent (Agyei et al., 2021). Following the example set by China, where the virus began, many nations throughout the world enacted travel limitations to stop the expansion of the disease. African governments put comparable restrictions on immigration, varying in degree and length from those in America, Asia, and Europe. Mobile limitations include bans on cross-border, lockdowns, international travel, the shutdown of schools and places of worship, and social segregation to stop the infection from spreading further (Mehtar et al. 2020). Due to the restricted movement of people, goods, and services within large cities, the economic situation for businesses grew more unstable.

The emergence of the novel coronavirus pandemic continues to affect global financial markets at an unprecedented level, posing greater concern to

2

global economies since the great recession (Boateng et al., 2021). The implied volatility of the United States stock market has been at an all-time high since 2011. The DJIA fell 7.83 percent in the second week of March 2020, while the NASDAQ and the S&P 500 fell 7.29 percent and 7.64 percent, respectively. In late February 2020, European market indices erased all of their gains from the previous year in a few days, with equities falling by more than 20% (Zoungrana, Toe, & Toé, 2021). The DAX, EuroSTOXX 50, and FTSE 100 all fell 12.24 percent, 8.45 percent, and 9.81 percent in March 2020, respectively, while the stock market of Italy had lost 17 percent since the pandemic began. Africa's stocks have also suffered as a result of the outbreak.

In the second week of March 2020, Africa's equities saw their well-known dismal days. The Johannesburg stock exchange dropped 9.72 percent, while the Casablanca Stock Exchange saw its biggest drop ever (Zoungrana, Toe, & Toé, 2021). It had a 6.7 percent drop. Furthermore, the Namibian stock exchange fell by 8.81 percent. In a similar vein, investors in the Nigerian Stock Exchange lost almost $2 billion as the exchange closed with a 3.72 percent drop.

Following the revelation of Kenya's first COVID-19 infection, the Stock Exchange of Nairobi had to pause operations after seeing a 15% drop in its stock price. As a result of these occurrences, various empirical research has sought to quantify and explain the nature and degree of the coronavirus pandemic's impact on Africa's financial markets (*see* Adenomon & Maijamaa, 2020; Abu et al. 2021; Takyi & Bentum-Ennin, 2020; Elsayed, & Elrhim, 2020; Zoungrana, Toe, & Toé, 2021).

The level to which the media has covered the COVID-19 outbreak regularly sets it apart from earlier pandemics. This information contains the daily increase in cases, deaths, tests, days spent in lockdowns, and monetary and fiscal policy decisions made during the pandemic (Haroon & Rizvi, 2020a). Depending on pre-existing factors like government policy in the case of a pandemic and healthcare readiness for infectious diseases, people all around the world have varied perspectives on information linked to pandemics.

Goodell (2020) found that the COVID-19 pandemic's economic impact is unparalleled as compared to previous pandemics.

According to several studies (Bai et al. 2020; Erdem, 2020; Alfaro et al. 2020; Lyócsa & Molnár, 2020; Ashraf, 2020), the media shape public views of the prevailing economic and health conditions as well as their projections for the future. This has a clear impact on stock market returns and volatility. Equity prices decreased for the majority of stock indices during the COVID-19 period as a result of risk-averse consumers, and trading their financial assets, and the financial markets were very unstable (Akhtaruzzaman et al., 2020; Bai et al., 2020; Ashraf, 2020).

The level of uncertainty varies per country, based on media coverage, public news, healthcare readiness for government fiscal policy, infectious diseases, non-pharmaceutical healthcare, monetary policy, and pharmaceutical policies in the face of the COVID-19 outbreak (Das et al., 2020). Also, Fake news has a huge impact on investors' decisions. According to Vosoughi et al., (2018) analysis of the comparative dynamics of actual and false information spreading on Twitter, false information is more novel than true information

4

and elicits fear, revulsion, and shock. Furthermore, sharing fake news has become pervasive in the modern digital environment. This can also be said about some government employees and individuals that spread false information to a big audience in order to further their own agendas (Rampersad et al., 2019). Fake news affects almost every part of our lives (Wasserman & Madrid-Morales, 2019), and the spread of false information during the COVID-19 outbreak became very concerning (Hou et al., 2020). The transmission mechanism of the relationship between fake news, panic index, media coverage, media hype, and the stock market operate through the adaptive responses of market participants. Fake news, with its potential to induce fear and uncertainty, triggers adaptive behaviours such as heightened scepticism among investors (Vosoughi et al., 2018). The panic index, as a measure of anxiety, influences adaptive risk aversion and altered trading patterns. Media coverage and hype shape perceptions, prompting adaptive adjustments in trading strategies. This research is crucial in uncovering the dynamics of these transmission mechanisms during the COVID-19 pandemic, aligning with the Adaptive Market Hypothesis (Lo, 2004). It contributes to a deeper understanding of how adaptive behaviours in response to information affect stock market returns in Africa, shedding light on the difference of financial market dynamics during crises.

As a result, it's critical to understand how fake news, panic index, media coverage, and media hype affect the stock market.

Statement of the problem

In recent years, the impact of public news on stock returns has garnered increased attention, with the dynamics of financial markets being influenced by economic or political news becoming a subject of empirical and theoretical research (Shi & Ho, 2020; Smales, 2014). In the first three months of 2020, financial markets all around the world saw significant losses as a result of the COVID-19 outbreak and the substantial volume of news surrounding it.

Extensive media coverage, hype, and the proliferation of false rumours about COVID-19 made distinguishing between valid and false news challenging (Huynh, 2020). The pandemic triggered financial uncertainty, leading governments worldwide to implement stimulus programs. African stock exchanges, including Johannesburg, Casablanca, Namibian, and Nigerian, experienced significant declines in March 2020 (Zoungrana, Toe & Toé, 2021). In March 2020, African stock exchanges saw substantial declines, with the Casablanca stock exchange recording its largest decline in history (6.7%) and the Nigerian stock market ending at -3.72% with nearly $2 billion in losses for investors (Zoungrana, Toe & Toé, 2021).

Notably, media coverage and fake news of COVID-19 surpassed earlier pandemics, detailing daily increases in cases, deaths, tests, lockdown durations, and policy decisions (Haroon & Rizvi, 2020). The unprecedented impact of the pandemic on global financial markets is comparable to the Great Recession (Boateng et al., 2021). Moreover, false information on social media significantly impacted investors' decisions, causing panic and prompting

6

authorities to rearrange trading hours in West African Economic and Monetary Union stock markets (Zoungrana, Toe & Toé, 2021).

Previous studies, such as those by Cepoi (2020), Narayan, (2020), Béjaoui et al., (2021), and Umar et al., (2021) etc., whether they are cross-country or country-specific analyses had little emphasis on Africa. For instance, Cepoi (2020) examines how financial markets in the six developed economies most impacted by COVID-19 (Spain, the United Kingdom, France, the United States, Germany, and Italy) reacted to news about the outbreak. Using a panel quantile regression analysis, the study finds that stock prices display asymmetric dependency on COVID-19-related news. The study found that fake news and announcements have an adverse nonlinear effect on the first and second quartiles of returns and that gold does not function as a safe haven asset during an outbreak. Narayan, (2020) looks into how much of an impact oil price news and coronavirus have on the change in prices of oil in the Japanese stock market. Negative and positive oil price news influence prices of oil at increasing change thresholds when COVID-19 is used as a baseline.

This study makes a triple contribution to existing literature. Firstly, while numerous studies explore the interaction between African stock market returns and COVID-19, none have systematically documented the dynamic relationship between COVID-19-related news and stock market returns in Africa. This research significantly addresses this gap by analyzing the dynamic asymmetric relationship across six major African stock markets: Morocco, South Africa, Nigeria, Mauritius, Ghana, and Egypt. Secondly, the selection of these countries, based on the World Health Organization Report

(2020), ensures relevance, considering their substantial economic impact from the coronavirus outbreak and their status as the most developed stock markets in Africa. Lastly, the study innovatively employs quantile-in-quantile regression and quantile regression methodologies, aligning with Bera et al. (2014) and Baur (2013), to comprehensively capture diverse conditional distributions and turbulent market conditions. The quantile-on-quantile regression, introduced by Sim and Zhou (2015), overcomes the limitations of traditional quantile regression, providing a nuanced understanding of the dynamic asymmetry connection between COVID-19-related news and stock market returns. This innovative approach adds depth to the research, offering valuable insights into the multifaceted responses of stock returns during periods of uncertainty.

Purpose of the study

The purpose of the study is to evaluate and analyse the dynamic relationship between COVID-19 news and stock market returns in Africa.

Research objectives

Through the following objectives, the dynamic relationship between COVID-19-related news and stock market returns in Africa is explored;

1. To establish the dynamic relationship between Africa's stocks and the Media coverage index during the COVID-19 outbreak.

2. To assess the dynamic relationship between Africa's stocks and the Media Hype index during the COVID-19 outbreak.

3. Determine the dynamic relationship between Africa's stocks and the Panic index during the COVID-19 outbreak.

4. To examine the dynamic relationship between Africa's stocks and the fake news Index during the COVID-19 outbreak

Research Hypothesis

H_1: There is a significant positive reaction of Africa's stock returns to Media coverage news.

H_2: There is no significant positive reaction of Africa's stock returns to Media coverage news.

H_1: There is a significant positive reaction of Africa's stock returns to Media Hype news.

H_2: There is no significant positive reaction of Africa's stock returns to Media Hype news.

H_1: There is a significant positive reaction of Africa's stock returns to Panic news.

H_2: There is a significant positive reaction of Africa's stock returns to Panic news.

H_1: There is a significant positive reaction of Africa's stock returns to Fake news.

H_2: There is a significant positive reaction of Africa's stock returns to Fake news.

Significance of the study

The findings of this study are expected to add to the body of knowledge about the dynamic asymmetric relationship between Africa's stock market and COVID-19-related news. The findings will reduce investors' flight to safety. Decision-makers and Investors are curious to see how the stock market will react to this unusual situation. The results of this research might reveal information about the range of behaviour during the outbreak, which

9

will aid in estimating the contributions that the pertinent markets will be required to make to control the pandemic. The stock markets' steady operation depends on the findings, which are thought to provide light on the happenings of the outbreak and provide a topic for further study.

Limitations of the study

The research is confined to secondary data and does not include primary data such as interviews or questionnaires because it may be outside the scope of the effectiveness and dependability of the outcomes. The scope of this investigation will be limited to COVID-19-related news and stock markets in Africa.

Organization of the Study

The following is the outline of the research: The study's background was presented in chapter one. It goes on to explain why the study is being conducted (Problem Statement), outline the objectives, and emphasize the research hypotheses. Chapter Two: This chapter will go over the study's theoretical structure, theories (Prospect theory, Black Swan theory and Efficient Market Hypothesis) as well as the empirical and conceptual framework. Chapter Three: This chapter will discuss the research methodology, as well as the research design, research paradigm, research approach, definition and measurements of variables and data collection. The main focus of this chapter is on how data is retrieved and gathered, and the techniques that are utilized to obtain the data. Chapter 4: This chapter included a presentation of the findings as well as an analysis of the findings. Chapter Five: this chapter will provide the summary of findings, conclusions, and recommendations for the study.

10

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter of the research examines both the theoretical and empirical literature on the dynamic asymmetric relationship between Africa's stock market and COVID-19-related news during the pandemic, with a focus on how these affect investors. This chapter begins by reviewing some generally recognized theories that are important to this study. This literature also covers relevant notions regarding the research topic and refers to some empirical investigations that have used these theories and concepts to aid researchers and other beneficiaries in better understanding it.

Theoretical Framework

The study underpins theories including prospect theory, Adaptive market hypothesis, and black swan theory.

Prospect theory

The Prospect theory, developed by Kahneman and Tversky in 1979, highlights how investors build and choose their portfolios based on risks. Han and Hsu (2004) addressed the application of Prospect Theory to in-aggregate stock market return riddles, stating that prospect theory can explain how the complexity of aggregate stock market mechanisms is examined.

This theory assumes that an investor's risk aversion behaviour is influenced by their prior experience. If they have previous experience with positive capital market results, they will return after a period of shock, because past losses will be quickly recovered by future earnings. Therefore, if they lose a significant amount of money, they will become less risk-averse and less

11

willing to take chances. Prospect theory also emphasizes the in-line risk premium, which states that investors seek higher revenues if there are frequent changes, so they anticipate that once a loss occurs, they would demand a larger and stronger recovery. In summary, in the capital market, investors will notice a variety of risk and income options (Han & Hsu,2004).

According to this theory, investors will keep making investments and make financial decisions based on prospects that will arise in the future. As long as there is still potential in the dating period, any shocks or stocks will be quickly followed by recovery. The findings of this research may therefore be able to explain the dynamic relationship between COVID-19-related news and stock returns. The goal of this research is to evaluate, using the theories to analyse the dynamic relationship between COVID-19-related news stock market returns in Africa during the outbreak.

Regulators and investors are interested in how the stock market will respond to the COVID-19 situation. Regulators might, for instance, be compelled to decide between preserving the economy's solvency and containing the outbreak of the coronavirus and its news. The findings of this research may shed light on the range of behaviours that people might exhibit during a pandemic, which may help determine how much will need to be sacrificed by the relevant markets to contain the outbreak. Because the results are anticipated to shed light on events that occurred during the outbreak of the coronavirus and give direction for further research, they are crucial for the sustainability of the stock market as a whole.

Black Swan theory

The stock market and business activity can be disrupted by sudden and unpredictable events, which are related to the "Black Swan theory" (Taleb et al. 2007; Taleb, 2001). The concept of the Black Swan can be applied to the outbreak of the coronavirus, which spread over the world because of its novelty. The health and mortality rates around the world have significantly increased as a result, and it has also affected the international stock market bubble.

The term "Black Swan Theory" is used to define very unlikely situations in this case, the COVID-19 outbreak, that had significant repercussions for the stock market, the money market, and the general economy. Because Black Swan events are unpredictable, experts advise diversification portfolios to lessen their damaging effects. The media coverage and fake news on the COVID-19 outbreak caused panic and fear among the public as well as investors and regulators of the stock markets. In 2020, investors' gloom was brought on by numerous swings in the money markets and the global stock market, as reported by the Financial Times. The restrictions and shutting of country borders in the labour fluctuation, which has affected global supply chains are factors impacting the stock markets. The findings of this research may shed light on the dynamic relationship between COVID-19-related news and stock market returns in Africa. This theory may explain how the impact of COVID-19 news should be dealt with.

13

The Adaptive Market Hypothesis (AMH)

The Adaptive Market Hypothesis (AMH) provides a valuable theoretical lens to analyze the dynamic relationship between COVID-19 news variables (fake news, panic index, media coverage, and media hype) and stock market returns in Africa. AMH, proposed by Andrew Lo, suggests that financial markets are not perfectly efficient but are adaptive systems where participants continuously learn and adapt their behavior based on changing information and market conditions (Lo, 2004). In the context of the COVID-19 pandemic, AMH helps elucidate how market participants dynamically respond to evolving information, reflecting the concept of adaptive behavior. Fake news, being misinformation deliberately created to deceive, may induce adaptive responses characterized by heightened skepticism and caution among investors as they strive to discern accurate information from falsehoods (Vosoughi et al., 2018). The adaptive nature of market participants, as posited by AMH, influences their decision-making processes in response to the prevalence of fake news.Media coverage and media hype play pivotal roles in shaping investor perceptions and sentiments. The AMH perspective emphasizes that market participants adapt their expectations and trading strategies based on the information environment. Increased media coverage, when aligned with the AMH framework, may trigger adaptive responses, influencing investor attention and trading behaviors (Lo, 2004; Bai et al., 2020). Similarly, media hype, characterized by exaggerated reporting, could lead to adaptive market reactions as investors adjust their expectations in response to sensationalized information (Smales, 2014). The Panic Index, as a measure of market anxiety, aligns with the AMH theory's emphasis on adaptive behavior. High panic

index values indicate increased uncertainty, prompting adaptive responses such as heightened risk aversion and altered trading patterns among investors (Akhtaruzzaman et al., 2020).Stock market returns, in the AMH framework, are viewed as outcomes of adaptive responses to changing information and sentiments. The adaptive nature of market participants influences their trading decisions, impacting stock prices and returns during the COVID-19 era (Lo, 2004; Zoungrana, Toe & Toé, 2021). In essence, the AMH theory provides a robust foundation for understanding the dynamic relationship between COVID-19 news and stock market returns in Africa, emphasizing the adaptive nature of market participants as they navigate the complex and uncertain information landscape during the pandemic.

Empirical Review

Public news and announcements induced panic about the daily tally of verified COVID-19 deaths and cases have a substantial influence on the financial markets in virtually every country on the planet, which influences investors' decisions. Studies on the effects of COVID-19 on macroeconomic variables, including international exchange, stock market performance, and oil prices, among others, were done as a result of the COVID-19 outbreak (Nwosa, 2020).

Relationship between COVID-19 and stock market returns

Many studies have investigated the reaction of COVID-19 on financial markets, including the influence of COVID-19 on the fluctuations of stock market returns and financial markets. Khatatbeh et al. (2020) examined that COVID-19 had an adverse influence on stock returns in all eleven countries (China, Belgium, Switzerland, United Kingdom, France, Italy, Germany,

Netherlands, the United States, South Korea, and Spain). A similar study in East Asian countries by Kartal, Depren, and Depren, (2021) observed that the outbreak of COVID-19 had a substantial adverse effect on the exchange rate and stock returns.

Bahrini and Filfilan, (2020) measured COVID-19 confirmed deaths and cases in relation to the stock returns for Gulf Cooperation Council (GCC) nations. The outcome of the study showed that there was a negative connection between the aggregates of deaths and the performance of stock returns while the aggregate of reported cases did not affect the performance stock market. In summary, the incidence of COVID-19 had substantial repercussions on global oil prices and the performance of stock markets.

Contessi and Pace, (2020) conducted a study on 18 major economies (Hong Kong, China, Japan, India, Taiwan, South Korea, France, Thailand, Spain, Germany, Switzerland, Italy, Sweden, UK, Australia, Brazil, USA, and Singapore) and found that as the coronavirus upsurge spread from China to other countries and it caused the economies to slowly digress, thereby causing rapid fluctuations

Results from Thorbecke, (2020) also suggested that COVID-19 had an adverse influence on the performance of the stock market and exchange rate. However, Korea suffered a minimal impact as compared to France in terms of exchange rate volatility. Mishra and Mishra, (2020) used variables including exchange rate, stock returns, oil prices, and COVID-19 confirmed cases to analyse the impact of the virus on the Asian stock market. It was observed that the instability of oil prices and exchange was occasioned by the increase in the

16

number of reported cases. The Asian stock market was submerged as a result of the fear and unpredictability posed by the coronavirus upsurge.

Takyi and Bentum-Ennin, (2020) studied the influence of the COVID-19 outbreak on the thirteen African stock markets in Africa. The results of the study suggested that coronavirus had an adverse influence on all the stock markets. The stock markets of Cote D'Ivoire, Uganda, and South Africa witnessed a minimal impact while the stock markets of the other ten countries (Botswana, Mauritius, Morocco, Namibia, Nigeria, Tunisia, Ghana, Kenya, Tanzania, and Zambia) were severely impacted by the pandemic. A study by Iyke and Ho, (2020) also examined the effect of investors' attention, and exchange rate on stock returns during COVID-19. The findings suggested that Zambia, Nigeria, and Botswana observed an adverse relationship between these variables (exchange rate returns, investor attention, and stock returns). However, COVID-19 had a positive influence on Ghana and Tanzania's stock market performance. This could be explained as investors' attention heightened it leading to the rise in stock returns.

Osagie, Maijamaa, and John, (2020) explored how the COVID-19 outbreak affects Nigeria's stock market performance. It was revealed that the COVID-19 upsurge had a more harmful effect on stock returns than in normal times. A similar study by Nwosa (2020) indicated that COVID-19 affects exchange rates, stock prices, and oil prices negatively. Further comparing COVID-19 to other global recessions, the outbreak had more perilous effects on the Nigerian market than any other economic crisis.

Singh et al. (2020) investigated the influence of the COVID-19 upsurge on G-20 countries' stock markets. They employed event study

17

methodology to measure panel data regression and abnormal returns (ARs) and to examine why abnormal returns occur. The findings showed that there was a heightened stock market panic caused by a rise in the number of COVID-19 reported cases in G-20 nations. Furthermore, panel data analysis results showed that stock markets will recover from the perilous effects of COVID-19 over time.

Insaidoo et al. (2020) investigated COVID-19 and the stock markets of developing countries with special reference to Ghana. It was found that COVID-19 has an adverse effect on how the stock market in Ghana is performing. The impact was minimal. Another study conducted in the Sub-Saharan with special reference to Ghana observed that the economy contracted by 5.7% after the COVID-19 upsurge (Amewu et al. 2020). The analysis by Raja Ram (2020) recognized that COVID-19 ruined the growing global share. In light of the collapse of the worldwide financial market, the stock market of India encountered extreme volatility. The returns on stocks of the stock market in India were once again lowered by a fall in international investment in portfolios. The study classified COVID-19 as a "black swan" by studying the prior information of all unusual events. According to his research, circumstances surrounding the demise and resurgence of the activeness of the stock market in India. The study also recognized that economists were unable to predict economic growth until there is a trustworthy public healthcare system.

Al-Alwadhi et al. (2020) employed panel regression to analyse the effect of the upsurge of COVID-19 on the stock market using the daily increase in the number of deaths and cases as a measurement. The results

showed that both metrics had a considerable adverse impact on stock returns for all companies and businesses listed on the Hang Seng Index and Shanghai Stock Exchange. The performance of the US stock market during the COVID-19 collapse in March 2020 was examined by Mazur et al. (2020). They discovered that stock prices in the real estate, oil, hospitality industries, and entertainment have fallen sharply, while those in the food, software, natural gas, and healthcare sectors exhibit substantial favourable significant returns. The stocks that lose also have extremely asymmetrical fluctuations, which negatively correlate with the performance of the stocks.

The collapse of the United States stock market performance in March 2020 was investigated by Mazur et al. (2020). According to the authors, although equity values in the hospitality, entertainment, oil, and real estate industries had sharp falls, those in the natural gas, software, healthcare sectors, and food gained an increase in positive returns. Additionally, they discovered that severe asymmetric volatility in losers' stocks exhibits a negative correlation with stock returns. By using the asymmetric power GARCH model, Shehzad et al. (2020) examined the nonlinear performance of the financial markets in China, Italy, the United States, and the market return of Japan. According to the analysis, COVID-19 affected the S&P 500's stock returns. However, NASDAQ Composite Index was not impacted.

Topcu and Gulal, (2020) looked into how the upsurge of COVID-19 rammed developing stock markets. According to their analysis, the COVID-19 outbreak had a greater influence on developing markets in Asia, whilst developed markets in Europe had the slightest effect. Ravi, (2020) examined the state of the stock market in India before and after the coronavirus. The

results showed that trade on the BSE and NSE had reached their highest levels at the start of January, just before the coronavirus, reflecting a favourable stock market environment. The stock markets sustained panic during the COVID-19 outbreak as the NSE Nifty and BSE Sensex fell by thirty-eight percent. As a result, the overall stock market lost 27.31 percent since the start of the year. The stock of multiple sectors, including tourism, entertainment, and hospitality declined by more than forty percent as a result of transportation problems.

Yan, (2020) looked at how the stock market in China responded to the upsurge of COVID-19 and discovered that the stock returns were perilously impacted by the outbreak of COVID-19 but turned around every ten days. He also discovered that large businesses are more shock-resistant because they have bigger assets or are monopolistic and experienced fewer distribution network failures. Alfaro et al. (2020) presented evidence that during the upsurge of the COVID-19 pandemic in the United States and the 2003 severe acute respiratory syndrome outbreak in Hong Kong, daily variations in the forecasts of traditional methods of infectious disease predicted a change in the total stock returns. They showed that sectors that were more vulnerable to viral transition (like entertainment) saw stock market drops that were more severe.

The impact of COVID-19 on the financial markets of the countries which were most severely impacted by this outbreak was examined by Zeren and Hizarci. (2020). The researchers employed the Maki cointegration test (2012) while accounting for the overall daily reported deaths and the overall daily reported cases. The findings indicate that the aggregate of reported cases

had a long-run cointegration connection in each of the financial markets examined.

Jung, (2020) looked into the stock market South Korea's stock market, another important emerging market. His investigation revealed that the country experienced turbulences. The monthly export pattern was downward in January, then it turned upward in February before declining once more in March and June during the COVID-19 outbreak. Export volume for the nation decreased by 11.2% percentage points from the prior year. Narayan et al. (2021a) looked at how the financial markets in G7 nations were affected by government actions taken in reaction to the COVID-19 pandemic, including travel restrictions, lockdowns, and stimulus packages. The empirical findings demonstrated that the travel bans and stimulus packages all had a favourable influence on stock markets, with lockdowns having a bigger impact than the other measures.

The stock prices of American companies were analysed by Ramelli and Wagner, (2020) across three distinct sample periods from January 1 to March 20 2020. They found that American companies that had been introduced to Chinese firms noticed negative anomalous returns during the time of incubation and considerably adverse returns during the pandemic time. Additionally, they found that during the "feverish" moment, analysts and investors greatly worried about the debts of corporate and solvency.

The degree of risk-return dependency and the structure in the United States were examined by Azimili, (2020) in an analysis that also used quantile regression. The researcher also investigated the association between stock returns and the Google Search Index for Coronavirus and found that it was

asymmetrical, with lower tails being adversely affected almost double as much as higher tails. Additionally, the study stipulates that the COVID-19 pandemic had reduced the advantages of diversifying by raising the higher quantiles of the market portfolio and the degree of return reliance across returns.

Onali, (2020) provided evidence using the GARCH model showing the returns of the United States stock market were unaffected by changes in the aggregate fatalities and cases associated with the coronavirus in the United States while the other six countries that are badly impacted by the coronavirus.

He et al. (2020) used non-parametric Mann-Whitney tests and standard t-tests to analyse the influence and spillovers of the virus on the stock markets and discovered that COVID-19 had a negative impact. Ozili and Arun, (2020) conducted existential research on the effects of social distancing rules that were put in place to restrict the spreading of the coronavirus using the four continents of Africa, North America, Europe, and Asia as their base. They also found that a thirty-day lockout or social exclusion regime affected the economy by lowering stock prices.

Liu et al. (2020) used the event research method to analyse the short-term effects of the innovative COVID-19 on Twenty-one significant stock exchange global markets, including those in Korea, Germany, Japan, and Italy. Their findings indicated that investors' uncertainty about potential earnings contributed to the first shock of the outbreak's negative impact on stock prices. Zhang et al. (2020) concluded that the COVID-19 pandemic raised the stock market risks for all economies using stock market data and COVID-19 cases reported from the ten major economies with proven COVID-19 cases.

According to Herrero, (2020), the upsurge of COVID-19 had the greatest influence on the emerging economy which resulted in a fall in economic activities and operations. This exceptional shock made people more risk-averse, which raised the cost to society financially. Latin America suffered the most as a result of its dependency on external assistance. The drop-in export is the result of transportation limitations. The tourism business was also hampered, resulting in drop-in earnings

To quantify how investors' expectations about social and economic development altered over time after COVID-19 and the ensuing policy responses up until July 2020, Gormsen and Koijen, (2020) analysed the total number of dividend futures market data and stocks. Their projections included a reduction of eight percent in the yearly increase of dividends in Japan and the United States and a decrease of fourteen percent in Europe. The continuous growth of the stock markets was also bolstered by news regarding the fiscal stimulus plan and United States monetary policy throughout March 24, although prospects for short-term growth were not significantly raised.

The influence of the upsurge of coronavirus on the operations of the Nigerian stock market is evaluated by Adenomon and Maijamaa, (2020). The findings showed that when compared to the typical time, stock returns were lower and more volatile in Nigeria during the COVID-19 era. Results of their demonstrated that the coronavirus has had a perilous effect on the Nigerian stock market. To strengthen the financial market and draw more potential investors to the Stock Exchange of Nigeria. Bash, (2020) used event study analysis to investigate the effect of the first coronavirus-recorded case on the performance stock market. Cumulative Abnormal Returns for thirty nations

were calculated using market model approaches and mean-adjusted returns. According to the findings, stock market returns had trended lower, with large adverse returns regarding the coronavirus outbreak.

In the empirical analysis of Ali et al. (2020), they used the change in prices and returns of the global indices from Morgan Stanley Capital for the major 9 nations with the coronavirus reported cases as well as numerous local indicators. Their findings indicated that the coronavirus crisis had an adverse effect on the returns of the majority of financial securities, while the COVID-19 deaths caused the stocks to become more unpredictable.

Alzyadat and Asfoura, (2021) proposed that there is a negative and significant connection between market returns and reported cases in Saudi Arabia. During the initial stages of the outbreak, there was a significant negative market reaction, and it was evident that VIX had turned into a route for the transmission of the impact of COVID-19 on stock markets. Narayan et al. (2022) carried out a study on how the pandemic impacted the stock market returns in Australia across all sectors using a quantile regression model. They used empirical evidence to show that, in reaction to COVID-19, the healthcare sectors, consumer staples, healthcare, and information technology performed atypically well, while the finance, communication, energy, and consumer discretionary sectors had significant declines.

The relationship between stock market and the Media Hype index during the COVID-19 outbreak

The relationship between the stock market and media coverage during the COVID-19 pandemic has garnered significant attention among researchers. The effect of COVID-19-related health news on the financial markets is

examined by Salisu and Vo, (2020). They used the panel technique, the financial markets of 20 nations were examined between January 1 and March 30, 2020. They demonstrated that news about health had a detrimental influence on stock market returns, suggesting that returns fall as more news about health was announced, including information about macroeconomic factors. Narayan, (2020) looked into the impact of COVID-19 news on oil prices had on oil prices in the Japanese stock market. Negative and positive oil price news influenced prices of oil at increasing change thresholds when COVID-19 is used as a baseline.

In the near run, the pandemic increased investors' tendency to herd. according to Mnif and Jarboui, (2021) findings, COVID-19 decreased prejudice in the herd. Urquhart (2018) investigated investors' interests using data from Google trends searches made on Bitcoin. He discovered that the recognition of Bitcoin during COVID-19 had no bearing on forecasting fluctuations and Bitcoin's returns.

Using the daily news headlines as their basis, Baker et al. (2020) carried out research on the fluctuations of the stock market of the United States because of COVID-19 and discovered that COVID-19 had a remarkable effect on the United States stock market, specifically after 24 February 2020.

Ambros et al. (2021) studied how news disseminated about how COVID-19 impacted eight stock market indices. Their conclusion of the research displayed that while fluctuations in the volume of stocks, and COVID-19-related news did not affect stock returns, they significantly exacerbated the changes in the prices of stocks in the European stock markets. Papadamou et al. (2020) also employed panel data analysis to investigate how

25

the use of Googling trends synthesized index on how COVID-19 affected the inferred price fluctuations of thirteen percent significant stock markets in Australia, the United States of America, Europe, and Asia. According to the study, increased COVID-19 search activity has an immediate impact on volatility, and the coronavirus' indirect effects are transferred through market returns due to risk-averse investors, with Europe being severely affected.

The relationship between stock market and the Media coverage index during the COVID-19 outbreak

The widespread spread of the coronavirus and the resulting socioeconomic impacts due to strict containment measures implemented by numerous countries have underscored the significance of media coverage surrounding the pandemic. This is particularly crucial in fostering public acceptance of measures such as curfews, lockdowns, and mobility restrictions, while also preparing for the economic recovery post the COVID-19 slowdown. Various studies in behavioural finance have utilized media monitoring to assess both societal behaviour and financial market trends (Bukovina, 2016; Umar & Gubareva, 2020). Overall, these studies concur that media monitoring serves as a potent tool for gathering data, focusing on factors such as market sentiment, public mood, and other behavioural drivers, which may not always be entirely rational.

In a specific study, Chen-Hui and Chan-Jane (2017) conducted research using an extensive dataset focusing on social media announcements regarding companies listed on the Taiwan Stock Exchange. Their findings suggest that investors' trading behaviors are impacted both by the quantity and quality of media coverage. Different groups of investment professionals

26

exhibit varied responses to the sentiment conveyed in news coverage, while foreign investors typically align their trading patterns with the overall tone—whether positive or negative—of media announcements.

Similarly, Yang et al. (2019) discovered that companies with a higher frequency of news coverage in the preceding month tend to experience more sustained stock returns compared to those with fewer publications in the following months. They conclude that the influence of publication frequency on stock returns is particularly pronounced and positive, especially in markets where retail or amateur investors dominate.

Furthermore, Yang et al. (2019) demonstrate that increased media coverage leads to sustained attention from the investment community toward a particular company. This heightened attention encourages stock purchases, thereby driving up prices and resulting in greater gains for shareholders. However, they acknowledge that the impact of media activity on stock returns varies depending on the characteristics of investment communities.

The daily newspaper-based indicator of unpredictability connected to the pandemic, according to Bouri et al. (2021), can improve predictions of the realized variation of gold. Research by Sun et al. (2021) discovered that neither financial news nor information about the coronavirus had an effect on investing behaviours in Hong Kong, Japan, China, the U.S., and Korea. To evaluate and analyse the connection between the upsurge of COVID-19, Bitcoin, and social media. Béjaoui et al. (2021) employed the fractional error correction model, impulse response functions, and fractional autoregressive vector model. They suggested that the pandemic influenced Bitcoin values and social media networks.

27

Relationship between stock market and the Panic index during the COVID-19 outbreak

Amid the COVID-19 outbreak, understanding the relationship between Africa's stocks and the panic index becomes imperative in navigating financial market dynamics. Haroon and Rizvi, (2020) conducted a study on how news disseminated about COVID-19 on the fluctuation of financial markets around the globe, sub-sectors indexes, and the United States. As a stand-in for news about COVID-19, the media coverage, panic index, and the global, sentiment indicator index was used. Their study demonstrated how panic due to coronavirus news can significantly raise the volatility in equities markets thought to be adversely impacted by the outbreak.

Pieiro-Chousa et al. (2022) looked at how the stock market reacted to the businesses that produced the first COVID-19 immunizations before and during the outbreak. They thought about how the stock returns of Moderna and Pfizer may be impacted by market fluctuations, the technological market, and investors' mood index. They discovered that investors' emotions cause panic and changes in the market have different effects on stock performance. The stock returns of Moderna and Pfizer also had an influence on the technological market during the COVID-19 epidemic.

By utilizing the RavenPack database Analytics, Shi and Ho, (2021) investigated the impact of sentiment on fluctuations in equities by employing a fractionally integrated exponential GARCH approach with Markov regime switching. The results showed that negative sentiment caused a huge change in the state of intraday stock returns.

Relationship between stock market and the fake news Index during the COVID-19 outbreak

Scholars have approached the concept of fake news from various angles, albeit with a common essence. McGonagle, (2017) defines fake news as deliberately crafted misinformation aimed at misleading individuals by presenting false or unverifiable facts. Similarly, Duffy et al., (2019) classify fake news as information mimicking legitimate news stories but containing false and deceptive content. In this study, fake news encompasses untrue information, including myths, rumors, and hoaxes intentionally or unintentionally spread on social media platforms (Wang et al., 2019). This definition highlights the distinction between the unintentional sharing and deliberate creation of fake content, particularly relevant in the context of COVID-19, where misinformation may be unwittingly shared with good intentions (Egelhofer & Lecheler, 2019).

Exploring the relationship between Africa's stocks and the fake news index amidst the COVID-19 pandemic reveals critical insights into market dynamics. Cepoi, (2020) examined how financial markets in the six developed economies most impacted by COVID-19 (Spain, the United Kingdom, Germany, the United States, France, and Italy) reacted to news about the outbreak. Using a panel quantile regression analysis, the study found that stock prices display asymmetric dependency on COVID-19-related news. The study also discovered that fake news had an adverse nonlinear effect on the second and first quartiles of returns and that gold did not function as a safe haven during an outbreak.

29

Using an event research approach, Harjoto et al. (2021) looked at how the global pandemic affected the financial markets. They discovered that developing stock markets were most adversely affected than established stock markets by the pandemic. Their study also focuses on analysing opinions about the COVID-19 vaccine using information from social media.

Hassan (2020) suggests that the proliferation of fake news may stem from a desire to increase online followership. Notably, a tweet suggesting Nigerian President Muhammadu Buhari's illness and potential COVID-19 contraction garnered significant engagement, amassing 3,300 likes and over 2,000 shares within hours. Additionally, sensationalist remarks attributed to purported "health experts" have circulated widely. On March 23, 2020, an audio clip purportedly from a WHO worker circulated on WhatsApp, forecasting 45 million Nigerian deaths due to the pandemic (Hassan, 2020).

Hou et al. (2020) conducted research indicating a correlation between increased use of social media for COVID-19 information and heightened risk perception of the virus. Similarly, Huynh (2020) observed in Vietnam that citizens tended to trust fake news about COVID-19 more than official government announcements. In Taiwan, Frenkel et al., (2020) discovered through social media posts a significant dissemination of false information regarding COVID-19 infections, including rumors about the country's President being infected. Parallel studies in the US revealed widespread dissemination of false virus-related information due to inadequate critical thinking (Pennycook et al., 2020). Recommendations emphasize the importance of verifying information for accuracy before sharing it within networks. Sahu et al. (2020) identified instances where self-proclaimed

30

experts in Nigeria advocated unproven cures like sun exposure and frequent intercourse. Others wrongly asserted the virus's harmlessness to Africans (Lampos et al., 2020). Despite lacking medical validation, these claims continue to spread among Nigerian and global social media users.

The Gap of the study

Numerous studies discuss the reaction of stock markets in Africa to the COVID-19 outbreak, whether they are country-specific or cross-country studies, but none of them has documented COVID-19-related news and stock market returns in Africa. Due to the lack of literature on the relationship between COVID-19 news and the stock market in Africa, this study makes a significant addition and fills the knowledge gap in that area. In this regard, this study provides knowledge and further advancement to this field of literature by using the top six stock market returns (Mauritius, South Africa, Ghana, Egypt, Nigeria, and Morocco) and their respective data to evaluate the dynamic asymmetry relationship between COVID-19-related news and stock market return in Africa. These countries were chosen for this study because, according to the World Health Organisation, 2020, their economies were immensely impacted by the COVID-19 pandemic in Africa.

During uncertain situations, estimating the parameters using the ordinary least squares model can greatly distort the findings, but calculations based on quantile regression models are more resistant to outliers than ordinary least squares models. In this study, the ordinary least square model is estimated between stock returns and COVID-19 news to set side by side their dynamics in the quantile regressions. The methodologies employed by this

31

study are quantile-in-quantile regression and quantile regression which fully account for different conditional distributions and turbulent markets.

According to Bera et al. (2014), quantile regression method is a valuable procedure and technique to employ if the majority of the key or selected variables are heterogeneous. Quantile regression is used to tackle this problem, allowing for a more detailed analysis of various market conditions (i.e. normal, turbulent markets, and benign). It also enables us to document and explain the multifaceted responses of the complete conditional distribution of the stock returns to the shocks in the COVID-19-related news, thus, it helps to present the degree and structure of the connection between the variables in both normal and severe market conditions (Baur, 2013).

Moreover, the quantile regression method also provides reliable estimates in the presence of outliers, heteroscedasticity, and skewness in the response variable (Koenker, & Hallock, 2001). This study offers insights by employing the quantile regression model propounded by Koenker and Basset, (1978) to analyse and examine the connection between the selected variables.

Stock markets in periods of crisis exhibit enormous heterogeneity and therefore the nature of the relationship may vary according to the conditional distribution of the returns. In that regard, the quantile regression approach becomes a useful tool that solves this problem as it is able to explain and analyse the different conditional distributions of the stock returns in these stock markets. This also enables the study to offer insights into the possibility of a safe haven in this period of uncertainty.

Finally, one of the quantile regression method's limitations is its inability to effectively scrutinize the asymmetric relationship between the

variables, whereas the quantile-on-quantile method presented by Sim and Zhou, (2015) used in this research is capable of accounting for the overall relationship between variables.

Conceptual Framework

The conceptual framework for this research involves understanding the interconnected relationships between fake news, media coverage, media hype, panic index, and stock market returns in the context of the COVID-19 pandemic. The arrows represent the potential directional influence of these variables on stock market returns.

By examining these relationships, the research aims to provide insights into how the information ecosystem surrounding COVID-19 influences stock market returns in Africa, contributing to a nuanced understanding of the complex dynamics in financial markets during times of crisis.
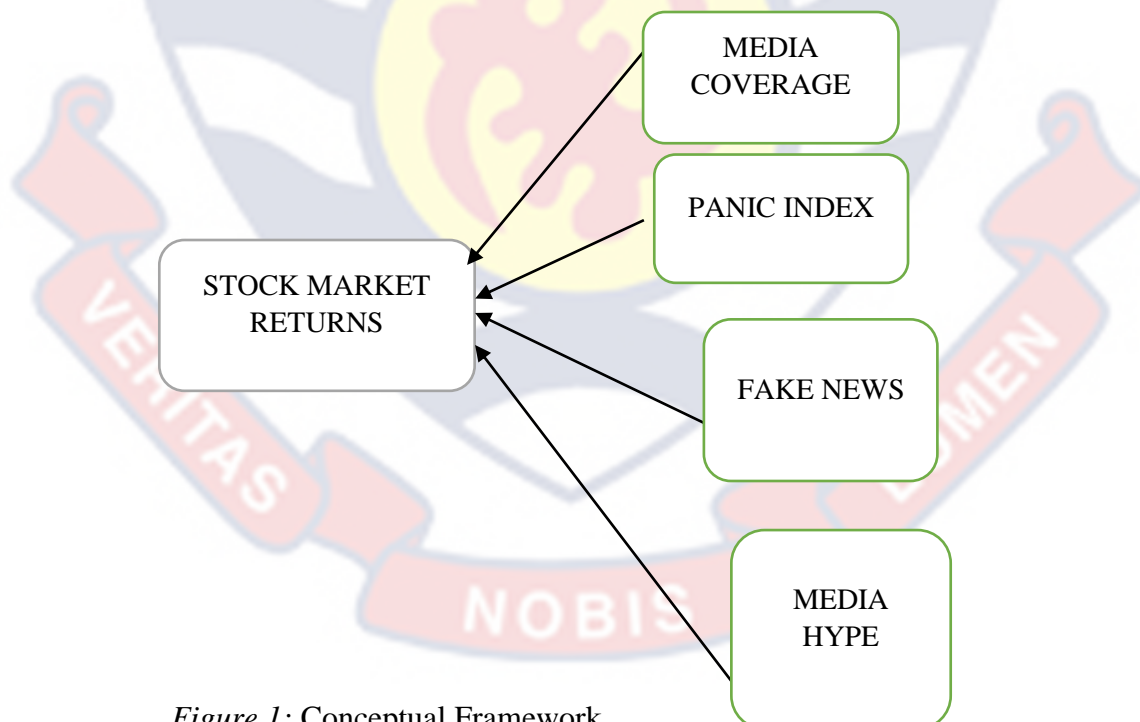
Figure 1: Conceptual Framework
Source: Author's construct (2022)

Chapter Summary

This chapter began with theories underlying the dynamic asymmetry relationship between COVID-19-related news (media hype, media coverage, panic index, and fake news) and stock market returns in Africa. This study uses these underpinning theories: black swan theory, efficient market hypothesis, and prospect theory. The second section likewise focused on existing research or previous studies that were linked to this topic. It was discovered after examining the aforementioned studies that no research has yet been done in Africa that evaluate and analyses the dynamic asymmetry connection between COVID-19-related news and stock market performance in Africa. By doing this research in the setting of Africa, this study hopes to add more knowledge to this field of literature.

CHAPTER THREE

RESEARCH METHODS

Introduction

This section examines the strategies employed to attain the study's goals. It highlights the research design, paradigm, data collection, and methodology employed in the study. This study also describes how the data was analysed.

Research paradigm

According to Thornhill et al. (2016), the phrase "research philosophy," sometimes known as "research paradigm". The five key ideologies that have affected social scientific research over the years, according to Saunders et al (2016), are critical realism, positivism, postmodernism, pragmatism, and interpretivism. The analytical and theoretical framework of positivism holds themes that may be scientifically tested and thus generalized. As a result, positivists place a premium on research techniques that result in the development of facts that are unaffected by human interpretation.

The positivist research paradigm used in this research enables the researcher to comprehend the topic using conversational, descriptive language (Malhotra & Birks, 2007; Aaker et al. 2001). The positivist paradigm's proponents claim that this approach comprises performing a study into an identity and social experience, deriving generalizations and conclusions, and allowing the prediction of a general phenomenon (Cooper & Schindler, 2008). The positivist paradigm, in particular, requires statistical significance testing of the data, data collection, presenting of quantitatively expressed results, and data analysis. Because it entails gathering information about the dynamic

35

relationship between COVID-19 news and stock market performance, the positivist paradigm is employed.

Research Approach

There are three primary types of research approaches: quantitative, qualitative, and blended techniques (Creswell, 2014). According to Saunder and Lewis, (2012), the positivist research paradigm employs a quantitative research approach, hence this study will use a quantitative research method. To make predictions, a quantitative research approach, according to Creswell, (2014), requires looking for causal explanations. This study will adopt a quantitative methodology since hypotheses will be drawn from models and theories will be created based on these presumptions. Since statistical analysis is a component of the quantitative approach to research, statistical techniques are used in this research to analyse the data.

Research Design

According to Saunder and Lewis (2012), research design can be descriptive exploratory, or explanatory. This study employs explanatory research. This study seeks to establish the link between variables, that is, how one influences the other. It also seeks to explain one or more variables' causes and/or effects Saunder and Lewis, (2012). Explanatory research design to explain the dynamic asymmetric relationship of the stock market to COVID-19 news.

Data Collection

This research determines the dynamic impact of COVID-19 news on stock market returns during the upsurge of the COVID-19 pandemic from 1st February 2020 to 28th February 2022 in six African countries (Mauritius,

36

Nigeria, South Africa, Ghana, Egypt, and Morocco). The selected nations were identified based on the data that was available, and they were also chosen because they have the most established stock exchanges in Africa and also, according to the World Health Organisation, (2020), they were the nations that were severely affected by the coronavirus.

Table 1: Data and Sources

Countries	Details, Index and Sources
Nigeria	Daily data, NSE All-Share Index (NGSEINDEX).
South Africa	Daily data, FTSE/JSE Top 40 Index (JTOPI)
Morocco	Daily data, Moroccan All-Shares Index (MASI).
Ghana	Daily data, GSE Composite Index (GSE-CI)
Mauritius	Daily data, SEMDEX (MDEX).
Egypt	Daily data, EGX 30 Source: www.investing.com

Source: Author's Construct (2022)

The secondary data were used to gather information. The research was based on information from publications and the internet that was relevant to the subject. All secondary data sources were properly credited in the research's reference section.

Model Specification

Quantile Regression

The research utilizes the Koenker and Basset, (1978) quantile regression approach because it offers a thorough description of the nature and strength of the association between the variables under various market situations (Baur, 2013). Additionally, the method is stronger against

37

heteroscedasticity, outliers, and skewness on the dependent variables (Koenker, & Hallock, 2001).

In quantile regression, it is assumed that the value of ε_i conditional on the τ-th quantile is zero. In light of this, the conditional quantile model of ε_i given that x_i can be calculated as follows:

$$Q_{yi}(\tau|x) = \alpha(\tau) + x_i'\phi(\tau) \qquad (1)$$

In the previous equation, $0< \tau <1$. Additionally, $Q_{yi}(\tau|x_i, \alpha)$ denotes the τ-th conditional quantile of y_i, $\phi(\tau)$ stands for the equation's parameters, and α is the unknown effect. In the model, x stands for each independent variable. The following formula can be used to calculate the coefficients of the conditional distribution τ-th quantile:

$$\hat{\phi}(\tau) = arg\ min_{\phi \in R^P} \sum_{i=1}^{n} \rho\tau\ (y_i - x_i'\phi(\tau) - \alpha(\tau)) \quad (2)$$

where $\rho\tau(u) = u(\tau - I(u\ b\ 0))$ is the check function and $I(\cdot)$ is an indicator function $(u= y_i - x_i'\phi(\tau) - \alpha(\tau))$.

Panic Index, Media coverage, Media hype, and Fake news are the new variables that affect stock market return that needs to be looked at. Many different factors can have an impact on stock market return, such as inflation rate, exchange rate, etc., which are widely known and thoroughly researched by many researchers Osagie, Maijamaa, and John, (2020). In that regard, we selected the below variables to fill the gap. To estimate the influence of COVID-19 news on stock returns, we estimate the quantile regression as:

$$Q_{\Delta stock\ Price_t} = \alpha(\tau) + \phi(\tau)\Delta COVID_t \qquad (3)$$

in the above equation, $\Delta Stock\ Price_t$ stands for the change in stock price at time t (stock returns), and $\Delta COVID_t$ is the change in media coverage, media hype, panic index, and fake news.

The study specifies seven quantiles, in this case, $\tau = (0.05, 0.10, 0.25, 0.5, 0.75, 0.90, 0.95)$ where they stand for the downturn condition, and the upper quantiles $\tau = (0.75, 0.90, 0.95)$ denote the benign conditions, and the median, $\tau = (0.5)$ is the normal condition

Quantile-on-Quantile Regression Approach

An empirical justification for the conditional quantile link across two or more variables is provided by the quantile-on-quantile technique, a non-parametric variant of quantile regression (Sim & Zhou, 2015). It is presumed that the quantile-in-quantile technique combines a non-parametric estimator with a quantile regression estimator (Sim & Zhou, 2015). Since quantiles can convey asymmetry across low and high returns concerning price patterns, the quantile-on-quantile technique appears suitable to analyse the bullish and/or bearish link between news relating to COVID-19, and stock returns. This paper examines this connection beginning with

$$ST_t = \beta^\theta(EX_t) + u_t^\theta \qquad (3)$$

where ST_t and EX_t denotes the stock and fake news, panic Index, media coverage and media hype return of African markets t, θ is the θth quantile of the conditional distribution of ST_t and u_t^θ is the error quantile whose θth conditional quantile is made-up to be zero, and $\beta^\theta(\cdot)$ represents the slope of this relationship. We can extend Eq. (3) by a first order Taylor expansion of a quantile of EX^τ as follows:

$$\beta^\theta(EX_t) \approx \beta^\theta(EX^\tau) + \beta^{\theta'}(EX^\tau)(EX_t - EX^\tau) \qquad (4)$$

where $\beta^{\theta'}$ explains the partial derivative of $\beta^\theta(EX_t)$, indicative of a marginal effect as the slope. We see that θ is the functional form of $\beta^\theta(EX^\tau)$ and $\beta^{\theta'}(EX^\tau)$ while τ is the functional form of EX and EX^τ, hence θ and τ

39

are the functional forms of $\beta^{\theta}(EX^{\tau})$ and $\beta^{\theta'}(EX^{\tau})$. If we represent $\beta^{\theta}(EX^{\tau})$

and $\beta^{\theta'}(EX^{\tau})$ by $\beta_0(\theta, \tau)$ and $\beta_1(\theta, \tau)$, respectively, then Eq. (5) can suffice.

$$\beta^{\theta}(EX_t) \approx \beta_0(\theta, \tau) + \beta_1(\theta, \tau)(EX_t - EX^{\tau}) \qquad (5)$$

By substituting Eq. (5) into Eq. (3), we arrive at the Eq. (6) as follows:

$$ST_t = \underbrace{\beta_0(\theta, \tau) + \beta_1(\theta, \tau)(EX_t - EX^{\tau})}_{(*)} + u_t^{\theta} \qquad (6)$$

and the conditional quantile of θth of stock returns is given by (*). Additionally, it demonstrates the real connection between the quantiles of fake news index, media coverage index, media hype index and panic index (θth) and stock returns (τth) for parameters β_0 and β_1 with indices of θ and τ respectively. As in ordinary least squares (OLS), an identical simplification is applied to arrive at Eq. (7)

$$\min_{b_0, b_1} \sum_{i=1}^{n} \rho_{\theta} \left[ST_t - b_0 - b_1 \left(\widehat{EX}_t - \widehat{EX}^{\tau} \right) \right] K \left(\frac{F_n(\widehat{EX}_t) - \tau}{h} \right) (7)$$

where i is the function of indicator, $K(\cdot)$ is the kernel density function and h represent kernel density function bandwidth parameter. The $\rho_{\theta}(u)$ is the quantile loss function represented as $\rho_{\theta}(u) = u(\theta - I(u < 0))$, The kernel function weights the observations of EX^{τ} where the minimal9 weights are adversely connected to distribution function of of $\widehat{EX}_t$ as $F_n(\widehat{EX}_t) = \frac{1}{n}\sum_{k=1}^{n} I(\widehat{EX}_k < \widehat{EX}_t)$. In accordance with Sim and Zhou (2015), $h = [0.05 \, to \, 0.95]$ was chosen

Quantiles' bandwidth is determined using empirical quantile-in-quantile analysis. The bandwidth, which divides the quantiles, controls how smoothly the estimation outcomes are presented. To avoid biasing the predicted coefficients, lower bandwidths are preferable over larger ones.

Quantile-on-quantile regression and quantile regression are used to determine the connection between COVID-19 news and African stock returns as input variables. By doing so, we can deduce the connection during both bull and bear return occurrences at long-term, short-term, and medium, in addition to capturing the non-linear non-stationary time-varying connection. This investigation of African stock markets is a first of its type. To help various kinds of investors achieve their objectives of increasing profits or reducing risks, it offers new insights.

Measurement of Variables

The variables under investigation will be measured using the relevant operational definitions during the duration of this research.

Dependent Variables

The goal of the research was to analyse and evaluate the dynamic connection between stock returns and COVID-19-related news (media coverage, fake news, media hype, and panic index). The return on stocks is hence the study's dependent variable.

Stock Market Movement

Stock Market Returns: The outcome of the interplay between fake news, media coverage, media hype, and panic index on investor behaviour. Stock market returns reflect the financial consequences of these dynamics during the COVID-19 era (Zoungrana, Toe & Toé, 2021). Stock exchange log return, which represents stock performance, is used to gauge stock market activity. The return Index after Aga and Kocaman (2006) is computed using the equally balanced return index.

41

Independent Variables

The study sought to examine the dynamic relationship between COVID-19-related news (media coverage, media hype, fake news, and panic index) and stock returns. Thus, the independent variables are media coverage, fake news, media hype, and panic index.

Fake News

Fake news refers to misleading information and rumors, particularly in the era of COVID-19, have the potential to impact investor sentiments and decision-making (Vosoughi et al., 2018). False information may induce panic, fear, and uncertainty, affecting stock market behavior.

Media Coverage

The extent and intensity of media reporting on COVID-19 events can shape public perception and influence market sentiments (Haroon & Rizvi, 2020; Bai et al., 2020). Increased media coverage may lead to heightened awareness and reactions in financial markets.

Media Hype

Exaggerated or sensationalized reporting can contribute to amplified market reactions (Smales, 2014). Media hype may create a sense of urgency or fear, impacting investor decisions and, consequently, stock market returns.

Panic Index

A quantifiable measure of panic or anxiety related to the COVID-19 outbreak. Higher panic index values indicate increased fear and uncertainty, potentially translating into volatile stock market movements (Akhtaruzzaman et al., 2020).

42

Table 2: Measurement of Variables

Variables	Measurement Indicators	Sources
The panic Index (PI)	It measures the level of news chatter that makes reference to panic or hysteria and coronavirus.	RavenPack https://coronavirus.raven pack.com/
The Media Hype Index (MH)	It measures the percentage of news talking about the novel coronavirus	RavenPack https://coronavirus.raven pack.com/
The media coverage Index (MC)	It calculates the percentage of all news sources covering the topic of the novel coronavirus	RavenPack https://coronavirus.raven pack.com/
The Fake News Index (FN)	It measures the level of media chatter about the novel virus that makes reference to misinformation or fake news alongside COVID-19.	RavenPack https://coronavirus.raven pack.com/

Chapter Summary

The research techniques employed in this study were covered in this chapter. This study mainly used the quantitative method. It also used his study to seek to establish the link between variables, i.e., how one influences the other. It also seeks to explain how one or more independent variables affect another variable (dependent). The data was collected from Raven Pack database Analytics and investing.com. The tool used to run the analysis in R programming.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The relationship between fake news, media hype, media coverage, panic index, and the stock market return are examined in this chapter. The study goes on to look into how COVID-19-related news (media hype, media coverage, panic index, and fake news) impacts stock market returns during the pandemic. Data collected from Ravenpack.com and investment.com was employed in this investigation. Descriptive analysis, correlation analysis, quantile regression, and quantile-on-quantile regression were examined using R programming are the statistical tools used in this study. To make the results more readable, they are given in tables. In keeping with the major study goal, this chapter reflects on the core research objectives described in Chapter One.

Descriptive Analysis

Table 2 exhibits the descriptive statistics on the stock returns and the changes in the emotions of investors through Panic, Fake news, Media hype, and Media coverage in South Africa, Nigeria, Egypt, Ghana, Mauritius, and Morocco. It can be observed that the mean stock returns for the sampled periods are very low for the stock markets. This may partly be attributed to the effect of the coronavirus pandemic since the countries represent the most affected in terms of numbers of COVID-19.

The mean of the stocks returns of Mauritius, South Africa, Nigeria, Egypt, Morocco, and Ghana for the time of analysis was 0.0003 (with a standard deviation of 0.0034), 0.0004 (with a standard deviation of 0.0235),

44

0.0004 (with a standard deviation of 0.0140), 0.0007 (with a standard deviation of 0.0003), 0.0004 (with a standard deviation of 0.0119) and 0.0065 (with a standard deviation of 0.0140) respectively. Results indicate that stock price movements were often small, and as a result, the datasets appear to be very close to the mean. The Shapiro-Wilk test results also show that the data on the variables are approximates rather than follow a normal distribution.

Further, from the Augmented Dickey-Fuller test, it can be seen that there is sufficient evidence to conclude that the data is stationary as we reject the null hypothesis of a unit root. This implies that the stock market returns series are stationary. In addition, the prices of stocks are negatively skewed for all countries while positively skewed for panic index, Media coverage, Fake news, and Media Hype except the media coverage of Ghana which is also negatively skewed. The findings show that all markets have negative skewness, which indicates that returns series are skewed to the left, and high levels of kurtosis, with kurtosis statistics higher than 3, which indicates a leptokurtic distribution, which also suggests that return series have fatter tails than the normal distribution. These findings suggest that the likelihood of encountering negatively extreme values is significantly larger than that of a normal distribution (Aloui et al. 2012).

Table 3: Descriptive Statistics

Statistics	Stock returns	Media coverage	Media Hype	Fake news	Panic news Index
Morocco					
Mean	0.0004	0.2840	0.2817	0.7590	0.8144
Std. Dev.	0.0119	0.2857	0.2741	0.8125	0.7130
Skewness	-2.3555	2.0469	1.9762	1.0679	1.4048
Kurtosis	16.9785	5.0482	4.6680	0.7687	2.4914
Normtest	0.7744**	0.7942**	0.8047**	0.8596**	0.8818*
ADF Test	0.0023	0.01	0.01	0.01	0.0003
Egypt					
Mean	0.0007	0.2213	0.2771	0.7893	0.7656
Std. Dev.	0.0003	0.2329	0.2853	0.7894	0.7046
Skewness	-1.4937	2.2791	3.4559	1.5636	1.6794
Kurtosis	9.5965	7.7582	26.0768	2.9508	3.2134
Normtest	0.8546**	0.7820**	0.7563**	0.8582**	0.8461*
ADF test	0.002	0.01	0.01	0.01	0.0012
Ghana					
Mean	0.0065	0.2522	0.2049	0.6882	0.5804
Std. Dev.	0.0140	0.2052	0.2277	0.5822	0.5561
Skewness	-1.8938	-0.1192	0.7384	1.0052	0.5271
Kurtosis	2.4689	-0.2597	1.0921	0.0018	-0.6898
Normtest	0.6568**	0.9729**	0.9143**	0.8756*	0.9370*
ADF test	0.0001	0.01	0.01	0.001	0.005
Mauritius					
Mean	0.0003	0.4114	0.4677	0.5149	0.9844
Std. Dev.	0.0034	0.4989	0.5880	0.7773	0.8160
Skewness	-0.9115	2.6387	2.5561	1.5251	0.6698
Kurtosis	1.8974	6.9809	8.3961	1.4010	6.5026
Normtest	0.9470**	0.6548**	0.7169**	0.7179***	0.9231**
ADF Test	0.001	0.01	0.01	0.002	0.002
Nigeria					
Mean	0.0004	0.2116	0.2638	0.7744	0.7184
Std. Dev.	0.0140	0.2340	0.2905	0.8036	0.6769
Skewness	-4.2022	2.5266	3.5299	1.7405	1.6051
Kurtosis	49.5519	8.8763	25.1776	3.6293	2.6006
Normtest	0.6806**	0.7484***	0.7367**	0.8264**	0.8439*
South Africa					
Mean	0.0004	0.1016	0.1304	0.6600	0.5890
Std. Dev.	0.0235	0.1428	0.1559	0.7169	0.4739
Skewness	-1.1308	5.5313	4.6271	1.7081	1.0859
Kurtosis	5.5614	49.3277	36.3060	3.1670	0.7816
Normtest	0.9043**	0.5752**	0.6531***	0.8107**	0.9072**
ADF Test	0.001	0.002	0.001	0.0004	0.0003

Note: ∗∗∗, ∗∗, and ∗ denote significance at 1%, 5%, and 10%, respectively.
 Std.Dev. represents standard deviation. Normtest= Shapiro-Wilk test
ADF Test= Augmented Dickey-Fuller test
Source: Author's Construct (2022).

Table 4: Correlation Matrix

Variables	1	2	3	4	5	VIF
Nigeria						
Media Coverage	1					1.81
Fake News	0.003	1				2.25
Media Hype	0.046*	-0.233	1			1.70
Panic Index	-0.507	0.432	-0.033	1		2.35
Stock Return	-0.292*	-0.320*	-0.167*	-0.213**	1	1.20
Ghana						
Variables	1	2	3	4	5	VIF
Media Coverage	1					2.02
Fake News	0.030	1				1.22
Media Hype	0.802	0.020	1			2.40
Panic Index	0.052	0.061	0.024	1		2.30
Stock Return	-0.432*	-0.239	-0.409*	-0.257	1	1.14
Egypt						
Variables	1	2	3	4	5	VIF
Media Coverage	1					3.29
Fake News	0.283	1				2.30
Media Hype	0.777*	0.058	1			3.92
Panic Index	0.639	0.283	0.305	1		1.61
Stock Return	-0.321*	-0.706*	-0.381*	-0.468*	1	1.12
Morocco						
Variables	1	2	3	4	5	VIF
Media Coverage	1					2.33
Fake News	0.051	1				1.24
Media Hype	0.055	-0.237	1			2.50
Panic Index	0.032	0.035	-0.557	1		3.05
Stock Return	-0.323*	-0.248	-0.684	-0.444**	1	1.40
Mauritius						
Variables	1	2	3	4	5	VIF
Media Coverage	1					3.60
Fake News	-0.002	1				2.20
Media Hype	0.0232*	0.453	1			3.20
Panic Index	0.034*	0.654	0.543	1		1.55
Stock Return	0.3210	-0.444*	-0.056*	-0.222*	1	1.33
South Africa						
Variables	1	2	3	4	5	VIF
Media Coverage	1					2.90
Fake News	0.541	1				1.82
Media Hype	0.800*	0.676	1			2.11
Panic Index	0.697	0.765	0.043	1		1.67
Stock Return	-0.562*	-0.289*	-0.784*	-0.065*	1	1.89

Note: 1,2,3,4 and 5 represent Media Coverage, Fake News, Media Hype, Panic Index and Stock Return respectively. ∗∗∗, ∗∗, and ∗ denote significance at 1%, 5%, and 10%, respectively.
Source: Author's Construct (2022).

Correlation Analysis

Table 3 shows the correlation matrix table. As the news of COVID-19 elevates in the media, the stock return of Nigeria, Egypt, Ghana, and South Africa decreases and vice versa. Furthermore, An increased panic Index with regard to COVID-19-related news increases, and the stock return of Nigeria, Egypt, Morocco, Mauritius, and South Africa decreases and vice versa. In addition, as the fake news of COVID-19 increases in Nigeria, Egypt, Mauritius, and South Africa increases, the stock return in these countries also decreases and vice versa.

The multicollinearity issues among independent variables are shown by the variance inflation factor (VIF). **Table 3** reveals that there is no problem with multicollinearity among the variables if the VIF is less than 5. If the VIF is greater than 5, multicollinearity is recognized as high in the regression model.

Quantile Regression (QR) Results

Table 5 displays quantile regression estimates from 0.05 to 0.95 quantiles. According to the results, in relation to Nigeria and Morocco, fake news has an adverse effect on quantiles, showing that nefarious businesses can utilize fake news to influence people's investment preferences and decisions (Zhang & Ghorbani, 2020). The returns of the indices are unaffected by fake news and information whether the market is either bullish (0.95 quantiles or higher) or bearish (0.05 quantiles or lower), Cepoi, (2020). The results also show that a decrease in fake news produces a rise in stock returns in Ghana, Mauritius, Egypt, and South Africa, and vice versa in extreme market conditions. The lower quantiles have a positive and significant impact on the stock market

50

return across all countries, whereas the upper quantiles have a negative and significant impact.

Table 5: Quantile Regression- Fake news

Quantiles	Nigeria	Ghana	Mauritius	Egypt	Morocco	South Africa
0.05	0.0145	0.1253***	0.0020***	0.0188*	-0.0096	0.0335*
0.10	0.0092	0.0009***	0.0020***	0.0112*	0.0060	0.0255*
0.15	0.0059	0.0070***	0.0016***	0.0077*	0.0031	0.0158*
0.20	0.0040	0.0070***	0.0017***	0.0059**	0.0019	0.0102**
0.25	-0.0028***	0.0050***	0.0010***	0.0051*	0.0136**	0.0070**
0.30	-0.0018***	0.0031**	0.0009***	0.0042**	0.0006**	0.00451**
0.35	-0.0013***	0.0017	0.0005	-0.0025*	0.0003**	0.00333
0.40	-0.0008***	0.0012	-0.0003**	-0.0011**	0.0004**	0.00239
0.45	-0.0004**	0.0000	-0.0006	-0.0003	0.0010**	-0.00006
0.50	-0.0001**	-0.0006**	-0.0008**	-0.0007*	0.0014**	-0.0021***
0.55	-0.0004***	-0.0006*	-0.0010*	-0.0005**	0.0017**	-0.0028**
0.60	-0.0004***	-0.0010**	-0.0013**	-0.0016*	0.0021**	-0.0041**
0.65	-0.0012***	-0.0079**	-0.0014**	-0.0023**	0.0025**	-0.0057**
0.70	-0.0017***	-0.0292**	-0.0014**	-0.0038**	-0.0034*	-0.0074*
0.75	-0.0041*	-0.0416**	-0.0018**	-0.0043*	-0.0045	-0.0108**
0.80	-0.0057*	-0.0104*	-0.0022**	-0.0056*	-0.0053	-0.0140*
0.85	-0.0068*	-0.0174*	-0.0031**	-0.0080*	-0.0066	-0.0187**
0.90	-0.0104*	-0.0174**	-0.0045**	-0.0114**	-0.0087	-0.0304*
0.95	-0.0221	-0.0275**	-0.0080**	-0.0213*	-0.0140	-0.0495**

Notes: ∗∗∗, ∗∗, and ∗ denote significance at 1%, 5%, and 10%, respectively.

Additionally, the media coverage index significantly and negatively affects all quantiles for Nigeria and Mauritius as well as the lower and upper quantiles for Ghana, Morocco, and South Africa. According to Fang and Peress, (2009), the amount of information distributed and conveyed has an impact on stock returns since stocks with little media coverage do better than those with more media coverage. The media's coverage of COVID-19-related news and the rise in the news about businesses have an impact on index performance (Cepoi, 2020; Haroon & Rizvi, 2020).

51

Table 6: Quantile Regression- Media coverage

Quantiles	Nigeria	Ghana	Mauritius	Egypt	Morocco	South Africa
0.05	-0.049***	-0.0032**	-0.0116***	0.0744*	-0.0508**	-0.2828**
0.10	-0.026***	-0.0032**	-0.0070***	0.0513*	-0.0228**	-0.1147**
0.15	-0.016***	-0.0179**	-0.0025***	0.0344**	-0.0119**	-0.0865**
0.20	-0.009***	-0.0179**	-0.0019***	0.0208*	-0.0075*	-0.0756**
0.25	-0.007***	-0.0049**	-0.0011***	0.0162*	-0.0047**	-0.0587**
0.30	-0.005***	0.0038	-0.0012***	0.01246	-0.0028**	-0.0405**
0.35	-0.003***	0.0000	-0.0013***	0.00661	0.0008	0.02571
0.40	-0.002***	0.0000	-0.0015***	0.00554	0.0001	0.01729
0.45	-0.0014**	0.0000	-0.0011***	0.00150	0.0006	0.00811
0.50	-0.0032**	0.0020	-0.0011***	-0.0003*	0.0027	0.0037
0.55	-0.0012**	0.0035	-0.0004***	-0.0019*	-0.0033*	0.00752
0.60	-0.0041**	-0.0044**	-0.0002***	-0.0050**	-0.0057**	-0.0182**
0.65	-0.0060**	-0.0117**	-0.0014***	-0.0066*	-0.0067**	-0.0273**
0.70	-0.0116**	-0.0117*	-0.0022***	-0.0097**	-0.0079**	-0.0436**
0.75	-0.0156**	-0.0259**	-0.0027***	-0.0129**	-0.0109**	-0.0593*
0.80	-0.0219**	-0.0193**	-0.0041***	-0.0172*	-0.0142*	-0.0809*
0.85	-0.0306**	-0.0585**	-0.0052***	-0.0260*	-0.0193**	-0.1226**
0.90	-0.0558**	-0.1175**	-0.0104***	-0.0417*	-0.0262**	-0.1735**
0.95	-0.0689**	-0.1253**	-0.0186***	-0.0901**	-0.0473**	-0.3081**

Notes: ∗∗∗, ∗∗, and ∗ denote significance at 1%, 5%, and 10%, respectively.

These African countries' economies deteriorate during economic downturns. Accordingly, investors in these companies experience panic and terror as a result of the bad news and false news about the COVID-19 pandemic, which affects how they value shares (Küçükçayli & Akinci, 2020) and causes significant declines in the value of financial assets. Also, because stock market prices can be influenced by investor attitudes (Chang et al., 2021), the negative effects are quickly transferred to the stock markets of these countries. The decrease in Panic Index leads to an increase in Stock returns in Nigeria, Morocco, Egypt, South Africa, Ghana, and Mauritius during the COVID-19 period and vice versa. This indicates that panic has a significant and positive influence on the stock returns in a bearish market (0.05 quantile or below) and a significant and negative effect on a bullish market (0.95 and above). According to Shi and Ho (2020), the news and information provided

to investors may lead to panic, which may alter the direction of stock market prices and returns.

Table 7: Quantile Regression- Panic index

Quantiles	Nigeria	Ghana	Mauritius	Egypt	Morocco	South Africa
0.05	0.0129***	0.0051***	0.0411***	0.0255**	0.01371	0.0535**
0.10	0.0079***	0.0051**	0.0208***	0.0159***	0.01084	0.0259*
0.15	0.0049**	0.0019**	0.0156***	0.0098**	0.00543	0.0192**
0.20	0.0038**	0.0015*	0.0122***	0.0070**	0.00436	0.0150*
0.25	0.0025***	0.0015	0.0071***	0.0054**	0.00237	0.0116
0.30	0.0016**	0.0005	0.0022***	0.0041***	0.00174	0.0062
0.35	0.0013**	0.0002	0.0005**	0.0027**	0.00093	0.0047
0.40	0.0007**	0.0002	0.0019**	0.0014**	0.00012	0.0023
0.45	0.0038	0.0000	0.0025	0.0009	0.00041	-0.0004
0.50	0.0022	0.0000	-0.0046	0.0013**	0.00068	-0.0029
0.55	-0.0022	0.0000	-0.0082	-0.0009**	0.00128	-0.0038
0.60	-0.0114	0.0000	-0.0089***	-0.0019*	-0.00156	-0.0064
0.65	-0.0176**	-0.0005**	-0.0136***	-0.0022**	-0.00250	-0.0083**
0.70	-0.0248**	-0.0011*	-0.0137***	-0.0035**	-0.00365	-0.0106**
0.75	-0.0039**	-0.0039*	-0.0154***	-0.0045*	-0.00421	-0.0124***
0.80	-0.0158**	-0.0071*	-0.0194***	-0.0066**	-0.00533	-0.0167***
0.85	-0.0973**	-0.0116**	-0.0253***	-0.0087*	-0.00662	-0.0219***
0.90	-0.0151*	-0.0185*	-0.0342***	-0.0139**	-0.00952	-0.0373**
0.95	-0.0199*	-0.0534**	-0.0452***	-0.0233**	-0.01599	-0.0633**

Notes: ∗∗∗, ∗∗, and ∗ denote significance at 1%, 5%, and 10%, respectively.

Regarding media hype, all the countries chosen for this study's analysis demonstrate that, throughout the COVID-19 period, a decline in the pandemic's media hype was accompanied by an increase in stock return and vice versa. Media hype has a positive significant influence on South Africa and a negative significant influence on Morocco, Mauritius, and Egypt.

Table 8: Quantile Regression- Media hype

Quantiles	Nigeria	Ghana	Mauritius	Egypt	Morocco	South Africa
0.05	-0.0424**	0.0042***	0.0113**	-0.0652***	-0.0577**	0.2583***
0.10	-0.0237*	0.0030*	0.0018**	0.0467**	-0.0271*	0.1411***
0.15	-0.0158**	0.0112*	0.0019	0.0329	-0.0145*	0.0815***
0.20	-0.0094**	0.0010**	0.0016	0.0209	-0.0085*	0.0669***
0.25	-0.0069**	0.0057*	0.0013	0.01598	-0.0061**	0.0405***
0.30	-0.0042**	0.0000	0.0012	0.00856	0.0046*	0.0292***
0.35	0.0028***	0.0000	0.0011	0.00627	0.0022**	0.0182**
0.40	0.0025***	0.0000	0.0010	0.00381	0.0007**	0.0132**
0.45	0.0018***	0.0003	0.0012	0.0019	0.0005	0.00829
0.50	0.0015***	0.0046	-0.0009*	0.0005	0.0020	0.00038
0.55	0.0115***	0.0069	-0.0004**	0.0017**	0.0036	0.00581
0.60	0.0035***	0.0493	-0.0003**	-0.0034**	-0.0054**	0.01530
0.65	0.0048***	0.0227	-0.0009**	-0.0071*	-0.0067**	0.02434
0.70	0.0078***	0.0238	-0.0017**	-0.0084**	-0.0091**	0.03944
0.75	0.0133***	-0.0477**	-0.0018*	-0.0105*	-0.0118*	-0.0520**
0.80	0.0187***	-0.0636**	-0.0023**	-0.0134**	-0.0155*	-0.0668**
0.85	0.0259***	-0.0886**	-0.0043*	-0.0197*	-0.0204**	-0.09560
0.90	0.0345***	-0.1117**	-0.0067**	-0.0277*	-0.0272*	-0.13898
0.95	0.0492**	-0.1507**	-0.0103**	-0.0576**	-0.0460*	-0.24305

Notes: ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table 9:Quantile-on-Quantile Regression (QQR)

	Nigeria				Ghana				Mauritius			
QQR	MC	FN	MH	PI	MC	FN	MH	PI	MC	FN	MH	PI
0.05	-0.16309	-0.18541	-0.15686	-0.1532	-0.08685	-0.12277	-0.13055	-0.13098	-0.1292	-0.0073	-0.0950	-0.0161
0.10	-0.14858	-0.17036	-0.14479	-0.13854	-0.07823	-0.11183	-0.11751	-0.11923	-0.1144	-0.0065	-0.0846	-0.0146
0.15	-0.13407	-0.15531	-0.13271	-0.12389	-0.06961	-0.10089	-0.10447	-0.10748	-0.0996	-0.0057	-0.0743	-0.0130
0.20	-0.11957	-0.14026	-0.12064	-0.10924	-0.06099	-0.08995	-0.09143	-0.09573	-0.0848	-0.0049	-0.0639	-0.0115
0.25	-0.10506	-0.12521	-0.10856	-0.09458	-0.05237	-0.079	-0.07839	-0.08397	-0.0700	-0.0041	-0.0536	-0.0099
0.30	-0.09056	-0.11016	-0.09649	-0.07993	-0.04375	-0.06806	-0.06536	-0.07222	-0.0553	-0.0033	-0.0432	-0.0084
0.35	-0.07605	-0.09511	-0.08441	-0.06528	-0.03513	-0.05712	-0.05232	-0.06047	-0.0405	-0.0025	-0.0329	-0.0068
0.40	-0.06154	-0.08006	-0.07234	-0.05063	-0.02651	-0.04618	-0.03928	-0.04872	-0.0257	-0.0017	-0.0225	-0.0053
0.45	-0.04704	-0.06501	-0.06027	-0.03597	-0.01789	-0.03523	-0.02624	-0.03696	-0.0109	-0.0009	-0.0122	-0.0038
0.50	-0.03253	-0.04996	-0.04819	-0.02132	-0.00927	-0.02429	-0.0132	-0.02521	0.0039	-0.0001	-0.0018	-0.0022
0.55	-0.01803	-0.03491	-0.03612	-0.00667	-0.00065	-0.01335	-0.00016	-0.01346	0.0187	0.0007	0.0085	-0.0007
0.60	-0.00352	-0.01986	-0.02404	0.007986	0.007974	-0.00241	0.012874	-0.00171	0.0335	0.0015	0.0189	0.0009
0.65	-0.010986	-0.00481	-0.01197	0.022639	0.016594	0.008538	0.025912	0.010046	0.0483	0.0023	0.0292	0.0024
0.70	-0.025492	0.010243	0.000106	0.037292	0.025215	0.01948	0.038951	0.021799	0.0631	0.0031	0.0396	0.0040
0.75	-0.039998	0.025293	0.012181	0.051945	0.033835	0.030423	0.051989	0.033551	0.0779	0.0039	0.0499	0.0055
0.80	-0.054504	0.040344	0.024255	0.066598	0.042455	0.041365	0.065028	0.045303	0.0927	0.0047	0.0603	0.0071
0.85	-0.06901	0.055394	0.03633	0.081251	0.051075	0.052308	0.078066	0.057056	0.1075	0.0055	0.0706	0.0086
0.90	-0.083516	0.070444	0.048404	0.095904	0.059695	0.063251	0.091104	0.068808	0.1223	0.0063	0.0810	0.0101
0.95	-0.098022	0.085495	0.060478	0.110557	0.068315	0.074193	0.104143	0.080561	0.1371	0.0071	0.0913	0.0117

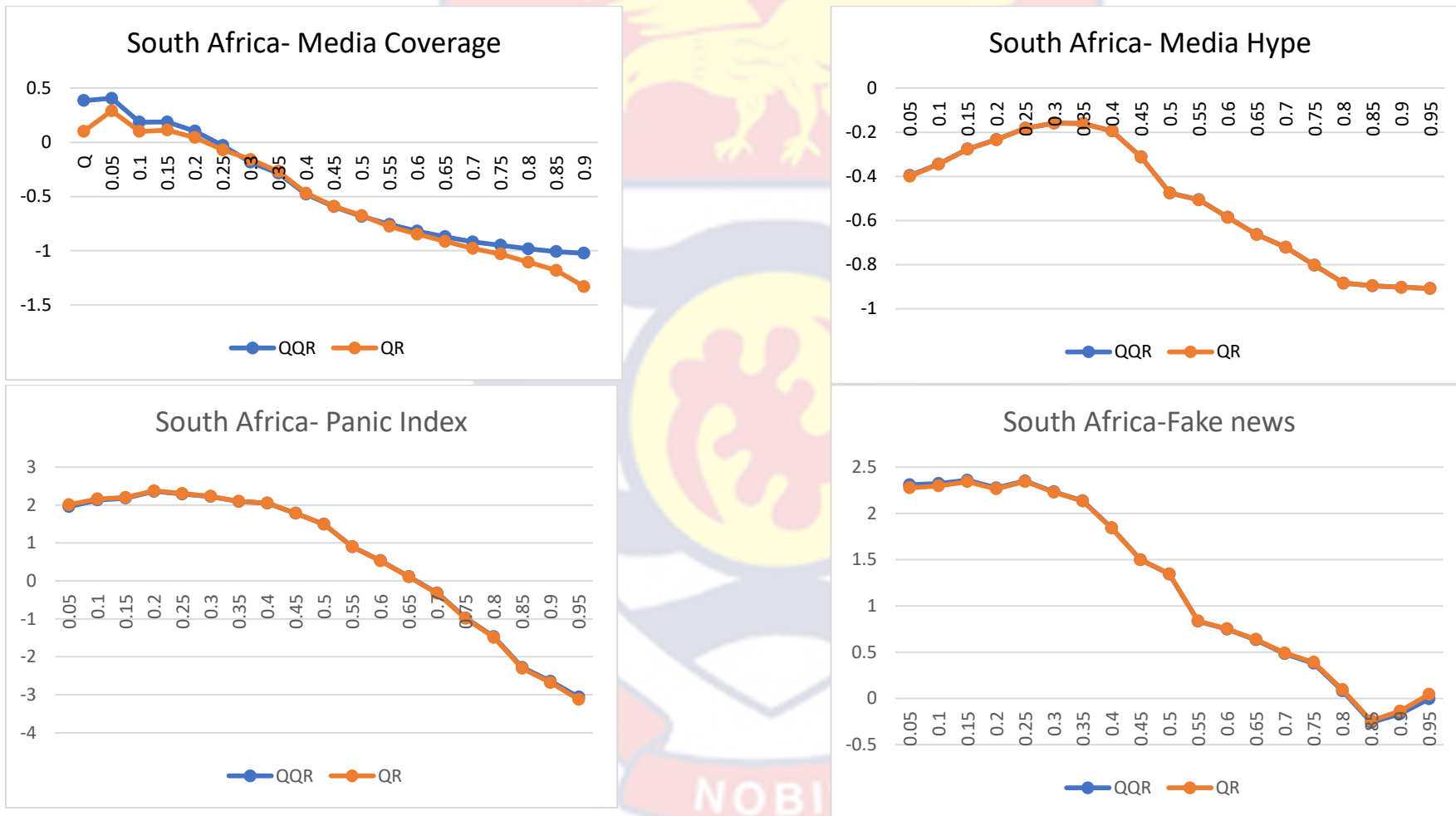Note: MC represents media coverage, FN= Fake news, MH= media hype, PI= panic index, QQR= Quantile-on-quantile.
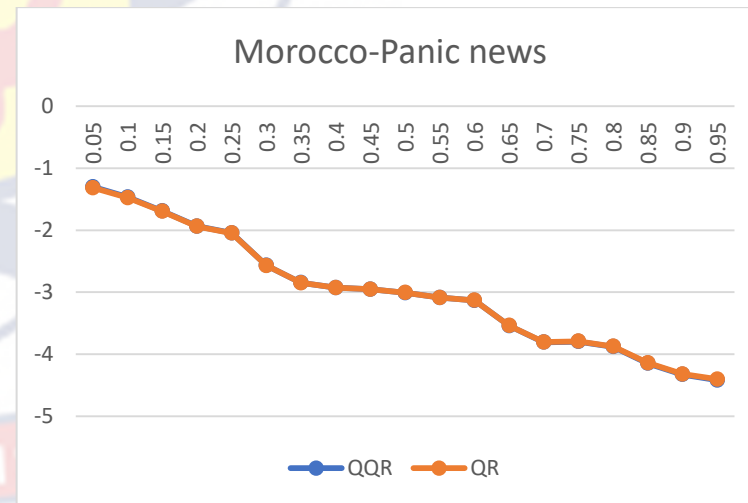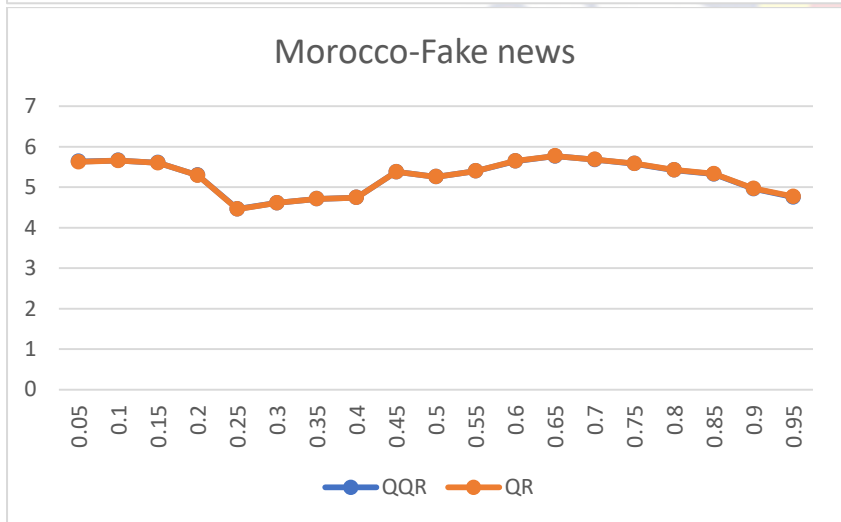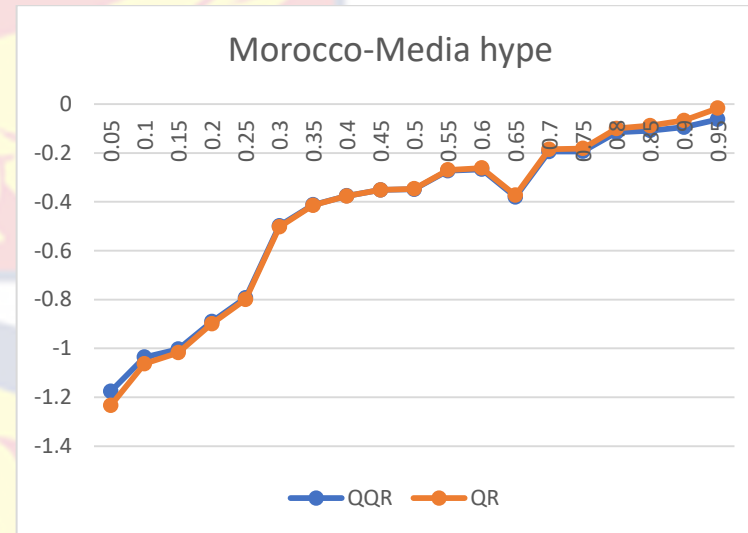Source: Author's study (2022).

Table 10: Quantile-on-Quantile Regression (QQR)

QQR	Egypt				Morocco				South Africa			
	MC	FN	MH	PI	MC	FN	MH	PI	MC	FN	MH	PI
0.05	-0.0722	-0.0024	-0.1828	-0.0019	-0.0334	-0.0017	-0.0984	-0.0538	-0.0032	-0.0015	-0.00345	-0.0014
0.10	-0.0647	-0.0021	-0.1627	-0.0017	-0.0296	-0.0015	-0.0869	-0.0476	-0.0029	-0.0014	-0.00124	-0.0015
0.15	-0.0571	-0.0019	-0.1426	-0.0015	-0.0259	-0.0013	-0.0754	-0.0414	-0.0026	-0.0013	-0.00133	-0.0013
0.20	-0.0496	-0.0016	-0.1226	-0.0012	-0.0221	-0.0011	-0.0640	-0.0352	-0.0022	-0.0012	-0.00125	-0.0011
0.25	-0.0420	-0.0013	-0.1025	-0.0010	-0.0184	-0.0009	-0.0525	-0.0290	-0.0019	-0.0011	-0.00111	-0.0009
0.30	-0.0345	-0.0011	-0.0824	-0.0008	-0.0146	-0.0007	-0.0410	-0.0228	-0.0016	-0.0010	-0.00100	-0.0002
0.35	-0.0269	-0.0008	-0.0623	-0.0006	-0.0108	-0.0005	-0.0295	-0.0166	-0.0013	-0.0009	-0.00092	-0.0004
0.40	-0.0194	-0.0005	-0.0422	-0.0003	-0.0071	-0.0003	-0.0180	-0.0104	-0.0010	-0.0008	-0.00081	-0.0003
0.45	-0.0119	-0.0003	-0.0221	-0.0001	-0.0033	-0.0001	-0.0065	-0.0042	-0.0007	-0.0007	-0.00072	-0.0022
0.50	-0.0043	0.0000	-0.0020	0.0001	0.0004	0.0001	0.0050	0.0020	-0.0004	-0.0006	-0.00067	0.00011
0.55	0.0032	0.0002	0.0181	0.0003	0.0042	0.0003	0.0165	0.0082	-0.0001	-0.0005	-0.00053	0.00031
0.60	0.0108	0.0005	0.0381	0.0006	0.0079	0.0005	0.0280	0.0144	0.0002	-0.0004	-0.00042	0.0005
0.65	0.0183	0.0008	0.0582	0.0008	0.0117	0.0007	0.0394	0.0205	0.0005	-0.0003	-0.00032	0.00073
0.70	0.0259	0.0010	0.0783	0.0010	0.0155	0.0009	0.0509	0.0267	0.0008	-0.0002	-0.00025	0.00091
0.75	0.0334	0.0013	0.0984	0.0012	0.0192	0.0011	0.0624	0.0329	0.0011	-0.0001	-0.00014	0.00113
0.80	0.0409	0.0016	0.1185	0.0015	0.0230	0.0013	0.0739	0.0391	0.0015	0.0000	0.000023	0.00132
0.85	0.0485	0.0018	0.1386	0.0017	0.0267	0.0015	0.0854	0.0453	0.0018	0.0001	0.000122	0.00150
0.90	0.0560	0.0021	0.1587	0.0019	0.0305	0.0017	0.0969	0.0515	0.0021	0.0002	0.000222	0.00172
0.95	0.0636	0.0024	0.1788	0.0021	0.0343	0.0019	0.1084	0.0577	0.0024	0.0003	0.000321	0.00190

Note: MC represents media coverage, FN= Fake news, MH= media hype, PI= panic index, QQR= Quantile-on-quantile.

Source: Author's study (2022)
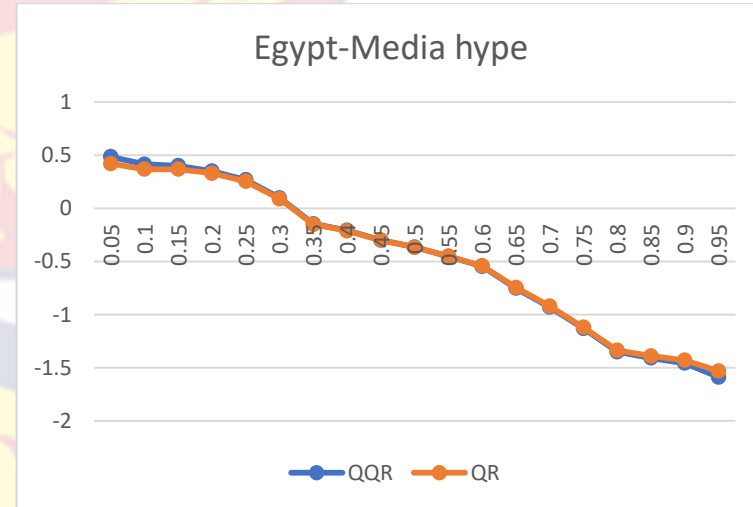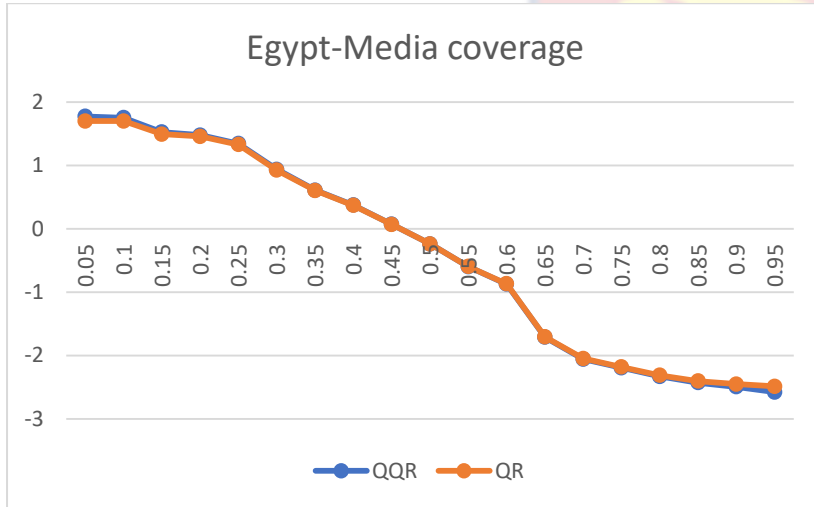
The Quantile-on-Quantile Regression (QQR) results

This technique can infer the relationships presented by quantile-on-quantile regression from those of quantile regression once the former can be validated. The significance of coefficients cannot be determined since the quantile-on-quantile regression is a non-parametric model. Nevertheless, the quantile-on-quantile regression methodology "decomposes" the quantile regression estimations into the particular quantiles of the explanatory or descriptive variables (Bouri et al.,2017). As a result, the quantile-on-quantile regression models can be verified based on how close their coefficients resemble those of quantile regression. The quantile regression and quantile-on-quantile regression coefficient line graphs in **Figure 3** also show this. The graphs have two objectives. In order to show the trend of fake news, media hype, panic index, media coverage, and the accompanying changes in stock returns, they first provide a visual representation of the quantile regression estimations.

The plots also examine how closely the quantile regression resembles the quantile-on-quantile regression estimations for validation purposes. It can be seen that estimates from quantile regression largely support those from quantile-on-quantile regression both across quantiles and throughout time. However, quantile-on-quantile regression estimates have lower orders of magnitude than quantile regression. Additionally, the quantile-on-quantile regression estimations are more adverse, with more variability across quantiles and temporal scales. As a result, the quantile-on-quantile regression method is effective in identifying patterns in the time-varying asymmetrical relationships between stock market returns and COVID-19-related news.

Figure 3: Quantile-on-Quantile plots and graphs

South Africa- Media Coverage

South Africa- Media Hype

South Africa- Panic Index

South Africa-Fake news

Egypt-Media coverage

Egypt-Media hype

Egypt-Panic news

Egypt-Fake news

Nigeria-Media coverage

Nigeria-Media hype

Nigeria- Panic news

Nigeria-Fake news

61

Mauritius-Media coverage

Mauritius-Panic Index
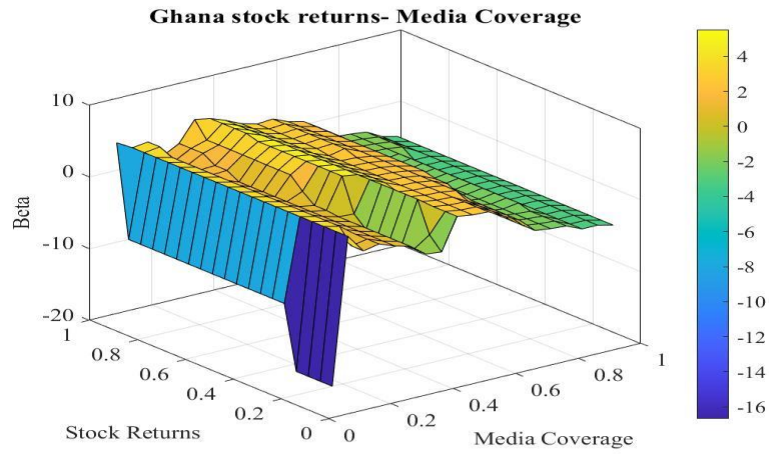

Mauritius-Fake news

Mauritius-Media Hype

63
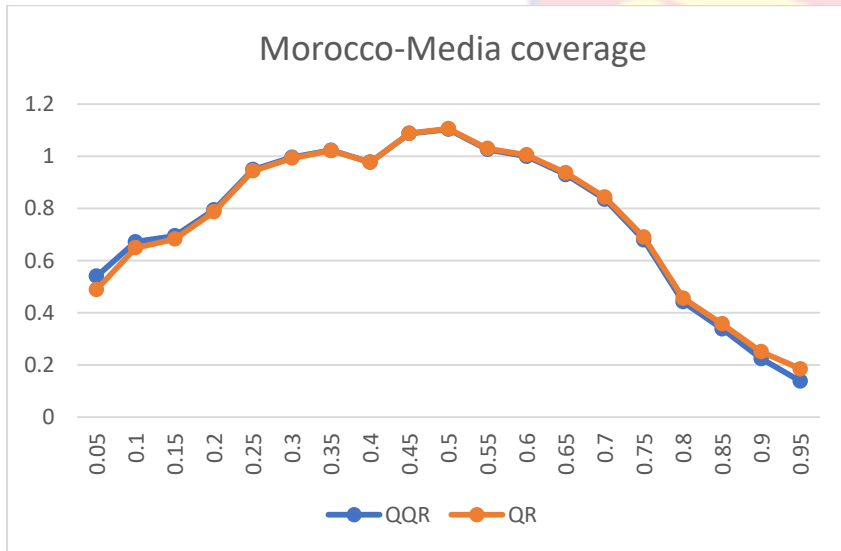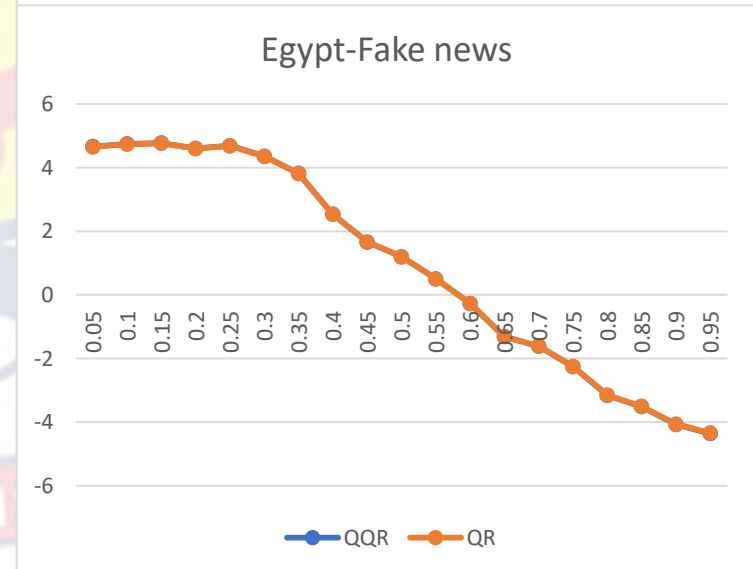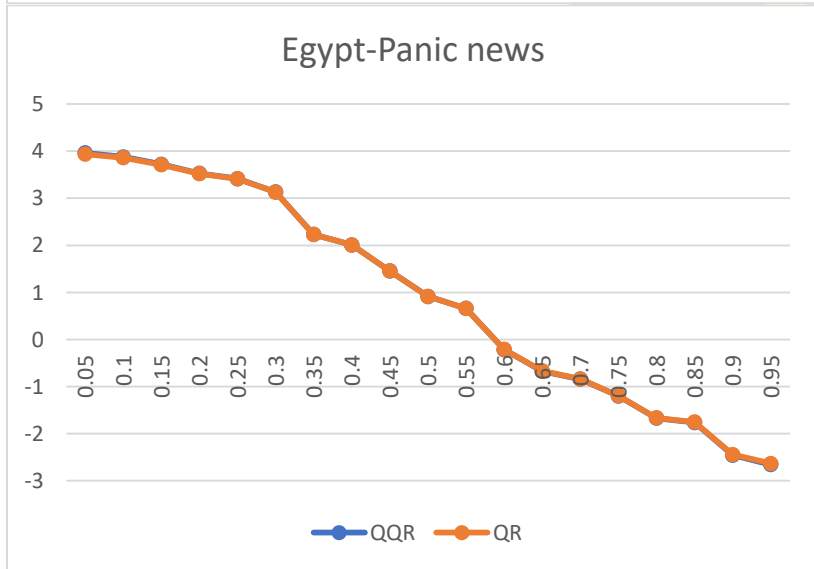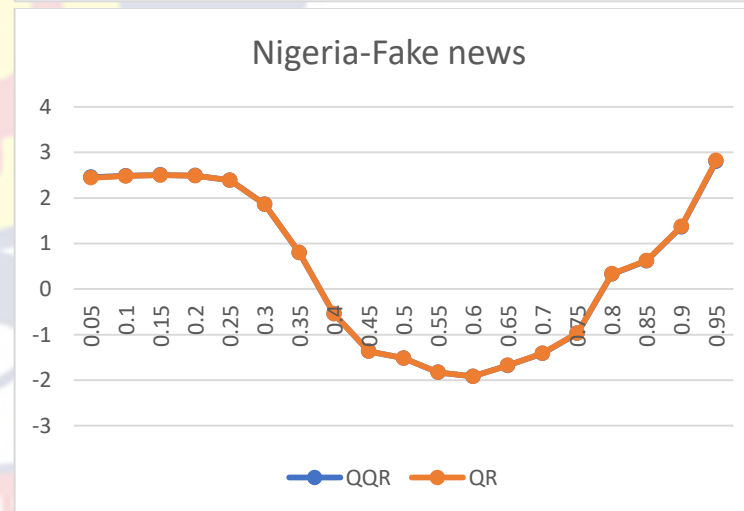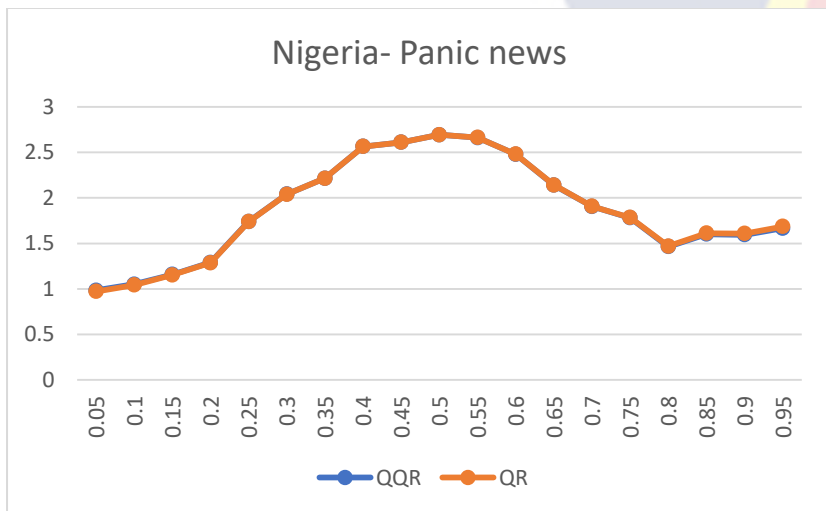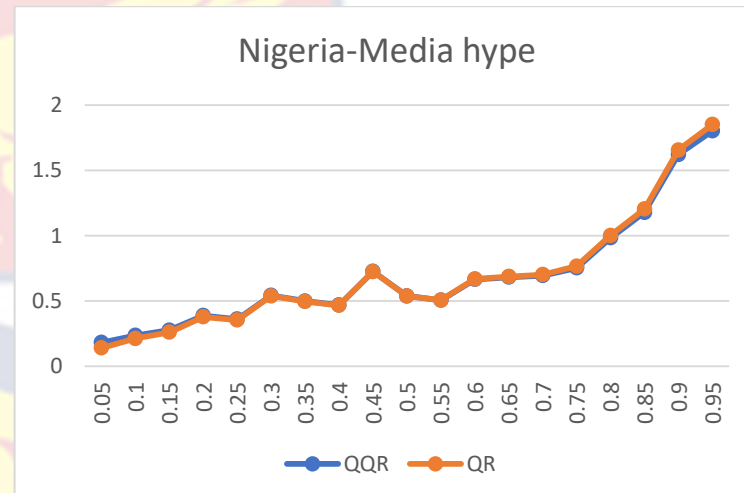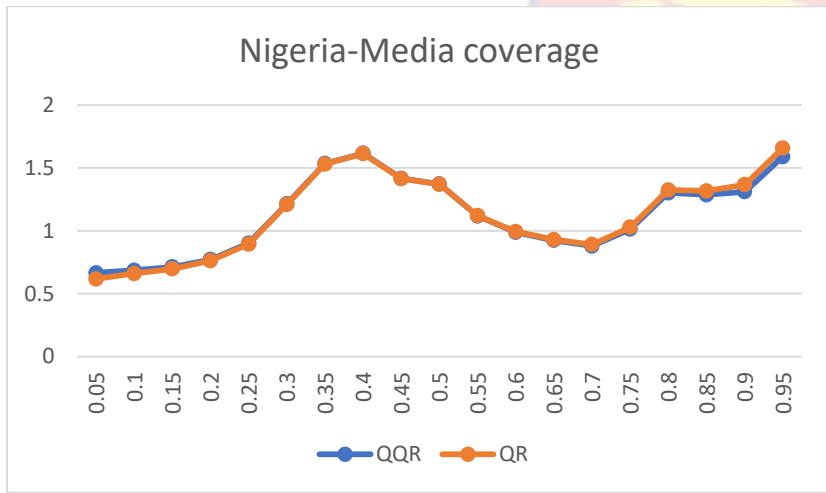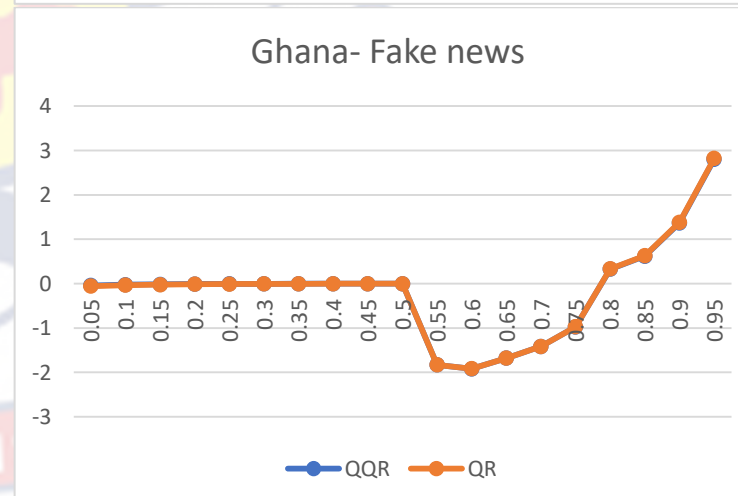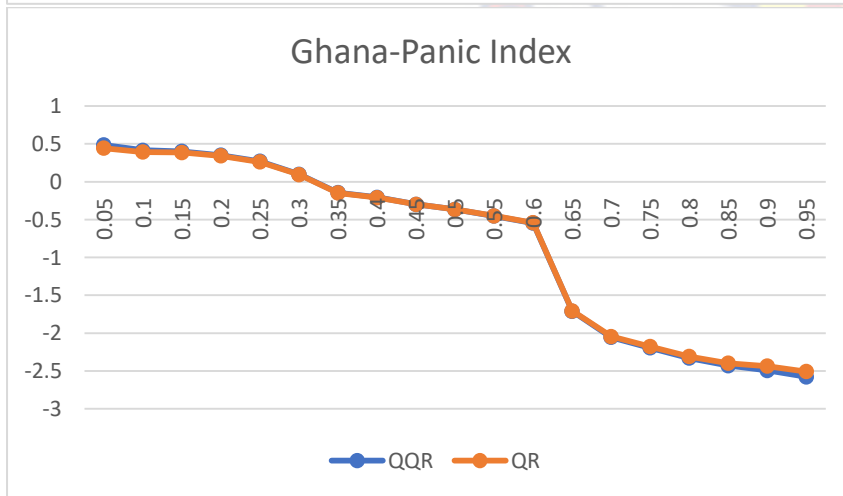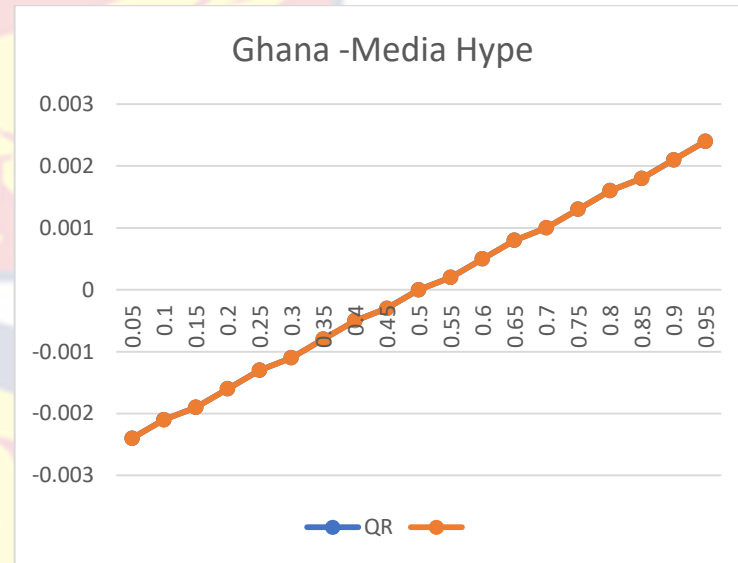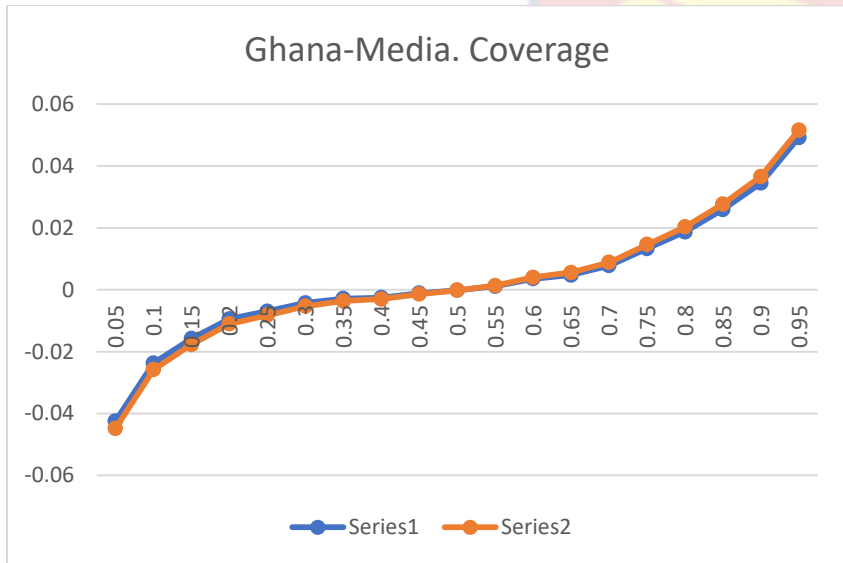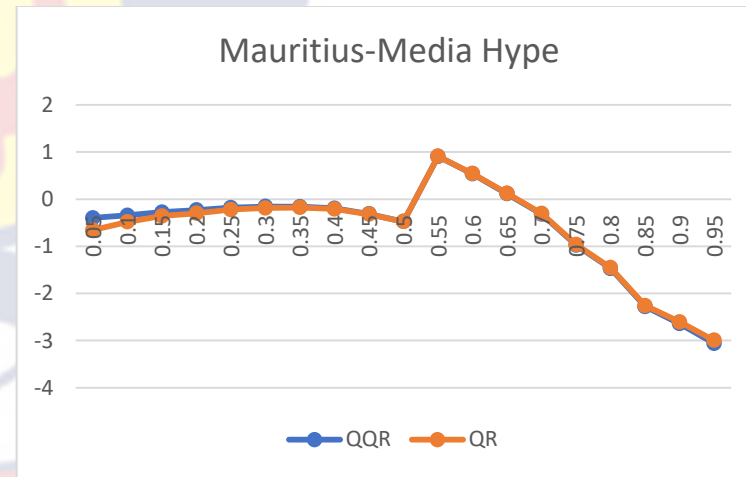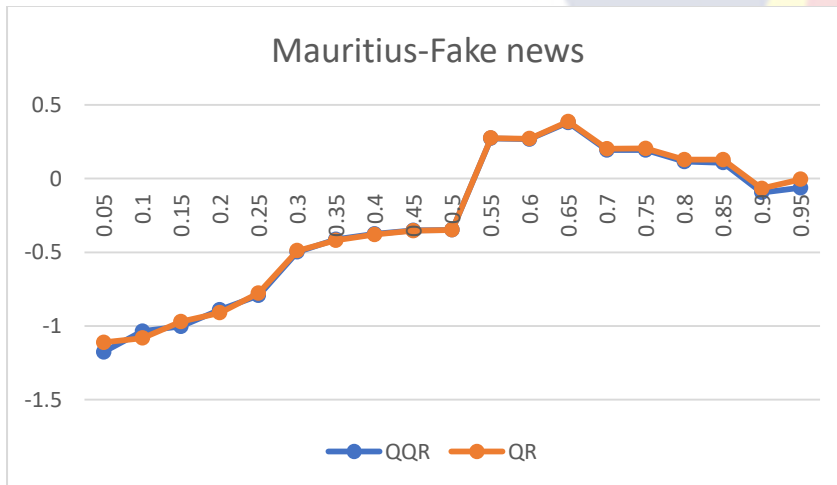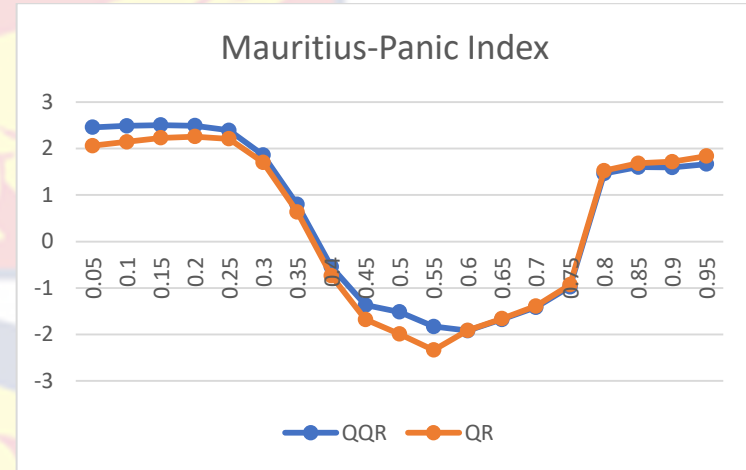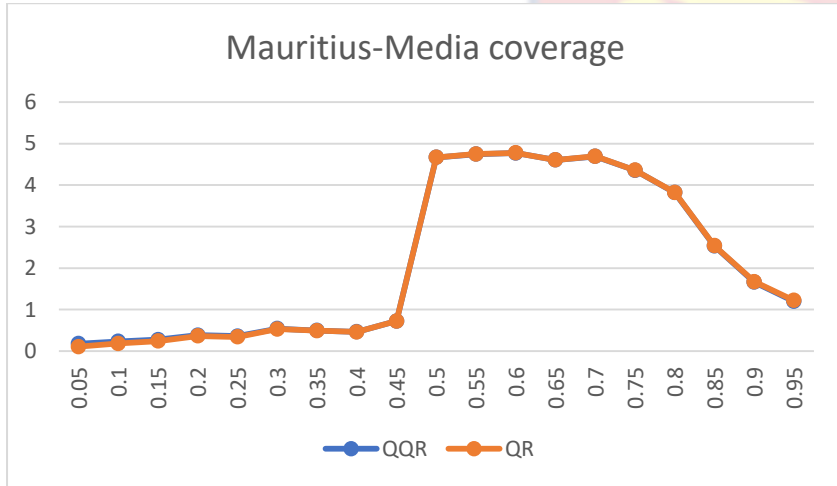
Figure 4 shows that Ghana's stock returns at the upper quantiles (0.65–0.95) are adversely impacted by media coverage. Yet, when it reaches the lower quantiles (0.05–0.4) of the stock returns, this influence turns positive. This positive impact is substantially more pronounced during the lower and middle quantiles (0.05-0.75) of the media coverage of COVID-19. On the other hand, as it proceeds to the upper quantiles (0.65-0.95) of COVID-19 media coverage, this adverse effect becomes less pronounced. The findings imply that when these stock markets are in a bearish position, media coverage of COVID-19 instances has a significant detrimental impact on stock returns.

For Mauritius, media coverage of COVID-19 had a negative impact on stock returns in the upper quantiles (0.65–0.95). This adverse effect persists across all media coverage quantiles. This effect is strongest during medium stock return quantiles (0.4-0.65) and weakest during lower stock return quantiles (0.05-0.4). According to these findings, media coverage has a slight negative connection with Mauritius stock returns at the upper quantiles of stock prices, but this influence becomes highly negative at the lower quantiles of stock returns. This result is consistent with Morocco, particularly in the bearish state. In Egypt, a weak negative association was identified at the upper quantiles (0.65–0.95) and it swings to a weak positive link at the lower quantiles (0.05-0.4). When stock returns are in the average (0.35-0.65) quantiles, the positive effect of media coverage is weak across all quantiles.

Furthermore, Nigeria's media coverage findings show a considerable positive effect on stock returns at the upper quantiles (0.60-0.95) and a negative effect on stock returns as it advances to the lower quantiles (0.05-0.4). In South Africa, media attention has a considerable beneficial effect on higher quantile (0.65-0.95) stock returns. Yet, in the lower quantiles (0.05- 0.50), there is a minimal positive impact.
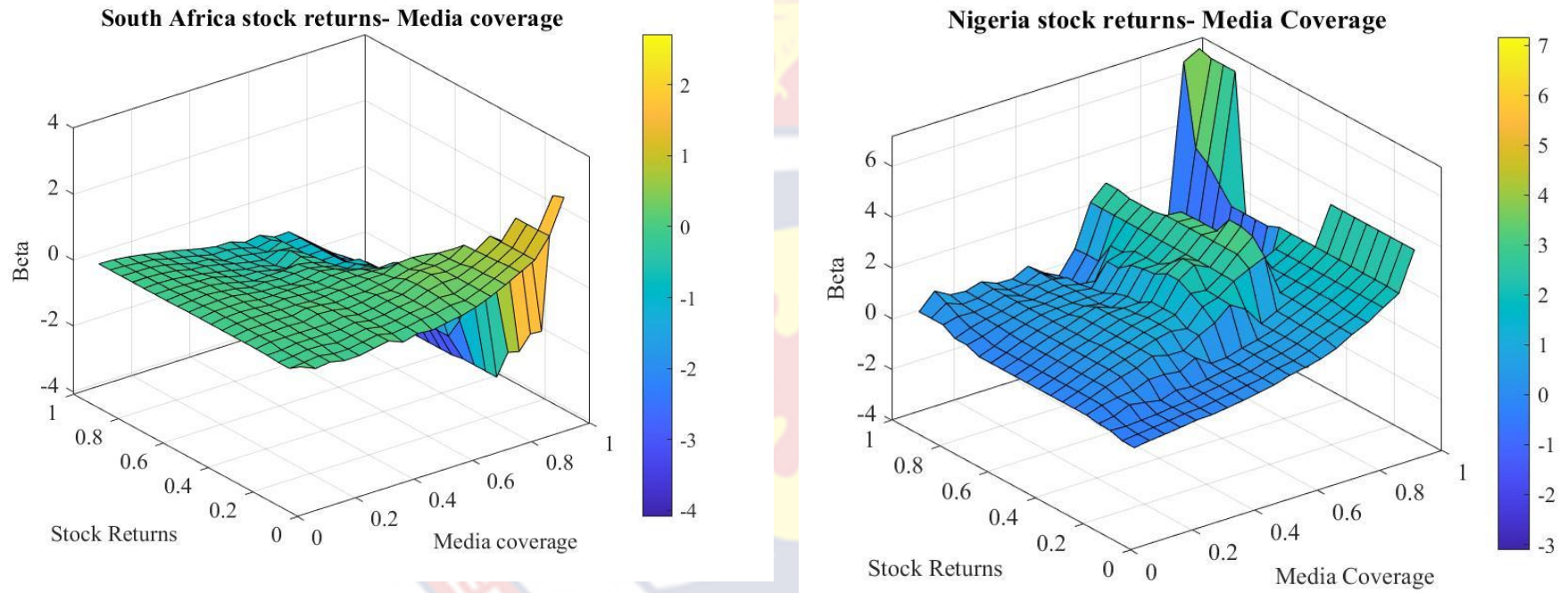
Ghana stock returns- Media Coverage

Mauritius Stock Returns- Media coverage

Egypt Stock Returns- Media coverage
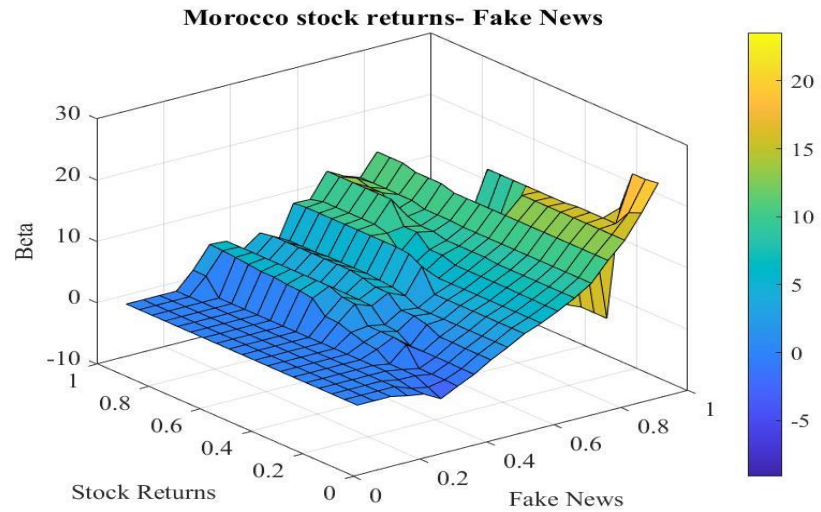
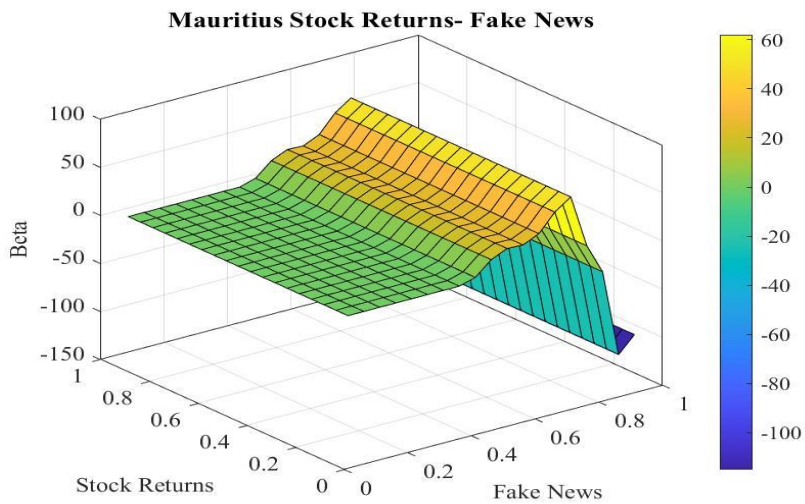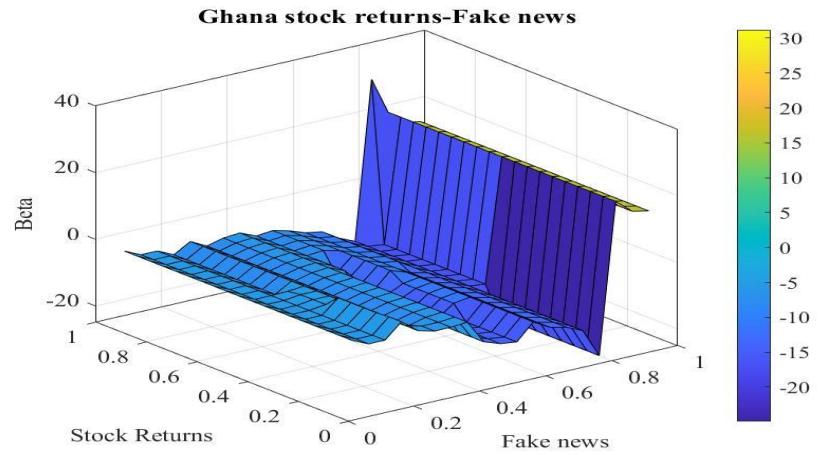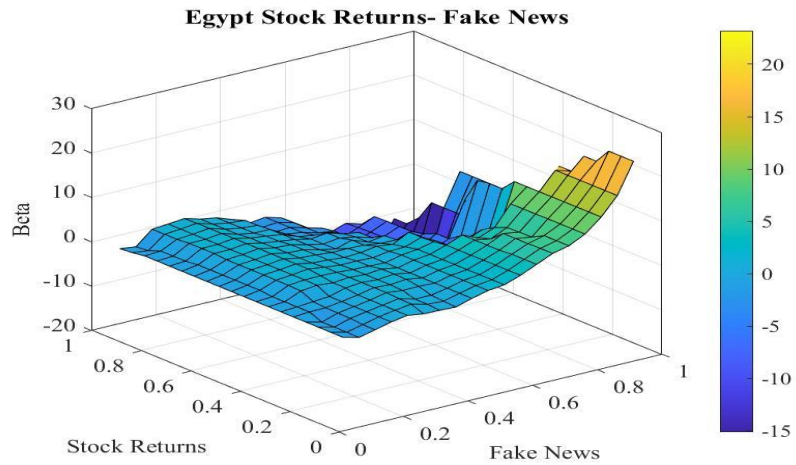**Morocco stock returns- Media Coverage**
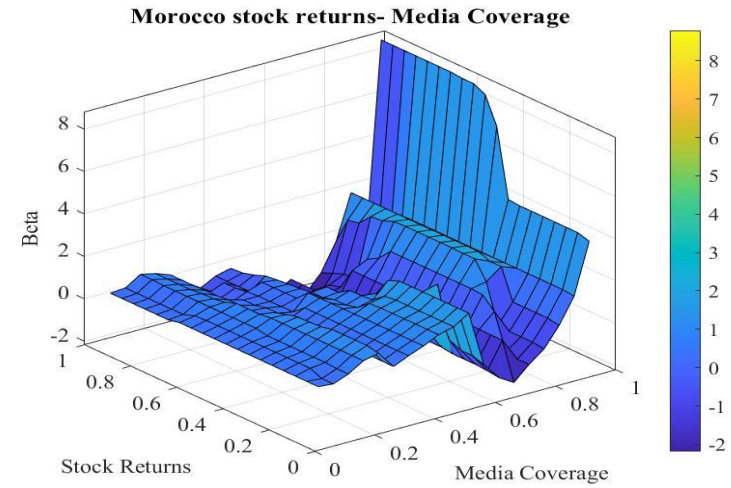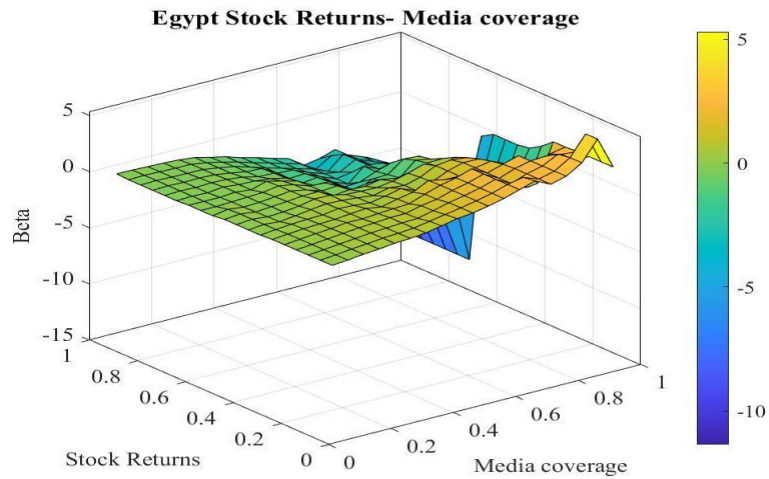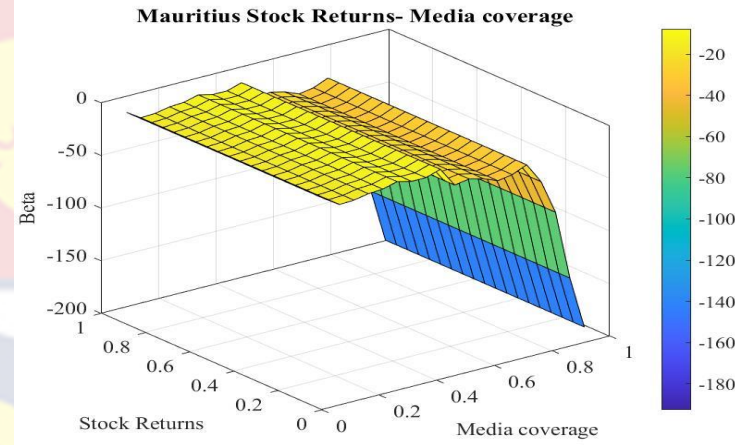
Figure 4: This represents the results of quantile-on-quantile regression for COVID-19 news (media coverage) and stock returns.

Figure 5 indicates that South Africa's fake news negatively affects returns at the upper quantiles of stock returns (0.65–0.95). However, this effect becomes positive when we move to the lower quantiles (0.05–0.4) of the stock returns. This positive effect during lower quantiles of stock returns is much stronger during lower and middle quantiles (0.05–0.75) of the fake news of COVID-19. Conversely, this negative effect becomes stronger when we move to the upper quantiles (0.65–0.95) of the fake news of COVID-19. These results suggest that the fake news of the COVID-19 cases has a strong negative effect on stock returns when these stock markets are in a bullish state. This result is consistent with Nigeria and Morocco.

For Egypt and Mauritius, the fake news of COVID-19 negatively affects stock prices at the upper quantiles of stock prices (0.65–0.95). It can be observed that there is a positive effect across all quantiles of the fake news of COVID-19. This effect becomes strong during average quantiles of stock prices (0.4–0.65) and becomes minimal at lower quantiles (0.05–0.4) of stock returns. These results indicate that fake news has a weak negative correlation with the Egyptian stock returns at upper quantiles of stock returns; however, there is no effect at lower quantiles of the stock returns.

Egypt Stock Returns- Fake News

Ghana stock returns-Fake news

Mauritius Stock Returns- Fake News

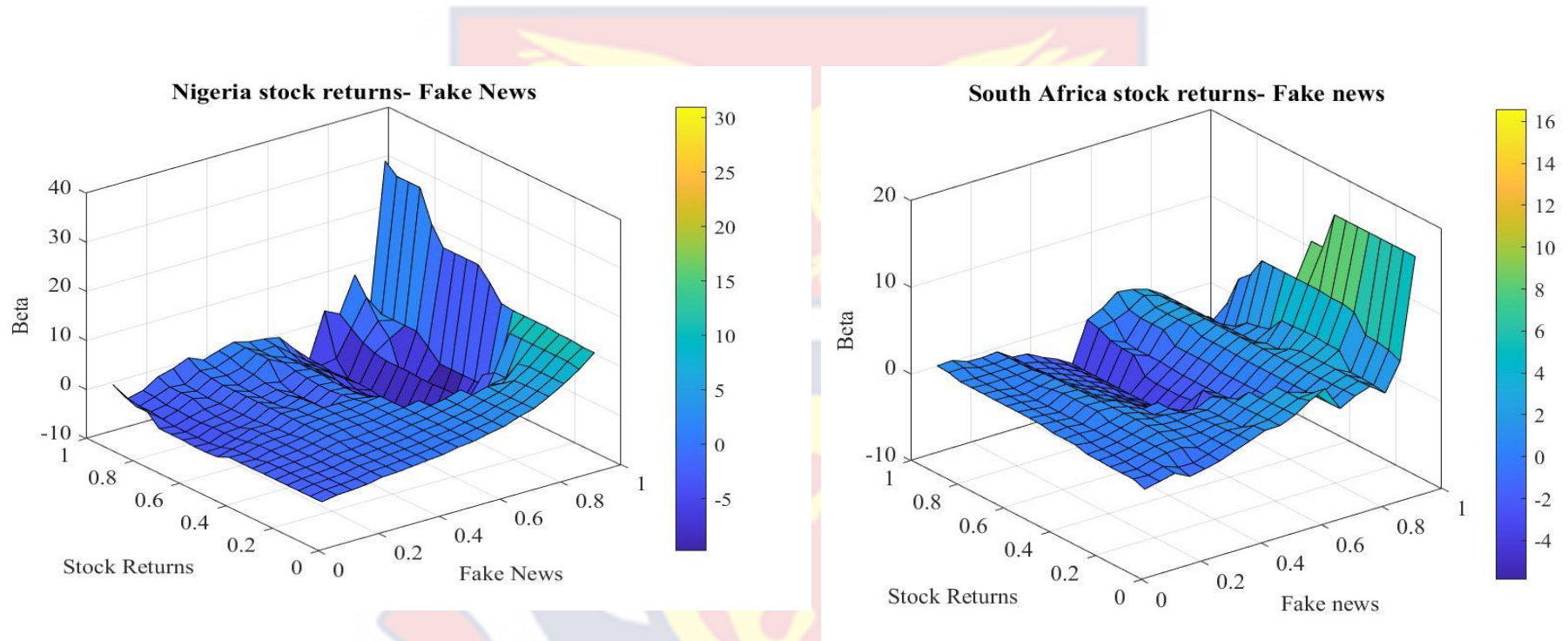**Morocco stock returns- Fake News**

Figure 5: This represents the results of quantile-on-quantile regression for COVID-19 news (Fake news) and stock returns.
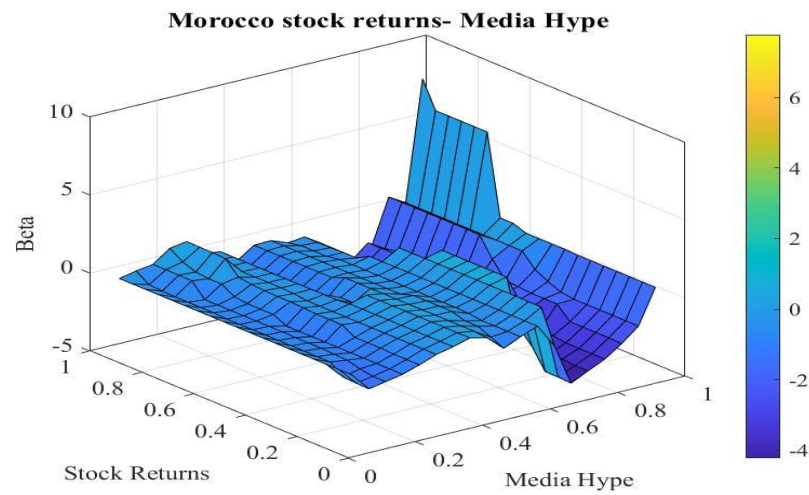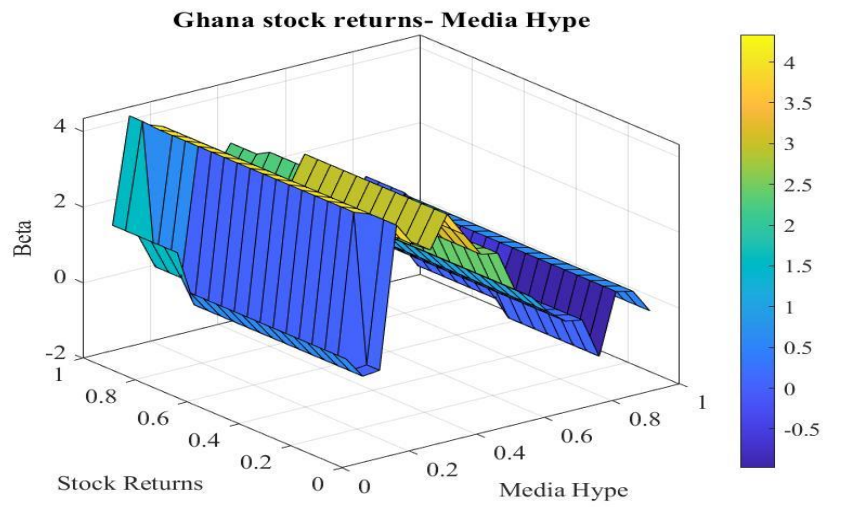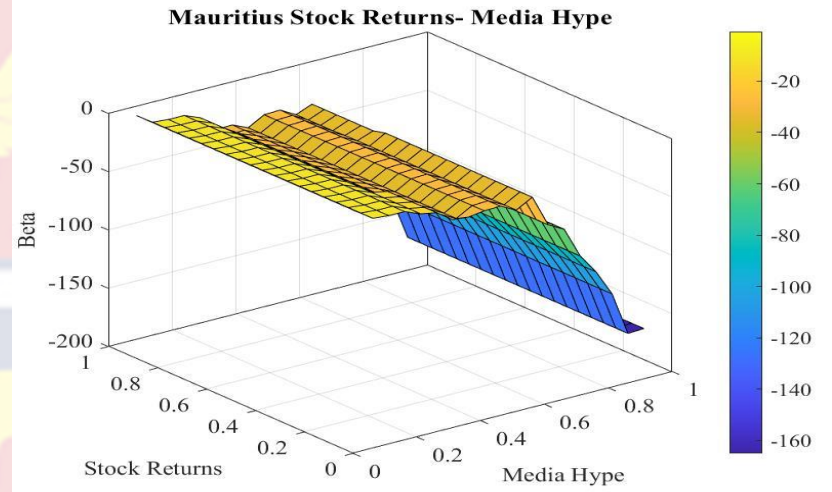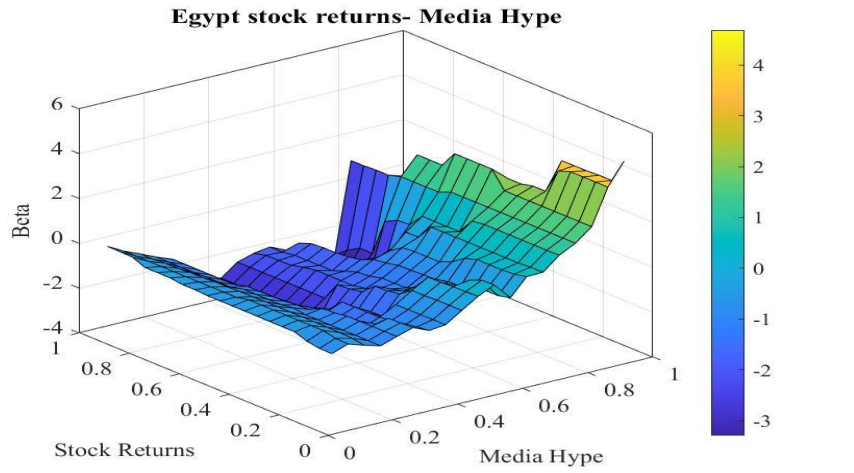
Figure 6 shows how stock market returns were impacted by media hype during the COVID-19 outbreak. All quantiles of stock returns in Mauritius were positively impacted by media hype, but the impact was strongest in the lower quantiles (0.05-0.4) and weakened as it moved up to the upper quantiles (0.6-0.95). This outcome shows that the Mauritius stock market, particularly while it was in a bearish condition, was adversely impacted by media hype.

According to the results from Nigeria, media hype positively impacted every quantile. The impact is marginal at the upper quantiles but substantial at the lower quantiles. This finding shows that media hype had a detrimental impact on Nigeria's stock market return during the bearish market. For Egypt, media hype during the COVID-19 outbreak positively affected stock market returns at the lower quantiles (0.65-0.95). However, the results also show that there was no effect on the middle quantiles (0.45-0.6) but a strong positive impact on the lower quantiles (0.05-0.4). Furthermore, the results also indicate that media hype had no effect on the Moroccan stock market at the lower quantile (0.05-0.30) and the middle quantiles (0.40-0.60). It also shows that media hype had a weak positive impact on the upper quantiles. For Ghana, the media hype during COVID-19 had a weak negative effect on both the upper and lower quantiles of the stock returns. It also shows that the media hype had a strong positive effect on the middle quantiles.

Also, South Africa's media hype during COVID-19 indicates a strong negative impact on stock returns at the middle quantiles (0.45-0.75). However, it shows a weak positive effect on stock returns at the upper quantile (0.80-0.95) and no effect at all at the lower quantile. This finding implies that South Africa's stock market was not affected by media hype of COVID-19 at the bearish state.

Egypt stock returns- Media Hype

Mauritius Stock Returns- Media Hype

Ghana stock returns- Media Hype

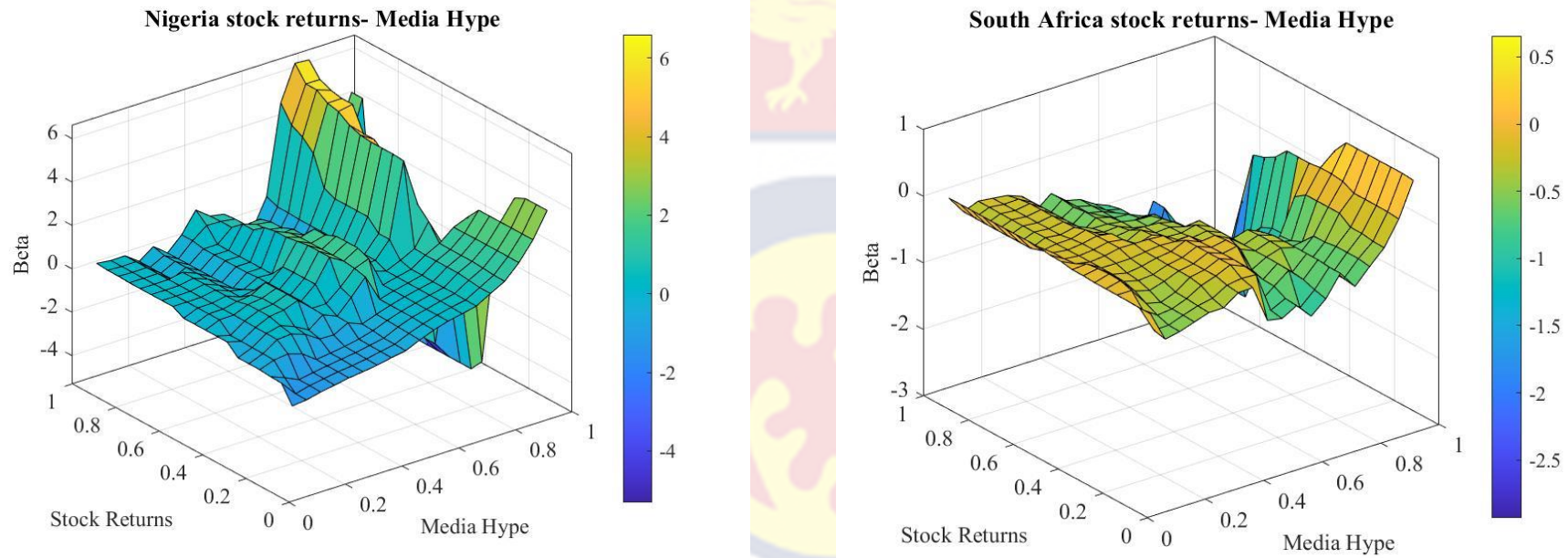Morocco stock returns- Media Hype

71

Figure 6: This represents the results of quantile-on-quantile regression for COVID-19 news (media hype) and stock returns.

Figure 7 presents that the panic during the COVID-19 outbreak negatively impacted the stock returns of Egypt, Nigeria, Morocco, and South Africa. The stock markets of these countries experienced a strong negative effect at the lower quantiles as well as a strong positive impact at the upper quantiles. This indicates that the fear and panic during the COVID-19 period posed a big risk for investors.

For Ghana, the panic during the COVID-19 negatively impacted the stock returns on all the quantiles. The results show that the stock market of Ghana was adversely affected during bearish and bullish state. Also, Mauritius' stock market experienced a positive impact at the lower quantile as well as a negative impact on the upper quantiles.

73

Egypt stock returns– Panic Index

Mauritius Stock Returns– Panic Index

Ghana stock returns– Panic Index

Morocco stock returns– Panic Index

74
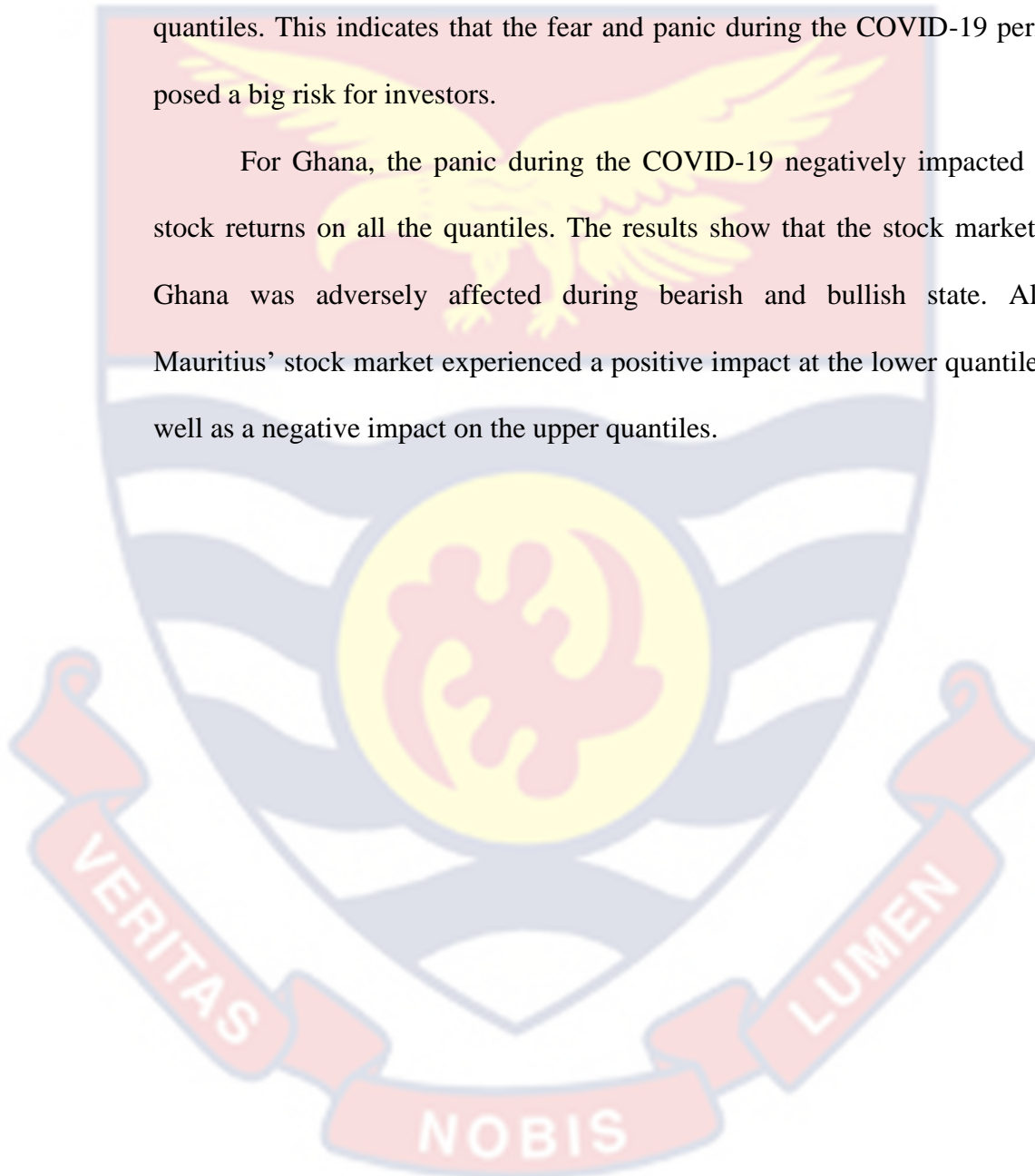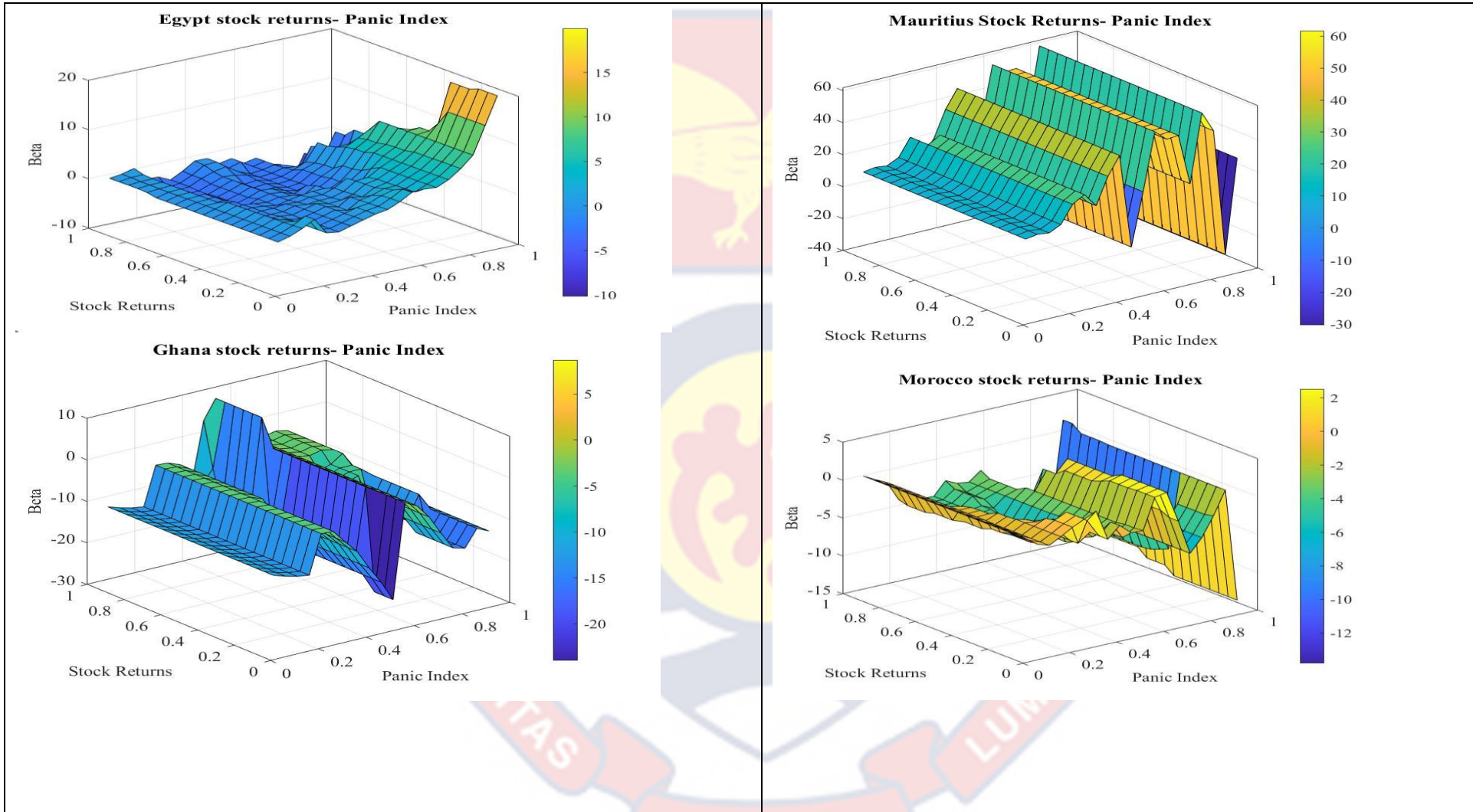
Concerning the initial research objective, the study reveals a noteworthy and adverse effect of the Media coverage index on the stock market returns in Nigeria, Mauritius, Ghana, Morocco, and South Africa. This outcome aligns with the investigations carried out by Cepoi (2020) and Haroon & Rizvi (2020). Moving on to the second objective, the results indicate that Media hype has a positive and significant impact on South Africa but exerts a negative and significant influence on Morocco, Mauritius, and Egypt. This observation is consistent with the insights derived from the research conducted by Cepoi (2020) and Haroon & Rizvi (2020).

Concerning the third objective, the study suggests that a reduction in the Panic Index during the COVID-19 period resulted in increased stock market returns in Nigeria, Egypt, South Africa, Ghana, and Mauritius, excluding Morocco. However, it is noteworthy that an increase in the panic index corresponds to an increase in stock market returns in these countries. This finding diverges from the conclusions drawn by Salisu & Vo (2020). Shifting to the fourth objective, the results indicate that, for Nigeria and Morocco, fake news does not exhibit an adverse effect on the stock market. However, an inverse relationship between fake news and stock market returns is observed in Ghana, Mauritius, Egypt, and South Africa. This result contradicts the findings of Corbet et al. (2020).

The empirical findings of this study affirm previous research reported by Cepoi (2020), suggesting that stock market returns react to macroeconomic news in unfavorable conditions. The impact on quantiles is not uniform. According to the findings, investors in African markets react differently to COVID-19-related news. Furthermore, the rate at which markets react to news

76

may have policy implications for ensuring the timely distribution of news to all market participants (Smales, 2014).

Regarding the relationship between variables at the upper quantiles tails of the distribution, the results imply a need to seek diversification, hedging, and a safe haven following Lucey and Baur's (2010) explanations due to the investment risk during the COVID-19 outbreak. Investors are keen on identifying safe havens during emergencies, and policymakers and investors are highly interested in understanding the connection between markets at the upper tails of the distribution during the pandemic (Badshah et al., 2018). The positive and significant relationship between COVID-19 news and stock market returns at the lower quantiles indicates that a decrease in COVID-19 news increases the stock market returns in the long run, implying that, over time, the stock market is expected to recover and adapt to the pandemic. To address this, the government may adopt mechanisms such as accurate and reliable dissemination of information related to the pandemic through proper communication. The findings suggest that a more intensive use of proper communication channels is required to mitigate COVID-19-related financial turbulence.

Chapter Summary

The results and discussion of the study's goals were covered in chapter four. The chapter examined the connection between COVID-19-related news and stock market return using quantile regression and quantile-on-quantile regression. Additionally, statistical diagnostics were run on each and every variable in the chapter. Tables with a summary of the findings are then evaluated and provided.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATION

Introduction

The main findings of the study's research objectives, as well as inferences taken from the findings and policy recommendations, were given in this chapter. There were also recommendations for more research in the chapter.

Summary

The COVID-19 pandemic has had an impact on the financial markets in addition to on economic and social life. Investors' decisions have been impacted by the extreme terror it has caused. Between 1st February 2020 and 28th February 2022 is the specific focus period of this research. The RavenPack data platform's fake news index, media hype index, media coverage index, and panic index are employed for the analysis. The study's goal is to investigate the dynamic relationship between COVID-19 news and stock market returns in Africa utilizing quantile-on-quantile regression and quantile regression as its methods of estimate.

This research investigates the dynamic relationship between Africa's stock returns and Media Hype news during the COVID-19 outbreak. It also aims to determine the dynamic relationship between Africa's stock returns and Panic news during the same period. Additionally, the study seeks to examine the dynamic relationship between Africa's stock returns and fake news during the COVID-19 outbreak. Furthermore, it aims to explore the dynamic relationship between Africa's stock returns and media coverage during the COVID-19 outbreak.

78

The research employed a quantitative methodology and utilized an explanatory research design to delve into various aspects. The primary discoveries of the study can be delineated in the subsequent sections.

In regards to the first research objective, the findings reveal a substantial and negative impact of the Media coverage index on the stock market returns of Nigeria, Mauritius, Ghana, Morocco, and South Africa. This outcome aligns with the studies conducted by Cepoi, (2020) and Haroon & Rizvi, (2020). Moving on to the second objective, the results unveil that Media hype exerts a positive and significant influence on South Africa but a negative and significant influence on Morocco, Mauritius, and Egypt. This observation is consistent with the insights derived from the research by Cepoi, (2020) and Haroon & Rizvi, (2020).

Concerning the third objective, the study indicates that a decrease in the Panic Index during the COVID-19 period led to an upswing in stock market returns in Nigeria, Egypt, South Africa, Ghana, and Mauritius, except in the case of Morocco. However, it is noteworthy that an increase in the panic index corresponds to an increase in stock market returns in these countries. This finding diverges from the conclusions drawn by Salisu & Vo, (2020). Shifting to the fourth objective, the results point out that, concerning Nigeria and Morocco, fake news exhibits no adverse effect on the stock market. However, there is an inverse relationship between fake news and stock market returns in Ghana, Mauritius, Egypt, and South Africa. This result contradicts the findings of Corbet et al., (2020).

Conclusion

This research focus from period of 1st February 2020 to 28th February 2022 sheds light on the multifaceted impact of the COVID-19 pandemic on financial markets, economic landscapes, and societal dynamics. The unprecedented terror instigated by the pandemic has reverberated in the decisions of investors, prompting a thorough investigation into the dynamic relationship between COVID-19 news and stock market returns in Africa. Employing the RavenPack data platform's fake news index, media hype index, media coverage index, and panic index, the study utilized a quantitative methodology and an explanatory research design to unravel the nuanced dynamics at play. The exploration of four distinct research objectives unearthed significant insights.

Firstly, the substantial and negative impact of the Media coverage index on stock market returns in Nigeria, Mauritius, Ghana, Morocco, and South Africa aligns with prior studies by Cepoi (2020) and Haroon & Rizvi (2020). Secondly, the positive and significant influence of Media hype on South Africa, juxtaposed with its negative impact on Morocco, Mauritius, and Egypt, mirrors the findings of Cepoi (2020) and Haroon & Rizvi (2020).

Thirdly, the study reveals that a decrease in the Panic Index during the COVID-19 period corresponded to increased stock market returns in several African countries, except for Morocco. Notably, an increase in the panic index correlated with increased returns, challenging the conclusions drawn by Salisu & Vo (2020). Lastly, the examination of the dynamic relationship between fake news and stock market returns showcased a lack of adverse effects in Nigeria and Morocco, while an inverse relationship was observed in Ghana,

80

Mauritius, Egypt, and South Africa, contradicting the findings of Corbet et al. (2020). In essence, the research contributes valuable insights into the intricate interplay between COVID-19 news dynamics and stock market behaviours in Africa, providing a detail understanding for investors, policymakers, and stakeholders navigating the evolving landscape shaped by the pandemic.

Table 11: Recommendation of the study

Objectives	Recommendations
Examine the relationship between Africa's stocks and the Media coverage index during the COVID-19 outbreak.	Given the negative impact of media coverage on stock market returns, investors may consider diversifying their portfolios across different regions to mitigate risks associated with media sentiment.
Analyze the relationship between Africa's stocks and the Media Hype index during the COVID-19 outbreak.	Policy makers should aim for stable and consistent policy measures to instill confidence in investors. This can help mitigate the impact of media-driven market fluctuations and create an environment conducive to sustained economic growth.
Analyze the relationship between Africa's stocks and the Panic index during the COVID-19 outbreak.	Implement robust risk management strategies, such as stop-loss orders, to protect investments, especially in countries where the Panic Index and stock returns exhibit a strong inverse relationship.
Analyze the relationship between Africa's stocks and the fake news Index during the COVID-19 outbreak	Develop a thorough understanding of the information environment and being able to discern between reliable and unreliable sources can contribute to making sound investment decisions

The suggestions for future study

The study is restricted to looking at how COVID-19-related news affects the returns of the African stock market; future studies can investigate the influence of COVID-19-related news on volatility and volume using various methodologies for examining international or other sub-markets by including country-specific variables. This expanded investigation would

81

provide detailed insights crucial for navigating the evolving dynamics of financial markets amidst global crises, enhancing the applicability of findings to diverse contexts and facilitating informed decision-making for investors and policymakers worldwide.

REFERENCES

Aaker, D. A., Kumar, V., & Day, G. S. (2008). *Marketing research*. John Wiley & Sons.

Abu, N., Gamal, A. A. M., Sakanko, M. A., Mateen, A., Joseph, D., & Amaechi, B. O. O. (2021). How have COVID-19 Confirmed Cases and Deaths Affected Stock Markets? Evidence from Nigeria. *Contemporary Economics*, *15*(1), 76-100.

Adenomon, M. O., Maijamaa, B., & John, D. O. (2022). The effects of Covid-19 outbreak on the Nigerian Stock Exchange performance: Evidence from GARCH Models. *Journal of Statistical Modeling & Analytics (JOSMA)*, *4*(1), 25-38.

Aga, M., & Kocaman, B. E. R. N. A. (2006). An empirical investigation of the relationship between inflation, P/E ratios and stock price behaviors using a new series called Index-20 for Istanbul Stock Exchange. *International Research Journal of Finance and Economics*, *6*(3), 133-165.

Agyei, S. K., Isshaq, Z., Frimpong, S., Adam, A. M., Bossman, A., & Asiamah, O. (2021). COVID-19 and food prices in sub-Saharan Africa. *African Development Review*, *33*, S102-S113.

Akhtaruzzaman, M., Boubaker, S., & Sensoy, A. (2021). Financial contagion during COVID–19 crisis. *Finance Research Letters*, *38*, 101604.

Akhtaruzzaman, M., Boubaker, S., Lucey, B. M., & Sensoy, A. (2021). Is gold a hedge or a safe-haven asset in the COVID–19 crisis?. *Economic Modelling*, *102*, 105588.

Albala-Bertrand, J. M. (2000). Responses to complex humanitarian emergencies and natural disasters: An analytical comparison. *Third World Quarterly*, 215-227.

Alfaro, L., Chari, A., Greenland, A. N., & Schott, P. K. (2020). *Aggregate and firm-level stock returns during pandemics, in real time* (No. w26950). National Bureau of Economic Research.

Ali, M., Alam, N., & Rizvi, S. A. R. (2020). Coronavirus (COVID-19)—An epidemic or pandemic for financial markets. *Journal of Behavioral and Experimental Finance*, *27*, 100341.

Al-Awadhi, A. M., Alsaifi, K., Al-Awadhi, A., & Alhammadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of behavioral and experimental finance*, *27*, 100326.

Alzyadat, j. a., & Asfoura, e. (2021). The effect of COVID-19 pandemic on stock market: An empirical study in Saudi Arabia. *The Journal of Asian Finance, Economics and Business*, *8*(5), 913-921.

Ambros, M., Frenkel, M., Huynh, T. L. D., & Kilinc, M. (2021). COVID-19 pandemic news and stock market reaction during the onset of the crisis: evidence from high-frequency data. *Applied Economics Letters*, *28*(19), 1686-1689.

Amewu, S., Asante, S., Pauw, K., & Thurlow, J. (2020). The economic costs of COVID-19 in sub-Saharan Africa: insights from a simulation exercise for Ghana. *The European Journal of Development Research*, *32*(5), 1353-1378.

Andersen, T. G. (1996). Return volatility and trading volume: An information flow interpretation of stochastic volatility. *The Journal of Finance*, *51*(1), 169-204.

Arif, M., Naeem, M. A., Hasan, M., M Alawi, S., & Taghizadeh-Hesary, F. (2022). Pandemic crisis versus global financial crisis: are Islamic stocks a safe haven for G7 markets? *Economic Research-Ekonomska Istraživanja*, *35*(1), 1707-1733.

Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance*, *54*, 101249.

Azimli, A. (2020). The impact of COVID-19 on the degree of dependence and structure of risk-return relationship: A quantile regression approach. *Finance Research Letters*, *36*, 101648.

Badshah, I., Bekiros, S., Lucey, B. M., & Uddin, G. S. (2018). Asymmetric linkages among the fear index and emerging market volatility indices. *Emerging Markets Review*, *37*, 17-31.

Bahrini, R., & Filfilan, A. (2020). Impact of the novel coronavirus on stock market returns: evidence from GCC countries. *Quantitative Finance and Economics*, *4*(4), 640-652.

Bai, L., Wei, Y., Wei, G., Li, X., & Zhang, S. (2021). Infectious disease pandemic and permanent volatility of international stock markets: A long-term perspective. *Finance research letters*, *40*, 101709.

Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The review of asset pricing studies*, *10*(4), 742-758.

Bash, A. (2020). International evidence of COVID-19 and stock market returns: An event study analysis. *International Journal of Economics and Financial Issues*, *10*(4), 34.

Baur, D. G. (2013). The structure and degree of dependence: A quantile regression approach. *Journal of Banking & Finance*, *37*(3), 786-798.

Béjaoui, A., Mgadmi, N., Moussa, W., & Sadraoui, T. (2021). A short-and long-term analysis of the nexus between Bitcoin, social media and Covid-19 outbreak. *Heliyon*, *7*(7), e07539.

Bera, A. K., Galvao, A. F., Montes-Rojas, G. V., & Park, S. Y. (2016). Asymmetric Laplace regression: maximum likelihood, maximum entropy and quantile regression. *Journal of Econometric Methods*, *5*(1), 79-101.

Boateng, E., Adam, A. M., & Junior, P. O. (2021). Modelling the heterogeneous relationship between the crude oil implied volatility index and African stocks in the coronavirus pandemic. *Resources Policy*, *74*, 102389.

Bouri, E., Cepni, O., Gabauer, D., & Gupta, R. (2021). Return connectedness across asset classes around the COVID-19 outbreak. *International review of financial analysis*, *73*, 101646.

Bouri, E., Gupta, R., Tiwari, A. K., & Roubaud, D. (2017). Does Bitcoin hedge global uncertainty? Evidence from wavelet-based quantile-in-quantile regressions. *Finance Research Letters*, *23*, 87-95.

Broadstock, D. C., & Zhang, D. (2019). Social-media and intraday stock returns: The pricing power of sentiment. *Finance Research Letters*, *30*, 116-123.

Bukovina, J. (2016). Social media big data and capital market—an overview. Journal of Behavioral and Experimental Finance, 11, 18–26.

Cepoi, C. O. (2020). Asymmetric dependence between stock market returns and news during COVID-19 financial turmoil. *Finance Research Letters*, *36*, 101658.

Chang, C. P., Feng, G. F., & Zheng, M. (2021). Government fighting pandemic, stock market return, and COVID-19 virus outbreak. *Emerging Markets Finance and Trade*, *57*(8), 2389-2406.

Chen-Hui, W., & Chan-Jane, L. (2017). The impact of media coverage on investor trading behavior and stock returns. Pacific-Basin Finance Journal, 43, 151–172.

Cooper, D. R., & Schindler, P. S. (2008). Business research methods (10th ed.). New York: McGraw-Hill

Contessi, S., & De Pace, P. (2021). The international spread of COVID-19 stock market collapses. *Finance Research Letters*, *42*, 101894.

Corbet, S., Larkin, C., & Lucey, B. (2020). The contagion effects of the COVID-19 pandemic: Evidence from gold and cryptocurrencies. *Finance Research Letters*, *35*, 101554.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approach*. Sage publications.

Das, M., Das, A., & Mandal, A. (2020). Examining the impact of lockdown (due to COVID-19) on Domestic Violence (DV): An evidence from India. *Asian Journal of psychiatry*, *54*, 102335.

Ding, S., Yuan, Z., Chen, F., Xiong, X., Lu, Z., & Cui, T. (2021). Impact persistence of stock market risks in commodity markets: Evidence from China. *PloS one*, *16*(11), e0259308.

Duffy, A., Tandoc, E., & Ling, R. (2019). Too good to be true, too good not to share: The social utility of fake news. Information, Communication & Society, 1–15.

Ederington, L. H., & Lee, J. H. (1993). How markets process information: News releases and volatility. *The Journal of Finance*, *48*(4), 1161-1191.

Egelhofer, J. L., & Lecheler, S. (2019). Fake news as a two-dimensional phenomenon: A framework and research agenda. Annals of the International Communication Association, 43(2), 97–116.

Erdem, O. (2020). Freedom and stock market performance during Covid-19 outbreak. *Finance Research Letters*, *36*, 101671.

Eldor, R, Melnick, R., (2004). Financial Markets and Terrorism, European Journal of Political Economy Vol. 20, 367–386

Elsayed, A., & Abd Elrhim, M. (2020). The effect of COVID-19 spread on Egyptian stock market sectors. *Available at SSRN 3608734*.

Fang, L., & Peress, J. (2009). Media coverage and the cross-section of stock returns. *The Journal of Finance*, *64*(5), 2023-2052.

Frenkel, S., Alba, D., & Zhong, R. (2020, March 8). Surge of Virus Misinformation Stumps Facebook and Twitter. The New York Times. Retrieved from; https://www.nytimes.com/2020/03/08/technology /coronavirus-misinformation-socialmedia.html

García-Herrero, A., & Ribakova, E. (2020). COVID-19's reality shock for external-funding dependent emerging economies. *Policy Contribution Issue nˀ10*.

Goodell, J. W. (2020). COVID-19 and finance: Agendas for future research. *Finance research letters*, *35*, 101512.

Gormsen, N. J., & Koijen, R. S. (2020). Coronavirus: Impact on stock prices and growth expectations. *The Review of Asset Pricing Studies*, *10*(4), 574-597.

Han, B., & Hsu, J. (2004). Prospect theory and its applications in finance. *Imagine*.

Haroon, O., & Rizvi, S. A. R. (2020). COVID-19: Media coverage and financial markets behaviour—A sectoral inquiry. *Journal of Behavioural and Experimental Finance*, *27*, 100343.

Harjoto, M. A., Rossi, F., Lee, R., & Sergi, B. S. (2021). How do equity markets react to COVID-19? Evidence from emerging and developed countries. *Journal of Economics and Business*, *115*, 105966.

Hassan, I. (2020). COVID-19: The Dual Threat of A Virus and A Fake News Epidemic. Premium Times. Retrieved from; https://headtopics.com/ng/covid-19-the-dual-threat-of-a-virus-and-a-fake-news-epidemic-by-idayat-hassan-premium-times-opin-12109663

He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economic and Political Studies*, *8*(3), 275-288.

He, P., Sun, Y., Zhang, Y., & Li, T. (2020). COVID–19's impact on stock prices across different sectors—An event study based on the Chinese stock market. *Emerging Markets Finance and Trade*, *56*(10), 2198-2212.

Ho, K. Y., Shi, Y., & Zhang, Z. (2020). News and return volatility of Chinese bank stocks. *International Review of Economics & Finance*, *69*, 1095-1105

Holthausen, R. W., & Verrecchia, R. E. (1990). The effect of informedness and consensus on price and volume behaviour. *Accounting Review*, 191-208.

Horwich, G. (2000). Economic lessons of the Kobe earthquake. *Economic development and cultural change*, *48*(3), 521-542.

Hou, Z., Du, F., Jiang, H., Zhou, X., Lin, L., Assessment, T., & Commission, N. H. (2020). Assessment of public attention, risk perception, emotional and behavioural responses to the COVID-19 outbreak: Social media surveillance in China.

Hyun-Jung, B. (2020). S. Korea's economy faces a tipping point as the COVID-19 pandemic persists. The Jakarta post Seoul, South Korea: The Korea Herald/Asian Networks.

Ichev, R., & Marinč, M. (2018). Stock prices and geographic proximity of information: Evidence from the Ebola outbreak. *International Review of Financial Analysis*, *56*, 153-166.

Insaidoo, M., Arthur, L., Amoako, S., & Andoh, F. K. (2021). Stock market performance and COVID-19 pandemic: evidence from a developing economy. *Journal of Chinese Economic and Foreign Trade Studies*.

90

Kahneman, D. & Tversky A. 1979. "Prospect Theory: An Analysis of Decision under Risk." Econometrica 47 (2): 263–91.

Kartal, M. T., Depren, Ö., & Depren, S. K. (2021). The relationship between mobility and COVID-19 pandemic: Daily evidence from an emerging country by causality analysis. *Transportation Research Interdisciplinary Perspectives*, *10*, 100366.

Khatatbeh, I. N., Hani, M. B., & Abu-Alfoul, M. N. (2020). The impact of COVID-19 pandemic on global stock markets: An event study. *International Journal of Economics and Business Administration*, *8*(4), 505-514.

Kim, O., & Verrechia, R. (1991). Trading volume and price reactions to public announcements. Journal of Accounting Research, 26, 302-321.

Koenker, R., & Bassett Jr, G. (1978). Regression quantiles. *Econometrica: journal of the Econometric Society*, 33-50.

Koenker, R., & Hallock, K. F. (2001). Quantile regression. *Journal of economic perspectives*, *15*(4), 143-156.

Küçükçayli, F. M., & Akinci, G. Y. (2020). Is COVID-19 the new black swan of the financial markets? On the linkage between COVID-19 and stock markets. *Modern Economy*, 201.

Lampos, V., Moura, S., Yom-Tov, E., Cox, I. J., McKendry, R., & Edelstein, M. (2020). Tracking COVID-19 using online search. 93.

Li, X., Li, B., Wei, G., Bai, L., Wei, Y., & Liang, C. (2021). Return connectedness among commodity and financial assets during the COVID-19 pandemic: Evidence from China and the US. *Resources Policy*, *73*, 102166.

Liu, H., Manzoor, A., Wang, C., Zhang, L., & Manzoor, Z. (2020). The COVID-19 outbreak and affected countries stock markets response. *International Journal of Environmental Research and Public Health*, *17*(8), 2800.

Lo, A. W. (2004). The adaptive markets hypothesis: Market efficiency from an evolutionary perspective. *Journal of Portfolio Management, Forthcoming*.

Lyócsa, Š., Baumöhl, E., Výrost, T., & Molnár, P. (2020). Fear of the coronavirus and the stock markets. *Finance research letters*, *36*, 101735.

Maki, D. (2012). Tests for cointegration allowing for an unknown number of breaks. *Economic Modelling*, *29*(5), 2011-2015.

Malhotra, N., & Birks, D. F. (2007). An applied approach. *Marketing research. London: Prentice Hall*.

Marston, C., 1996, "The Organization of Investor Relations Function by Large UK Quoted Companies, 24-2, 477-488.

Mazur, M., Dang, M., & Vega, M. (2021). COVID-19 and the march 2020 stock market crash. Evidence from S&P1500. *Finance research letters*, *38*, 101690

McGonagle, T. (2017). "Fake news": False fears or real concerns? Netherlands Quarterly of Human Rights, 35(4), 203–209.

Mehtar, S., Preiser, W., Lakhe, N. A., Bousso, A., TamFum, J. J. M., Kallay, O., ... & Nachega, J. B. (2020). Limiting the spread of COVID-19 in Africa: size mitigation strategies do not fit all countries. *The Lancet Global Health*, *8*(7), e881-e883.

Mishra, P. K., & Mishra, S. K. (2020). Corona pandemic and stock market behaviour: empirical insights from selected Asian countries. *Millennial Asia*, *11*(3), 341-365.

Mnif, E., & Jarboui, A. (2021). The resilience of Islamic cryptocurrency markets to Covid-19 shocks and the Federal Reserve policy. *Asian Journal of Accounting Research*.

Narayan, P. K. (2020). Oil price news and COVID-19—Is there any connection? *Energy Research Letters*, *1*(1), 13176.

Narayan, P. K., Gong, Q., & Ahmed, H. J. A. (2022). Is there a pattern in how COVID-19? has affected Australia's stock returns? *Applied Economics Letters*, *29*(3), 179-182.

Nwosa, P. I. (2021). Oil price, exchange rate and stock market performance during the COVID-19 pandemic: Implications for TNCs and FDI inflow in Nigeria. *Transnational Corporations Review*, *13*(1), 125-137.

Onali, E. (2020). Covid-19 and stock market volatility. *Available at SSRN 3571453*

Osagie, M., Maijamaa, A. B., & John, D. O. (2020). On the effects of COVID-19 outbreak on the Nigerian stock exchange performance: Evidence from GARCH models.

Ozili, P. K., & Arun, T. (2020). Economic Effects of Coronavirus Outbreak.

Papadamou, S., Fassas, A., Kenourgios, D., & Dimitriou, D. (2020). Direct and indirect effects of COVID-19 pandemic on implied stock market volatility: Evidence from panel data analysis.

Pennycook, G., McPhetres, J., Zhang, Y., & Rand, D. (2020). Fighting COVID-19 misinformation on social media: Experimental evidence for a scalable accuracy nudge intervention. PsyArXiv [Working Paper], 1–24.

Popescu, O. M. (2019). The impact of Terrorist Attacks on the World Economy. Stock Market Case Study. *Romanian Economic Journal*, *22*(74), 100-113.

Raja Ram, A. (2020). COVID-19 and stock market crash. Outlook Money. New Delhi, India: Outlook.

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies*, *9*(3), 622-655.

Rampersad, G., & Althiyabi, T. (2020). Fake news: Acceptance by demographics and culture on social media. *Journal of Information Technology & Politics*, *17*(1), 1-11

Ravi, S., 2020. Business World. [Online] Available at: http://www.business world.in/article/Impact-Of-COVID-19-On-The-IndianStock-Markets /11-05-2020-191755/

Sahu, K. K., Mishra, A. K., & Lal, A. (2020). Comprehensive update on current outbreak of novel coronavirus infection (2019-nCoV). Annals of Translational Medicine.

Salisu, A. A., & Vo, X. V. (2020). Predicting stock returns in the presence of COVID-19 pandemic: The role of health news. *International Review of Financial Analysis*, *71*, 101546.

Saunders, M.N.K., & Lewis, P. (2012). Doing your research project. Harlow: FT Prentice Hall.

Saunders, M., Lewis, P., & Thornhill, A. (2016). Research Methods for Business Students. England:

Schwert, G. W. (1981). Using financial data to measure effects of regulation. *The Journal of Law and Economics*, *24*(1), 121-158.

Shehzad, K., Xiaoxing, L., & Kazouz, H. (2020). COVID-19's disasters are more perilous than Global Financial Crisis: A rumor or fact? *Finance research letters*, *36*, 101669.

Shi, Y., & Ho, K. Y. (2021). News sentiment and states of stock return volatility: Evidence from long memory and discrete choice models. *Finance Research Letters*, *38*, 101446.

Sim, N., & Zhou, H. (2015). Oil prices, US stock return, and the dependence between them quantiles. *Journal of Banking & Finance*, *55*, 1-8.

Singh, B., Dhall, R., Narang, S., & Rawat, S. (2020). The outbreak of COVID-19 and stock market responses: An event study and panel data analysis for G-20 countries. *Global Business Review*, 0972150920957274.

Skidmore, M., & Toya, H. (2002). Do natural disasters promote long-run growth? *Economic Inquiry*, *40*(4), 664-687.

Smales, L. A. (2014). News sentiment in the gold futures market. *Journal of Banking & Finance*, *49*, 275-286.

Sun, Y., Bao, Q., & Lu, Z. (2021). Coronavirus (Covid-19) outbreak, investor sentiment, and medical portfolio: Evidence from China, Hong Kong, Korea, Japan, and the US. *Pacific-Basin Finance Journal*, *65*, 101463.

Syifaudin, A., Yusuf, Y., Mulyatno, R., & Dhevyanto, B. (2020, March). Fundamental Financial Information as a Signal of Company Value. In *1st International Conference on Accounting, Management and Entrepreneurship (ICAMER 2019)* (pp. 22-24). Atlantis Press.

Takyi, P. O., & Bentum-Ennin, I. (2021). The impact of COVID-19 on stock market performance in Africa: A Bayesian structural time series approach. *Journal of Economics and Business*, *115*, 105968.

Taleb, N.N. (2007). The black swan: the impact of the highly improbable, Random House Publishing Group, USA.

Talib, N. N. (2001). Fooled by Randomness: The Hidden Role of Chance in Life and the Markets. New York: Penguin Random House LLC.

Teitler-Regev, S., & Tavor, T. (2019). The impact of disasters and terrorism on the stock market. *Jàmbá: Journal of Disaster Risk Studies*, *11*(1), 1-8. Thorbecke, W. (2020). The impact of the COVID-19 pandemic on the US economy: Evidence from the stock market. *Journal of Risk and Financial Management*, *13*(10), 233.

Thornhill, I., Loiselle, S., Lind, K., & Ophof, D. (2016). The citizen science opportunity for researchers and agencies. *BioScience*, *66*(9), 720-721.

Topcu, M., & Gulal, O. S. (2020). The impact of COVID-19 on emerging stock markets. *Finance Research Letters*, *36*, 101691

Umar, Z., & Gubareva, M. (2021). Faith-based investments and the Covid-19 pandemic: Analyzing equity volatility and media coverage time-frequency relations. *Pacific-Basin Finance Journal*, *67*, 101571.

Umar, Z., & Gubareva, M. (2020). A time-frequency analysis of the impact of the COVID-19 induced panic on the volatility of currency and cryptocurrency markets. Journal of Behavioral and Experimental Finance, 28, 100404.

Umar, Z., Jareño, F., & de la O González, M. (2021). The impact of COVID-19-related media coverage on the return and volatility connectedness of cryptocurrencies and fiat currencies. *Technological Forecasting and Social Change*, *172*, 121025.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *science*, *359*(6380), 1146-1151.

Urquhart, A. (2018). What causes the attention of Bitcoin? *Economics Letters*, *166*, 40-44.

Wasserman, H., & Madrid-Morales, D. (2019). An exploratory study of "fake news" and media trust in Kenya, Nigeria and South Africa. *African Journalism Studies*, *40*(1), 107-123.

World Bank. (2020). *Global economic prospects, June 2020*. The World Bank.

World Health Organization. (2020). Coronavirus disease 2019 (COVID-19): situation report, 73.

Worthington, A., & Valadkhani, A. (2004). Measuring the impact of natural disasters on capital markets: an empirical application using intervention analysis. *Applied Economics*, *36*(19), 2177-2186.

Yan, C. (2020). COVID-19 Outbreak and stock prices: Evidence from China. *Available at SSRN 3574374*.

Yang, T., Liu, J., Ying, Q., & Yousaf, T. (2019). Media coverage and sustainable stock returns: Evidence from China. Sustainability, 11, 2335.

Zeckhauser, R. (1996). The economics of catastrophes. *Journal of risk and uncertainty*, *12*, 113-140.

Zeren, F., & Hizarci, A. (2020). The impact of COVID-19 coronavirus on stock markets: evidence from selected countries. *Muhasebe ve Finans İncelemeleri Dergisi*, *3*(1), 78-84.

Zhang, D., Hu, M., & Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Finance research letters*, *36*, 101528.

Zhou, X., Zafarani, R., Shu, K., & Liu, H. (2019). Fake news: Fundamental theories, detection strategies and challenges. In *Proceedings of the twelfth ACM international conference on web search and data mining* (pp. 836-837).

Zoungrana, T. D., Toe, D. L. T., & Toé, M. (2021). Covid-19 outbreak and stocks return on the West African Economic and Monetary Union's stock market: An empirical analysis of the relationship through the event study approach. *International Journal of Finance & Economics*.