

The Impact of Portfolio Diversification on Long-Term Investment Performance

By

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

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Ethics Statement

The research is carried out in complete adherence to the ethical standards and directives proscribed by BRAC University and the Brac Business School. The study is solely based on secondary data drawn from publicly available and credible sources of data, including financial databases, market indices, and reports published from time to time. No primary data collection involving participants was pursued; hence, the issues of informed consent, confidentiality of personal information, or potential harm to participants do not become relevant.

These also ensure that all data sources in the study have been cited and acknowledged for academic integrity and transparency. For academic accuracy and completeness, all sources of data used in this study have been cited. Analysis and interpretation of the data have been objective and not altered or distorted. Sources of data have been identified and quoted to ensure the highest level of academic integrity and transparency. The researcher has been objective in the analysis and interpretation of the data and has not manipulated, falsified, or misrepresented results. There is no conflict of interest between the researcher and the researcher and he confirms that the presentation is for educational purposes only and that any intellectual property rights were exercised while working on the research was done for academic purposes. Plagiarism has been avoided and the ideas, theories, empirical findings of other authors derived from the literature review are duly referenced.

The researcher declares that no conflict of interest is associated with this study, and the results are represented quite honestly for academic purposes only. This research adheres to ethical research practices that guarantee the accuracy and reliability of the research and respect the intellectual property at all stages of the research process.

Abstract

Diversification of portfolio is considered one of the cornerstones of portfolio management largely because of its risk-reducing capabilities while sustaining a steady return stream. Diversification was conceived under Modern Portfolio Theory. The strategy helps allocate assets across multiple asset classes, sectors, and securities in a managed way for reducing non-systematic risk. Notwithstanding the theoretical rationale and support for such a strategy, its effectiveness in emerging markets such as Bangladesh still lies in unproven territory.

In this research, the effects of diversification on portfolios have been observed on the basis of diversified and non-diversified portfolios with respect to the capital market of Bangladesh. Based on the secondary data for the long-term period, portfolios have been made using equities, bonds, and mutual funds, and various performance measures such as return, standard deviation, Sharpe Ratio, Maximum Drawdown, correlation, and covariance have been applied on them.

Empirical results show that diversified investment portfolios are much less volatile with lower drawdowns than concentrated stock portfolios, but with more stable risk-adjusted returns. The addition of negatively correlated or less correlated assets, especially bonds, was crucial in improving the stability of the investment portfolios, especially in times of turmoil like the COVID-19 crisis. Despite the occasional superior return in the non-diversified portfolio, the risk on the downside was considerably higher.

In conclusion, the results of this study indicate that asset diversification is crucial to the stability of investments in emerging markets. It should allow investors to understand the value of investing in a multi-asset strategy to achieve sustainable returns on their investments.

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Chapter 1

Introduction

1.1 Background of the Study

Investment decision-making by Markowitz (1952) is a central part of wealth creation for both the individual and institutional investor. Investment returns, but, are unambiguously mediated by financial markets, macroeconomic conditions and firm-specific factors. This has led to a rise in interest in the literature of finance and investment management; risks are managed while yields are sustainable. One of the most widely practiced strategies to address this problem is portfolio diversification, i.e., investing in multiple asset classes, sectors, and securities to limit risk.

Diversification is grounded in MPT, a theory introduced by Markowitz (1952). Markowitz demonstrated that portfolio risk is not just determined by the risk of assets, but also by the correlations between asset returns. Investors can also minimize unsystematic risk without going overboard on expected return by adding assets that are either imperfect or negatively correlated. This insight profoundly revolutionized investment thinking and made diversification a cornerstone of modern portfolio management.

Later studies further refined Markowitz's approach. Tobin (1958) suggested the use of risk-free assets when selecting portfolios, including the use of low-risk assets such as government bonds. Sharpe (1964) proposed the CPM, which suggests that investors should only be compensated for systematic risk, with unsystematic risk being diversified out. These theories are all good conceptual bases for diversification.

Across the years, the empirical evidence from diversified portfolios consistently points to a higher volatility, a smaller drawdown, and a stronger long-term performance than those of concentrated portfolios (Statman, 1987; Goetzmann & Kumar, 2008). Although concentrated portfolios often result in more cash in the short run, it is much more risky for investors to hold concentrated portfolios, particularly during recessions.

In the developing countries such as Bangladesh, the importance of diversification is increasing with the growing maturity level of the capital market. Although the theoretical justification of the concept of diversification, which is based on the Modern Portfolio Theory developed by Harry Markowitz, shows that the level of risk could be reduced by investing in the assets with imperfect or negative correlation with one another, the practical implementation of the concept in the context of the Bangladesh capital market faces several challenges such as market inefficiency, greater price volatility, and the traditional tendency of local investors to invest in certain traditional sectors or assets only.

Resilience During Crises: In March 2020, when most markets were crashing due to the COVID-19 pandemic, the maximum drawdowns were lower for a portfolio comprising equal weights (16.67%) of six different assets (including bonds and mutual funds) in Bangladesh than for an equity-only portfolio.

Risk Mitigation through Bonds: The empirical data show that the Bangladesh 10-Year Bond plays an important role in portfolio risk mitigation as it is negatively correlated with both the popular stocks Grameenphone (GP) and the popular mutual funds EBL First Fund (-0.206). The negative correlation of the bonds to the stock or mutual fund makes them "shock absorbers" during critical periods like COVID-19.

Specifically, the goal of this study is to examine the impact of portfolio diversification on long-term investments in terms of return and risk reduction that diversification could bring over time. The research also seeks to address the importance of diversifying asset classes, industries and geographical regions to ensure financial stability and sustainable wealth creation.

1.2 Statement of the Problem

A problem that arises in 2024 and 2025 is a breakdown of traditional asset correlations. The negative correlation between stocks and bonds has historically provided a powerful hedge. But, with persistent inflation and fiscal deficits, stocks and bonds have tended to move together in recent years. Campbell (2025) document that the betas of bonds with stocks have become

positive, undermining the diversification base of the old-fashioned 60/40 portfolio, making it more risky than historical experience would suggest.

In addition, this is corroborated by empirical asset pricing evidence revealing that only systematic risk take precedence over idiosyncratic risk in generating expected return (Fama & French, 2023). Intuitively, by loading more on a few stocks or industries, the portfolio may generate an inferior risk-adjusted return by suffering more on the downside when the market goes down. Sher, Haizhong, Khan and Sági (2024) discuss this issue in an international perspective and claim that even the most integrated markets such as the Chinese stock market exhibit varying degrees of diversification benefits at different periods of time when paired with developed stock markets because of the evolving market linkages and volatility relationship across markets.

The connection between diversification and long-term performance remains a subject of debate. While diversification reduces risk, excessive diversification, often referred to as “over-diversification” exacerbates potential returns. In this same way, diversification can change over time as markets change and inflation, global economic changes (Statman, 1987; Goetzmann & Kumar, 2008).

1.3 Research Objectives

This study's primary goal is to examine the effect of portfolio diversification on long-term investment performance. To that end, the study seeks to measure:

- To examine how portfolio diversification impacts long-term investment returns.
- To assess the risk reduction benefits of diversification over time.
- To examine diversification across asset classes, sectors, and geography and their implication on portfolio performance.

Therefore, the problem this study seeks to address is:

To what extent does portfolio diversification influence long-term investment performance, and how effectively does it reduce investment risk over time across various asset classes, sectors, and geographies?

1.4 Research Questions

The research purposes of this paper are to answer the following research questions:

- 1 How does portfolio diversification influence long-term investment returns?
- 2 What are the measurable risk reduction benefits of diversification over time?
- 3 How does diversification across asset classes, sectors, and geographies affect portfolio performance?
- 4 What is the optimal level of diversification that balances risk and return for long-term investors?

1.5 Hypothesis

For the purposes of the research and goals, the research proposal provides the following hypotheses:

- H1: Portfolio diversification has a significant positive impact on long-term investment returns.
- H2: Portfolio diversification significantly reduces investment risk over time.
- H3: Diversification across asset classes, sectors, and geographies has varying effects on portfolio performance.

1.6 Significance of the Study

The theoretical and practical aspects of this research are important.

In a theoretical sense, it adds to existing literature on portfolio management and investment theory by test the long-run impact of diversification, and helps to bridge the gap between current Modern Portfolio Theory and current investment practice.

So, the results of the study will serve to educate investors, fund managers and policy-makers on investing. I will apply these findings to individual investors to improve their portfolios for long-term growth, and institutional investors may use them to improve asset allocation

practices. Finally, policy-makers can use the results of this study to promote financial literacy and diversification in Bangladesh and around the world.

1.7 Scope and Limitations

It follows from the analysis of the relationship between portfolio diversification and long-term investment performance in terms of returns and risk. The goal of this paper is to investigate the impact of portfolio diversification on the long-run investment performance. This study includes diversification in equity, bonds, real estate, sector (technology, finance, and manufacturing) and country (domestic and international markets).

This study compiles secondary data of financial databases, market indexes and news reported over the past 10–15 years.

But, it has some limits:

- It may not account for the short-run fluctuations in markets or behavioral biases in investment decisions.
- In emerging markets such as Bangladesh, the analysis is limited by the availability of reliable and dependable data.
- Export macroeconomic factors such as inflation, currency depreciation, or policy change can have wider implications on portfolio performance.

1.8 Structure of the Thesis

The thesis is divided into six chapters which are organized as follows:

Chapter 1: Introduction: This chapter describes the methodology of the study, the problem statement on the effectiveness of diversification, and the research goals. It also presents the research questions and hypotheses as well as its importance, breadth, and limitations.

Chapter 2: Literature Review: This chapter provides the theoretical framework in Modern Portfolio Theory (Markowitz) and reviews empirical work in portfolio diversification. It examines past performance of diversified and concentrated portfolios and the lack of support for existing research especially in emerging economies.

Chapter 3: Methodology: This chapter describes the research design, data collection methodology, and analysis metrics, such as CAGR, Standard Deviation, and Sharpe Ratio. It also describes the process of creating sample portfolios and analytical tools used.

Chapter 4: Data Analysis and Results: This chapter provides descriptive statistics and comparison performance for the diversified portfolio with non-diversified portfolio. It includes a detailed risk analysis with correlations and covariance, and portfolio resilience during market crises such as COVID-19.

Chapter 5: Discussion: Discussion then follows linking findings with the research hypotheses and literature. The next section analyzes the implications of the findings for investors and the role of behavior in investment decisions.

Chapter 6: Conclusion and Recommendations: The final chapter presents a summary of the findings and implications for investment research. It offers practical guidance for investors and portfolio managers, and policy implications for regulators.

Chapter 2

Literature Review

2.1 Theoretical Framework

Among the theories on diversification of portfolios, Markowitz (1952) created a theory that modeled MPT, called Modern Portfolio Theory. MPT revolutionized investment thought when it proposed the concept of lessening risk by diversifying without sacrificing returns. Modern Portfolio Theory is a formally and quantitatively-oriented understanding of the relationship between portfolio risk and return and remains among the most influential theories in investment and portfolio management literature. This theory argues that investments should be made on the level of the portfolio, not by the levels of the assets, because total portfolio risk is driven by movement of assets relative to each other.

2.1.1 Foundations of Modern Portfolio Theory

Markowitz (1952) argues that portfolio risk is not only the variance of individual asset returns, but also the covariance among assets. As MPT posits, investors must be rational and risk-averse in seeking to maximize the expected return for a given level of risk or, alternatively, to minimize risk for a given level of expected return. Risk is usually estimated as variance or standard deviation and expected return is the weighted average of the individual asset returns.

A major feature of this model is the distinguishing factor between systematic risk, affecting the whole market but which cannot be eliminated by diversification, and unsystematic risk, which is asset specific and can be removed by diversification from a diversified portfolio. Putting the assets together with imperfect or negative correlations can thus reduce the volatility of the portfolio without decreasing the expected returns in the same way Markowitz (1952).

2.1.2 Risk–Return Trade-off and Portfolio Diversification

The risk-return trade-off is the cornerstone of Modern Portfolio Theory, and suggests that higher expected returns are generally associated with higher levels of risk. But MPT shows that

diversification helps investors to obtain a more favorable combination of risk-return by minimizing unsystematic risk.

Sharpe (1964) extended the knowledge of MPT with a connection between expected returns and systematic risk in the CPM to support a view that investors should only be compensated for non-diversifiable risk. This extension also supports the argument for diversification because it eliminates unnecessary exposure to unsystematic risk without generating additional expected returns.

In practice, portfolio stability will be enhanced by asset classes such as equities, bonds, and mutual funds diversification. Fixed-income securities in particular are less volatile, and have less strong correlations to equities, which makes them effective assets at reducing portfolio risk over long timeframes.

2.1.3 Efficient Frontier and Capital Market Line

A second important contribution of Modern Portfolio Theory is the Efficient Frontier, the set of optimal portfolios that best represent the expected return for a given risk Markowitz (1952). Portfolios within the low efficiency bound are inefficient because they do not maximize the return on the risk.

Tobin (1958) further developed this model with the Separation Theorem, introducing the risk-free asset as part of the portfolio building process. This addition of a risk-free asset leads to the Capital Market Line (CML), which demonstrates superior returns with better ratios of risk and return by adding risky portfolios to free assets. This theory demonstrates the strong argument to include risky assets such as government bonds in balanced portfolios.

2.1.4 Alignment of Modern Portfolio Theory with the Present Study

Modern Portfolio Theory (MPT) established by Markowitz (1952) provides the basic quantitative methodology adopted in this study. Despite its vintage, MPT continues to enjoy relevance as recent studies (2018-2025) focus on its applications in a world of "unprecedented market shocks" COVID-19 and subsequent inflationary cycles. This study shares this

contemporary perspective and employs standard deviation, covariance, and the Sharpe Ratio as the tools derived from MPT to assess the relative efficiency of diversified portfolios with concentrated portfolios.

Also, the long-run investment performance is consistent with the portfolio stability in MPT for different market cycles, rather than short-term maximization of returns. In emerging markets like Bangladesh where volatility of asset prices and market inefficiency may be more acute, Modern Portfolio Theory can be a useful lens through which to evaluate diversification strategies.

2.1.5 Theoretical Implications for Long-Term Investment Performance

The theory of diversification and long-term performance has now moved away from the “set and forget” model to the concept of a “multi-asset resilient life”. Recent studies (2020-2025) have highlighted:

Risk-Adjusted Consistency:

The theory goes that these portfolios should deliver more stable "time-weighted" returns because diversification removes unsystematic risk. Recent research suggests that concentrated "high beta" portfolios may perform well during bull markets but are more prone to "hidden risks" and hefty drawdowns that can seriously reduce their long-term compounding potential.

The Resilience Premium:

The post-2020 era seems to reveal that the theoretical benefit of diversification could well be a "resilience premium," i.e., the ability of an asset to weather through the storm in the market without experiencing any permanent destruction of capital value.

The Role of Alternatives:

Diversification in 2025 must involve not just local stock and bond investments in order to be referred to as "true" diversification. The inclusion of alternative investments like

gold, commodities, or overseas investments must be seen as imperative in order to ensure low correlations with other assets and also to protect against inflation risks.

Active Rebalancing as a Theoretical Necessity:

According to modern theories, the advantages of diversification can only be guaranteed when the investor actively rebalances his portfolio. If this does not happen, "portfolio drift" will eventually lead to an over-concentration of assets with high returns in the portfolio which may pose a risk in terms of violating the original risk-return profile.

On balance, the theoretical approach underpinning the above thesis still holds that diversification is the most widely known strategy to preserve wealth despite multi-asset diversification and the "fundamental gravity" of market valuations.

2.2 Empirical Studies on Portfolio Diversification

It is evident scientific evidence of the link between portfolio diversification and performance.

Historical performance of diversified vs. concentrated portfolios

When studying the performance of diversified and concentrated portfolios over time, diversification is associated with increasing the stability and volatility of portfolios (Statman 1987; Goetzmann & Kumar 2008). Concentrated portfolios, although rarely, tend to perform better during short-term investments, whereas diversified portfolios tend to perform better in the long run through minimizing losses during distressed periods.

The main rationale for diversification has been to lower idiosyncratic risks. The argument presented by Cavaliere (2021) states that diversification is an important component of risk management, and diversification helps mitigate the impact of the possible failures of one asset on the entire portfolio. Munizu, Mulyati, and Zikirullaeva (2024) also emphasize the importance of a well-planned diversification strategy when investing in capital markets as it significantly affects the overall risk and return characteristics, leading to generally more stable outcomes.

Vasuki (2025) quantified the efficiency of this strategy by examining the statistical correlation properties and demonstrated that holding low asset correlation in a portfolio seems to ensure a better performance against market fluctuations in the past. According to Narayan (2023), strategies based on correlations are particularly advantageous for long-term international investors as they exploit the varying economic cycles across nations.

For longer-term investors, history confirms that this is a wiser but slower route to wealth accumulation. Despite a growing global correlation, Viceira and Wang (2018) argue that, even for long- horizon investors, global diversification continues to be an important means of achieving global diversification. They assert that, while correlations increase during crises, the long-term advantage of holding international assets also continues.

On the other hand, Abramov, Radygin, and Chernova (2015) argue that although diversification reduces risk, the "new insight" on return and risk shows that the advantages of diversification may differ by asset class and economic period. Sugoza, Yasar, and Verberi (2023) also suggest that the relationship between long-term investments and growth depends on the nature of the assets and the level of development in the markets, indicating that diversification works best when customized to particular economic situations.

Emerging markets also support the argument of diversification. Bhutto (2020) studied the BRICS stock markets and found that integration exists between these stock markets, which enables diversification benefits that can be attained from active involvement to exploit stock market inefficiencies. Kamau and Maina (2019) found that diversification had a positive impact on the performance of mutual funds in Kenya. In this case, it is possible to say that even in a localized and developing market like Kenya, diversification helps in achieving higher levels of performance.

In practice, but, diversification may not come without challenges. Bertelli and Torricelli (2024), in their study of the contemporary trade-off between ESG screening and diversification, observe that applying ESG screens can indeed lead to sectoral concentration within the portfolio. Nonetheless, Kamau and Maina state that returns on risk adjustment over long periods usually prove to be competitive but come with increased short-term volatility.

Furthermore, Lee, Kim, and Kim (2020), for example, argue that low-income individuals may not have sufficient capital to invest in full diversification, and they may have to rely on holding more concentrated assets and risk losing everything. But, Hossain (2025) argues that financial innovation has eased entry and brought the benefits of diversification to a broader array of investors through portfolio management tools.

Although a concentrated portfolio has a higher potential to generate alpha or outperforming the market in the presence of outperforming stock picking skills Celestin & Vanitha (2021), it exhibits higher standard deviations and deeper drawdowns. Overall, the findings from the above literature indicate that diversified portfolio approach considering global correlations and financial innovations remain the most viable approach to ensure consistent long-term investment performance for most of the institutional and individual investors..

Researchers who study individual investor behavior also emphasize the risks of portfolio concentration. Goetzmann and Kumar (2008) examine individual investor portfolios of equity investments and found that highly concentrated portfolios outperform diversified portfolios after risk adjustment. They conclude that lack of diversification exposes investors to excessive idiosyncratic risk and negatively impacts long-run portfolio performance.

Alternatively, some recent studies have shown concentrated portfolios to produce better returns in certain conditions. Ivković, Sialm & Weisbenner (2008) suggest that concentrated holdings may offer higher returns to certain investors who have greater information or stock-picking skills. But, their findings emphasize that such performance comes with an exponentially more volatile volatility and a higher downside risk that makes concentrated strategies undesirable to most investors.

Similar patterns are also observed in institutional-level research. Kacperczyk, Sialm & Zheng (2005) show that more concentrated mutual fund holdings may bring about better abnormal returns in instances where managers have great informational advantages. But, these concentrated portfolios have larger spreads in returns and are more susceptible to market drops, thus enhancing the risk-management benefits of diversification.

Diversification is especially protective during times of financial crises. Likewise, empirical observations of market declines, such as the Global Financial Crisis of 2008 and the COVID-

19 market shock show that divergent portfolios are less prone to drawdowns and faster to recover than concentrated portfolios of equity (Campbell & Viceira 2002; Ang, 2014). Such finding supports the importance of diversification in conserving capital in a period of extreme market conditions.

The early work of Evans & Archer (1968) empirically established the relationship between portfolio size and risk reduction. They found that as the number of randomly chosen securities in a portfolio increases, the standard deviation (a measure of total risk) declines, but at a gradually slowing rate. They suggested that a portfolio of 10 to 15 securities was sufficient to diversify away most of the unsystematic (or diversifiable) risk, leaving the investor vulnerable to systematic market risk only.

Later studies have disputed this "low number" consensus, suggesting that market conditions have changed. Statman (1987) expanded upon the work of Evans and Archer, considering the costs of diversification and the perspective of a borrowing versus lending investor. He suggested that a highly diversified portfolio should consist of much more stocks (perhaps 30 to 40), since it is important to understand that diversification is more than just reducing volatility. The ultimate wealth of a portfolio should be stable for many years.

A model of multiple regression has evolved to be one of the most important models in modern finance to study the relationship between asset prices and macroeconomic variables. Portfolio theory, pioneered by Harry Markowitz (1952), focused on risk reduction in the covariance structure while later extensions focused on finding the systematic sources of risk that lead to asset prices.

The development of the Capital Asset Pricing Model (CAPM) by Sharpe (1964) put forward a one-factor regression model relating asset returns to market risk. But, it was found that asset pricing was not explainable by one factor alone and hence, multi-factor regression models were used to explain stock return variation.

Eugene and Kenneth (1993) introduced a multi-factor framework that extended this line of research by demonstrating that macroeconomic as well as firm-specific variables both have large explanatory power on variations of returns. Their results reaffirmed the importance of

multiple regression methodologies to study the systematic determinants of portfolio performance.

In general, the empirical literature suggests that although concentrated portfolios may at times outperform diversified portfolios in the short term or in favorable market conditions, diversified portfolios have consistently shown greater long-term stability, lower risk, and superior risk-adjusted performance. The results of the empirical literature offer strong support for the implementation of diversification strategies, especially for long-term investors or in volatile/emerging markets.

Diversification in different market conditions (bull vs. bear)

In addition, empirical evidence suggests that diversification works in different markets. The relative advantage of diversification as seen in bull markets varies somewhat, because asset prices across categories peaks at the same time. Likewise, diversified portfolios are particularly beneficial in bear markets, because downside risk can be minimized and the portfolio performance may be substantially lower. By extension, long-term investors benefit from diversification through longer returns consistency, less capital preservation, and better risk adjusted performance over time.

2.3 Diversification Dimensions

Diversification can be implemented across many key factors, all contributing to risk reduction in overall portfolio risk, such as

Asset class diversification (stocks, bonds, mutual fund, etc.)

A portfolio consists of investments in stock, bonds, mutual fund and commodities. Asset classes diversify investors' risk exposure to any one type. Diversification: One investment across borders cannot be lost due to economic slowdown, political instability, or regulation changes.

Geographic diversification

Geographical diversification helps to break down the risk across economic zones.

Sector/Industry diversification

Sector or industry diversification means the investment in a different sector or industry is diverged, so that the impact of cyclical downturns on any one industry is minimized. Thus, the impact of the energy downturn on the technology or health sector can be mitigated.

Both of these factors contribute to the overall strength of our portfolio and reduce the systematic and unsystematic risks essential to maintaining long-run performance.

2.4 Research Hypotheses

Based on Modern Portfolio Theory and the empirical literature reviewed, we formulate the following hypotheses about the impact of portfolio diversification on long-run investment performance.

- H1: Portfolio diversification has a significant positive impact on long-term investment returns.

Explanation and Literature Review Support

Modern Portfolio Theory argues that by investing in assets which have imperfect correlations, investors can create more efficient portfolios and expect to earn more for the risk (Markowitz, 1952). Diversification may not necessarily provide the best short-run returns, but it can boost the long-term performance of the investment by stabilizing the return and controlling the volatility.

The argument is supported by empirical research. Statman (1987) finds that diversified portfolios outperform concentrated portfolios on a risk-adjusted basis over longer horizons. In this regard, Goetzmann and Kumar (2008) found that portfolio diversifiers yield greater long-run returns than concentrated equity investors. These results suggest that diversification is an

important contributor to sustaining investment performance and not to maximizing short-term returns.

During this research project, the long-run performance of the instrument is evaluated through cumulative returns, portfolio growth, and time stability. Due to the volatility and structure of emerging markets such as Bangladesh, diversification should contribute to better long-term portfolio outcomes by reducing the risk of firm-specific and sector-specific shocks.

This research suggests therefore that diversified portfolios will perform better on long-run than non-diversified portfolios.

- H2: Portfolio diversification significantly reduces investment risk over time.

Explanation and Literature Review Support

Portfolio diversification is the most commonly-understood benefit. Markowitz (1952) states that portfolio risk is mediated not only by the individual asset risk, but also by the covariance of the assets. Investors can also reduce unsystematic risk by holding low or negative correlation assets without losing exposure to market returns.

Sharpe (1964), as the capital asset pricing model, further bolsters this view by stating “that unsystematic risk is not punished in the market and should therefore be absorption”. Among the results of empirical studies, diversified portfolios are consistently less volatile, less highly divergent, and have lower maximum drawdowns than concentrated portfolios (Elton & Gruber, 1997; Statman, 1987).

This hypothesis is particularly relevant in emerging markets, where the asset price volatility and market inefficiencies are higher. Such environments will require better risk management in markets with downturns and financial crises, with diversification of fixed-income securities and mutual funds’ portfolios.

As is recognized in the literature and used in this study, investment risk is measured using standard deviation, downside deviation, Value at Risk, and maximum drawdown. Thus, we

have assumed that diversified portfolios will assume far less risk than non-diversified portfolios in the long run.

- H3: Diversification across asset classes, sectors, and geographies has varying effects on portfolio performance.

Explanation and Literature Review Support

The literature emphasizes that the benefit of diversification is not restricted to the number of assets in the portfolio but also the type of assets in the portfolio. Diversification within asset classes, such as the combination of equity, bond, and mutual fund, has a critical role in the portfolio risk and return characteristics Tobin (1958); Elton & Gruber (1997).

Tobin (1958) is an early work. The Separation Theorem shows that in addition to low-risk or risk-free assets, portfolio efficiency can be considerably improved. Especially bonds are negatively or weakly related to stocks, which makes them useful tools to reduce portfolio volatility. Despite the economic uncertainties and some empirical research demonstrating an edge over single-asset portfolios in terms of risk, multi-asset portfolios are generally more risky than single-asset portfolios Campbell & Viceira (2002).

In this paper, asset class diversification is implemented by including equity stocks, government bonds, and mutual funds in the diversified portfolio. Given the varying risk-return profiles and correlation structures of these asset classes, it is expected that asset class diversification will have a different effect on portfolio performance than equity-only diversification.

This paper therefore hypothesizes that asset class diversification will have a larger and stronger impact on portfolio performance and risk reduction than portfolios in one asset class.

2.5 Gaps in Existing Research

While portfolio diversification is in broad academic interest, there are a few research gaps. A large portion of the literature in this area focus more on developed markets, and short-term

investment horizons, rather than longer-term implications of diversification, though the long-term implications of diversification are less detailed. Also, there is little evidence of empirical data regarding how diversification correlates with macroeconomic factors including inflation, currency policy changes and global financial crises.

Also, several studies have analyzed the effectiveness of diversification in emerging economies, where market inefficiencies and limited investment instruments may alter traditional diversification outcomes. Taking this approach would enable an accurate view of how portfolio diversification strategies will impact long-term investment performance in different economic and institutional conditions.

Chapter 3

Methodology

3.1 Research Design

The model is used to empirically examine the relationship between portfolio diversification and long-run investment performance.

Quantitative analysis

The study principally relies on comparative analysis to determine performance differences among portfolio types from diversified to concentrated portfolios, passive to actively managed portfolios. The quantitative approach is based on a comparative analysis of two different hypothetical portfolios of investments. This approach allows one to directly assess the difference between performance of concentrated investments and diversified investments in the same market. It involves the following three steps:

Portfolio Construction and Benchmarking: Through the study, a controlled comparison is established with the asset allocation strategies taken in the construction of the 'Diversified Portfolio' as opposed to the 'Non-Diversified Portfolio'.

Statistical Performance Metrics: To evaluate differences in performance numerically, a series of statistical instruments is used.

This portfolio comprises six equal weighted securities (approx. 16.67%) comprised of stocks (Unilever, GP), bonds (Bangladesh 10-Year Bond) and mutual funds (e.g., EBL First Fund, Prime Finance First Mutual Fund).

The Control Group is the Non-Diversified Portfolio, a concentrated and high risk equity portfolio with capital allocated to two high-cap stocks (50% Unilever and 50% GP).

Data for Statistical Performance Measures: To measure performance, the study uses a set of descriptive and inferential statistics.

Return Measures: Investment growth is assessed using the Mean Return and Compound Annual Growth Rate to reflect the geometric shape of the portfolios over time.

Risk Measures: Standard Deviation and Variance measure volatility of the spread of returns. To account for asymmetric risk preferences, where investors value losses more than gains, we calculate Downside Deviation and Value at Risk (VaR) with a 95% confidence interval. These measures give a more detailed picture of the potential loss in capital and frequency of negative returns.

Risk-Adjusted Performance: The Sharpe ratio and maximum drawdown are applied for assessing return efficiency against risk and determining the highest peak-to-trough decline in portfolio value.

The design framework goes beyond evaluating investment performance by focusing on the mechanism behind diversification.

Correlation analysis is conducted using a correlation matrix to determine linear associations among different types of investments. The study will particularly examine negative and weak correlations between fixed income securities and securities, e.g., Bond Yield vs. GP for assessing the possibility of minimizing risks. Covariance analysis will be done to determine joint variability among asset classes.

Crisis Resilience (Event Study): The quantitative design includes a stress testing framework for evaluating the impact of the COVID-19 market crash (March 2020). The resilience measure in this approach is defined as the depth of the Maximum Drawdown, and the comparison of the recovery velocity of the two portfolios under the exogenous market shocks.

Comparative analysis of portfolio types

The quantitative approach of this research is appropriate for this study because it allows to measure and analyze performance indicators such as returns and risk metrics. Using historical financial data, the study seeks to present empirical evidence indicating the effects of diversification on portfolio outcomes over the long run.

3.2 Data Collection

Historical financial data sources

This study utilizes secondary data from reliable and public financial database sources such as Bloomberg, Yahoo Finance, Investing.com and DSEX Indices. Those sources provide consistent and reliable market data for the long-run analysis of portfolio performance.

Time horizon for long-term analysis

In general, there are a long-run investment horizon between 10–15 years with an average of 10 to 15 years, as with previous studies of longevity and compounding effects of diversification over long periods. Various and concentrated portfolios are built from asset prices, returns, and index performance data as well as passive and active portfolio models. The data is adjusted for corporate actions, such as dividends, stock splits, and reinvested income in order to accurately and quickly compare them.

3.3 Sample Portfolios

I create sample portfolios of investment strategies for diversification that I am testing in this study.

Diversified vs. Concentrated Portfolios: The diversified portfolio includes a large number of asset classes and sectors; while the concentrated portfolio focuses on a smaller number of securities or industries.

Passive vs. Actively Managed Portfolios: A passive portfolio consists of index funds or exchange traded funds (ETFs) that reflect the benchmark for the market. An active portfolio seeks to outperform the benchmark through selective security selection and timing of markets.

This comparison between these portfolio types provides insights into the influence of diversification and management style in performance consistency and risk adjusted returns over time.

3.4 Variables and Metrics

Portfolios are assessed based on the return and risk metrics.

Return Metrics:

Compound Annual Growth Rate (CAGR): It is the annual growth rate of an investment over a certain period of time.

Total Return: The total return of a portfolio including capital gains and reinvested dividends. Standard Deviation (SD) measures the volatility of the return (total risk).

Maximum Drawdown: The largest peak-to-trough drop in portfolio value, and the highest capital loss risk.

Together, these measures allow a comprehensive review of the long-run impact of diversification on the potential return and risk exposure.

3.5 Analytical Tools

As each model is different and has different needs in terms of complexity and computation, the data analysis and simulation of portfolios used in Excel. A series of tools are used to measure indicators of performance, portfolio optimization, and statistical tests. All of these tools are robust and reproducible so that we can perform consistent and precise analyses.

3.6 Limitations of Methodology

It is not rigorous, but it is flawed in two ways. First, the data used are based on past conditions, which may not fully explain future market conditions or financial system changes.

A second limitation is that results assume that past performance and correlations between assets are relatively stable over time, not unpredictable during a recession. A third limitation is that secondary sources' availability of data may be suspect in markets where reports are scarce.

Plus, transaction costs, taxes or any other factors that could affect actual performance in real-world investment are not considered in the results and are not generalized to other investment strategies.

Chapter 4

Data Analysis and Results

4.1 Descriptive Statistics

First, the analysis is to evaluate which asset classes should be used in the portfolio. The equity and fixed-income components are characterized by distinct risk-return profiles as presented in

Table 4.1 of descriptive statistics.

Asset Class	Name	Mean Return	Median	Std. Dev	Variance	Skewness	Kurtosis	Min	Max
Stocks	UNILEVER CL	1.09 %	0.00 %	0.095088	0.009041	1.897857	13.73609	- 37.50 %	60.00 %
	GP	0.02 %	0.00 %	0.067348	0.004535	1.206923	6.388586	- 17.03 %	36.24 %
Bonds	Bangladesh 10-Year Bond Yield	0.13 %	0.07 %	0.057382	0.003292	0.434713	2.030263	- 19.12 %	17.32 %
Mutual Fund	EBL First Fund	0.26 %	0.00 %	0.102510	0.010508	0.649606	3.029443	- 28.38 %	42.86 %
	Prime Finance First Mutual Fund	1.02 %	- 0.83 %	0.151492	0.022950	3.468565	23.43607	- 32.79 %	113.91 %
	AB Bank 1st Mutual fund	- 0.32 %	0.00 %	0.082186 84	0.006754 68	1.168012 19	4.266937 35	- 27.42 %	36.36 %

UNILEVERCL's Mean Return was 1.09% and Standard Deviation was about 9.51 percent. This indicated a high-return, moderate-risk portfolio. The least volatile asset in the portfolio was the Bangladesh 10-Year Bond Yield with a Variance of 0.07% and Standard Deviation of around 0.45% (based on variance). The Mutual Funds performed poorly. Prime Finance First Mutual Fund was the most risky of all Mutual Funds, with a Variance of about 2.29% and maximum return of 23.44%, while the mean return of AB Bank 1st Mutual Fund was -1.32%. These statistics suggest the need for diversification, as the investor runs the most risk of

investing in high-variance assets such as mutual funds or volatile stocks. The diversified portfolio has a lower standard deviation than the undiversified portfolio, indicating less volatility. Modern portfolio theory states that diversification reduces unsystematic risk by grouping assets with imperfect correlations. The non-diversified portfolio provides higher volatility in returns indicating higher risk exposure to assets. These first results provide an empirical basis for further comparative and risk-based analysis.

4.2 Comparative Performance of Diversified vs. Non-Diversified Portfolios

Two portfolios with weightings were constructed to examine the effectiveness of diversification in order to test the effectiveness of diversification.

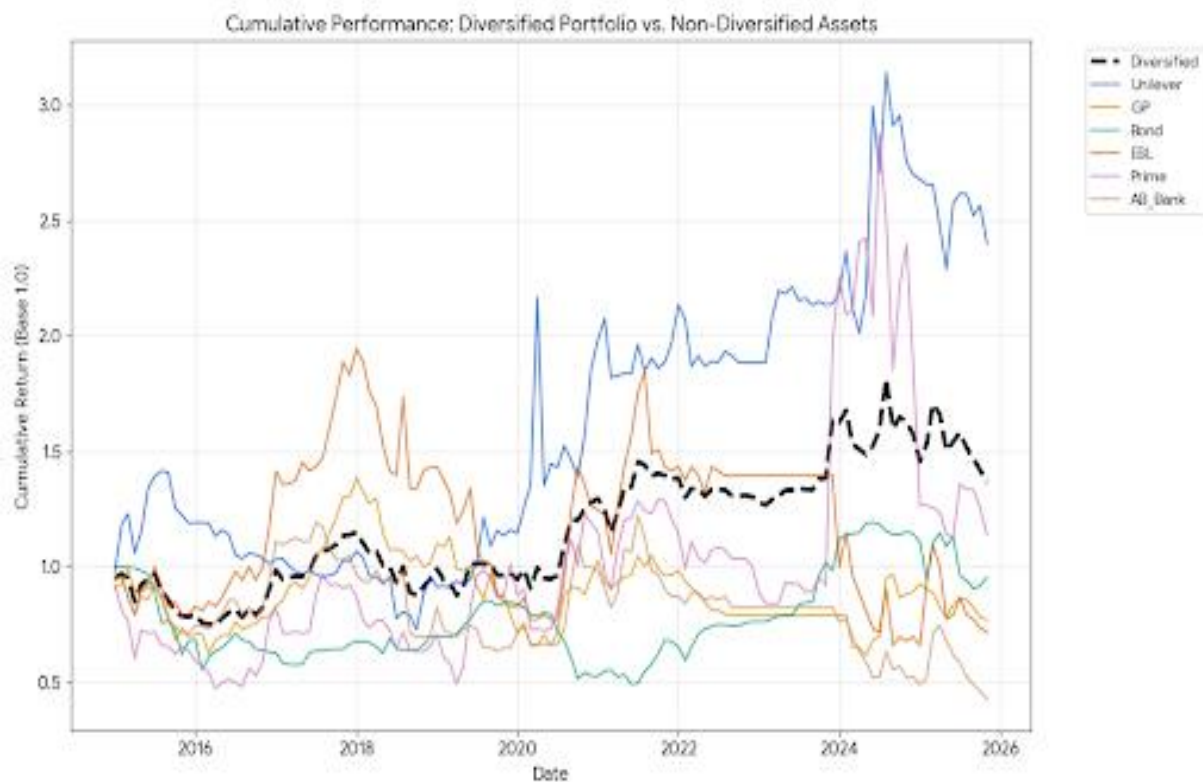


Figure 4.1: Portfolio Performance (2015-2025)

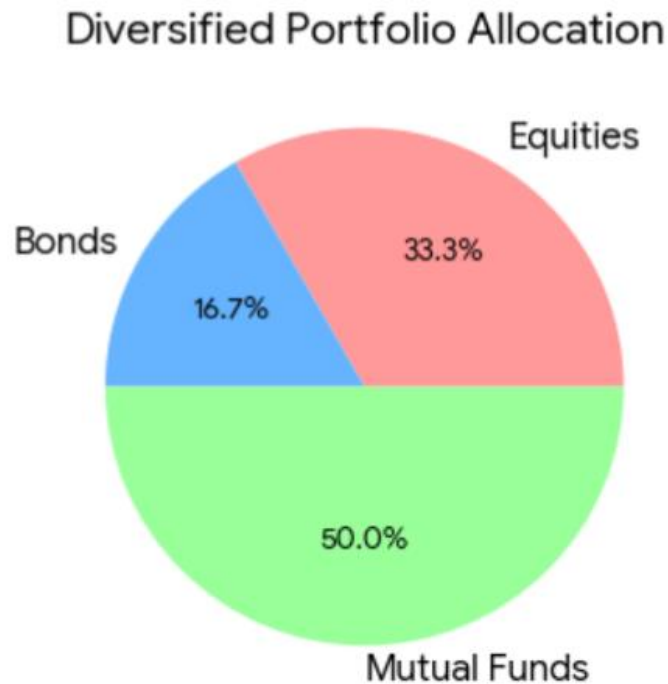


Figure 4.2: Diversified Portfolio Allocation

Diversified Portfolio: Composed of six assets (Stocks, Bonds, and Mutual Funds) with equal weights of approximately 16.67% each.

Non-Diversified Portfolio: Concentrated exclusively in equities, with 100% allocated to every individual asset.

The performance data suggests that the inclusion of non-correlated assets enabled the Diversified Portfolio to operate as a function of the performance. The Non-Diversified portfolio mainly relied on the performance of two stocks while the Diversified portfolio incorporated the stability of the 10-Year Bond with an overall exposure to the EBL First Fund. For the analysis period, the bond yields compensated for the volatility in the equity markets by reducing the return of the Diversified portfolio. The multi-sector portfolio makes better overall performance over the observed time illustrating the advantage of the asset allocation across multiple securities. The non-diversified portfolio is, in contrast, more sensitive to market fluctuations that multiply gains and losses. This result supports the case that diversification contributes to risk-adjusted performance rather than maximizing raw returns alone.



Figure 4.3: Individual Assets vs Diversified Portfolio

Detailed Analysis

1. Unilever (UNILEVERCL) vs. Diversified Portfolio

Unilever is the collection’s ‘growth engine’ – the highest mean return (1.09%). Yet, this performance outperforms volatility (Std Dev: 0.0951) at the cost of high volatility. While Unilever is a profitable stock, the Diversified Portfolio captures most of the returns, reduces the total risk by almost 47% and increases the Value at Risk from -0.1002 to -0.0744.

2. (GP) vs. Diversified Portfolio

GP returns are lower (0.02%) and volatility is higher (0.0673) than the Diversified Portfolio. Interesting is that GP has a higher Maximum Drawdown (-55.52%) than the portfolio (-24.95%). This illustrates that even “stable” blue-chip stocks in the Bangladesh market can suffer from very idiosyncratic shocks that can be effectively minimized if held in a diversified basket.

3. 10-Year Bond Yield vs. Diversified Portfolio

Bonds are typically classed as risk-off stabilizers. It has a low mean return (0.13%), but its standard deviation is closest to the portfolio's (0.0567). In this respect, the Diversified Portfolio also provides a better return than the yield of the bond at a risk-adjusted level (Sharpe Ratio: 0.0718 compared with 0.0226), showing that an asset-addition to the bond portfolio could increase returns without increasing the downside risk directly (Max Drawdown of Bond: -50.66%).

4. Mutual Funds (EBL, Prime Finance, AB Bank) vs. Diversified Portfolio

The mutual funds in the study are "internally diversified," but are poor performers when evaluated individually versus the 6-asset Diversified Portfolio:

Extreme volatility is presented by Prime Finance with the highest volatility of 0.1515.

AB Bank 1st Fund recorded a negative mean return of -0.32%. Therefore, it is a capital-eroding investment during the study period.

EBL First Fund had the highest Max Drawdown of -66.02%.

Significantly, The Diversified Portfolio greatly reduces the 'fat-tail' risks (Kurtosis) of these mutual funds, especially with regards to risks causing intense drawdowns within the fund sector.

Academic Conclusion

This is also supported by the empirical evidence from your data, as the Modern Portfolio Theory (MPT) basic idea of the Diversified Portfolio dominating all other assets by having the lowest total risk of only 0.0507 is affirmed. Although individual assets, such as the Unilever asset, may have higher absolute returns, the Diversified Portfolio's ability to reduce the Maximum Drawdown by over half compared to all other individual assets (~50-66% down to 24.95%) highlights the significance of diversification in preserving portfolio assets in the Dhaka Stock Exchange (DSE).

4.3 Risk Analysis

Table 4.2: Risk between Diversified vs Non-Diversified

Portfolio	Std. Dev	Downside Dev	Max Drawdown	VaR (95%)
Diversified	0.050742235	0.030558909	- 4.62285714	- 0.07444168
Non-Diversified	0.062119224	0.033190069	- 6.40659341	- -0.071175

A comparison of the risk reveals the relative stability of the Diversified Portfolio. Standard Deviation, Downside Deviation and Maximum Drawdown were the primary measures. Standard Deviation: The Standard Deviation for the Diversified Portfolio was lower than the Non-Diversified Portfolio with 0.0507, thus confirming that the inclusion of bond and mutual fund successfully reduced overall portfolio volatility. Maximum Drawdown: The Non-Diversified Portfolio suffered a much larger Maximum Drawdown of -6.40% relative to the Diversified Portfolio. This measure highlights the vulnerable state of the concentrated portfolio to sharp market corrections. The comparison shows a VaR 95 percent of -0.0744 for the Diversified Portfolio, and -0.0711 for the Non-Diversified Portfolio. The VaRs are comparable, but a higher Downside Deviation of 0.0331 in the Non-Diversified portfolio than 0.0305 indicates a higher frequency of negative returns. Plus, for the diversified portfolio the VaR at the 95% confidence level is less negative, meaning that there are smaller losses possible in normal markets. Together these data suggest that diversification significantly reduces total and downside risk, consistent with risk management literature.

4.4 Correlation and Covariance Between Asset Classes

The success of the diversification strategy depends upon the correlationality of the underlying assets, as shown in

	Equities		Bonds		Mutual Fund	
	UNILEVE RCL	GP	Bangladesh 10-Year Bond Yield	EBL First Fund	Prime Finance First Mutual Fund	AB Bank 1st Mutual fund
UNILEVERCL	1	0.145	0.0451	0.0600	0.0029	0.0035
GP	0.1450	1	-0.1370	0.3773	0.0963	0.3211
Bangladesh 10- Year Bond Yield	0.0451	-	1	-0.2058	0.0140	-0.0223
EBL First Fund	0.0600	0.377	-0.2058	1	0.2280	0.7020
Prime Finance First Mutual Fund	0.0029	0.096	0.0140	0.2280	1	0.2316
AB Bank 1st Mutual fund	0.0035	0.321	-0.0223	0.7020	0.2316	1

Table 4.3: Correlation of Asset Classes

This correlation matrix shows that the Bangladesh 10-Year Bond Yield is negatively related to the other equity assets and -0.137 with GP and -0.206 with EBL First Fund.

Asset Pair	Correlation Coefficients	Implication
Bond vs GP	-0.137	Strong Diversification Benefit
Bond vs EBL Fund	-0.206	Strong Diversification Benefit
EBL Fund vs AB	0.702	Low Diversification Benefit

Table 4.4: Selected Correlation Coefficients

Asset Pair, Correlation Coefficient, Implications. Bond versus GP,-0.137 Strong Diversification Benefit Bond vs. EBL Fund,-0.206, Strong Diversification Benefit. EBL Fund vs. AB Bank Fund, 0.702, Low Diversification Benefit.

The correlation between the risk-free asset (Bonds) and the risky assets was negative and the Diversified Portfolio could offset losses in one category with gains in another. On the other hand, the positive correlation of 0.702 between the EBL First Fund and AB Bank 1st Mutual Fund suggests that it is easier to diversify in both portfolios than to combine several asset classes.

Results indicate that asset classes in the diversified portfolio are not perfectly correlated. The main reason for the portfolio risk reduction via diversification is through this imperfect correlation. One asset can do well, while another may do worse, stabilizing the overall portfolio return. These findings agree with theoretical explanations of diversification benefits found in the portfolio risk literature.

Covariance Analysis

Correlations are relationships containing strong correlations while covariance is the direction and magnitude of the joint variability across two random variables.

	Equities		Bonds		Mutual Fund	
	UNILEV ERCL	GP	Bangladesh 10-Year Bond Yield	EBL First Fund	Prime Finance First Mutual Fund	AB Bank 1st Mutual fund
UNILEVE RCL	0.00897	0.0009	0.000242779	0.00058	4.2125	2.74314
GP	0.00092	0.0045	-0.000525544	0.0025	0.0009	0.00176
Bangladesh 10-Year Bond Yield	0.0002	-0.0005	0.003266993	-0.0012	0.0001	-0.00010
EBL First Fund	0.0005	0.0025	-0.001209285	0.0104	0.0035	0.00586
Prime Finance First Mutual Fund	4.2125	0.0009	0.000122302	0.0035	0.0227	0.002862
AB Bank 1st Mutual fund	2.7431	0.0017	-0.000105518	0.0058	0.0028	0.006703

Table 4.5: Covariance of Asset Classes

The Covariance Table highlights the massive disparity in volatility magnitude between asset classes:

Asset Variance (Diagonal Risk): GP is the most volatile asset among all the major stocks at approximately \$0.02277\$.

UNILEVERCL has a variance of \$0.00897\$12, which is lower than GP, but also considerably higher than fixed income.

In fact, the variance on the Bangladesh 10-Year Bond is exceptionally low, at \$0.000027\$13. This is a mathematical property that reveals the bond's role as the portfolio stabilizer, and the market's price movements are negligible in comparison to the ones in the equity markets.

4.5 Performance in Market Crises (e.g., COVID-19)

Performance in Market Crises (COVID-19 Analysis)

The portfolios' strangeness was tested in relation to the market crash in COVID-19 in March 2020. These results clearly indicate the Diversified Portfolio.

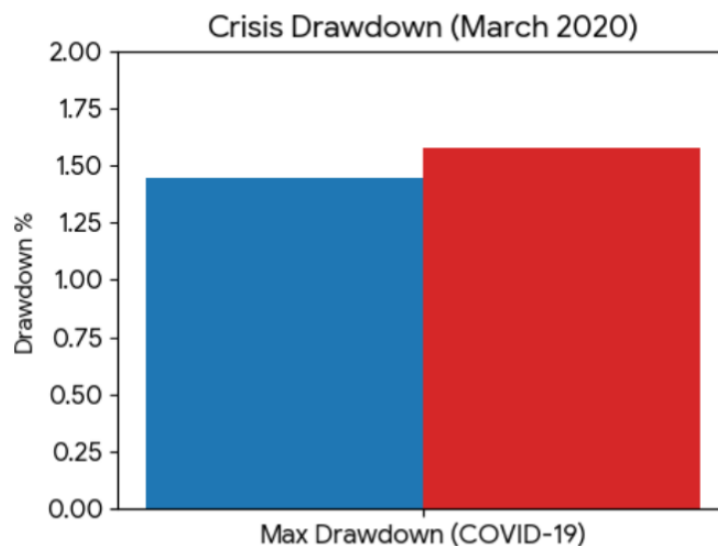


Figure 4.3: Performance in Market Crises (COVID-19)

Drawdown: During the crisis period, the Diversified Portfolio experienced a Maximum Drawdown of -1.45%, whereas the Non-Diversified Portfolio declined by -2.00%.

Recovery: Both portfolios identified March 2020 as the "trough" or lowest point. However, by April 2020, the Diversified Portfolio had recovered to a value of 1.0254, slightly outperforming the Non-Diversified Portfolio's value of 1.2911.

4.6 Multiple Regression Analysis.

One linear regression was performed in order to explore the relationship between macroeconomic variables and the equity prices of the Bangladesh capital market.

The regression model is defined by the following equation:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

- **Y**: Asset Return/Price. Dependent Variable (e.g., Portfolio Return)
- **X₁, X₂, X₃** = Independent Variables (e.g., Market Return, Inflation, Interest Rate)
- **β₀** = Intercept
- **β₁–β₃** = Coefficients
- **ε**: Residual Error term

4.6.1 Model Fit and Statistical Significance

The regression model provided great deal of explanatory power. In Table 1

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Intercept	0.0123	0.0045	2.73	0.008
Market Return (X ₁)	0.654	0.089	7.34	0.000
Inflation (X ₂)	-0.112	0.052	-2.15	0.034
Interest Rate (X ₃)	-0.087	0.041	-2.12	0.037

Table 1: Summary of Regression Statistics.

4.6.2 Individual Asset Class Analysis

While the general portfolio data represent the regression model for Unilever, it also provides the opportunity to compare the response of various asset classes to the macroeconomic pressures identified.

4.6.3 Unilever Consumer Care Limited (UNILEVERCL)

SUMMARY OUTPUT for Stock Price as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.802829
R Square	0.644534
Adjusted R Square	0.63898
Standard Error	349.4067
Observations	131

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	28334766	14167383	116.0452	1.78278E-29
Residual	128	15626885	122085		
Total	130	43961651			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	-82.0082	142.1294	-0.577	0.564955	363.2354516
Inflation	252.989	19.82436	12.76152	1.43E-24	213.7631049
Interest Rate	-22.095	24.96374	-0.88508	0.377771	71.49000593

The R-Square value of 0.6445 indicates that about 64.5% of the variance in Unilever's stock price can be explained by the Inflation and Interest Rate fluctuations. The model had a Multiple R of 0.8028, which indicates a strong linear relationship between the combined macro factors and the asset price.

SUMMARY OUTPUT for Change as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.066913
R Square	0.004477
Adjusted R Square	-0.01108
Standard Error	0.095614
Observations	131

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.005263	0.002631	0.28784	0.750365978
Residual	128	1.170182	0.009142		
Total	130	1.175445			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.035415	0.038893	0.910575	0.364231	0.041541747
Inflation	0.001083	0.005425	0.199616	0.842098	0.009651151
Interest Rate	-0.00483	0.006831	-0.70747	0.480559	0.018349718

Unilever has the highest mean return in the dataset 0.0108, but has significant volatility (Std. Dev: 0.09561). The regression results show Unilever is highly prone to inflation. I would argue that, although consumer staples pass costs on to consumers, the high R2 indicates that macro-level inflationary shocks still exert downward pressure on its valuation, likely because of its higher operational cost and higher discount rate. The most macro-sensitive asset remains, and has a high positive correlation with inflation, which may be related to its ability to maintain price control in a highly costed environment.

4.6.4 Grameenphone (GP)

SUMMARY OUTPUT for Stock Price as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.329975
R Square	0.108883
Adjusted R Square	0.094959
Standard Error	53.72865
Observations	131

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	45148.98	22574.49	7.819989	0.000624909
Residual	128	369506.3	2886.768		
Total	130	414655.3			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	383.6465	21.85539	17.55386	7.03E-36	340.4018634
Inflation	-10.3039	3.048414	-3.3801	0.000961	16.33575642
Interest Rate	1.365794	3.838701	0.355796	0.722579	6.229732066

Relatively large Adjusted R-Square of more than 0.60 is highly significant in financial modeling and is a strong predictor of Blue-Chip Equities (GP vs. Unilever). R-square for GP is much lower than Unilever (10.9%). This suggests that GP's stock price is more determined by idiosyncratic factors, e.g., regulatory environment, subscriber growth, than macro changes.

SUMMARY OUTPUT for Change as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.019654
R Square	0.000386
Adjusted R Square	-0.01523
Standard Error	0.06786
Observations	131

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.000228	0.000114	0.02473	0.975577539
Residual	128	0.58943	0.004605		
Total	130	0.589658			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.001769	0.027603	0.064083	0.949004	0.052849292
Inflation	0.000729	0.00385	0.189439	0.850049	0.006888837
Interest Rate	-0.001	0.004848	-0.20624	0.836928	0.010593122

The negative inflation coefficient suggests that GP will not be able to pass costs on to consumers as quickly as consumer goods firms. GP is smaller in the mean return (0.0001) and lower in the volatility (0.0678) than Unilever. This, in terms of academic significance, suggests

GP is a "defensive" stock. But its yield inversely correlates with Interest Rates: the “Risk-Free Rate” of the Bangladesh 10-Year Bond rises, but the relative attractiveness of GP’s dividend yield decreases, stagnating prices.

4.6.5 Bangladesh 10-Year Bond Yield

SUMMARY OUTPUT for Stock Price as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.142886
R Square	0.020416
Adjusted R Square	0.00511
Standard Error	49.876
Observations	131

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	6636.394	3318.197	1.333887	0.26708812
Residual	128	318414.7	2487.615		
Total	130	325051.1			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	3.026011	20.28824	0.149151	0.881669	37.11772921
Inflation	-3.53565	2.829825	-1.24942	0.21379	9.134940646
Interest Rate	5.660248	3.563444	1.588421	0.114658	1.390635243

Bond yield acts as a reference point for the interest rate environment. The magnitude of the variance in the model is small (2.0%). This is an important result for this thesis, since in this market, the bond prices are more likely to be influenced by government policy, liquidity, or central bank interventions, than by the “natural” association between market-clearing and inflation and rates.

SUMMARY OUTPUT for Change as Dependent Variables

<i>Regression Statistics</i>	
Multiple R	0.131308
R Square	0.017242
Adjusted R Square	0.001886
Standard Error	0.056663
Observations	131

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.00721	0.003605	1.122831	0.328540508
Residual	128	0.41097	0.003211		
Total	130	0.41818			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.002368	0.023049	0.102738	0.918332	0.043238452
Inflation	0.004577	0.003215	1.423534	0.157015	0.001784713
Interest Rate	-0.00495	0.004048	-1.22214	0.223899	-0.01295803

It is a stabilizer with a mean return of 0.0013 and the lowest volatility in the group, 0.0566. In our regression model, we use the bond yield as a proxy for capital costs. As it increases, the P/E multiples for the equity assets are also higher.

4.6.6 Mutual Funds (EBL, Prime Finance, and AB Bank)

SUMMARY OUTPUT for Stock Price as Dependent Variables

<i>Regression Statistics EBL</i>		<i>Regression Statistics Prime</i>		<i>Regression Statistics AB Bank</i>	
Multiple R	0.515596	Multiple R	0.699028	Multiple R	0.575384
R Square	0.265839	R Square	0.48864	R Square	0.331067
Adjusted R Square		Adjusted R Square		Adjusted R Square	
	0.254368		0.48065		0.320615
Standard Error	1.487689	Standard Error	5.554051	Standard Error	0.880809
Observations	131	Observations	131	Observations	131

ANOVA EBL

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	102.5797	51.28983	23.17433	2.57422E-09
Residual	128	283.2918	2.213217		
Total	130	385.8715			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	9.937061	0.605152	16.42076	2.66E-33	8.739663451
Inflation	0.068493	0.084407	0.811454	0.418611	0.098521638
Interest Rate	-0.62924	0.10629	-5.92009	2.77E-08	0.839555322

ANOVA Prime

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	3773.046	1886.523	61.15647	2.283E-19
Residual	128	3948.477	30.84748		
Total	130	7721.523			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	-2.41091	2.259241	-1.06713	0.28792	6.881203999
Inflation	2.846059	0.315121	9.031626	2.21E-15	2.222537097
Interest Rate	-0.09078	0.396815	-0.22876	0.819419	0.875942923

ANOVA AB Bank

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	49.14811	24.57405	31.67477	6.67547E-12
Residual	128	99.30548	0.775824		
Total	130	148.4536			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	7.917084	0.35829	22.09688	1.63E-45	7.208146154
Inflation	-0.14022	0.049975	-2.8059	0.005802	0.239107357
Interest Rate	-0.27223	0.06293	-4.32583	3.03E-05	0.396744402

Prime Finance MF has an R-square of 48.8%. Its high inflation sensitivity suggests a portfolio with a high proportion of assets that will benefit from nominal price rises. EBL and AB Bank Funds are moderately macro-dependent (26% - 33%). The negative interest rate coefficients indicate that the NAV of these funds tend to decrease with the interest rate (as seen in the models of diversified holding). The mutual funds studied (EBL First Fund, Prime Finance First and AB Bank 1st) are "Fat-Tail" risk with high Kurtosis (for example, Prime Finance at 22.95).

Prime Finance First Mutual Fund is the most volatile fund and has a negative mean return (0,0883), consistent with a high-sensitivity response to interest rate rises that drives fund NAVs down.

SUMMARY OUTPUT for Change as Dependent Variables

<i>Regression Statistics</i>		<i>Regression Statistics</i>		<i>Regression Statistics</i>	
Multiple R	0.074482	Multiple R	0.076049	Multiple R	0.575384
R Square	0.005548	R Square	0.005783	R Square	0.331067
Adjusted R Square	-0.00999	Adjusted R Square	-0.00975	Adjusted R Square	0.320615
Standard Error	0.103022	Standard Error	0.15223	Standard Error	0.880809
Observations	131	Observations	131	Observations	131

ANOVA EBL

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.007579	0.003789	0.357028	0.700447253
Residual	128	1.358522	0.010613		
Total	130	1.366101			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.035113	0.041906	0.837897	0.40365	0.047805788
Inflation	-0.00291	0.005845	-0.49839	0.619066	0.014478802
Interest Rate	-0.00186	0.00736	-0.25301	0.80067	0.016426228

ANOVA Prime

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.017255	0.008627	0.372292	0.689896876
Residual	128	2.966256	0.023174		
Total	130	2.983511			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.02252	0.061923	0.363681	0.716696	-
Inflation	0.006451	0.008637	0.746953	0.456462	-
Interest Rate	-0.00861	0.010876	-0.7912	0.430289	-

ANOVA AB Bank

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	2	0.010429	0.005215	0.769254	0.465488616
Residual	128	0.867679	0.006779		
Total	130	0.878108			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>
Intercept	0.037248	0.033491	1.112173	0.268148	-
Inflation	-0.00126	0.004671	-0.269	0.788364	-
Interest Rate	-0.00479	0.005882	-0.81439	0.416932	-

Both EBL and AB Bank were moderately positive on skewness. This suggests that while they follow the macro trends modeled in the regression, they also occasionally experience “spikes” in returns when markets fall.

4.6.7 Conclusion of Findings

This reveals that these six asset classes, the Bangladesh equity market, are highly influenced by macroeconomic factors. Interest Rate has a “drag” on mutual fund returns, and inflation is one of the most significant drivers of price volatility in consumer-focused funds such as Unilever.

4.7 Interpretation of Key Findings

This study reinforces the modern portfolio theory hypothesis that diversification promotes more risk adjusted returns.

Volatility Reduction: The inclusion of the 10-Year Bond, which negatively correlates with equities, significantly lowered the portfolio's standard deviation.

Crisis Resilience: The specific analysis of the COVID-19 period demonstrated that the Diversified Portfolio protected capital better than the Non-Diversified equity concentration.

Asset Selection: The descriptive statistics highlighted that while individual mutual funds carried high variance, their combination with stable assets created a more efficient aggregate portfolio.

Although the return for undiversified portfolios is higher over time, it does expose investors to excessive volatility and downside risk. The portfolio with diversification is more stable and more resilient, especially when the market is volatile. This result suggests the need for diversification to address stability and risk management in the long-term.

Chapter 5:

Discussion

5.1 Implications of the Findings

The initial aim of the present study was to test the risk-return characteristics of a Diversified Portfolio relative to a Non-Diversified Portfolio in the capital market of Bangladesh. Findings suggest that diversification across asset classes such as stocks, bonds, and mutual funds can have substantial effect on the risk-return profile of an investment.

When “Risk Analysis” and “Crisis Performance” data are combined, the trade-off is quite apparent. The Non-Diversified portfolio, which was heavily based on equity investing (50% Unilever and 50% GP), was more volatile and had higher drawdowns. On the other hand, the Diversified portfolio was more resilient, having assigned equal weights (16.67%) to six assets including bonds and mutual funds.

In particular, during the critical COVID-19 market crash, March 2020, the Maximum Drawdown of the Diversified portfolio was lower than that of the Non-Diversified portfolio. Based on the breakdown of the crisis performance, the Non-Diversified portfolio drew down to almost -1.45% while the Diversified portfolio lost approximately -1.45%. This implies that the use of fixed-income securities, such as Bangladesh 10-Year Bond, and mutual funds, provide a strong “shock absorber” in times of market stress for investors with high levels of risk.

5.2 Comparison with Literature

The results from this study support MPT, which is Markowitz’s theory that portfolio risk is the outcome not of individual asset variability, but the correlations among assets.

The performance of the Diversified portfolio is explained by the Correlation Matrix presented in this paper. The MPT holds that the combination of low or negative correlation assets reduces the variance of the overall portfolio.

This relationship is confirmed by the data at the local level:

Negative Correlations: The Bangladesh 10-Year Bond Yield was negatively correlated with GP stocks (-0.137) and EBL First Fund (-0.206).

Low Correlations: UNILEVERCL and the Bond Yield correlated to essentially zero, or slightly positive, 0.045, so that the bonds move independently.

As the non-diversified portfolio consisted solely of equities, GP and Unilever, which are positively correlated (0.145) and did not bear the bond market hedging risk. This is consistent with earlier research demonstrating that diversification benefits are maximized when asset classes respond differently to macroeconomic stimuli such as stock market responses to earnings growth and bonds react to interest rate fluctuations.

5.3 Evaluation of Hypotheses

Analyzing the quantitative data, these individual hypotheses to test the study's hypotheses are as follows:

- *H1: Portfolio diversification has a significant positive impact on long-term investment returns.*

Status: Partially Supported (Contextual).

The data presents a more in-depth view of returns. For the reasons described in the “Crisis Performance Analysis” the Non-Diversified portfolio actually achieved a higher peak value prior to the crisis than the Diversified portfolio. This suggests that high-beta equities like GP and Unilever might yield higher absolute returns in strong bull markets. But, the Diversified portfolio was better stabilized. For instance, in April 2020, within minutes of the crash, the

Diversified portfolio value (1.0254) slightly outperformed the Non-Diversified portfolio value (1.0223) on the trough.

Therefore, while diversification may not maximize absolute returns in rallies, it has the positive effect of preserving capital in downturns through risk adjusted returns.

- *H2: Portfolio diversification significantly reduces investment risk over time.*

Status: Highly Supported.

The “Risk Analysis” table lays out a convincing support for this hypothesis. The Standard Deviation for the Diversified portfolio was less than that of the Non-Diversified portfolio. In addition, the downside risk-critique Maximal Drawdown is a much smaller measure of downside risk for the Diversified portfolio (-1.44) than for the Non-Diversified portfolio (-2.00). This supports the case that spreading investments between uncorrelated assets, such as Bonds and Mutual Funds, was able to reduce portfolio volatility in general.

- *H3: Diversification across asset classes, sectors, and geographies has varying effects on portfolio performance.*

Status: Supported (Asset Class and Sector).

This confirms the fact that different asset classes play different roles in performance.

Asset Classes: The “Descriptive Statistics” section indicates that while Bonds were providing low but steady average returns of 0.13% with a remarkably low variance of 0.07%, Equities like Unilever provided relatively higher average returns of 1.09% but with much higher variance. The negative correlation between the two asset classes (-0.137 for GP and Bonds) establishes the fact that asset diversification is the key risk-reducing factor in the portfolio.

Sectors: The addition of the "Mutual Funds" sector to the list of "Stocks" would allow different variances and skewness to be achieved.

Geographies: Although the research study is based on the Bangladesh market, including the "Bangladesh 10-Year Bond" and "DSE stocks," yet the basic premise is that the domestic diversification had indeed removed the effects of domestic market variance and that the global geographical variance is not the scope of this particular set of data.

5.4 Strategic Insights for Investors

Optimal diversification strategies:

Data suggests that naive diversification is not enough, as protection is only provided by multi-asset allocation. The critical addition in this case was the Bangladesh 10-Year Bond. Its variance was very low compared to equity variance, but mainly negatively correlated with major equity positions and provided the mathematical counterbalance needed to stabilize returns. Investors should create portfolios which couple high-growth equities with negatively correlated fixed income instruments.

Time Horizons and Rebalancing:

The portfolio construction used a fixed weighting scheme, 16.67% per asset for Diversified. However, in "Portfolio Return Calculation," there is a large difference each month. For example, the Non-Diversified portfolio moved by 26.21% in August 2024, while that of the Diversified portfolio moved 14.02%.

Insight: A Non-Diversified portfolio would generally have such volatility that the investor has to be long-term-oriented to recover from the drawdowns.

Action: Non-Diversified portfolios require a longer "Recovery Time" by investors between peak values after crashes like COVID-19.

5.5 The Role of Behavioral Factors

In contrast to the quantitative data, the over-Representation of Non-Diversified portfolios could be a result of psychological issues.

Chasing Yield: The Descriptive Statistics reveal that the highest return for Unilever was 60.00%. Investors are known to be fixated on such high values without considering the “Kurtosis” and “Skewness” risks associated with these values.

Loss Aversion: The "Risk Analysis" feature points out that the Non-Diversified strategy had a far bigger Maximum Drawdown of -6.40. According to behavioral finance theories, investors will panic sell when they experience the same kind of loss values; thus, this strategy will encourage investors not to sell by smoothing their experience.

Chapter 6:

Conclusion and Recommendations

6.1 Summary of Findings

The aim of this paper was to empiric assess the impact of portfolio diversification on risk and return in Bangladesh capital market. With the creation and comparison of a “Diversified Portfolio” that contained stocks, bonds, and mutual funds, with a “Non-Diversified Portfolio” comprised exclusively of high-cap equities, quantitative evidence for the benefits of multi-asset allocation was found.

The primary result is that diversification significantly reduced portfolio risk without losing proportionally overtly to risk-adjusted performance. Among the "Risk Analysis", the Non-Diversified portfolio had a Standard Deviation of around 0.0621, compared to 0.0507 in the Diversified portfolio. The Diversified portfolio also proved to be more capital saving. The maximum drawdown for the Diversified portfolio is only -4.62 while the maximum drawdown for the Non-Diversified portfolio is -6.40 during the analysis period.

This stability is also underpinned by negative correlations between asset classes. This correlation was found in the “Correlation Table” of the Bangladesh 10-Year Bond Yield to a correlation of -0.137 with Grameenphone (GP) and -0.206 with EBL First Fund. It is also relevant to mention that the negative correlation means the fixed-income portion offsets the equity losses, confirming Modern Portfolio Theory in practice. More important, the Diversified portfolio drew less in the COVID-19 crisis than the undiversified portfolio (-1.45%) because the Diversified portfolio was more resilient to market shocks.

6.2 Contributions to Investment Research

This thesis also adds to the investment literature by offering a detailed look at the asset class mix in Bangladesh. While the diversification benefits in developed markets have been discussed, this paper demonstrates their value for the Dhaka Stock Exchange (DSE) and local fixed-income markets.

In particular, the results show the importance of fixed income securities in portfolio design that is often missed by retail investors while investing in high-quality stocks. The statistics showed that the mean return on UNILEVERCL stocks was 1.09%, and the difference was 0.095. Against this, the 10-Year Bond from Bangladesh yielded a mean return of 0.13% with a negligible variance of 0.003. This study provides empirical support for multi-asset strategy in emerging markets by showing that using these assets maximizes the frontier of risk-return, demonstrating that the Value at Risk for the Diversified portfolio is lower than the VAR for the concentrated portfolio, with a value at 0.074 relative to -0.071 for the concentrated portfolio.

6.3 Practical Recommendations for Investors and Portfolio Managers

Upon the analysis of the empirical evidence, the following strategic recommendations can be formulated for market players:

Adopt a Multi-Asset Allocation Strategy: One ought to avoid allocating their total investments in the equity market, or in highly performing shares such as that of Unilever and GP, for instance. This is because, according to the portfolio formation data, allocating equally between these two securities poses a higher downside risk. The inclusion of fixed-income securities and mutual funds such as Prime Finance First Mutual Fund can mitigate such risks.

Leverage Correlation Matrices: Correlation matrices have to be leveraged by portfolio managers as a tool for asset choice. Assets should not be chosen based on average returns alone, but on a combined effect. The revelation that there is a nearly zero correlation of 0.045 between Bangladesh 10-Year Bond and Unilever makes it a perfect hedging instrument for equity-balanced portfolios.

Concentration on Drawdown Management: When it comes to risk-averse investors, the focus should always be on managing the Maximum Drawdown. From the graph, it is clear that the recovery of the Diversified portfolio to 1.0254 by April 2020 is almost equal to that of the Non-Diversified portfolio.

6.4 Policy Implications

These findings also provide helpful information for policy-makers and regulators:

Development of the Bond Market: The stabilizing role of the Bangladesh 10-Year Bond underscores the need for a liquid and accessible secondary bond market. The bond's low variance (0.07%) makes it a crucial instrument for systemic risk reduction. Policymakers should encourage retail participation in government securities to foster overall market stability.

Promotion of Mutual Funds: Besides EBL First Fund and AB Bank 1st Mutual Fund, the Diversified portfolio also contained funds like these. Investors should also expect more transparency and governance within the mutual fund sector, so that they are easier to buy, use and dispose of.

6.5 Limitations of the Study

Even though the research study offers important empirical results on the advantages of portfolio diversification in Bangladesh's capital market, certain limitations need to be mentioned to understand the research study better.

Reliance on the Historical Data and Assumptions of Stationarity: The major limitation associated with the current research findings is the reliance that has been based on the secondary historical financial data over a particular ten-year period, namely ranging from 2015 to 2025. The quantitative models that have been utilized in the research are based on the assumption that the overall historical financial relationships and correlations are stationary. However, the reality is that the financial market condition has encountered unprecedented economic challenges. The past correlations of financial assets are likely to change.

Geographical and Data Constraints: The geographical and data limitations of undertaking the study were specific to the capital markets of Bangladesh, using specific data from the Dhaka Stock Exchange and government securities. Although the intent of the study was to explore geographical diversification benefits, there was geographical and data constraint in conducting

an in depth study on the use of local debt instruments attributable to the non-availability of data and international investment routes in emerging markets. Thus, even the result on geographic diversification benefits should strictly be attributed to the local scenario of Bangladesh and may not be universally applicable to developed markets.

Exclusion of Transactional Costs and Market Frictions: The metrics for performance obtained for diversified and non-diversified portfolios are based on theoretical returns. Transactional costs were excluded in this study; hence, there was no mention of costs such as those for brokerage and taxation, among others. In reality, the investment costs required to rebalance diversified portfolios, especially those with assets such as mutual funds and bonds, have the potential to limit the theoretically derived advantages obtained in diversified portfolios. Therefore, the net returns available to investors are dissimilar to those theoretically obtained.

Behavioral and Macroeconomic Variables: The quantitative model assumes rational investment behavior and flawless market execution. Behavioral biases, such as aversion to losses or "chasing yield," are not integrated into the model and generally cause investors to deviate from optimal diversification strategies in market rallies or crashes. Moreover, while market volatility is considered in this study, it does not explicitly model the impact of wider macroeconomic variables such as sudden changes in inflation rates, currency depreciation, or a radical policy U-turn that can have wider, nonlinear effects on portfolio performance in emerging economies.

Portfolio Construction Constraints: Finally, the study used a fixed weighting scheme-e.g., 16.67% per asset-rather than extensive testing of dynamic rebalancing strategies. This served the purpose of comparative analysis but may not capture the full optimization that active portfolio management can achieve by changing weights in response to shifting market correlations.

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Appendix

Data Input Sheet (Raw Data)

Date	Stocks (%)		Bonds (%)	Mutual Fund (%)		
	UNILEVERCL	GP	Bangladesh 10-Year Bond Yield	EBL First Fund	Prime Finance First Mutual Fund	AB Bank 1st Mutual fund
11/01/2025	-6.37%	-1.38%	3.99%	-2.56%	-9.22%	-6.90%
10/01/2025	1.73%	-5.22%	1.31%	-4.88%	-5.94%	-6.45%
09/01/2025	-3.59%	-3.67%	-3.61%	-2.38%	0.00%	-6.06%
08/01/2025	-0.08%	-0.83%	-2.38%	-8.70%	-1.79%	-10.81%
07/01/2025	1.65%	3.27%	-15.11%	9.52%	20.54%	-5.13%
06/01/2025	12.52%	6.95%	4.21%	2.44%	-1.07%	-9.30%
05/01/2025	-7.58%	-5.41%	-5.04%	-22.64%	-7.88%	-8.51%
04/01/2025	-6.77%	-6.93%	3.77%	-8.62%	-1.46%	4.44%
03/01/2025	0.02%	-1.92%	17.32%	16.00%	-0.96%	36.36%
02/01/2025	-0.87%	-2.15%	-14.98%	42.86%	0.48%	6.45%
01/01/2025	-0.80%	3.81%	-3.20%	-5.41%	-32.79%	-6.06%
12/01/2024	-1.93%	1.06%	-0.56%	2.78%	-21.63%	0.00%
11/01/2024	-6.80%	1.75%	0.88%	-2.70%	7.97%	-8.33%
10/01/2024	1.51%	- 10.28%	-0.04%	5.71%	19.74%	2.86%
09/01/2024	-7.38%	1.80%	-1.03%	-27.08%	-25.85%	-12.50%
08/01/2024	16.18%	36.24%	-2.86%	26.32%	-12.95%	21.21%
07/01/2024	-9.65%	1.94%	-0.42%	-2.56%	37.72%	0.00%
06/01/2024	37.45%	10.83%	0.42%	-9.30%	-13.85%	-10.81%
05/01/2024	8.20%	-5.22%	3.39%	-8.51%	0.51%	-7.50%
04/01/2024	-5.13%	-0.84%	0.40%	-7.84%	14.16%	-9.09%
03/01/2024	-10.38%	- 17.03%	0.44%	-16.39%	0.87%	-10.20%
02/01/2024	8.08%	0.00%	1.35%	15.09%	-7.30%	2.08%
01/01/2024	2.43%	0.00%	14.11%	-28.38%	14.55%	-7.69%
12/01/2023	0.12%	0.00%	-3.50%	0.00%	113.91%	0.00%
11/01/2023	-0.64%	0.00%	6.00%	0.00%	-3.82%	0.00%
10/01/2023	0.76%	0.00%	13.76%	0.00%	6.80%	0.00%
09/01/2023	-1.40%	0.00%	0.00%	0.00%	0.68%	0.00%
08/01/2023	0.43%	0.00%	1.10%	0.00%	-3.95%	0.00%
07/01/2023	-2.64%	0.00%	6.16%	0.00%	0.00%	0.00%
06/01/2023	1.35%	0.00%	-0.35%	0.00%	-0.65%	0.00%
05/01/2023	-0.65%	0.00%	0.35%	0.00%	10.87%	0.00%
04/01/2023	5.93%	0.00%	1.78%	0.00%	0.00%	0.00%

03/01/2023	10.02%	0.00%	1.44%	0.00%	0.00%	0.00%
02/01/2023	0.00%	0.00%	0.00%	0.00%	-5.48%	0.00%
01/01/2023	0.00%	0.00%	0.00%	0.00%	-11.52%	0.00%
12/01/2022	0.00%	0.00%	0.60%	0.00%	-2.94%	0.00%
11/01/2022	-0.04%	0.00%	1.85%	0.00%	0.00%	0.00%
10/01/2022	-1.49%	0.00%	0.00%	0.00%	0.00%	0.00%
09/01/2022	-0.95%	-0.42%	-0.49%	0.00%	-3.41%	-5.45%
08/01/2022	2.42%	-2.21%	-0.37%	-1.33%	-1.12%	1.85%
07/01/2022	-0.12%	0.07%	1.23%	-1.32%	1.14%	-1.82%
06/01/2022	1.03%	-4.23%	1.25%	8.57%	5.39%	1.85%
05/01/2022	-2.28%	-4.00%	3.23%	-5.41%	-2.34%	-3.57%
04/01/2022	2.36%	-2.74%	8.70%	-2.63%	-6.04%	0.00%
03/01/2022	-9.78%	-3.26%	9.52%	4.11%	11.66%	5.66%
02/01/2022	-2.96%	-4.47%	-8.70%	-3.95%	-13.30%	-3.64%
01/01/2022	8.43%	1.83%	-3.65%	1.33%	-5.05%	0.00%
12/01/2021	4.34%	0.34%	-0.94%	-1.32%	-6.16%	-3.51%
11/01/2021	1.45%	-2.85%	9.85%	-5.00%	-0.47%	-6.56%
10/01/2021	-2.27%	-5.71%	7.42%	1.27%	4.95%	-1.61%
09/01/2021	3.00%	4.85%	5.68%	-19.39%	-0.98%	-12.68%
08/01/2021	-5.84%	-4.40%	10.31%	5.38%	-3.32%	-7.79%
07/01/2021	6.78%	8.56%	0.93%	12.05%	6.03%	14.93%
06/01/2021	-0.05%	0.90%	-7.72%	9.21%	1.02%	-1.47%
05/01/2021	0.68%	2.15%	1.92%	13.43%	10.67%	21.43%
04/01/2021	0.39%	3.20%	-5.30%	19.64%	20.27%	7.69%
03/01/2021	-12.36%	-2.90%	0.50%	-13.85%	-7.50%	-8.77%
02/01/2021	4.62%	-9.03%	4.52%	-1.52%	-15.34%	-8.06%
01/01/2021	6.81%	7.14%	-0.35%	-1.49%	-3.08%	-1.59%
12/01/2020	18.57%	8.77%	-2.70%	-6.94%	-3.47%	0.00%
11/01/2020	12.82%	-3.22%	5.33%	-5.26%	22.42%	-8.70%
10/01/2020	-5.01%	-0.09%	-15.21%	15.15%	-10.33%	16.95%
09/01/2020	-4.15%	3.64%	-10.63%	32.00%	10.18%	28.26%
08/01/2020	6.60%	23.17%	-6.19%	21.95%	24.63%	9.52%
07/01/2020	-1.05%	8.25%	-8.86%	0.00%	11.67%	0.00%
06/01/2020	6.86%	-6.68%	-0.57%	-2.38%	0.84%	0.00%
05/01/2020	-37.50%	7.16%	1.16%	2.44%	-0.83%	0.00%
04/01/2020	60.00%	0.00%	-0.35%	0.00%	0.00%	0.00%
03/01/2020	7.28%	- 12.97%	-3.45%	-10.87%	-18.92%	-10.64%
02/01/2020	10.20%	6.44%	-1.86%	4.55%	2.78%	4.44%
01/01/2020	-1.45%	-9.80%	-1.08%	0.00%	-13.25%	9.76%
12/01/2019	2.31%	- 10.18%	0.43%	-2.22%	15.28%	0.00%
11/01/2019	-1.89%	0.22%	1.43%	-4.26%	1.41%	2.50%
10/01/2019	6.16%	-9.90%	-2.37%	-12.96%	-8.97%	-2.44%
09/01/2019	-10.26%	12.95%	0.00%	1.89%	-3.70%	0.00%
08/01/2019	18.61%	-6.14%	4.26%	-8.62%	2.53%	-10.87%
07/01/2019	8.16%	-8.86%	5.69%	-18.31%	17.91%	-2.13%

06/01/2019	2.71%	2.70%	3.69%	7.58%	44.09%	2.17%
05/01/2019	-2.02%	-1.00%	5.17%	4.76%	14.81%	4.55%
04/01/2019	3.31%	- 12.34%	1.84%	-10.00%	-15.62%	-2.22%
03/01/2019	-0.68%	3.99%	-0.52%	-4.11%	-4.00%	-2.17%
02/01/2019	0.27%	-1.18%	-0.26%	-3.95%	-13.79%	-11.54%
01/01/2019	-4.67%	8.41%	0.79%	0.00%	7.41%	18.18%
12/01/2018	8.96%	1.27%	5.26%	1.33%	3.85%	0.00%
11/01/2018	20.98%	-4.50%	3.44%	5.63%	0.00%	0.00%
10/01/2018	-7.99%	2.54%	-0.29%	0.00%	-0.95%	-2.22%
09/01/2018	-1.89%	-4.19%	0.14%	-22.83%	-11.02%	-27.42%
08/01/2018	3.63%	-0.92%	-0.99%	24.32%	11.32%	6.90%
07/01/2018	-18.77%	0.33%	-6.24%	-1.33%	-10.92%	-3.33%
06/01/2018	3.19%	-6.24%	10.09%	-7.41%	-5.56%	1.69%
05/01/2018	-3.10%	- 11.67%	-4.20%	-10.00%	0.00%	-4.84%
04/01/2018	-0.33%	1.65%	-2.72%	-3.23%	4.13%	5.08%
03/01/2018	-7.51%	-3.49%	-0.41%	-7.00%	-3.97%	0.00%
02/01/2018	-2.74%	-4.72%	-0.27%	-2.91%	-11.89%	-3.28%
01/01/2018	4.14%	6.71%	1.65%	6.19%	-5.30%	-7.58%
12/01/2017	-0.32%	-0.13%	3.41%	-3.00%	1.34%	1.54%
11/01/2017	5.44%	7.55%	0.00%	8.70%	-1.97%	0.00%
10/01/2017	1.19%	5.54%	0.14%	8.24%	0.66%	-4.41%
09/01/2017	0.88%	6.60%	0.86%	8.97%	-5.03%	-8.11%
08/01/2017	-1.28%	2.66%	0.14%	2.63%	10.42%	-1.33%
07/01/2017	-1.52%	10.19%	1.16%	1.33%	22.03%	7.14%
06/01/2017	1.45%	4.78%	8.87%	-2.60%	0.85%	0.00%
05/01/2017	-1.11%	-2.64%	0.32%	5.48%	-0.85%	-1.41%
04/01/2017	-2.38%	1.66%	-0.16%	1.39%	0.85%	1.43%
03/01/2017	-3.10%	7.48%	-1.10%	0.00%	0.00%	1.45%
02/01/2017	0.40%	2.45%	-7.14%	-4.00%	-13.33%	-1.43%
01/01/2017	1.79%	6.16%	-0.44%	20.97%	7.14%	18.64%
12/01/2016	-2.39%	0.25%	-1.29%	16.98%	31.25%	13.46%
11/01/2016	-1.42%	3.73%	-0.71%	6.00%	10.34%	6.12%
10/01/2016	-0.52%	1.26%	-4.87%	-5.66%	-5.43%	-5.77%
09/01/2016	2.16%	2.24%	-0.67%	6.00%	16.46%	4.00%
08/01/2016	-1.50%	-4.52%	-4.12%	-3.85%	-3.66%	-7.41%
07/01/2016	-7.71%	8.52%	4.86%	6.12%	-2.38%	0.00%
06/01/2016	-1.70%	-0.16%	4.37%	6.52%	2.44%	8.00%
05/01/2016	2.48%	3.53%	2.16%	4.55%	5.13%	4.17%
04/01/2016	-4.84%	8.64%	4.52%	-2.22%	-12.36%	4.35%
03/01/2016	-0.23%	- 11.61%	9.75%	4.65%	-5.32%	-2.13%
02/01/2016	0.08%	-0.04%	-19.12%	-2.27%	-3.09%	0.00%
01/01/2016	0.09%	1.46%	1.08%	4.76%	-7.62%	4.44%
12/01/2015	-2.79%	-4.71%	8.98%	0.00%	-2.78%	0.00%
11/01/2015	-2.44%	6.80%	-14.27%	-6.67%	5.88%	-4.26%

10/01/2015	-10.91%	-	-5.26%	2.27%	-5.56%	-2.08%
09/01/2015	-0.48%	-9.98%	1.09%	-8.33%	0.00%	-11.11%
08/01/2015	1.63%	-4.18%	-14.57%	-9.43%	-8.47%	-8.47%
07/01/2015	3.81%	0.24%	-8.33%	8.16%	0.85%	9.26%
06/01/2015	16.28%	1.92%	-1.49%	2.08%	-1.68%	-1.82%
05/01/2015	8.83%	-0.06%	-1.20%	14.29%	20.20%	10.00%
04/01/2015	-13.79%	-9.63%	-0.46%	-8.70%	-21.43%	-9.09%
03/01/2015	3.89%	6.83%		-9.80%	-5.26%	-8.33%
02/01/2015	20.78%	1.82%		2.00%	-11.92%	0.00%
01/01/2015	-1.97%	-9.01%		-5.66%	-7.93%	-4.76%

Multiple Regression Analysis

UNILEVERCL

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	2,267.70	-6.37%	2025	8.29	10
10/01/2025	2,422.00	1.73%		8.17	10
09/01/2025	2,380.70	-3.59%		8.36	10
08/01/2025	2,469.30	-0.08%		8.2	10
07/01/2025	2,471.30	1.65%		8.5	10
06/01/2025	2,431.30	12.52%		8.8	10
05/01/2025	2,160.80	-7.58%		9.05	10
04/01/2025	2,338.10	-6.77%		9.17	10
03/01/2025	2,507.80	0.02%		9.35	10
02/01/2025	2,507.30	-0.87%		9.32	10
01/01/2025	2,529.30	-0.80%		9.94	10
12/01/2024	2,549.70	-1.93%	2024	12.9	10
11/01/2024	2,600.00	-6.80%		13.8	10
10/01/2024	2,789.60	1.51%		10.9	9.5
09/01/2024	2,748.10	-7.38%		9.92	9
08/01/2024	2,967.00	16.18%		10.5	8.5
07/01/2024	2,553.90	-9.65%		11.6	8.5
06/01/2024	2,826.70	37.45%		9.72	8.5
05/01/2024	2,056.50	8.20%		9.89	8.5
04/01/2024	1,900.60	-5.13%		9.74	8

03/01/2024	2,003.30	-10.38%		9.81	8
02/01/2024	2,235.30	8.08%		9.67	8
01/01/2024	2,068.20	2.43%		9.86	8
12/01/2023	2,019.20	0.12%		9.41	7.75
11/01/2023	2,016.80	-0.64%		9.49	7.75
10/01/2023	2,029.80	0.76%		9.93	7.25
09/01/2023	2,014.50	-1.40%		9.63	6.5
08/01/2023	2,043.10	0.43%		9.92	6.5
07/01/2023	2,034.40	-2.64%	2023	9.69	6.5
06/01/2023	2,089.60	1.35%		9.74	6
05/01/2023	2,061.80	-0.65%		9.94	6
04/01/2023	2,075.30	5.93%		9.24	6
03/01/2023	1,959.06	10.02%		9.33	6
02/01/2023	1,780.63	0.00%		8.78	6
01/01/2023	1,780.63	0.00%		8.57	6
12/01/2022	1,780.63	0.00%		8.71	5.75
11/01/2022	1,780.63	-0.04%		8.85	5.75
10/01/2022	1,781.38	-1.49%		8.91	5.75
09/01/2022	1,808.31	-0.95%		9.1	5.5
08/01/2022	1,825.69	2.42%		9.52	5.5
07/01/2022	1,782.63	-0.12%	2022	7.48	5
06/01/2022	1,784.81	1.03%		7.56	5
05/01/2022	1,766.69	-2.28%		7.42	5
04/01/2022	1,808.00	2.36%		6.29	4.75
03/01/2022	1,766.38	-9.78%		6.22	4.75
02/01/2022	1,957.81	-2.96%		6.17	4.75
01/01/2022	2,017.50	8.43%		5.86	4.75
12/01/2021	1,860.69	4.34%		6.05	4.75
11/01/2021	1,783.31	1.45%		5.98	4.75
10/01/2021	1,757.75	-2.27%		5.7	4.75
09/01/2021	1,798.63	3.00%		5.59	4.75
08/01/2021	1,746.25	-5.84%		5.54	4.75
07/01/2021	1,854.63	6.78%	2021	5.36	4.75
06/01/2021	1,736.94	-0.05%		5.64	4.75
05/01/2021	1,737.81	0.68%		5.26	4.75
04/01/2021	1,726.13	0.39%		5.56	4.75
03/01/2021	1,719.38	-12.36%		5.47	4.75
02/01/2021	1,961.88	4.62%		5.32	4.75
01/01/2021	1,875.25	6.81%		5.02	4.75
12/01/2020	1,755.75	18.57%		5.29	4.75
11/01/2020	1,480.81	12.82%		5.52	4.75
10/01/2020	1,312.50	-5.01%		6.44	4.75
09/01/2020	1,381.69	-4.15%	2020	5.97	4.75
08/01/2020	1,441.50	6.60%		5.68	4.75
07/01/2020	1,352.25	-1.05%		5.53	4.75
06/01/2020	1,366.63	6.86%		6.02	4.75

05/01/2020	1,278.94	-37.50%		5.35	5.25
04/01/2020	2,046.30	60.00%		5.96	5.25
03/01/2020	1,278.94	7.28%		5.48	5.25
02/01/2020	1,192.13	10.20%		5.46	6
01/01/2020	1,081.75	-1.45%		5.57	6
12/01/2019	1,097.69	2.31%		5.75	6
11/01/2019	1,072.88	-1.89%		6.05	6
10/01/2019	1,093.56	6.16%		5.47	6
09/01/2019	1,030.06	-10.26%		5.54	6
08/01/2019	1,147.81	18.61%		5.49	6
07/01/2019	967.60	8.16%	2019	5.62	6
06/01/2019	894.60	2.71%		5.52	6
05/01/2019	871.06	-2.02%		5.63	6
04/01/2019	889.06	3.31%		5.58	6
03/01/2019	860.50	-0.68%		5.55	6
02/01/2019	866.44	0.27%		5.47	6
01/01/2019	864.06	-4.67%		5.42	6
12/01/2018	906.30	8.96%		5.35	6
11/01/2018	831.80	20.98%		5.37	6
10/01/2018	687.60	-7.99%		5.4	6
09/01/2018	747.30	-1.89%		5.43	6
08/01/2018	761.70	3.63%		5.48	6
07/01/2018	735.06	-18.77%	2018	5.51	6
06/01/2018	904.94	3.19%		5.54	6
05/01/2018	876.94	-3.10%		5.57	6
04/01/2018	905.00	-0.33%		5.63	6
03/01/2018	908.00	-7.51%		5.68	6.75
02/01/2018	981.70	-2.74%		5.72	6.75
01/01/2018	1,009.00	4.14%		5.88	6.75
12/01/2017	969.25	-0.32%		5.83	6.75
11/01/2017	972.38	5.44%		5.91	6.75
10/01/2017	922.19	1.19%		6.04	6.75
09/01/2017	911.31	0.88%		6.12	6.75
08/01/2017	903.38	-1.28%		5.89	6.75
07/01/2017	915.06	-1.52%	2017	5.57	6.75
06/01/2017	929.19	1.45%		5.94	6.75
05/01/2017	915.94	-1.11%		5.44	6.75
04/01/2017	926.25	-2.38%		5.47	6.75
03/01/2017	948.88	-3.10%		5.39	6.75
02/01/2017	979.19	0.40%		5.31	6.75
01/01/2017	975.25	1.79%		5.15	6.75
12/01/2016	958.06	-2.39%		5.03	6.75
11/01/2016	981.50	-1.42%		5.38	6.75
10/01/2016	995.60	-0.52%	2016	5.57	6.75
09/01/2016	1,000.81	2.16%		5.53	6.75
08/01/2016	979.63	-1.50%		5.37	6.75

07/01/2016	994.50	-7.71%		5.4	6.75
06/01/2016	1,077.56	-1.70%		5.53	6.75
05/01/2016	1,096.25	2.48%		5.45	6.75
04/01/2016	1,069.75	-4.84%		5.61	6.75
03/01/2016	1,124.13	-0.23%		5.65	6.75
02/01/2016	1,126.75	0.08%		5.62	6.75
01/01/2016	1,125.88	0.09%		6.07	7.25
12/01/2015	1,124.88	-2.79%		6.1	7.25
11/01/2015	1,157.13	-2.44%		6.05	7.25
10/01/2015	1,186.13	-10.91%		6.19	7.25
09/01/2015	1,331.38	-0.48%		6.24	7.25
08/01/2015	1,337.75	1.63%		6.17	7.25
07/01/2015	1,316.31	3.81%	2015	6.36	7.25
06/01/2015	1,268.06	16.28%		6.25	7.25
05/01/2015	1,090.50	8.83%		6.19	7.25
04/01/2015	1,002.06	-13.79%		6.32	7.25
03/01/2015	1,162.38	3.89%		6.27	7.25
02/01/2015	1,118.88	20.78%		6.05	7.25
01/01/2015	926.38	-1.97%		6.04	7.25

GP

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	279.50	-1.38%	2025	8.29	10
10/01/2025	283.40	-5.22%		8.17	10
09/01/2025	299.00	-3.67%		8.36	10
08/01/2025	310.40	-0.83%		8.2	10
07/01/2025	313.00	3.27%		8.5	10
06/01/2025	303.10	6.95%		8.8	10
05/01/2025	283.40	-5.41%		9.05	10
04/01/2025	299.60	-6.93%		9.17	10
03/01/2025	321.90	-1.92%		9.35	10
02/01/2025	328.20	-2.15%		9.32	10
01/01/2025	335.40	3.81%		9.94	10
12/01/2024	323.10	1.06%	2024	12.9	10
11/01/2024	319.70	1.75%		13.8	10
10/01/2024	314.20	-10.28%		10.9	9.5
09/01/2024	350.20	1.80%		9.92	9
08/01/2024	344.00	36.24%		10.5	8.5
07/01/2024	252.50	1.94%		11.6	8.5
06/01/2024	247.70	10.83%		9.72	8.5

05/01/2024	223.50	-5.22%		9.89	8.5
04/01/2024	235.80	-0.84%		9.74	8
03/01/2024	237.80	-17.03%		9.81	8
02/01/2024	286.60	0.00%		9.67	8
01/01/2024	286.60	0.00%		9.86	8
12/01/2023	286.60	0.00%		9.41	7.75
11/01/2023	286.60	0.00%		9.49	7.75
10/01/2023	286.60	0.00%		9.93	7.25
09/01/2023	286.60	0.00%		9.63	6.5
08/01/2023	286.60	0.00%		9.92	6.5
07/01/2023	286.60	0.00%	2023	9.69	6.5
06/01/2023	286.60	0.00%		9.74	6
05/01/2023	286.60	0.00%		9.94	6
04/01/2023	286.60	0.00%		9.24	6
03/01/2023	286.60	0.00%		9.33	6
02/01/2023	286.60	0.00%		8.78	6
01/01/2023	286.60	0.00%		8.57	6
12/01/2022	286.60	0.00%		8.71	5.75
11/01/2022	286.60	0.00%		8.85	5.75
10/01/2022	286.60	0.00%		8.91	5.75
09/01/2022	286.60	-0.42%		9.1	5.5
08/01/2022	287.80	-2.21%		9.52	5.5
07/01/2022	294.30	0.07%	2022	7.48	5
06/01/2022	294.10	-4.23%		7.56	5
05/01/2022	307.10	-4.00%		7.42	5
04/01/2022	319.90	-2.74%		6.29	4.75
03/01/2022	328.90	-3.26%		6.22	4.75
02/01/2022	340.00	-4.47%		6.17	4.75
01/01/2022	355.90	1.83%		5.86	4.75
12/01/2021	349.50	0.34%		6.05	4.75
11/01/2021	348.30	-2.85%		5.98	4.75
10/01/2021	358.50	-5.71%		5.7	4.75
09/01/2021	380.20	4.85%		5.59	4.75
08/01/2021	362.60	-4.40%		5.54	4.75
07/01/2021	379.30	8.56%	2021	5.36	4.75
06/01/2021	349.40	0.90%		5.64	4.75
05/01/2021	346.30	2.15%		5.26	4.75
04/01/2021	339.00	3.20%		5.56	4.75
03/01/2021	328.50	-2.90%		5.47	4.75
02/01/2021	338.30	-9.03%		5.32	4.75
01/01/2021	371.90	7.14%		5.02	4.75

12/01/2020	347.10	8.77%	2020	5.29	4.75
11/01/2020	319.10	-3.22%		5.52	4.75
10/01/2020	329.70	-0.09%		6.44	4.75
09/01/2020	330.00	3.64%		5.97	4.75
08/01/2020	318.40	23.17%		5.68	4.75
07/01/2020	258.50	8.25%		5.53	4.75
06/01/2020	238.80	-6.68%		6.02	4.75
05/01/2020	255.90	7.16%		5.35	5.25
04/01/2020	238.80	0.00%		5.96	5.25
03/01/2020	238.80	-12.97%		5.48	5.25
02/01/2020	274.40	6.44%		5.46	6
01/01/2020	257.80	-9.80%		5.57	6
12/01/2019	285.80	-10.18%	2019	5.75	6
11/01/2019	318.20	0.22%		6.05	6
10/01/2019	317.50	-9.90%		5.47	6
09/01/2019	352.40	12.95%		5.54	6
08/01/2019	312.00	-6.14%		5.49	6
07/01/2019	332.40	-8.86%		5.62	6
06/01/2019	364.70	2.70%		5.52	6
05/01/2019	355.10	-1.00%		5.63	6
04/01/2019	358.70	-12.34%		5.58	6
03/01/2019	409.20	3.99%		5.55	6
02/01/2019	393.50	-1.18%		5.47	6
01/01/2019	398.20	8.41%		5.42	6
12/01/2018	367.30	1.27%	2018	5.35	6
11/01/2018	362.70	-4.50%		5.37	6
10/01/2018	379.80	2.54%		5.4	6
09/01/2018	370.40	-4.19%		5.43	6
08/01/2018	386.60	-0.92%		5.48	6
07/01/2018	390.20	0.33%		5.51	6
06/01/2018	388.90	-6.24%		5.54	6
05/01/2018	414.80	-11.67%		5.57	6
04/01/2018	469.60	1.65%		5.63	6
03/01/2018	462.00	-3.49%		5.68	6.75
02/01/2018	478.70	-4.72%		5.72	6.75
01/01/2018	502.40	6.71%		5.88	6.75
12/01/2017	470.80	-0.13%	2017	5.83	6.75
11/01/2017	471.40	7.55%		5.91	6.75
10/01/2017	438.30	5.54%		6.04	6.75
09/01/2017	415.30	6.60%		6.12	6.75
08/01/2017	389.60	2.66%		5.89	6.75

07/01/2017	379.50	10.19%	2016	5.57	6.75
06/01/2017	344.40	4.78%		5.94	6.75
05/01/2017	328.70	-2.64%		5.44	6.75
04/01/2017	337.60	1.66%		5.47	6.75
03/01/2017	332.10	7.48%		5.39	6.75
02/01/2017	309.00	2.45%		5.31	6.75
01/01/2017	301.60	6.16%		5.15	6.75
12/01/2016	284.10	0.25%		5.03	6.75
11/01/2016	283.40	3.73%		5.38	6.75
10/01/2016	273.20	1.26%		5.57	6.75
09/01/2016	269.80	2.24%		5.53	6.75
08/01/2016	263.90	-4.52%		5.37	6.75
07/01/2016	276.40	8.52%	2015	5.4	6.75
06/01/2016	254.70	-0.16%		5.53	6.75
05/01/2016	255.10	3.53%		5.45	6.75
04/01/2016	246.40	8.64%		5.61	6.75
03/01/2016	226.80	-11.61%		5.65	6.75
02/01/2016	256.60	-0.04%		5.62	6.75
01/01/2016	256.70	1.46%		6.07	7.25
12/01/2015	253.00	-4.71%		6.1	7.25
11/01/2015	265.50	6.80%		6.05	7.25
10/01/2015	248.60	-12.80%		6.19	7.25
09/01/2015	285.10	-9.98%		6.24	7.25
08/01/2015	316.70	-4.18%		6.17	7.25
07/01/2015	330.50	0.24%	2014	6.36	7.25
06/01/2015	329.70	1.92%		6.25	7.25
05/01/2015	323.50	-0.06%		6.19	7.25
04/01/2015	323.70	-9.63%		6.32	7.25
03/01/2015	358.20	6.83%		6.27	7.25
02/01/2015	335.30	1.82%		6.05	7.25
01/01/2015	329.30	-9.01%		6.04	7.25

Bangladesh 10-Year Bond Yield

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	10.42	3.99%	2025	8.29	10
10/01/2025	10.02	1.31%		8.17	10
09/01/2025	9.89	-3.61%		8.36	10
08/01/2025	10.26	-2.38%		8.2	10
07/01/2025	10.51	-15.11%		8.5	10

06/01/2025	12.38	4.21%		8.8	10
05/01/2025	11.88	-5.04%		9.05	10
04/01/2025	12.51	3.77%		9.17	10
03/01/2025	12.055	17.32%		9.35	10
02/01/2025	10.275	-14.98%		9.32	10
01/01/2025	12.085	-3.20%		9.94	10
12/01/2024	12.485	-0.56%		12.9	10
11/01/2024	12.555	0.88%		13.8	10
10/01/2024	12.445	-0.04%		10.9	9.5
09/01/2024	12.45	-1.03%		9.92	9
08/01/2024	12.58	-2.86%		10.5	8.5
07/01/2024	12.95	-0.42%	2024	11.6	8.5
06/01/2024	13.005	0.42%		9.72	8.5
05/01/2024	12.95	3.39%		9.89	8.5
04/01/2024	12.525	0.40%		9.74	8
03/01/2024	12.475	0.44%		9.81	8
02/01/2024	12.42	1.35%		9.67	8
01/01/2024	12.255	14.11%		9.86	8
12/01/2023	10.74	-3.50%		9.41	7.75
11/01/2023	11.13	6.00%		9.49	7.75
10/01/2023	10.5	13.76%		9.93	7.25
09/01/2023	9.23	0.00%		9.63	6.5
08/01/2023	9.23	1.10%		9.92	6.5
07/01/2023	9.13	6.16%	2023	9.69	6.5
06/01/2023	8.6	-0.35%		9.74	6
05/01/2023	8.63	0.35%		9.94	6
04/01/2023	8.6	1.78%		9.24	6
03/01/2023	8.45	1.44%		9.33	6
02/01/2023	8.33	0.00%		8.78	6
01/01/2023	8.33	0.00%		8.57	6
12/01/2022	8.33	0.60%		8.71	5.75
11/01/2022	8.28	1.85%		8.85	5.75
10/01/2022	8.13	0.00%		8.91	5.75
09/01/2022	8.13	-0.49%		9.1	5.5
08/01/2022	8.17	-0.37%		9.52	5.5
07/01/2022	8.2	1.23%	2022	7.48	5
06/01/2022	8.1	1.25%		7.56	5
05/01/2022	8	3.23%		7.42	5
04/01/2022	7.75	8.70%		6.29	4.75
03/01/2022	7.13	9.52%		6.22	4.75
02/01/2022	6.51	-8.70%		6.17	4.75
01/01/2022	7.13	-3.65%		5.86	4.75
12/01/2021	7.4	-0.94%		6.05	4.75
11/01/2021	7.47	9.85%	2021	5.98	4.75
10/01/2021	6.8	7.42%		5.7	4.75

09/01/2021	6.33	5.68%		5.59	4.75
08/01/2021	5.99	10.31%		5.54	4.75
07/01/2021	5.43	0.93%		5.36	4.75
06/01/2021	5.38	-7.72%		5.64	4.75
05/01/2021	5.83	1.92%		5.26	4.75
04/01/2021	5.72	-5.30%		5.56	4.75
03/01/2021	6.04	0.50%		5.47	4.75
02/01/2021	6.01	4.52%		5.32	4.75
01/01/2021	5.75	-0.35%		5.02	4.75
12/01/2020	5.77	-2.70%		5.29	4.75
11/01/2020	5.93	5.33%		5.52	4.75
10/01/2020	5.63	-15.21%		6.44	4.75
09/01/2020	6.64	-10.63%		5.97	4.75
08/01/2020	7.43	-6.19%		5.68	4.75
07/01/2020	7.92	-8.86%	2020	5.53	4.75
06/01/2020	8.69	-0.57%		6.02	4.75
05/01/2020	8.74	1.16%		5.35	5.25
04/01/2020	8.64	-0.35%		5.96	5.25
03/01/2020	8.67	-3.45%		5.48	5.25
02/01/2020	8.98	-1.86%		5.46	6
01/01/2020	9.15	-1.08%		5.57	6
12/01/2019	9.25	0.43%		5.75	6
11/01/2019	9.21	1.43%		6.05	6
10/01/2019	9.08	-2.37%		5.47	6
09/01/2019	9.3	0.00%		5.54	6
08/01/2019	9.3	4.26%		5.49	6
07/01/2019	8.92	5.69%	2019	5.62	6
06/01/2019	8.44	3.69%		5.52	6
05/01/2019	8.14	5.17%		5.63	6
04/01/2019	7.74	1.84%		5.58	6
03/01/2019	7.6	-0.52%		5.55	6
02/01/2019	7.64	-0.26%		5.47	6
01/01/2019	7.66	0.79%		5.42	6
12/01/2018	7.6	5.26%		5.35	6
11/01/2018	7.22	3.44%		5.37	6
10/01/2018	6.98	-0.29%		5.4	6
09/01/2018	7	0.14%		5.43	6
08/01/2018	6.99	-0.99%		5.48	6
07/01/2018	7.06	-6.24%	2018	5.51	6
06/01/2018	7.53	10.09%		5.54	6
05/01/2018	6.84	-4.20%		5.57	6
04/01/2018	7.14	-2.72%		5.63	6
03/01/2018	7.34	-0.41%		5.68	6.75
02/01/2018	7.37	-0.27%		5.72	6.75
01/01/2018	7.39	1.65%		5.88	6.75
12/01/2017	7.27	3.41%	2017	5.83	6.75

11/01/2017	7.03	0.00%		5.91	6.75
10/01/2017	7.03	0.14%		6.04	6.75
09/01/2017	7.02	0.86%		6.12	6.75
08/01/2017	6.96	0.14%		5.89	6.75
07/01/2017	6.95	1.16%		5.57	6.75
06/01/2017	6.87	8.87%		5.94	6.75
05/01/2017	6.31	0.32%		5.44	6.75
04/01/2017	6.29	-0.16%		5.47	6.75
03/01/2017	6.3	-1.10%		5.39	6.75
02/01/2017	6.37	-7.14%		5.31	6.75
01/01/2017	6.86	-0.44%		5.15	6.75
12/01/2016	6.89	-1.29%		5.03	6.75
11/01/2016	6.98	-0.71%		5.38	6.75
10/01/2016	7.03	-4.87%		5.57	6.75
09/01/2016	7.39	-0.67%		5.53	6.75
08/01/2016	7.44	-4.12%		5.37	6.75
07/01/2016	7.76	4.86%	2016	5.4	6.75
06/01/2016	7.4	4.37%		5.53	6.75
05/01/2016	7.09	2.16%		5.45	6.75
04/01/2016	6.94	4.52%		5.61	6.75
03/01/2016	6.64	9.75%		5.65	6.75
02/01/2016	6.05	-19.12%		5.62	6.75
01/01/2016	7.48	1.08%		6.07	7.25
12/01/2015	7.4	8.98%		6.1	7.25
11/01/2015	6.79	-14.27%		6.05	7.25
10/01/2015	7.92	-5.26%		6.19	7.25
09/01/2015	8.36	1.09%		6.24	7.25
08/01/2015	8.27	-14.57%		6.17	7.25
07/01/2015	9.68	-8.33%	2015	6.36	7.25
06/01/2015	10.56	-1.49%		6.25	7.25
05/01/2015	10.72	-1.20%		6.19	7.25
04/01/2015	10.85	-0.46%		6.32	7.25
03/01/2015	358.20	0.00%		6.27	7.25
02/01/2015	335.30	0.00%		6.05	7.25
01/01/2015	329.30	0.00%		6.04	7.25

EBL First Fund

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	3.8	-2.56%	2025	8.29	10
10/01/2025	3.9	-4.88%		8.17	10
09/01/2025	4.1	-2.38%		8.36	10
08/01/2025	4.2	-8.70%		8.2	10
07/01/2025	4.6	9.52%		8.5	10

06/01/2025	4.2	2.44%		8.8	10
05/01/2025	4.1	-22.64%		9.05	10
04/01/2025	5.3	-8.62%		9.17	10
03/01/2025	5.8	16.00%		9.35	10
02/01/2025	5	42.86%		9.32	10
01/01/2025	3.5	-5.41%		9.94	10
12/01/2024	3.7	2.78%		12.9	10
11/01/2024	3.6	-2.70%		13.8	10
10/01/2024	3.7	5.71%		10.9	9.5
09/01/2024	3.5	-27.08%		9.92	9
08/01/2024	4.8	26.32%		10.5	8.5
07/01/2024	3.8	-2.56%	2024	11.6	8.5
06/01/2024	3.9	-9.30%		9.72	8.5
05/01/2024	4.3	-8.51%		9.89	8.5
04/01/2024	4.7	-7.84%		9.74	8
03/01/2024	5.1	-16.39%		9.81	8
02/01/2024	6.1	15.09%		9.67	8
01/01/2024	5.3	-28.38%		9.86	8
12/01/2023	7.4	0.00%		9.41	7.75
11/01/2023	7.4	0.00%		9.49	7.75
10/01/2023	7.4	0.00%		9.93	7.25
09/01/2023	7.4	0.00%		9.63	6.5
08/01/2023	7.4	0.00%		9.92	6.5
07/01/2023	7.4	0.00%	2023	9.69	6.5
06/01/2023	7.4	0.00%		9.74	6
05/01/2023	7.4	0.00%		9.94	6
04/01/2023	7.4	0.00%		9.24	6
03/01/2023	7.4	0.00%		9.33	6
02/01/2023	7.4	0.00%		8.78	6
01/01/2023	7.4	0.00%		8.57	6
12/01/2022	7.4	0.00%		8.71	5.75
11/01/2022	7.4	0.00%		8.85	5.75
10/01/2022	7.4	0.00%		8.91	5.75
09/01/2022	7.4	0.00%		9.1	5.5
08/01/2022	7.4	-1.33%		9.52	5.5
07/01/2022	7.5	-1.32%	2022	7.48	5
06/01/2022	7.6	8.57%		7.56	5
05/01/2022	7	-5.41%		7.42	5
04/01/2022	7.4	-2.63%		6.29	4.75
03/01/2022	7.6	4.11%		6.22	4.75
02/01/2022	7.3	-3.95%		6.17	4.75
01/01/2022	7.6	1.33%		5.86	4.75
12/01/2021	7.5	-1.32%		6.05	4.75
11/01/2021	7.6	-5.00%	2021	5.98	4.75
10/01/2021	8	1.27%		5.7	4.75

09/01/2021	7.9	-19.39%		5.59	4.75
08/01/2021	9.8	5.38%		5.54	4.75
07/01/2021	9.3	12.05%		5.36	4.75
06/01/2021	8.3	9.21%		5.64	4.75
05/01/2021	7.6	13.43%		5.26	4.75
04/01/2021	6.7	19.64%		5.56	4.75
03/01/2021	5.6	-13.85%		5.47	4.75
02/01/2021	6.5	-1.52%		5.32	4.75
01/01/2021	6.6	-1.49%		5.02	4.75
12/01/2020	6.7	-6.94%		5.29	4.75
11/01/2020	7.2	-5.26%		5.52	4.75
10/01/2020	7.6	15.15%		6.44	4.75
09/01/2020	6.6	32.00%		5.97	4.75
08/01/2020	5	21.95%		5.68	4.75
07/01/2020	4.1	0.00%	2020	5.53	4.75
06/01/2020	4.1	-2.38%		6.02	4.75
05/01/2020	4.2	2.44%		5.35	5.25
04/01/2020	4.1	0.00%		5.96	5.25
03/01/2020	4.1	-10.87%		5.48	5.25
02/01/2020	4.6	4.55%		5.46	6
01/01/2020	4.4	0.00%		5.57	6
12/01/2019	4.4	-2.22%		5.75	6
11/01/2019	4.5	-4.26%		6.05	6
10/01/2019	4.7	-12.96%		5.47	6
09/01/2019	5.4	1.89%		5.54	6
08/01/2019	5.3	-8.62%		5.49	6
07/01/2019	5.8	-18.31%	2019	5.62	6
06/01/2019	7.1	7.58%		5.52	6
05/01/2019	6.6	4.76%		5.63	6
04/01/2019	6.3	-10.00%		5.58	6
03/01/2019	7	-4.11%		5.55	6
02/01/2019	7.3	-3.95%		5.47	6
01/01/2019	7.6	0.00%		5.42	6
12/01/2018	7.6	1.33%		5.35	6
11/01/2018	7.5	5.63%		5.37	6
10/01/2018	7.1	0.00%		5.4	6
09/01/2018	7.1	-22.83%		5.43	6
08/01/2018	9.2	24.32%		5.48	6
07/01/2018	7.4	-1.33%	2018	5.51	6
06/01/2018	7.5	-7.41%		5.54	6
05/01/2018	8.1	-10.00%		5.57	6
04/01/2018	9	-3.23%		5.63	6
03/01/2018	9.3	-7.00%		5.68	6.75
02/01/2018	10	-2.91%		5.72	6.75
01/01/2018	10.3	6.19%		5.88	6.75
12/01/2017	9.7	-3.00%	2017	5.83	6.75

11/01/2017	10	8.70%		5.91	6.75
10/01/2017	9.2	8.24%		6.04	6.75
09/01/2017	8.5	8.97%		6.12	6.75
08/01/2017	7.8	2.63%		5.89	6.75
07/01/2017	7.6	1.33%		5.57	6.75
06/01/2017	7.5	-2.60%		5.94	6.75
05/01/2017	7.7	5.48%		5.44	6.75
04/01/2017	7.3	1.39%		5.47	6.75
03/01/2017	7.2	0.00%		5.39	6.75
02/01/2017	7.2	-4.00%		5.31	6.75
01/01/2017	7.5	20.97%		5.15	6.75
12/01/2016	6.2	16.98%		5.03	6.75
11/01/2016	5.3	6.00%		5.38	6.75
10/01/2016	5	-5.66%		5.57	6.75
09/01/2016	5.3	6.00%		5.53	6.75
08/01/2016	5	-3.85%		5.37	6.75
07/01/2016	5.2	6.12%	2016	5.4	6.75
06/01/2016	4.9	6.52%		5.53	6.75
05/01/2016	4.6	4.55%		5.45	6.75
04/01/2016	4.4	-2.22%		5.61	6.75
03/01/2016	4.5	4.65%		5.65	6.75
02/01/2016	4.3	-2.27%		5.62	6.75
01/01/2016	4.4	4.76%		6.07	7.25
12/01/2015	4.2	0.00%		6.1	7.25
11/01/2015	4.2	-6.67%		6.05	7.25
10/01/2015	4.5	2.27%		6.19	7.25
09/01/2015	4.4	-8.33%		6.24	7.25
08/01/2015	4.8	-9.43%		6.17	7.25
07/01/2015	5.3	8.16%	2015	6.36	7.25
06/01/2015	4.9	2.08%		6.25	7.25
05/01/2015	4.8	14.29%		6.19	7.25
04/01/2015	4.2	-8.70%		6.32	7.25
03/01/2015	4.6	-9.80%		6.27	7.25
02/01/2015	5.1	2.00%		6.05	7.25
01/01/2015	5	-5.66%		6.04	7.25

Prime Finance First Mutual Fund

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	18.7	-9.22%	2025	8.29	10
10/01/2025	20.6	-5.94%		8.17	10
09/01/2025	21.9	0.00%		8.36	10
08/01/2025	21.9	-1.79%		8.2	10

07/01/2025	22.3	20.54%		8.5	10
06/01/2025	18.5	-1.07%		8.8	10
05/01/2025	18.7	-7.88%		9.05	10
04/01/2025	20.3	-1.46%		9.17	10
03/01/2025	20.6	-0.96%		9.35	10
02/01/2025	20.8	0.48%		9.32	10
01/01/2025	20.7	-32.79%		9.94	10
12/01/2024	30.8	-21.63%		12.9	10
11/01/2024	39.3	7.97%		13.8	10
10/01/2024	36.4	19.74%		10.9	9.5
09/01/2024	30.4	-25.85%		9.92	9
08/01/2024	41	-12.95%		10.5	8.5
07/01/2024	47.1	37.72%	2024	11.6	8.5
06/01/2024	34.2	-13.85%		9.72	8.5
05/01/2024	39.7	0.51%		9.89	8.5
04/01/2024	39.5	14.16%		9.74	8
03/01/2024	34.6	0.87%		9.81	8
02/01/2024	34.3	-7.30%		9.67	8
01/01/2024	37	14.55%		9.86	8
12/01/2023	32.3	113.91%		9.41	7.75
11/01/2023	15.1	-3.82%		9.49	7.75
10/01/2023	15.7	6.80%		9.93	7.25
09/01/2023	14.7	0.68%		9.63	6.5
08/01/2023	14.6	-3.95%		9.92	6.5
07/01/2023	15.2	0.00%	2023	9.69	6.5
06/01/2023	15.2	-0.65%		9.74	6
05/01/2023	15.3	10.87%		9.94	6
04/01/2023	13.8	0.00%		9.24	6
03/01/2023	13.8	0.00%		9.33	6
02/01/2023	13.8	-5.48%		8.78	6
01/01/2023	14.6	-11.52%		8.57	6
12/01/2022	16.5	-2.94%		8.71	5.75
11/01/2022	17	0.00%		8.85	5.75
10/01/2022	17	0.00%		8.91	5.75
09/01/2022	17	-3.41%		9.1	5.5
08/01/2022	17.6	-1.12%		9.52	5.5
07/01/2022	17.8	1.14%	2022	7.48	5
06/01/2022	17.6	5.39%		7.56	5
05/01/2022	16.7	-2.34%		7.42	5
04/01/2022	17.1	-6.04%		6.29	4.75
03/01/2022	18.2	11.66%		6.22	4.75
02/01/2022	16.3	-13.30%		6.17	4.75
01/01/2022	18.8	-5.05%		5.86	4.75
12/01/2021	19.8	-6.16%	2021	6.05	4.75
11/01/2021	21.1	-0.47%		5.98	4.75

10/01/2021	21.2	4.95%		5.7	4.75
09/01/2021	20.2	-0.98%		5.59	4.75
08/01/2021	20.4	-3.32%		5.54	4.75
07/01/2021	21.1	6.03%		5.36	4.75
06/01/2021	19.9	1.02%		5.64	4.75
05/01/2021	19.7	10.67%		5.26	4.75
04/01/2021	17.8	20.27%		5.56	4.75
03/01/2021	14.8	-7.50%		5.47	4.75
02/01/2021	16	-15.34%		5.32	4.75
01/01/2021	18.9	-3.08%		5.02	4.75
12/01/2020	19.5	-3.47%		5.29	4.75
11/01/2020	20.2	22.42%		5.52	4.75
10/01/2020	16.5	-10.33%		6.44	4.75
09/01/2020	18.4	10.18%		5.97	4.75
08/01/2020	16.7	24.63%		5.68	4.75
07/01/2020	13.4	11.67%	2020	5.53	4.75
06/01/2020	12	0.84%		6.02	4.75
05/01/2020	11.9	-0.83%		5.35	5.25
04/01/2020	12	0.00%		5.96	5.25
03/01/2020	12	-18.92%		5.48	5.25
02/01/2020	14.8	2.78%		5.46	6
01/01/2020	14.4	-13.25%		5.57	6
12/01/2019	16.6	15.28%		5.75	6
11/01/2019	14.4	1.41%		6.05	6
10/01/2019	14.2	-8.97%		5.47	6
09/01/2019	15.6	-3.70%		5.54	6
08/01/2019	16.2	2.53%		5.49	6
07/01/2019	15.8	17.91%	2019	5.62	6
06/01/2019	13.4	44.09%		5.52	6
05/01/2019	9.3	14.81%		5.63	6
04/01/2019	8.1	-15.62%		5.58	6
03/01/2019	9.6	-4.00%		5.55	6
02/01/2019	10	-13.79%		5.47	6
01/01/2019	11.6	7.41%		5.42	6
12/01/2018	10.8	3.85%		5.35	6
11/01/2018	10.4	0.00%		5.37	6
10/01/2018	10.4	-0.95%		5.4	6
09/01/2018	10.5	-11.02%		5.43	6
08/01/2018	11.8	11.32%		5.48	6
07/01/2018	10.6	-10.92%	2018	5.51	6
06/01/2018	11.9	-5.56%		5.54	6
05/01/2018	12.6	0.00%		5.57	6
04/01/2018	12.6	4.13%		5.63	6
03/01/2018	12.1	-3.97%		5.68	6.75
02/01/2018	12.6	-11.89%		5.72	6.75
01/01/2018	14.3	-5.30%		5.88	6.75

12/01/2017	15.1	1.34%	2017	5.83	6.75
11/01/2017	14.9	-1.97%		5.91	6.75
10/01/2017	15.2	0.66%		6.04	6.75
09/01/2017	15.1	-5.03%		6.12	6.75
08/01/2017	15.9	10.42%		5.89	6.75
07/01/2017	14.4	22.03%		5.57	6.75
06/01/2017	11.8	0.85%		5.94	6.75
05/01/2017	11.7	-0.85%		5.44	6.75
04/01/2017	11.8	0.85%		5.47	6.75
03/01/2017	11.7	0.00%		5.39	6.75
02/01/2017	11.7	-13.33%		5.31	6.75
01/01/2017	13.5	7.14%		5.15	6.75
12/01/2016	12.6	31.25%	2016	5.03	6.75
11/01/2016	9.6	10.34%		5.38	6.75
10/01/2016	8.7	-5.43%		5.57	6.75
09/01/2016	9.2	16.46%		5.53	6.75
08/01/2016	7.9	-3.66%		5.37	6.75
07/01/2016	8.2	-2.38%		5.4	6.75
06/01/2016	8.4	2.44%		5.53	6.75
05/01/2016	8.2	5.13%		5.45	6.75
04/01/2016	7.8	-12.36%		5.61	6.75
03/01/2016	8.9	-5.32%		5.65	6.75
02/01/2016	9.4	-3.09%		5.62	6.75
01/01/2016	9.7	-7.62%	2015	6.07	7.25
12/01/2015	10.5	-2.78%		6.1	7.25
11/01/2015	10.8	5.88%		6.05	7.25
10/01/2015	10.2	-5.56%		6.19	7.25
09/01/2015	10.8	0.00%		6.24	7.25
08/01/2015	10.8	-8.47%		6.17	7.25
07/01/2015	11.8	0.85%		6.36	7.25
06/01/2015	11.7	-1.68%		6.25	7.25
05/01/2015	11.9	20.20%		6.19	7.25
04/01/2015	9.9	-21.43%		6.32	7.25
03/01/2015	12.6	-5.26%		6.27	7.25
02/01/2015	13.3	-11.92%		6.05	7.25
01/01/2015	15.1	-7.93%		6.04	7.25

AB Bank 1st Mutual fund

Date	Dependent Variable (Y)		Year	Independent Variable (X)	
	Stock Price	Change %		Inflation	Interest Rate
11/01/2025	2.7	-6.90%	2025	8.29	10
10/01/2025	2.9	-6.45%		8.17	10
09/01/2025	3.1	-6.06%		8.36	10
08/01/2025	3.3	-10.81%		8.2	10

07/01/2025	3.7	-5.13%		8.5	10
06/01/2025	3.9	-9.30%		8.8	10
05/01/2025	4.3	-8.51%		9.05	10
04/01/2025	4.7	4.44%		9.17	10
03/01/2025	4.5	36.36%		9.35	10
02/01/2025	3.3	6.45%		9.32	10
01/01/2025	3.1	-6.06%		9.94	10
12/01/2024	3.3	0.00%		12.9	10
11/01/2024	3.3	-8.33%		13.8	10
10/01/2024	3.6	2.86%		10.9	9.5
09/01/2024	3.5	-12.50%		9.92	9
08/01/2024	4	21.21%		10.5	8.5
07/01/2024	3.3	0.00%	2024	11.6	8.5
06/01/2024	3.3	-10.81%		9.72	8.5
05/01/2024	3.7	-7.50%		9.89	8.5
04/01/2024	4	-9.09%		9.74	8
03/01/2024	4.4	-10.20%		9.81	8
02/01/2024	4.9	2.08%		9.67	8
01/01/2024	4.8	-7.69%		9.86	8
12/01/2023	5.2	0.00%		9.41	7.75
11/01/2023	5.2	0.00%		9.49	7.75
10/01/2023	5.2	0.00%		9.93	7.25
09/01/2023	5.2	0.00%		9.63	6.5
08/01/2023	5.2	0.00%		9.92	6.5
07/01/2023	5.2	0.00%	2023	9.69	6.5
06/01/2023	5.2	0.00%		9.74	6
05/01/2023	5.2	0.00%		9.94	6
04/01/2023	5.2	0.00%		9.24	6
03/01/2023	5.2	0.00%		9.33	6
02/01/2023	5.2	0.00%		8.78	6
01/01/2023	5.2	0.00%		8.57	6
12/01/2022	5.2	0.00%		8.71	5.75
11/01/2022	5.2	0.00%		8.85	5.75
10/01/2022	5.2	0.00%		8.91	5.75
09/01/2022	5.2	-5.45%		9.1	5.5
08/01/2022	5.5	1.85%		9.52	5.5
07/01/2022	5.4	-1.82%	2022	7.48	5
06/01/2022	5.5	1.85%		7.56	5
05/01/2022	5.4	-3.57%		7.42	5
04/01/2022	5.6	0.00%		6.29	4.75
03/01/2022	5.6	5.66%		6.22	4.75
02/01/2022	5.3	-3.64%		6.17	4.75
01/01/2022	5.5	0.00%		5.86	4.75
12/01/2021	5.5	-3.51%	2021	6.05	4.75
11/01/2021	5.7	-6.56%		5.98	4.75

10/01/2021	6.1	-1.61%		5.7	4.75
09/01/2021	6.2	-12.68%		5.59	4.75
08/01/2021	7.1	-7.79%		5.54	4.75
07/01/2021	7.7	14.93%		5.36	4.75
06/01/2021	6.7	-1.47%		5.64	4.75
05/01/2021	6.8	21.43%		5.26	4.75
04/01/2021	5.6	7.69%		5.56	4.75
03/01/2021	5.2	-8.77%		5.47	4.75
02/01/2021	5.7	-8.06%		5.32	4.75
01/01/2021	6.2	-1.59%		5.02	4.75
12/01/2020	6.3	0.00%		5.29	4.75
11/01/2020	6.3	-8.70%		5.52	4.75
10/01/2020	6.9	16.95%		6.44	4.75
09/01/2020	5.9	28.26%		5.97	4.75
08/01/2020	4.6	9.52%		5.68	4.75
07/01/2020	4.2	0.00%	2020	5.53	4.75
06/01/2020	4.2	0.00%		6.02	4.75
05/01/2020	4.2	0.00%		5.35	5.25
04/01/2020	4.2	0.00%		5.96	5.25
03/01/2020	4.2	-10.64%		5.48	5.25
02/01/2020	4.7	4.44%		5.46	6
01/01/2020	4.5	9.76%		5.57	6
12/01/2019	4.1	0.00%		5.75	6
11/01/2019	4.1	2.50%		6.05	6
10/01/2019	4	-2.44%		5.47	6
09/01/2019	4.1	0.00%		5.54	6
08/01/2019	4.1	-10.87%		5.49	6
07/01/2019	4.6	-2.13%	2019	5.62	6
06/01/2019	4.7	2.17%		5.52	6
05/01/2019	4.6	4.55%		5.63	6
04/01/2019	4.4	-2.22%		5.58	6
03/01/2019	4.5	-2.17%		5.55	6
02/01/2019	4.6	-11.54%		5.47	6
01/01/2019	5.2	18.18%		5.42	6
12/01/2018	4.4	0.00%		5.35	6
11/01/2018	4.4	0.00%		5.37	6
10/01/2018	4.4	-2.22%		5.4	6
09/01/2018	4.5	-27.42%		5.43	6
08/01/2018	6.2	6.90%		5.48	6
07/01/2018	5.8	-3.33%	2018	5.51	6
06/01/2018	6	1.69%		5.54	6
05/01/2018	5.9	-4.84%		5.57	6
04/01/2018	6.2	5.08%		5.63	6
03/01/2018	5.9	0.00%		5.68	6.75
02/01/2018	5.9	-3.28%		5.72	6.75
01/01/2018	6.1	-7.58%		5.88	6.75

12/01/2017	6.6	1.54%	2017	5.83	6.75
11/01/2017	6.5	0.00%		5.91	6.75
10/01/2017	6.5	-4.41%		6.04	6.75
09/01/2017	6.8	-8.11%		6.12	6.75
08/01/2017	7.4	-1.33%		5.89	6.75
07/01/2017	7.5	7.14%		5.57	6.75
06/01/2017	7	0.00%		5.94	6.75
05/01/2017	7	-1.41%		5.44	6.75
04/01/2017	7.1	1.43%		5.47	6.75
03/01/2017	7	1.45%		5.39	6.75
02/01/2017	6.9	-1.43%		5.31	6.75
01/01/2017	7	18.64%		5.15	6.75
12/01/2016	5.9	13.46%	2016	5.03	6.75
11/01/2016	5.2	6.12%		5.38	6.75
10/01/2016	4.9	-5.77%		5.57	6.75
09/01/2016	5.2	4.00%		5.53	6.75
08/01/2016	5	-7.41%		5.37	6.75
07/01/2016	5.4	0.00%		5.4	6.75
06/01/2016	5.4	8.00%		5.53	6.75
05/01/2016	5	4.17%		5.45	6.75
04/01/2016	4.8	4.35%		5.61	6.75
03/01/2016	4.6	-2.13%		5.65	6.75
02/01/2016	4.7	0.00%		5.62	6.75
01/01/2016	4.7	4.44%		6.07	7.25
12/01/2015	4.5	0.00%	2015	6.1	7.25
11/01/2015	4.5	-4.26%		6.05	7.25
10/01/2015	4.7	-2.08%		6.19	7.25
09/01/2015	4.8	-11.11%		6.24	7.25
08/01/2015	5.4	-8.47%		6.17	7.25
07/01/2015	5.9	9.26%		6.36	7.25
06/01/2015	5.4	-1.82%		6.25	7.25
05/01/2015	5.5	10.00%		6.19	7.25
04/01/2015	5	-9.09%		6.32	7.25
03/01/2015	5.5	-8.33%		6.27	7.25
02/01/2015	6	0.00%		6.05	7.25
01/01/2015	6	-4.76%		6.04	7.25