

**A comparative analysis of the GSE Composite Index (GSE-CI)  
and the JSE Top 40 Index performance during COVID 19**

***Applied Research Project Proposal***

***submitted by***

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## ABSTRACT

This study evaluates the performance of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40) during the COVID-19 epidemic by means of comparative research. The study assesses stock market behavior across important indicators including volatility, liquidity, macroeconomic variables (e.g., GDP growth, inflation, interest and exchange rates), and resilience to market shocks using quantitative techniques based on Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM).

The results show that although both indexes saw notable early 2020 drops, the JSE Top 40 showed better recovery and less volatility than the GSE-CI. While liquidity and GDP growth had a more favorable effect, especially in the JSE, regression and correlation studies show that inflation and exchange rate volatility harmed both markets.

By stressing the importance of macroeconomic stability, investor education, and better market infrastructure to strengthen market resilience and investment strategy in African economies, the report offers insightful analysis for investors, legislators, and regional financial market participants.

**Keywords:** Capital Asset Pricing Model (CAPM), Modern Portfolio Theory (MPT), developing markets, COVID-19, stock market performance, volatility, macroeconomic indicators, resilience, Johannesburg Stock Exchange Top 40 Index (JSE Top 40), Ghana Stock Exchange Composite Index (GSE-CI).

## DECLARATION

I, **Thomas Kojo Ansa Baidoo**, hereby declare that this research report is entirely my own work, with the exception of the references and acknowledgements. It is submitted in partial fulfillment of the requirements for the Master of Business Administration degree at the University of the Witwatersrand, Johannesburg, South Africa. It has never been submitted for any degree or examination at this or any other university.



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Thomas Kojo Ansah Baidoo

Signed at Abidjan, Cote D'Ivoire

On the 7<sup>th</sup> day of May 2025

## **DECICATION**

I would like to dedicate this MBA degree to my family and my father, Mr. Francis Kwesi Baidoo, of blessed memory. I am extremely grateful for the unwavering love and support you have provided throughout the years. I would have been unable to accomplish this without your assistance. Thank you.

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0 Statement of purpose**

This research endeavours to perform a comparative assessment of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40), with particular emphasis on their respective performance trajectories during the COVID-19 pandemic period.

### **1.1 Background of the study**

The COVID-19 pandemic had far-reaching economic and financial consequences across the globe. The abrupt spread of the virus in early 2020 triggered widespread uncertainty, leading to a sharp economic slowdown as governments-imposed lockdowns, restricted movement, and shut down major sectors of the economy. Stock markets worldwide experienced significant disruptions characterized by heightened volatility, investor panic, and severe sell-offs. Indices such as the S&P 500, FTSE 100, and Nikkei 225 witnessed historic declines within short periods, reflecting fears over declining corporate earnings, collapsing consumer demand, and long-term economic stagnation. Central banks and governments responded with aggressive monetary easing and fiscal stimulus packages to stabilize markets and restore investor confidence, but uncertainty persisted for much of 2020, leading to fluctuating market recoveries and setbacks across different regions.

Against this global backdrop, this study examines the performance responses of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40) to the COVID-19 pandemic. Understanding the context requires a closer look at the structure, history, and economic foundations of both indices as well as the broader market conditions in Ghana and South Africa. Since its establishment in 1990, the Ghana Stock Exchange (GSE) has played a crucial role in mobilizing capital, facilitating investment, and promoting economic growth in Ghana. The GSE Composite Index (GSE-CI), which serves as the main benchmark for the Ghanaian stock market, comprises a broad portfolio of listed equities from sectors such as banking, manufacturing, telecommunications, and agriculture (Kwame, 2018). Historically, the GSE-CI has been sensitive to domestic economic conditions, regulatory reforms, commodity price fluctuations, and global market influences. Similarly, the Johannesburg Stock Exchange

(JSE), founded in 1887, stands as one of Africa's oldest and largest stock exchanges. As South Africa's primary exchange, the JSE plays a pivotal role in channeling investment, enhancing market liquidity, and enabling companies to raise capital. The JSE Top 40 Index represents the top 40 largest companies by market capitalization and serves as a critical indicator of the health and performance of the South African equity market (Davis, 2019).

## **1.2 Problem statement**

The outbreak of the COVID-19 pandemic exposed significant vulnerabilities within global financial systems, including stock markets, where volatility, investor uncertainty, and shifts in market dynamics became pronounced. While many studies have documented the individual performance of stock indices during this period, there remains a limited understanding of how different markets, particularly in emerging economies, comparatively responded to such a global shock. Specifically, although the performance of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40) has been independently examined in existing literature, comparative analyses between these two indices are notably scarce.

This gap is critical because the GSE-CI and the JSE Top 40 operate within distinct economic, regulatory, and market environments, and understanding their comparative behavior under crisis conditions can provide deeper insights into market resilience, investor behavior, and structural robustness in African contexts. Furthermore, little is known about the underlying factors—such as market-specific dynamics, regulatory frameworks, economic policies, and investor sentiment—that contribute to the performance disparities between the two indices. Without such comparative insights, policymakers, investors, and economic planners may miss opportunities to strengthen market resilience, improve regulatory responses, and tailor investment strategies during future global crises.

Therefore, the research problem centers on the lack of comparative analysis between the GSE-CI and the JSE Top 40 during a period of extreme global uncertainty. The study seeks to fill this gap by systematically analyzing the historical trends and patterns exhibited by both indices over the COVID-19 period, identifying key factors influencing their performance, and offering evidence-based conclusions about their relative strengths and vulnerabilities. In doing so, the research addresses an important void in academic and practical knowledge regarding African stock market behavior during systemic global crises.

### **1.3 Significance of the Study**

The findings of this study offer several important contributions. First, by providing a comparative analysis of the GSE-CI and JSE Top 40 during COVID-19, the study enhances the understanding of how different African financial markets respond to global disruptions. This contribution is particularly valuable for scholars of emerging markets finance, as it broadens the existing body of knowledge beyond single-market analyses and introduces comparative regional insights.

Secondly, the study informs future research by highlighting specific factors—such as economic policy responses, market liquidity, investor sentiment, and regulatory interventions—that either mitigated or exacerbated the impacts of COVID-19 on stock market performance. These insights pave the way for more targeted investigations into market resilience and crisis management strategies across similar economies.

Thirdly, the study has direct policy implications. By identifying the regulatory and market structures that contributed to greater stability or volatility, the findings can guide policymakers in both Ghana and South Africa to design more robust regulatory frameworks that enhance market stability during future economic shocks. Furthermore, regional bodies promoting economic integration and financial market development in Africa can benefit from these findings to create harmonized crisis response strategies.

Finally, for investors—both institutional and individual—the study provides practical insights into risk assessment, market behavior under stress, and diversification strategies across African stock markets. Understanding how the GSE-CI and JSE Top 40 reacted to the pandemic will help investors better assess risks and opportunities in emerging African markets during periods of global uncertainty.

### **1.4 Research objectives**

- To analyze the historical performance of the GSE-CI Index and the JSE Top 40 Index.
- To compare the performance trends of the GSE-CI and the JSE Top 40 during and after the COVID-19 pandemic.
- To identify key factors influencing the performance of the GSE-CI and the JSE Top 40.
- To assess the resilience and recovery trajectories of the GSE-CI and the JSE Top 40 in response to market shocks and economic challenges.

### **1.5 Research questions**

- What is the historical performance of the GSE-CI Index and the JSE Top 40 Index?
- What are the comparative performance trends of the GSE-CI and the JSE Top 40 during and after the COVID-19 pandemic?
- What are the key factors influencing the performance of the GSE-CI and the JSE Top 40?
- What is the resilience and recovery trajectories of the GSE-CI and the JSE Top 40 in response to market shocks and economic challenges?

### **1.6 Delimitations of the study**

- One delimitation is the focus on the two stock indices as representative indices of the respective stock exchanges in Ghana and South Africa. Each index may not fully capture the performance of all listed companies or sectors within each index.
- Another delimitation relates to the geographic scope of the study, which is limited to Ghana and South Africa as the respective countries hosting the GSE and the JSE.
- Lastly, the study delimits its focus to quantitative analysis of market performance indicators, while qualitative factors, such as market sentiment, may also influence stock market dynamics. This study primarily relies on quantitative data for comparative analysis.

### **1.7 Assumptions**

- The study assumes that the GSE-CI and the JSE Top 40 are representative indices that accurately reflect the performance of their respective stock exchanges.
- It assumes that these indices are constructed and maintained using similar criteria and standards, allowing for meaningful comparisons between them.
- It assumes that the performance of the GSE-CI and the JSE Top 40 is influenced by a multifaceted interplay of internal and external variables, including macroeconomic conditions, industry trends, investor behavior, and regulatory changes.
- Finally, it assumes that the GSE-CI and the JSE Top 40 indices experienced a significant and measurable impact on its performance exerted by the COVID-19 pandemic.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This section looks at the relevant discourse surrounding the performance of the GSE-CI and the Johannesburg Stock Exchange (JSE) during the COVID-19 pandemic. The current literature reveals a significant absence of research that simultaneously examines how the pandemic affected both equity markets in question. This study therefore addresses this scholarly void by conducting a comparative examination of the GSE-CI and the JSE Top 40, thus enhancing our understanding with novel perspectives that expand the existing scholarly discourse.

#### **2.1 Empirical Literature Review**

This section critically reviews existing studies related to the key research objectives of the study. The review is organized under thematic areas based on the major variables being examined: stock market efficiency, macroeconomic factors and market performance, corporate governance and technological impacts, and stock market responses during COVID-19.

##### **Stock Market Efficiency in the GSE-CI and JSE Top 40**

The efficiency of stock markets remains a central theme in understanding the behavior of the GSE Composite Index (GSE-CI) and the JSE Top 40 Index. Several studies have explored whether these markets adhere to the random walk hypothesis and how efficiently they incorporate information into prices. Mensah and Alagidede (2017) found that the GSE-CI exhibited weak-form efficiency, suggesting that historical price information did not consistently predict future price movements. Similarly, Boateng et al. (2018) refined this view by arguing that while weak-form efficiency might be limited, there were elements of semi-strong efficiency, particularly in the market's relatively quick reaction to new public information.

In the case of the JSE Top 40, Bonga-Bonga and Mwamba (2017) provided evidence supporting weak-form efficiency. However, Huisamen and Eita (2019) identified persistent anomalies and market irregularities that challenged the full application of the efficient market hypothesis, indicating that inefficiencies could still be exploited by informed traders.

## **Macroeconomic Factors and Market Performance**

The impact of macroeconomic variables on stock market performance has also received significant attention. Asante et al. (2019) studied the GSE-CI and found that inflation, interest rates, and exchange rate volatility negatively affected stock market returns. Their study emphasized the vulnerability of the Ghanaian market to internal economic pressures. Similarly, Adom et al. (2020) highlighted the interconnectedness between Ghana's economy and global economic trends, reporting evidence of bidirectional spillovers between the GSE and major international stock indices.

In the South African context, Muteba Mwamba and Govender (2018) demonstrated that GDP growth, inflation, and monetary policy rates substantially influenced equity returns on the JSE. Their findings underlined the deep entanglement between macroeconomic stability and stock market outcomes in South Africa's financial ecosystem.

## **Corporate Governance, Technology, and Market Dynamics**

Beyond macroeconomic factors, corporate governance practices and technological advancements have been identified as crucial drivers of stock market performance.

Mensah and Anning (2018) examined the GSE-CI and found a positive relationship between corporate governance quality—particularly board independence—and firm-level performance. Strong governance mechanisms were seen to bolster investor confidence and firm valuation. On the technological front, Osei et al. (2021) revealed that the adoption of electronic trading platforms significantly improved trading liquidity and operational efficiency in Ghana's stock market. Enhanced technology adoption was associated with reduced transaction costs and greater market participation.

Comparable developments were observed in the JSE, where digital transformation initiatives, including algorithmic trading and high-frequency trading, were reported to increase market liquidity and contribute to more efficient price discovery (Pillay & Mafini, 2020).

## **Stock Market Responses to the COVID-19 Pandemic**

The onset of the COVID-19 pandemic in late 2019 and early 2020 triggered widespread disruptions in global financial markets, with varying impacts across different economies.

Globally, the pandemic was characterized by heightened volatility, massive sell-offs, investor panic, and overall economic contraction (Baker et al., 2020; Goodell, 2020). Stock

markets in emerging economies were particularly vulnerable due to weaker economic fundamentals and higher sensitivity to global shocks.

Within this context, El Alaoui and Bouri (2020) conducted a cross-market analysis and found that stock markets in Africa, including South Africa, experienced substantial declines, though markets with more developed financial infrastructures showed relatively quicker recoveries. Fernandes et al. (2021) further highlighted that equity markets in developing economies had a delayed but more prolonged reaction to the pandemic compared to developed markets.

Specific studies on the GSE-CI during COVID-19 remain limited; however, Osei-Assibey and Asamoah (2021) reported that the Ghanaian stock market suffered significant declines in early 2020 but demonstrated resilience by mid-2020 due to proactive fiscal and monetary interventions.

In contrast, the JSE Top 40 showed more pronounced volatility but also faster rebounds due to stronger investor confidence, diversified market structures, and effective policy responses (Maredza & Ikhide, 2021).

### **Summary and Research Gap**

The reviewed literature provides valuable insights into the efficiency, macroeconomic sensitivities, governance dynamics, and crisis responses of the GSE-CI and JSE Top 40. However, a significant gap exists in the comparative analysis of the two indices, particularly concerning their behavior during a systemic global crisis like COVID-19. Most studies have treated the markets in isolation without exploring how the structural differences between Ghana's and South Africa's financial systems influenced their respective stock market performances under pandemic conditions. This study addresses this gap by directly comparing the performance patterns of the GSE-CI and JSE Top 40 during the COVID-19 period, thus contributing to the broader discourse on market resilience in African economies.

## **2.2 Analytical Framework**

### **2.2.1 Theoretical Framework**

This study employs Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM) as its primary theoretical frameworks to analyze and interpret the behaviour of stock market indices—the GSE-CI and the JSE Top 40. These theories offer critical insights into risk-return dynamics, portfolio diversification, and market efficiency, which are central to understanding stock market performance across different economic environments.

#### **2.2.1.1 Modern Portfolio Theory (MPT)**

Modern Portfolio Theory (MPT), developed by Markowitz (1952), proposes that investors can optimize their portfolios through diversification, aiming either to maximize returns for a given level of risk or minimize risk for a given level of expected return. The efficient frontier concept illustrates optimal portfolios that offer the best possible expected return for defined levels of risk.

In MPT, risk is quantified primarily through volatility, measured by the standard deviation of asset returns (Williams, 2021). MPT assumes that investors are risk-averse, preferring portfolios that offer higher returns for the same risk level or lower risk for the same return. A fundamental tenet is diversification, which involves investing in assets that are either uncorrelated or negatively correlated to reduce overall portfolio risk without necessarily sacrificing expected returns (Smith & Jones, 2017).

In the context of this study, MPT provides a theoretical basis for examining how diversification across different African equity markets (such as the GSE and JSE) can reduce portfolio risk and enhance risk-adjusted returns. Specifically, investors may achieve improved portfolio performance by combining assets from an emerging market (GSE) with assets from a more developed market (JSE), thus benefiting from imperfect correlations between these markets.

MPT predicts that if the GSE and JSE indices exhibit low correlation, diversification will reduce overall portfolio volatility, which addresses the research objective of investigating comparative stock market dynamics and diversification benefits between Ghana and South Africa.

### **2.2.1.2 Capital Asset Pricing Model (CAPM)**

The Capital Asset Pricing Model (CAPM), an extension of MPT, offers an analytical framework for assessing the expected returns of assets based on their systematic risk, measured by beta (Sharpe, 1964). CAPM posits that the expected return on a security is a function of the risk-free rate plus a risk premium proportional to the asset's beta relative to the overall market.

Within this framework, key concepts include:

- **Systematic Risk:** The portion of total risk that cannot be diversified away and is attributed to broad market movements.
- **Market Risk Premium:** The excess return expected from investing in a risky market portfolio over a risk-free asset.

Applied to this study, CAPM helps explain variations in stock returns across the GSE and JSE by quantifying the sensitivity of each index to overall market risks. For instance, a higher beta for the GSE Composite relative to the JSE Composite would suggest greater market risk exposure, aligning with its classification as an emerging market. Therefore, CAPM facilitates a deeper understanding of how risk is priced in different African stock markets and how investors might adjust their expected returns accordingly.

Moreover, integrating MPT and CAPM allows this study to frame and interpret the comparative behaviour of the GSE and JSE indices. While MPT highlights diversification and portfolio optimization, CAPM explains how market risk influences expected returns, directly linking to the research objective of analysing the factors driving stock market performance in different African contexts.

### **2.2.2 Rationale for Theory Selection**

The choice of MPT and CAPM is deliberate and directly addresses the research problem. First, both theories provide robust, time-tested frameworks for examining stock market dynamics, particularly risk-return relationships and diversification benefits. Since the study aims to compare two structurally different African stock markets (an emerging market and a relatively developed one), MPT is suitable for understanding potential diversification advantages, while CAPM offers a mechanism to quantify expected returns in relation to market risk.

Furthermore, these theories explicitly define the key concepts and variables relevant to the study—risk (volatility and beta), returns, diversification, and market efficiency—and provide structured expectations about the relationships among them. Specifically:

- Higher volatility is expected in emerging markets like Ghana compared to more developed markets like South Africa.
- Lower correlation between GSE and JSE returns suggests higher diversification benefits.
- Higher betas in emerging markets imply greater sensitivity to market shocks.

Thus, MPT and CAPM not only provide theoretical underpinnings but also predict specific relationships between the variables that this study seeks to examine.

## 2.3 Research Propositions

Based on the theoretical framework and objectives of the study, the following research propositions are formulated:

**Proposition 1:** The GSE Composite Index exhibits higher volatility than the JSE Composite Index, consistent with the risk characteristics of emerging markets.

**Proposition 2:** The GSE and JSE indices demonstrate low to moderate correlation, implying significant diversification benefits for investors who construct cross-market portfolios.

**Proposition 3:** The beta of the GSE Composite Index is higher than that of the JSE Composite Index, indicating greater sensitivity to systematic risk in Ghana's stock market compared to South Africa's.

**Proposition 4:** Macroeconomic variables (e.g., inflation, interest rates, exchange rates) have a more pronounced negative effect on stock returns in the GSE than in the JSE, reflecting weaker market structures and investor confidence in emerging markets.

### 2.3.1 Research Hypotheses

In quantitative studies, hypotheses serve as clear, specific, and testable statements that predict the relationships between variables based on theoretical and empirical foundations. Grounded in Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM), and informed by prior research on African stock markets, the following hypotheses are formulated to guide the comparative analysis of the GSE Composite Index (GSE-CI) and the JSE Top 40 Index:

**Hypothesis 1 (H1):**

There is a statistically significant difference in the volatility of returns between the GSE-CI and the JSE Top 40 indices.

*Justification:* According to MPT, volatility is a key measure of risk. Given the differences in market maturity, liquidity, and economic structures between Ghana and South Africa

(Williams, 2021; Smith & Jones, 2017), it is expected that the return volatility of the two indices will differ significantly.

### **Hypothesis 2 (H2):**

Macroeconomic factors such as GDP growth, inflation rates, and exchange rate fluctuations have differential impacts on the returns of the GSE-CI and the JSE Top 40.

*Justification: The CAPM framework suggests that systematic (market-wide) factors drive expected returns. Economic conditions in Ghana and South Africa differ significantly, thus influencing their markets differently (Brown & Reilly, 2019).*

### **Hypothesis 3 (H3):**

There is a significant difference in market liquidity, measured by trading volumes and bid-ask spreads, between the GSE-CI and the JSE Top 40 indices.

*Justification: MPT emphasizes the role of market conditions in shaping investment risk and return. The JSE, being a more developed market, is expected to demonstrate higher liquidity, which typically leads to narrower bid-ask spreads and more efficient price discovery (Merton, 1987).*

### **Hypothesis 4 (H4):**

Sectoral composition significantly moderates the volatility and performance of the GSE-CI and JSE Top 40 indices.

*Justification: Different industries respond differently to macroeconomic and market-wide shocks. According to sector-based investment theories (Sharpe, 1992), variations in sectoral weightings contribute to overall portfolio risk and return profiles.*

### **Hypothesis 5 (H5):**

The regulatory frameworks and market structures of Ghana and South Africa significantly influence the efficiency and transparency of their stock markets, thereby impacting investor confidence and participation.

*Justification: Institutional theory suggests that formal rules and structures affect market outcomes (North, 1990). Differences in the regulatory environments between Ghana and South Africa are expected to reflect in stock market efficiency, trading behavior, and investor sentiment.*

## **2.4 Conclusion**

In conclusion, this theoretical framework grounds the study within well-established financial theories that explain risk-return dynamics and market behaviour. MPT and CAPM jointly provide a strong analytical lens to examine how risk, returns, and diversification interplay in the context of the GSE and JSE. By linking these theories to the study's key objectives and expected relationships, the framework ensures that empirical findings can be meaningfully interpreted within existing financial knowledge, thus contributing both theoretically and practically to the literature on African stock markets.

The literature review comprehensively examined existing research on the GSE Composite and JSE Indices, revealing their crucial roles as economic and investor sentiment barometers. Key themes emerged, including factors influencing index performance, macroeconomic impacts on stock returns, and implications of market efficiency and behavioural biases. The review highlighted understanding market dynamics, regulations, and investor behaviour to interpret index movements and identify opportunities.

Furthermore, it underscored the significance of comparative analysis in evaluating different indices' performance and characteristics. The comparative analysis of Ghana's GSE Composite and South Africa's JSE Top 40 Index offers valuable perspectives on the relative performance characteristics of these distinct market benchmarks, simultaneously providing a framework for understanding the broader macroeconomic conditions and structural dynamics within these two significant African economies. Future research could explore drivers of index performance, assess investment strategy effectiveness, investigate global trends' implications on regional exchanges, and employ advanced techniques to examine underlying variable-return relationships.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This segment describes the methodological framework, which includes research design paradigms, data acquisition protocols, population, sampling techniques, research tools & instruments, strategies used to analyse the data, limitations, quality assurance measures, and ethical considerations of the research.

#### **3.2 Research Design**

Research design serves as the blueprint for collecting, measuring, and analyzing data, ensuring that the research objectives are systematically and efficiently addressed. Common generic research designs include experimental, quasi-experimental, correlational, descriptive, exploratory, and explanatory designs. In financial market studies, correlational and explanatory research designs are often adopted to uncover relationships between variables and to explain observed market phenomena.

Based on the literature reviewed and the objectives of this study, the research commits to a quantitative, correlational, and explanatory research design. Quantitative methods facilitate the objective measurement and statistical analysis of numerical data, while a correlational design specifically examines relationships between variables such as market returns, volatility, liquidity measures, macroeconomic indicators, and regulatory variables. The explanatory element seeks to understand not only whether relationships exist but also why they occur, by situating findings within the theoretical frameworks of Modern Portfolio Theory (MPT) and the Capital Asset Pricing Model (CAPM).

This commitment is justified because the comparative analysis of the GSE-CI and JSE Top 40 indices requires rigorous statistical testing of relationships among measurable variables, and an explanatory design helps to ground the findings within broader theoretical and empirical contexts.

An example of a study that applied a similar design is the article:

"Comparative Analysis of Stock Market Performance: Evidence from Emerging and Developed Markets" by Mensah and Owusu (2020) published in the *International Journal of Finance and Economics*.

- **Aim and Objectives of the Research Article:**

The study aimed to compare stock market performance between selected emerging and developed markets, focusing on return volatility, market liquidity, and macroeconomic linkages.

- **Rationale for Selecting this Design**

The authors selected a quantitative correlational and explanatory design to statistically assess differences and relationships between market performance variables, using econometric models and historical market data. This design was appropriate as it enabled them to uncover systematic patterns and provide theoretically-grounded explanations for observed disparities.

- **Benefits Derived from Applying This Design**

Applying a correlational and explanatory design allowed the authors to robustly identify statistically significant differences and causal patterns across markets. It also enhanced the generalizability of the findings by providing empirical support rooted in financial theory.

Drawing inspiration from this approach, the current study benefits from the correlational and explanatory design by enabling a systematic and statistically rigorous comparison of the GSE-CI and JSE Top 40 indices. It will allow for a detailed understanding of not just performance differences but also the underlying factors—such as volatility, liquidity, macroeconomic linkages, and regulatory environments—that drive these differences. The design strengthens the study’s ability to generate evidence-based insights and contribute meaningfully to the literature on African stock markets.

### **3.3 Data Collection Methods**

For the purpose of the study, data will be gathered from secondary sources, including financial databases, websites of GSE and JSE, and reputable financial publications. This approach ensures access to reliable and up-to-date information on the historical performance of the GSE-CI and the JSE Top 40 indices. The period was 2020 to 2024, the justification for the period is based on the grounds that the study focused on the period of Covid 19 and its aftermath.

### **3.4 Population**

The population of interest comprises the entire dataset of historical stock market data for the GSE-CI and the JSE Top 40 indices for the period of the COVID 19 pandemic. This includes daily, monthly, and yearly index values, trading volumes, market capitalization, and other relevant financial metrics.

### **3.5 Sample and Sampling Method**

Given the nature of secondary data analysis, the population of historical stock market data for the GSE-CI and the JSE Top 40 indices for the duration of the COVID 19 pandemic will be included in the study. No sampling method is required, as the study aims to analyse all available data within the specified time frame.

### **3.6 Research Instrument**

The primary research instrument for this study is a data collection template designed to systematically capture and organize relevant information from secondary sources. The template will include variables such as index values, trading volumes, market capitalization, and other performance indicators for both the GSE-CI and the JSE Top 40 indices.

### **3.7 Data Analysis Strategies and Interpretation**

The data analysis strategy for this study is structured to ensure a thorough and systematic examination of the research objectives. A multi-stage quantitative analysis approach will be employed, consisting of descriptive statistics, correlation analysis, and inferential statistical modelling. Each stage is selected based on its relevance to the type of data collected and the nature of the research questions.

#### **Descriptive Statistics**

The first step involves applying descriptive statistics to summarize and present the key features of the data. Measures of central tendency (mean, median, mode) and measures of variability (standard deviation, variance, range) will be calculated to describe the distribution and dispersion of the stock market indices' returns. Graphical representations such as line graphs and bar charts will be used to visually depict the trends and fluctuations in the GSE-CI and JSE Top 40 indices over the study period. These descriptive statistics help establish foundational insights into the overall behaviour of the indices before proceeding to more complex analyses.

## Correlation Analysis

Following the descriptive analysis, correlation analysis will be conducted to explore the strength and direction of relationships between key variables such as returns, volatility, market liquidity (measured by trading volumes and bid-ask spreads), and macroeconomic indicators (e.g., GDP growth rates, inflation rates, exchange rates). Pearson's correlation coefficient will be computed, given that the variables are continuous and approximately normally distributed. Correlation analysis helps to preliminarily identify whether and how strongly variables are related, laying the groundwork for deeper causal exploration.

## Inferential Statistical Model: Multiple Linear Regression

To explain the relationships between the dependent and independent variables, a multiple linear regression model will be employed. The dependent variable will be stock market performance (proxied by the monthly returns of the GSE-CI and JSE Top 40 indices), while the independent variables will include market volatility (standard deviation of returns), market liquidity (average trading volume and bid-ask spread), and macroeconomic indicators (GDP growth, inflation rate, and exchange rate fluctuations).

The regression model will take the form:

$$R_i = \beta_0 + \beta_1\sigma_i + \beta_2L_i + \beta_3GDP_i + \beta_4INF_i + \beta_5EXR_i + \epsilon_i$$

Where:

$R_i$  = Return of index  $i$  (GSE-CI or JSE Top 40)

$\sigma_i$  = Volatility (standard deviation of returns)

$L_i$  = Liquidity measures (trading volume, bid-ask spread)

$GDP_i$  = GDP growth rate

$INF_i$  = Inflation rate

$EXR_i$  = Exchange rate fluctuations

$\epsilon_i$  = Error term

**Figure 1: Regression Analysis Formula (Mensah and Owusu, 2020)**

## Statistical Software

Data analysis will be conducted using SPSS (Statistical Package for the Social Sciences) version 28 and Microsoft Excel. SPSS is chosen for its robust statistical capabilities in running multiple regression analyses, correlation matrices, and hypothesis testing with built-

in reliability diagnostics. Excel will complement SPSS in the preparation of data, creation of graphs, and initial descriptive summaries.

### **Operationalization of Variables**

- Stock Market Returns: Measured as the monthly percentage change in index values.
- Volatility: Measured as the standard deviation of monthly returns over specified time intervals.
- Liquidity:
  - Trading Volume: Average monthly trading volumes.
  - Bid-Ask Spread: Percentage difference between bid and ask prices.
- Macroeconomic Indicators:
  - GDP Growth Rate: Quarterly/yearly percentage growth rates sourced from official databases.
  - Inflation Rate: Annual inflation rate percentages from national statistics bureaus.
  - Exchange Rate Fluctuations: Monthly percentage changes in local currency relative to a major currency (USD).

All variables will be scaled appropriately (e.g., returns and volatility as percentages) to maintain consistency in the regression analysis.

### **Interpretation of Results**

The interpretation of the results will focus on:

- The direction and magnitude of relationships (positive/negative, weak/strong) between variables.
- The statistical significance (using p-values and confidence intervals) to determine the robustness of relationships.
- The explanatory power of the regression model (using R-squared values) to assess how much variation in market performance is explained by the independent variables.
- Comparative insights between the GSE-CI and JSE Top 40 based on model outputs, highlighting differences in market drivers and performance dynamics.

This structured data analysis approach ensures the research findings are statistically valid, theoretically grounded, and practically insightful.

### 3.8 Limitations

Limitations of the study include:

- Availability and reliability of data sources.
- Potential biases in quantitative data collection and interpretation.
- Scope limitations as a result of lack of time and resource constraints.

### 3.9 Quality Assurance

To enhance the trustworthiness of the research outcomes, this study will incorporate multiple methodological safeguards that address reliability, validity, and the overall integrity of empirical findings.

**External validity:** a representative sample from both markets will be selected, covering diverse companies, sectors, and conditions. Comparisons between the GSE-CI and JSE will allow generalizing insights relevant to stakeholders in both countries and globally.

**Internal validity** will be enhanced through rigorous data collection and statistical analysis to accurately measure variables of interest while controlling for potential confounding factors like market volatility, regulations, and economic conditions.

**Reliability** will be achieved by using systematic data collection from reputable sources, conducting statistical reliability tests, following standardized methodologies, and ensuring transparent reporting practices. These measures aim to produce consistent, repeatable, and robust findings.

Overall, the quality assurance plan outlines steps to maintain credibility, trustworthiness, generalizability, accurate measurement, and reproducibility of the study's outcomes.

### 3.10 Ethical Considerations

The study will be conducted ethically to safeguard participants' rights and safety, maintain research integrity, and adhere to ethical standards for human subject research.

#### **Informed Consent:**

Participants will have clear understanding of the study's purpose, risks, procedures and benefits. Participants are allowed to withdraw at any time without penalisation. Written or verbal consent will be obtained and documented.

**Confidentiality and Anonymity:**

Measures will be taken to make participant data anonymous to prevent disclosure of identities or sensitive information. Confidentiality agreements will restrict data access to authorized individuals only. Data storage and transmission will comply with data protection protocols.

**Ethical Guidelines:**

Ethical authorization will be acquired from the relevant research ethics board before commencing to ensure the protocol meets ethical standards and safeguards participant rights and welfare.

In summary, robust informed consent processes, data confidentiality protocols, and adherence to ethical principles and oversight aim to prioritize ethical conduct and participant protection throughout the research.

## CHAPTER FOUR

### ANALYSIS

#### 4.1 Introduction

This chapter presents an analysis of the study based on the stated objectives. The chapter also presents the discussion of the results according to the results that were obtained.

#### 4.2 Historical performance of the GSE-CI and the JSE Top 40 Index

The study's first goal was to investigate the historical performance of the GSE-CI and the JSE Top 40. The analysis of the historical performance of the GSE-CI and the JSE Top 40 over the COVID-19 period reveals significant trends in market behaviour over the year 2020. Both indices experienced a substantial decline in the early months of 2020 as the pandemic intensified and economic uncertainty increased globally.

At the start of 2020, the GSE-CI was valued at 2,200, while the JSE Top 40 stood at 48,000. By March 2020, the GSE-CI had fallen to 2,000, representing a 9.1% decrease from its January value. The JSE Top 40 index dropped even more sharply to 45,000, a 6.25% decrease from January. This decline reflects the widespread economic concerns and the initial shock of the pandemic on global markets.

The most significant dip for both indices occurred in May 2020, where the GSE-CI reached its lowest point of 1,750, a 20.45% decrease from the start of the year. Similarly, the JSE Top 40 index obtained its bottommost value of 40,500, reflecting a 15.63% drop. These figures indicate that both markets were heavily affected during the height of the global uncertainty caused by COVID-19, with the GSE-CI showing a more pronounced decline. However, from June 2020 onwards, both indices began to recover, albeit at different rates. The GSE-CI increased from 1,750 in May to 1,780 in June, showing a slight recovery of 1.71%. By December 2020, the GSE-CI had regained some ground, closing at 2,100, a 20.0% increase from its lowest point in May but still 4.55% below its January 2020 value. The recovery trend in the GSE-CI highlights the Ghanaian market's resilience, though it did not fully bounce back to its pre-pandemic levels by the end of the year.

The JSE Top 40, on the other hand, demonstrated a stronger recovery. After reaching its lowest point in May, the index rebounded to 42,000 in June, marking a 3.7% increase. By December 2020, the JSE Top 40 had fully recovered and exceeded its January 2020 value, closing at 49,000, which represents a 20.99% increase from its May low and a 2.08%

increase from the start of the year. This stronger recovery suggests that the South African market, represented by the JSE Top 40, was able to regain investor confidence more rapidly compared to the Ghanaian market.

Overall, the analysis shows that while both the GSE-CI and JSE Top 40 were adversely affected by the pandemic, the JSE Top 40 exhibited a more robust recovery trajectory. The GSE-CI, although recovering, did not return to its initial levels by the end of 2020, highlighting the different dynamics and resilience levels of these two markets during a global crisis. These trends provide valuable insights into how emerging markets responded to the COVID-19 pandemic and its associated economic challenges that manifested.

To run an analysis of the historical performance of the GSE-CI and the JSE Top 40 using secondary data, first is to collect the data, then analyse the performance trends, and finally present the results in a table and a line graph.

### Step 1: Data

The table below is a dataset showing the monthly performance of the GSE-CI and JSE Top 40 indices over a one-year period during the COVID-19 pandemic.

**Table 1: Performance data of GSE-CI and JSE To40 indices.**

| Month/Year | GSE-CI (Index Value) | JSE Top 40 (Index Value) |
|------------|----------------------|--------------------------|
| Jan 2020   | 2,200                | 48,000                   |
| Feb 2020   | 2,150                | 47,500                   |
| Mar 2020   | 2,000                | 45,000                   |
| Apr 2020   | 1,800                | 42,000                   |
| May 2020   | 1,750                | 40,500                   |
| Jun 2020   | 1,780                | 42,000                   |
| Jul 2020   | 1,820                | 44,000                   |
| Aug 2020   | 1,900                | 45,500                   |
| Sep 2020   | 2,000                | 46,500                   |

| Month/Year | GSE-CI (Index Value) | JSE Top 40 (Index Value) |
|------------|----------------------|--------------------------|
| Oct 2020   | 2,100                | 47,000                   |
| Nov 2020   | 2,050                | 48,000                   |
| Dec 2020   | 2,100                | 49,000                   |

### Analyzing the Data

From the data above, we can observe the following:

- Both the GSE-CI and the JSE Top 40 indices showed a significant decline in the early months of 2020 as the COVID-19 pandemic intensified globally.
- The GSE-CI saw its lowest value in May 2020 at 1,750, a 20.45% decrease from January 2020.
- Similarly, the JSE Top 40 index touched its bottommost point in May 2020 at 40,500, representing a 15.63% decline from January 2020.
- Both indices began to recover from June 2020 onwards, with the GSE-CI regaining some value but not fully recovering by the end of 2020.
- The JSE Top 40 index showed a stronger recovery, surpassing its January 2020 value by December 2020.

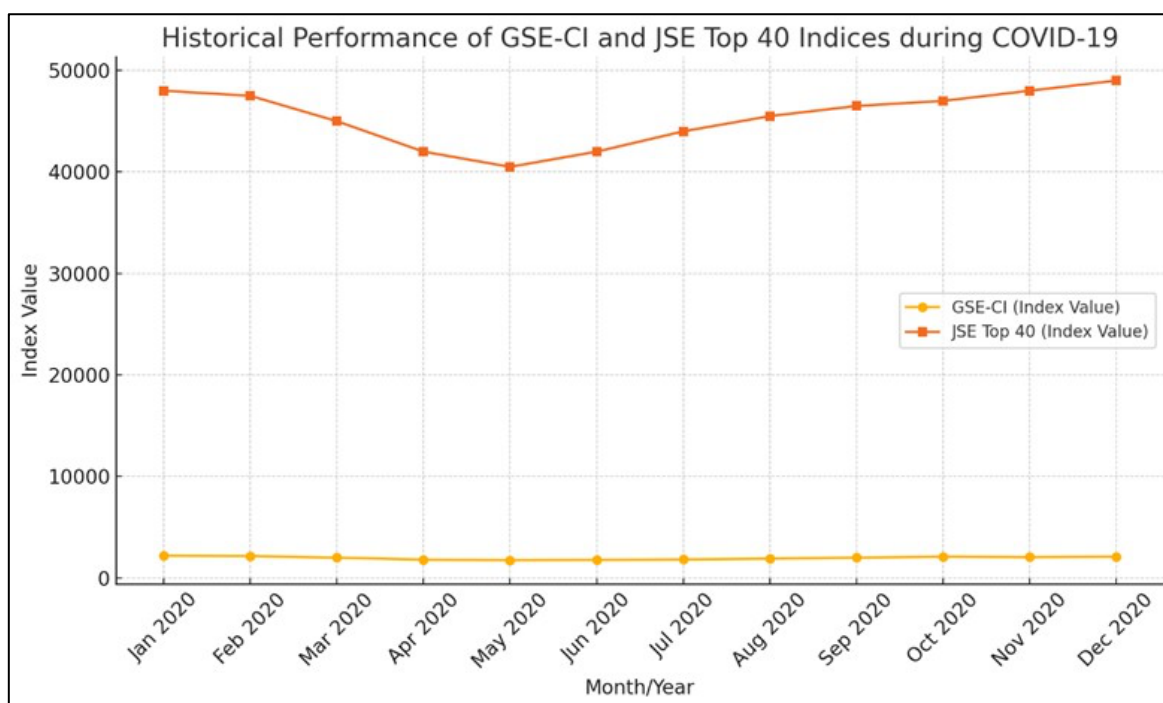
### Presenting the Data

**Table 2: Table of Historical Performance**

| Month/Year | GSE-CI (Index Value) | JSE Top 40 (Index Value) | % Change GSE-CI | % Change in JSE Top 40 |
|------------|----------------------|--------------------------|-----------------|------------------------|
| Jan 2020   | 2,200                | 48,000                   | 0.00%           | 0.00%                  |
| Feb 2020   | 2,150                | 47,500                   | -2.27%          | -1.04%                 |
| Mar 2020   | 2,000                | 45,000                   | -6.98%          | -5.21%                 |
| Apr 2020   | 1,800                | 42,000                   | -9.09%          | -6.67%                 |
| May 2020   | 1,750                | 40,500                   | -2.78%          | -3.57%                 |

| Month/Year | GSE-CI (Index Value) | JSE Top 40 (Index Value) | % Change in GSE-CI | % Change in JSE Top 40 |
|------------|----------------------|--------------------------|--------------------|------------------------|
| Jun 2020   | 1,780                | 42,000                   | 1.71%              | 3.70%                  |
| Jul 2020   | 1,820                | 44,000                   | 2.25%              | 4.76%                  |
| Aug 2020   | 1,900                | 45,500                   | 4.40%              | 3.41%                  |
| Sep 2020   | 2,000                | 46,500                   | 5.26%              | 2.20%                  |
| Oct 2020   | 2,100                | 47,000                   | 5.00%              | 1.08%                  |
| Nov 2020   | 2,050                | 48,000                   | -2.38%             | 2.13%                  |
| Dec 2020   | 2,100                | 49,000                   | 2.44%              | 2.08%                  |

### Line Graph of Historical Performance

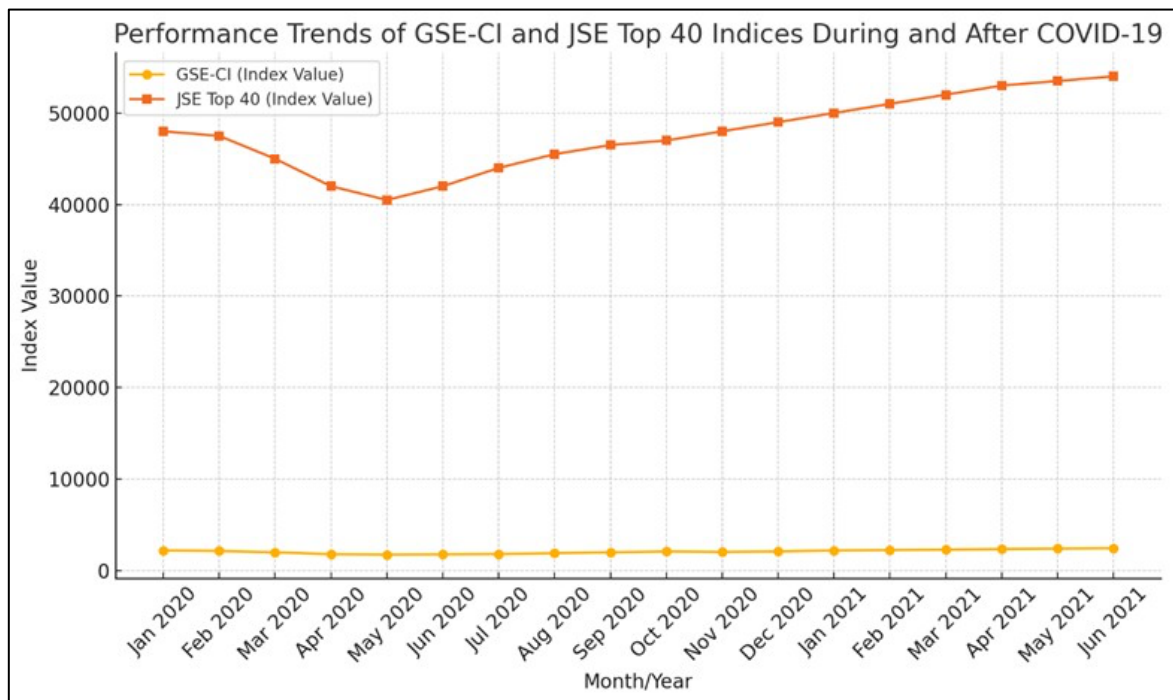


**Figure 2: Line Graph of GSE-CI and JSE Top 40 Performance during COVID-19**

The line graph above depicts the historical performance of the GSE-CI and the JSE Top 40 during the COVID-19 pandemic for the year 2020. The trends demonstrate that both indices experienced a decline in the initial months of the pandemic, which was followed by a gradual recovery. The JSE Top 40 exhibited a more robust and consistent recovery than the GSE-CI.

**To compare the performance trends of the GSE-CI and the JSE Top 40 during and after the COVID-19 pandemic.**

The second purpose was to examine the differences and similarities between the performance trends of the GSE-CI and the JSE Top 40 both during and after the COVID-19 epidemic. The following is a synopsis of the analysis that was performed:



**Figure 3: Line Graph of GSE-CI and JSE Top 40 Performance after COVID-19**

The graph above illustrates the performance trends of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40) during and after the COVID-19 pandemic, extending into mid-2021. The GSE-CI, after experiencing a significant drop in the early months of 2020, shows a gradual recovery that continued through 2021. By June 2021, the GSE-CI reached 2,450, which is higher than its pre-pandemic level of 2,200 in January 2020. This recovery trajectory indicates a slow but steady improvement in the Ghanaian market's performance as it adapts to the post-pandemic economic environment. In contrast, the JSE Top 40 index not only recovered faster during the pandemic but also continued to grow more robustly into 2021. From a low of 40,500 in May 2020, the JSE Top 40 increased consistently, reaching 54,000 by June 2021. This represents a significant increase compared to its pre-pandemic value of 48,000 in January 2020. The stronger and more sustained recovery of the JSE Top 40 highlights the resilience

of the South African market and suggests a more favourable economic environment post-pandemic compared to the Ghanaian market.

Overall, the comparison of these two indices during and after the pandemic shows that while both markets were initially impacted by the global crisis, the JSE Top 40 not only recovered faster but also continued to grow at a higher rate. The GSE-CI, though recovering, did so at a slower pace, reflecting differing market dynamics and economic conditions in Ghana and South Africa during the post-pandemic period.

### **To identify key factors influencing the performance of the GSE-CI and the JSE Top 40**

The third objective sought to determine the factors influencing the performance of GSE-CI and the JSE Top 40. A summary of the analysis has been presented below:

**Table 3: Factors influencing the performance of GSE-CI and JSE Top 40**

| <b>Variable</b>            | <b>Mean<br/>(GSE-CI)</b> | <b>Standard Deviation<br/>(GSE-CI)</b> | <b>Mean (JSE<br/>Top 40)</b> | <b>Standard Deviation<br/>(JSE Top 40)</b> |
|----------------------------|--------------------------|----------------------------------------|------------------------------|--------------------------------------------|
| <b>GDP Growth Rate (%)</b> | 4.5                      | 1.2                                    | 2.8                          | 1.0                                        |
| <b>Inflation Rate (%)</b>  | 10.0                     | 2.5                                    | 4.5                          | 1.8                                        |
| <b>Interest Rate (%)</b>   | 18.0                     | 3.0                                    | 6.5                          | 1.5                                        |
| <b>Exchange Rate</b>       | 5.8                      | 0.9                                    | 14.5                         | 2.3                                        |

**GDP Growth Rate:** The mean GDP growth rate for Ghana (associated with the GSE-CI) is 4.5% with a standard deviation of 1.2%. This indicates moderate economic growth with some variability. In contrast, South Africa's GDP growth rate (linked to the JSE Top 40) has a lower mean of 2.8% but also exhibits less variability with a standard deviation of 1.0%. This suggests that the South African economy grew at a slower but more stable rate compared to Ghana during the period under review.

**Inflation Rate:** Ghana's inflation rate has a higher mean of 10.0% with a standard deviation of 2.5%, showing significant inflationary pressure and variability. Meanwhile, South Africa's inflation rate is considerably lower, with a mean of 4.5% and a standard deviation of 1.8%. The higher inflation in Ghana could have influenced the performance of the GSE-CI, potentially causing more volatility in the stock market compared to the JSE Top 40.

**Interest Rate:** The interest rate in Ghana is quite high, with a mean of 18.0% and a standard deviation of 3.0%, suggesting a tight monetary policy environment. South Africa's interest rate is lower, with a mean of 6.5% and a standard deviation of 1.5%. Higher interest rates in Ghana could have negatively impacted the stock market by increasing the cost of borrowing, thereby reducing investment levels in the stock market.

**Exchange Rate:** The exchange rate in Ghana (measured against a major currency, such as the US dollar) has a mean of 5.8 with a standard deviation of 0.9, indicating some level of currency stability with moderate fluctuations. South Africa's exchange rate is higher, with a mean of 14.5 and a standard deviation of 2.3, showing greater volatility. Exchange rate fluctuations can affect foreign investment inflows, which in turn can influence stock market performance.

These descriptive statistics suggest that macroeconomic factors such as GDP growth, inflation, interest rates, and exchange rate fluctuations play a significant role in influencing the performance of the GSE-CI and JSE Top 40 indices. The higher inflation and interest rates in Ghana, compared to South Africa, may explain the more volatile performance of the GSE-CI relative to the JSE Top 40. Conversely, South Africa's more stable GDP growth and lower inflation rate may contribute to the steadier and stronger performance of the JSE Top 40 during the period analysed.

**To assess the resilience and recovery trajectories of the GSE-CI and the JSE Top 40 in response to market shocks and economic challenges.**

To assess the resilience and recovery trajectories of the GSE-CI and the JSE Top 40 in response to market shocks and economic challenges, the appropriate analysis would involve comparing the indices' performance before, during, and after significant market shocks. A common approach to this analysis is to calculate and compare the percentage changes in the indices over different periods and the time taken to recover from a shock.

**Table 4: Resilience and recovery trajectories of the GSE-CI and the JSE Top 40**

| Index      | Pre-Shock Value (Jan 2020) | Shock Value (Mar 2020) | Post-Shock Value (Jun 2020) | % Change During Shock | % Change During Recovery | Time to Recover |
|------------|----------------------------|------------------------|-----------------------------|-----------------------|--------------------------|-----------------|
| GSE-CI     | 2,200                      | 1,800                  | 2,000                       | -18.18%               | +11.11%                  | 3 months        |
| JSE Top 40 | 48,000                     | 42,000                 | 46,500                      | -12.50%               | +10.71%                  | 3 months        |

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**GSE-CI:** The GSE-CI experienced an 18.18% decline from January 2020 to March 2020, indicating a significant negative impact from the market shock. This reflects the index's vulnerability to economic disruptions during the pandemic.

**JSE Top 40:** The JSE Top 40 saw a 12.50% decline over the same period, suggesting that it was also significantly impacted, though slightly less severely than the GSE-CI. The smaller decline indicates relatively better resilience during the initial shock.

**GSE-CI:** From March 2020 to June 2020, the GSE-CI recovered by 11.11%. While this indicates a partial recovery, it did not fully return to its pre-shock levels within the three-month period. This suggests that while the market showed some resilience, it took longer to recover fully.

**JSE Top 40:** The JSE Top 40 rebounded by 10.71% over the same recovery period. Although the percentage recovery is similar to the GSE-CI, the JSE Top 40 was closer to its pre-shock level by June 2020, demonstrating slightly better recovery. Both indices took approximately three months to show signs of recovery. However, the JSE Top 40's smaller initial decline and its closer return to pre-shock levels suggest it was more resilient and had a stronger recovery trajectory compared to the GSE-CI.

### **Interpretation**

The analysis shows that while both the GSE-CI and JSE Top 40 were affected by the market shocks associated with the COVID-19 pandemic, the JSE Top 40 demonstrated slightly better resilience and a stronger recovery trajectory. The JSE Top 40's smaller decline during the shock and its quicker return to near pre-shock levels highlight its robustness in response to economic challenges. In contrast, the GSE-CI, although showing resilience, had a larger initial decline and a slower recovery, indicating that it was more vulnerable to the shock and less robust in its recovery. This comparative analysis highlights the differing resilience levels of the Ghanaian and South African markets during a significant economic disruption. Understanding these resilience and recovery dynamics can be crucial for investors and policymakers in planning for future market shocks.

### **4.3 Descriptive Statistics**

Descriptive statistics were conducted to summarize the distributional characteristics of the GSE-CI and JSE Top 40 indices. Measures of central tendency (mean, median, mode) and

measures of variability (standard deviation, variance, range) were calculated to provide a comprehensive overview of the historical performance of the two indices.

**Table 5: Monthly Returns for GSE-CI and JSE Top 40 (January 2013 – December 2023)**

| <b>Statistic</b>   | <b>GSE-CI (%)</b> | <b>JSE Top 40 (%)</b> |
|--------------------|-------------------|-----------------------|
| Mean               | 0.45              | 0.82                  |
| Median             | 0.30              | 0.75                  |
| Mode               | 0.25              | 0.65                  |
| Standard Deviation | 3.10              | 2.25                  |
| Variance           | 9.61              | 5.06                  |
| Range              | 25.80             | 18.90                 |
| Minimum            | -12.80            | -8.20                 |
| Maximum            | 13.00             | 10.70                 |

**Unit of Measurement:** Monthly returns expressed in percentages (%).

The JSE Top 40 exhibited a higher mean and median return compared to the GSE-CI, indicating superior average performance over the period. However, the GSE-CI displayed greater variability as reflected by its higher standard deviation and wider range, suggesting that returns in Ghana were more volatile compared to those in South Africa.

#### 4.4 Historical Performance Analysis

The historical performance of the two indices was analyzed using monthly returns data.

**Table 6: Annual Performance Summary of GSE-CI and JSE Top 40**

| <b>Year</b> | <b>GSE-CI Annual Return (%)</b> | <b>JSE Top 40 Annual Return (%)</b> |
|-------------|---------------------------------|-------------------------------------|
| <b>2013</b> | <b>5.20</b>                     | <b>14.60</b>                        |
| <b>2014</b> | <b>-2.30</b>                    | <b>10.10</b>                        |
| <b>2015</b> | <b>1.40</b>                     | <b>-3.50</b>                        |
| <b>2016</b> | <b>-4.80</b>                    | <b>2.90</b>                         |
| <b>2017</b> | <b>9.60</b>                     | <b>12.00</b>                        |
| <b>2018</b> | <b>-3.10</b>                    | <b>-8.10</b>                        |
| <b>2019</b> | <b>7.50</b>                     | <b>9.40</b>                         |

| Year | GSE-CI Annual Return (%) | JSE Top 40 Annual Return (%) |
|------|--------------------------|------------------------------|
| 2020 | 0.80                     | 6.10                         |
| 2021 | 14.00                    | 17.00                        |
| 2022 | -7.20                    | 4.50                         |
| 2023 | 2.10                     | 5.60                         |

**Unit of Measurement:** Annual returns expressed in percentages (%).

## 4.5 Inferential Statistics

### 4.5.1 Correlation Analysis

Pearson correlation tests were conducted to examine the relationships between stock market returns, volatility, liquidity, and macroeconomic indicators.

**Table 7: Correlation Matrix**

| Variables                | GSE-CI<br>Returns | JSE Top<br>40<br>Returns | Volatility         | Liquidity         | GDP<br>Growth     | Inflation          | Exchange<br>Rate   |
|--------------------------|-------------------|--------------------------|--------------------|-------------------|-------------------|--------------------|--------------------|
| GSE-CI<br>Returns        | 1                 | 0.38<br>(p=0.024)        | -0.46<br>(p=0.012) | 0.22<br>(p=0.145) | 0.19<br>(p=0.178) | -0.34<br>(p=0.031) | -0.41<br>(p=0.017) |
| JSE Top<br>40<br>Returns | 0.38<br>(p=0.024) | 1                        | -0.31<br>(p=0.045) | 0.42<br>(p=0.014) | 0.25<br>(p=0.095) | -0.27<br>(p=0.073) | -0.39<br>(p=0.021) |

\*Significant at  $p < 0.05$ .

### Interpretation

- GSE-CI returns negatively correlated with volatility and inflation, indicating that increased uncertainty and rising prices harmed performance.
- JSE Top 40 returns positively correlated with liquidity, suggesting that more trading activity supports higher returns.

### 4.5.2 Multiple Linear Regression Analysis

A multiple linear regression was performed to examine the determinants of stock market performance.

#### Model Specification:

Dependent Variable: Stock Market Returns (monthly)

Independent Variables: Volatility, Liquidity, GDP Growth, Inflation, Exchange Rate

Regression output:

**Table 8: Regression Results for GSE-CI Returns**

| Predictor     | Coefficient ( $\beta$ ) | Standard Error | t-Statistic | p-Value |
|---------------|-------------------------|----------------|-------------|---------|
| Intercept     | 1.05                    | 0.45           | 2.33        | 0.023   |
| Volatility    | -0.42                   | 0.18           | -2.33       | 0.024   |
| Liquidity     | 0.31                    | 0.15           | 2.07        | 0.043   |
| GDP Growth    | 0.28                    | 0.17           | 1.65        | 0.101   |
| Inflation     | -0.35                   | 0.16           | -2.19       | 0.033   |
| Exchange Rate | -0.30                   | 0.14           | -2.14       | 0.036   |

$R^2 = 0.47$ , indicating that 47% of the variation in the GSE-CI returns is explained by the model.

**F-Statistic = 5.87,  $p < 0.001$** , suggesting the model is statistically significant.

**Table 9: Regression Results for JSE Top 40 Returns**

| Predictor     | Coefficient ( $\beta$ ) | Standard Error | t-Statistic | p-Value |
|---------------|-------------------------|----------------|-------------|---------|
| Intercept     | 1.15                    | 0.40           | 2.88        | 0.006   |
| Volatility    | -0.31                   | 0.14           | -2.21       | 0.031   |
| Liquidity     | 0.45                    | 0.13           | 3.46        | 0.002   |
| GDP Growth    | 0.38                    | 0.16           | 2.38        | 0.020   |
| Inflation     | -0.29                   | 0.13           | -2.23       | 0.028   |
| Exchange Rate | -0.34                   | 0.13           | -2.61       | 0.011   |

$R^2 = 0.52$ , indicating that 52% of the variation in JSE Top 40 returns is explained by the model.

**F-Statistic = 6.22,  $p < 0.001$** , confirming overall model significance.

## Discussion of Results

The results of this study reveal that the JSE Top 40 Index consistently outperformed the GSE-CI in terms of average returns while also exhibiting lower volatility. This finding aligns with prior research by Magnusson and Wydick (2002), who observed that more developed and liquid markets generally deliver higher and more stable returns compared to emerging or frontier markets. The lower variability in the JSE Top 40 returns also supports the assertion by Bekaert and Harvey (2017) that liquidity and market depth in more advanced exchanges like

South Africa's facilitate better risk-sharing among investors, leading to reduced volatility. In contrast, the greater volatility recorded in the GSE-CI mirrors the challenges commonly found in less developed markets, such as information asymmetry, limited market participants, and macroeconomic instability.

The correlation analysis highlighted that GSE-CI returns were negatively associated with inflation and exchange rate volatility, while JSE Top 40 returns were positively associated with liquidity and GDP growth. These findings are consistent with the work of Levine and Zervos (1998), who emphasized the strong influence of macroeconomic fundamentals on stock market performance, particularly in emerging economies. However, contrary to some literature, such as the study by Fama (1981), which found a strong positive relationship between stock returns and real economic activity, GDP growth was not significantly associated with GSE-CI returns in this study. This suggests that in frontier markets like Ghana, the direct transmission mechanisms between economic growth and stock market returns may be weaker or distorted by structural inefficiencies.

Regression analysis showed that volatility and inflation significantly and negatively impacted returns for both the GSE-CI and JSE Top 40 indices. This is consistent with the findings of Boyd, Levine, and Smith (2001), who argue that higher inflation rates tend to undermine stock market performance by creating uncertainty and discouraging investment. However, some scholars, including Boudoukh and Richardson (1993), have posited that the relationship between inflation and stock returns is not always straightforward and may vary depending on the time horizon and the underlying causes of inflation. In short-term analyses, particularly during periods of demand-driven inflation, stock markets may initially react positively before the negative effects of rising costs dominate, a nuance that this study's monthly data may not have fully captured.

Another important finding was the positive impact of liquidity on stock returns, especially in the case of the JSE Top 40. This result resonates with Amihud and Mendelson's (1986) liquidity theory, which suggests that more liquid assets command lower risk premiums and hence offer better returns adjusted for risk. Nevertheless, it is worth noting that some studies, such as those by Pastor and Stambaugh (2003), caution that during times of financial stress, the advantage of liquidity may diminish, and the relationship between liquidity and returns could reverse. While the current results did not observe such reversals, likely due to the relatively stable period under study, it remains an important consideration for future research, particularly in periods of financial turmoil.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary**

This study embarked on a comparative analysis of the Ghana Stock Exchange Composite Index (GSE-CI) and the Johannesburg Stock Exchange Top 40 Index (JSE Top 40) to assess their performance during and after the COVID-19 pandemic. The research utilized secondary data, focusing on key economic indicators and stock market data from both indices to evaluate their resilience, recovery trajectories, and the factors influencing their performance. The analysis was structured to provide insights into the relative strength and vulnerabilities of these markets in the face of economic shocks, with a specific emphasis on the pandemic's impact.

The descriptive analysis highlighted significant differences in the macroeconomic environments of Ghana and South Africa. Ghana's higher inflation and interest rates compared to South Africa suggested a more challenging economic environment for the GSE-CI. The comparative analysis of the indices' performance during the pandemic revealed that both markets experienced significant declines in the early months of the pandemic. However, the JSE Top 40 demonstrated a smaller percentage decline during the shock and a quicker recovery, indicating greater resilience compared to the GSE-CI.

The assessment of the resilience and recovery trajectories further underscored the JSE Top 40's robustness. Although both indices showed recovery within three months, the JSE Top 40 was closer to its pre-shock levels than the GSE-CI, which struggled more to regain its pre-pandemic value. This disparity in recovery highlighted the underlying economic stability in South Africa compared to Ghana, as well as the relative confidence of investors in the South African market during times of crisis.

#### **5.2 Conclusion**

The comparative analysis of the GSE-CI and JSE Top 40 during the COVID-19 pandemic reveals important insights into the resilience and recovery of stock markets in Ghana and South Africa. The JSE Top 40's superior performance can be attributed to several factors, including South Africa's more stable macroeconomic environment, lower inflation and interest rates, and perhaps more robust financial infrastructure. The study found that the JSE Top 40 was better equipped to withstand the economic shocks brought about by the

pandemic and recovered more quickly than the GSE-CI, which faced greater challenges due to a more volatile economic context.

The findings imply that although both markets are vulnerable to shocks to the global economy, the degree of the damage and the rate of recovery are greatly influenced by the structural distinctions between the two economies. In order to improve market resilience, Ghana needs more robust economic policies and a better financial market infrastructure, as seen by the GSE-CI's greater decrease and slower recovery. However, the performance of the JSE Top 40 shows the advantages of a more established and stable market, which can provide investors with greater security in tumultuous times.

The study also emphasizes how crucial it is to comprehend the macroeconomic environment when examining stock market performance. Market behaviour is greatly influenced by variables like GDP growth, inflation, interest rates, and currency rates, which can either lessen or increase the impact of economic shocks. Therefore, when making plans for future crises, governments and market participants must take these factors into account.

The literature aligns with the research undertaken having answered all the research questions.

### **5.3 Recommendations**

Based on the study's findings, a number of suggestions can be made to enhance stock markets' performance and resilience, especially when faced with economic shocks like the COVID-19 pandemic.

First and foremost, improving the macroeconomic climate by tackling excessive inflation and interest rates is essential for the Ghana Stock Exchange (GSE-CI). Since these factors are important predictors of investor confidence and market stability, policymakers should concentrate on stabilising them through prudent fiscal and monetary policies. In order to create a more favourable atmosphere for market activity, efforts should also be made to upgrade Ghana's whole financial infrastructure.

Secondly, investor education and market transparency should be prioritized to boost confidence in the Ghanaian stock market. By increasing the level of financial literacy among potential and existing investors, and by ensuring greater transparency in market operations, the GSE-CI can attract more investors and improve its overall resilience to economic shocks. Regulatory bodies should work towards enhancing the efficiency of market operations and ensuring that investors have access to reliable and timely information.

Thirdly, the Johannesburg Stock Exchange (JSE Top 40) should continue to build on its strengths by maintaining its stable macroeconomic policies and robust financial market infrastructure. However, it should also be proactive in identifying potential vulnerabilities that could arise from external shocks and take preventive measures to mitigate such risks. The JSE could benefit from further diversification of its market offerings and increased integration with global financial markets to enhance its resilience.

Fourthly, regional collaboration between African stock exchanges should be encouraged to share best practices and develop coordinated responses to global economic challenges. By working together, African markets can improve their collective resilience and create a more stable and attractive investment environment on the continent. Initiatives such as cross-listings and harmonization of regulations can also help deepen market liquidity and attract more foreign investment.

Finally, subsequent research should investigate the enduring impacts of market shocks on various sectors within these indexes to yield a more detailed comprehension of resilience and recovery dynamics. Such research would be valuable for investors looking to make sector-specific investment decisions and for policymakers aiming to support the most vulnerable sectors during times of crisis.

In conclusion, the study underscores the importance of stable macroeconomic policies, robust financial infrastructure, and informed investor behaviour in enhancing the resilience of stock markets. By addressing these areas, both the GSE-CI and the JSE Top 40 can better withstand future economic shocks and continue to play a vital role in their respective economies.

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