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Project Dissertation Report on

THE ROIC-WACC SPREAD AND STOCK RETURNS: AN EMPIRICAL PORTFOLIO STUDY OF NSE-LISTED NON-FINANCIAL FIRMS IN INDIA (FY2017–FY2025)

Submitted By

Shubham Juyal

24/DMBA/225

Under the Guidance of

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EXECUTIVE SUMMARY

This study investigates whether the ROIC-WACC SPREAD (the difference between a company's Return on Invested Capital and its Weighted Average Cost of Capital) is associated with differences in annual stock returns, return volatility, and risk-adjusted performance among NSE-listed companies in India. The study follows the portfolio-sorting methodology developed by Steen and Turesson (2021) and extends their analysis to one of the world's largest emerging equity markets over the period FY2017 to FY2025.

A sample of 6 non-financial companies drawn from NSE 500 across thirteen sectors was examined. Financial data including ROIC components and WACC inputs were sourced from Screener.in, NSE India, and the Reserve Bank of India. Stock prices were collected for March 31 of every year from 2016 to 2025. Firms were sorted annually into five equal portfolios based on their three-year rolling Average SPREAD. Portfolio-level performance was assessed on three dimensions: Average annual return, Standard Deviation of returns, and Sharpe ratio. Three OLS regression models were estimated at the portfolio-year level (N = 35), and supplementary firm-level regressions were conducted using all 540 firm-year observations.

The descriptive analysis reveals that the Average ROIC of 32.92 percent substantially exceeds the Average WACC of 11.51 percent across the sample, yielding a mean SPREAD of 21.20 percent. Portfolio 1 firms (highest SPREAD) include capital-light businesses in IT, FMCG, and pharmaceuticals with Average ROICs of 85.84 percent, while Portfolio 5 firms (lowest SPREAD) are predominantly from capital-intensive sectors including metals, energy, and cement.

The three regression models find no statistically significant association between the SPREAD and any of the three dependent variables. Portfolio 1 earned an Average annual return of 16.31%, the lowest of the five portfolios, while Portfolio 4 earned the highest Average of 26.39%. These findings are consistent with EMH: the superior capital efficiency of high-SPREAD firms is already incorporated into their market prices, leaving no systematic excess return for investors who sort on the basis of the SPREAD. The results align closely with those of Steen and Turesson (2021).

However, a firm-level regression on absolute return volatility yields a statistically significant result ($\beta = -0.095$, $p = 0.029$), signifies that higher-SPREAD firms exhibit lower return volatility. This finding constitutes the study's most robust empirical contribution and suggests that the SPREAD functions as a risk indicator rather than a return predictor in the Indian market. The year-by-year analysis further reveals that high-SPREAD firms outperform defensively during market downturns (FY2020: Portfolio 1 returned +1.54 percent versus Portfolio 5's -18.30 percent) but underperform significantly during cyclical recoveries (FY2021: Portfolio 5 returned +121.50 percent versus Portfolio 1's +53.82 percent).

The study contributes to international literature on ROIC-WACC framework by providing the first systematic portfolio-sorting test of this relationship in Indian equity market. The findings have implications for investors seeking risk management benefits rather than excess returns, for corporate managers committed to value-based management frameworks, and for academics studying the applicability of capital efficiency metrics in emerging market contexts.

39 CHAPTER 1: INTRODUCTION

1.1 Background

5 The relationship between capital efficiency and stock market performance has been a subject of enduring interest in the field of finance. A central proposition in corporate
52 finance holds that a firm creates economic value only when the returns it earns on its
52 invested capital exceed the cost of that capital. This principle, articulated most
55 prominently by Koller, Goedhart, and Wessels (2020) in their seminal work *Valuation: Measuring and Managing the Value of Companies*, forms the theoretical cornerstone of the present study. When ROIC exceeds WACC, the firm generates a positive economic profit; when it falls short, value is destroyed even in the presence of accounting profits.

The difference between ROIC and WACC, referred to in the present study as the SPREAD, represents a firm's capital efficiency and economic profitability. A firm with a consistently positive SPREAD is one that deploys its capital in a manner that generates returns above what investors require. In contrast, a firm with a negative SPREAD is, in effect, consuming more economic resources than it creates, regardless of how its conventional accounting metrics may appear. The SPREAD therefore offers a more complete picture of firm performance than traditional metrics such as EPS, ROE, or net profit margin, all of which fail to incorporate the WACC.

Despite of theoretical clarity of this framework, the empirical relationship between the SPREAD and stock market performance remains an open & contested question. On one hand, if capital markets are efficient, all publicly available information about a firm's profitability, including its SPREAD, should already be fully incorporated into
51 its stock price. This view, grounded in the Efficient Market Hypothesis (EMH) articulated by Fama (1970), would imply that a high SPREAD does not necessarily translate into superior future stock returns, since market has already priced in the superior quality of firm's capital allocation. On other hand, value-based management
43 frameworks such as Economic Value Added (EVA), developed by Stern Stewart and Company (1991), have long argued that measures of excess return over the cost of capital are meaningful predictors of firm value and, by extension, stock performance.

This apparent tension between theoretical expectations and empirical evidence has given rise to a body of literature examining how profitability metrics that did not
9 account for the cost of capital, a critical limitation that the present study seeks to
address by focusing explicitly on the SPREAD between ROIC and WACC.

The Indian equity market presents a particularly compelling setting for this investigation. India is among the fastest-growing major economies, with the NSE ranking among the largest stock exchanges globally by market capitalisation. Indian listed firms operate across a diverse range of industries, from capital-intensive sectors such as metals and cement to asset-light businesses in information technology and consumer goods. This diversity creates significant cross-sectional variation in ROIC
6 and WACC, making the Indian market a rich environment for testing the relationship
between capital efficiency and stock returns. Furthermore, while the ROIC-WACC framework has been tested in developed markets such as Sweden by Steen and Turesson (2021) and the Nordic region by Leitner and Olofsson (2025), its applicability to an emerging economy like India remains largely unexplored, representing a clear gap in the existing literature.

1.2 Problem Statement

Traditional financial analysis relies heavily on accounting-based performance metrics
116 such as revenue growth, EBITDA margins, and earnings per share. While these metrics
are widely used by analysts and investors, they suffer from a fundamental limitation:
19 they do not account for the cost of capital. A firm that earns a return of 15 percent may
19 appear profitable in absolute terms, but if its cost of capital is 12 percent, it is creating
19 value. If the cost of capital is 18 percent, it is destroying value. The difference is
consequential, yet conventional metrics obscure it entirely.

The ROIC-WACC SPREAD framework addresses this limitation by directly measuring whether a firm's operating returns exceed the cost of financing those
12 operations. If financial markets are informationally efficient, the SPREAD should
already be reflected in the price of a stock, meaning that high-SPREAD firms should not systematically generate higher future returns. However, if markets are less than perfectly efficient, or if the SPREAD carries information beyond what is already priced in, then portfolios constructed on the basis of the SPREAD may exhibit different return and risk characteristics.

In the context of the Indian equity market, this problem takes on additional dimensions. India's capital markets have grown rapidly in terms of both depth and retail participation. However, investor decision-making in Indian markets is often driven by short-term earnings momentum, price-to-earnings multiples, and sector-level trends, rather than by fundamental measures of capital efficiency. This raises the question of whether the SPREAD, as a measure grounded in long-run value creation, has any observable association with stock returns and risk in the Indian market. If high-SPREAD firms exhibit lower return volatility, they may be attractive from a risk-management perspective even if they do not generate excess returns. Conversely, if low-SPREAD firms are systematically more volatile, investors may be underestimating the risk embedded in such stocks.

The present study addresses this problem by constructing portfolios of NSE-listed non-financial firms sorted by their ROIC-WACC SPREAD and examining whether the SPREAD is associated with differences in annual stock returns, return volatility, and risk-adjusted performance as measured by the Sharpe ratio. The study period of FY2017 to FY2025 spans a diverse range of macroeconomic conditions in India, including a period of economic slowdown, the COVID-19 pandemic, a sharp recovery, and subsequent global uncertainty, making it a robust period for examining the behaviour of capital efficiency across market cycles.

1.3 Objectives of the Study

The present study is guided by the following research objectives:

i. To examine whether portfolios of NSE-listed non-financial firms with a higher ROIC-WACC SPREAD generate significantly higher annual stock returns compared to portfolios with a lower SPREAD.

ii. To investigate whether the ROIC-WACC SPREAD is associated with differences in the Standard Deviation of annual stock returns across the five portfolios, thereby assessing its role as a potential risk indicator.

iii. To assess whether the Sharpe ratio, as a measure of risk-adjusted return, differs systematically across portfolios sorted by the ROIC-WACC SPREAD.

iv. To contribute empirical evidence on the applicability of the ROIC-WACC
1 framework in the context of an emerging market, specifically the Indian equity market,
thereby extending the existing international literature on this topic.

87 **1.4 Research Questions and Hypotheses**

The central research question of this study is: Does the ROIC-WACC SPREAD of NSE-listed non-financial firms have a statistically significant association with their annual stock returns, return volatility, and Sharpe ratio over the period FY2017 to FY2025?

To operationalise this research question, the following three pairs of hypotheses are tested:

Hypothesis 1 — Annual Stock Return

H(null): There is no statistically significant correlation between the ROIC-WACC SPREAD and the annual stock returns of the portfolios at the five percent significance level.

6 H(alternate): There is a statistically significant positive correlation between the ROIC-
51 WACC SPREAD and the annual stock returns of the portfolios at the five percent
significance level.

Hypothesis 2 — Standard Deviation of Returns

H(null): There is no statistically significant correlation between the ROIC-WACC
106 SPREAD and the Standard Deviation of annual stock returns of the portfolios at the
five percent significance level.

H(alternate): There is a statistically significant negative correlation between the ROIC-
15 WACC SPREAD and the Standard Deviation of annual stock returns, indicating that
higher SPREAD portfolios exhibit lower return volatility.

Hypothesis 3 — Sharpe Ratio

H(null): There is no statistically significant correlation between the ROIC-WACC SPREAD and the Sharpe ratio of the portfolios at the five percent significance level.

H(alternate): There is a statistically significant positive correlation between the ROIC-WACC SPREAD and the Sharpe ratio of the portfolios, indicating that higher SPREAD portfolios deliver better risk-adjusted returns.

The hypotheses are grounded in the theoretical tension between the Efficient Market Hypothesis, which would predict no systematic relationship between the SPREAD and future returns, and the value-based management literature, which holds that capital efficiency is a meaningful driver of long-term stock performance. The study tests both the return and risk dimensions of this relationship, following the methodological approach of Steen and Turesson (2021).

1.5 Scope of the Study

The study focuses on non-financial firms listed on the National Stock Exchange of India (NSE). The sample comprises sixty companies drawn from the NSE 500 universe, spanning thirteen sectors including information technology, fast-moving consumer goods, pharmaceuticals, automobiles, capital goods, metals and mining, cement, specialty chemicals, consumer discretionary, energy, telecom, and infrastructure. Financial sector companies, including banks, non-banking financial companies (NBFCs), and insurance firms, were excluded from the sample. This exclusion follows the convention established by Fama and French (1992) and adopted in similar studies, on the grounds that financial firms carry inherently high leverage as part of their normal business model, making the standard ROIC and WACC calculations non-comparable with non-financial firms.

The study period spans nine financial years from FY2017 (April 2016 to March 2017) to FY2025 (April 2024 to March 2025). This period was selected to ensure data availability across all sample companies, including the most recent financial year for which data was available at the time of the study. The period encompasses a variety of macroeconomic conditions, including periods of moderate GDP growth (FY2017–FY2019), a significant economic contraction due to the COVID-19 pandemic (FY2021), a sharp recovery phase (FY2022), and subsequent periods of normalisation, providing a robust basis for examining the relationship between capital efficiency and stock returns across different market environments.

All financial data including ROIC components, WACC inputs, and stock prices were sourced from Screener.in, the National Stock Exchange of India website, and the Reserve Bank of India's database on government securities yields. The study uses annual stock returns based on March 31 closing prices as the measure of stock performance, consistent with India's financial year end. The ROIC-WACC SPREAD is computed at the individual firm level for each year and then Averaged over a rolling three-year window to construct the portfolio sorting variable, following the methodology of Steen and Turesson (2021). Portfolios are rebalanced annually.

1.6 Significance of the Study

This study makes several contributions to the existing literature and to investment practice. First, it extends the empirical testing of the ROIC-WACC framework to the Indian equity market, an emerging economy that has received limited attention in this specific research area. Prior studies examining this relationship have been conducted primarily in developed market contexts, including Sweden and the Nordic region. The Indian market's unique characteristics, including its diverse corporate landscape, relatively high Average ROIC levels driven by India's growth dynamics, and an investor base that is increasingly driven by retail participation, make it a distinctive and valuable setting for this investigation.

Second, the study covers the period FY2017 to FY2025, which includes the COVID-19 pandemic and its aftermath, a phase during which return patterns in Indian equities diverged significantly from historical norms. Examining whether the SPREAD-based portfolio sorting holds its properties across this exceptional period adds to the robustness of the findings and their relevance for contemporary investors.

Third, the study's findings have direct practical implications. For investors, the study provides evidence on whether a fundamentals-based, capital-efficiency metric can serve as a useful portfolio construction tool. For corporate managers, the findings reinforce or challenge the case for adopting value-based management frameworks that centre on the ROIC-WACC SPREAD. For academic researchers, the study offers a

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replication and extension of a European methodology in an emerging market context, contributing to the growing body of international evidence on this topic.

8

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical literature that forms the foundation of the present study. The review is organised thematically, beginning with the Efficient Market Hypothesis, which provides the theoretical baseline against which the study's findings must be interpreted. It then covers the evolution of asset pricing models, from the Capital Asset Pricing Model through the multi-factor models of Fama and French and others, before turning to value-based performance measures, particularly the Economic Value Added framework and the ROIC-WACC spread. The chapter concludes by reviewing empirical studies that have specifically examined the relationship between excess capital returns and stock performance, including prior work on the Indian market, and identifies the research gap that the present study seeks to address.

2.2 The Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH), formalised by Fama (1970), is the theoretical pillar against which any claim about a return-predicting variable must be evaluated. The EMH states that the price of a security at any point in time reflects all information available to market participants. In its semi-strong form, the hypothesis holds that prices instantaneously incorporate all publicly available information, implying that no systematic excess return can be earned by analysing publicly disclosed financial data. In the strong form, even privately held information is assumed to be reflected in prices.

The direct implication for the present study is that if the ROIC-WACC SPREAD is publicly observable information, and if markets are semi-strong efficient, then portfolios sorted by the SPREAD should not generate systematically different risk-adjusted returns. The SPREAD would already be priced into the stock, and any superior capital efficiency would be reflected in the firm's current valuation multiples rather than in future returns. This prediction provides the theoretical basis for the null hypotheses of this study.

Fama (1991) revisited the EMH in a subsequent paper, acknowledging that while extreme versions of the hypothesis are unlikely to hold in practice due to the existence of trading costs and information acquisition costs, the hypothesis remains a useful benchmark. He concluded that the bulk of the evidence supports the view that stock prices are largely unpredictable on the basis of historical data or publicly available fundamental information. This updated position, often described as a near-efficient market framework, is consistent with the expectation that the SPREAD may carry some information about risk characteristics, even if it does not predict abnormal returns.

Evidence from Indian markets presents a more nuanced picture. Several studies conducted by Sehgal and Balakrishnan (2002) and Tripathi (2008) have found evidence of return anomalies in Indian equities, including momentum effects and value premiums, suggesting that Indian markets may be less than fully efficient in the semi-strong sense. This partial inefficiency creates the theoretical possibility that a fundamentals-based sorting variable such as the SPREAD could have predictive power for returns in the Indian context, providing additional motivation for the present study.

2.3 Asset Pricing Models

2.3.1 The Capital Asset Pricing Model

The CAPM is directly relevant to the present study in two respects. First, it forms the basis of the cost of equity calculation used in computing the WACC for each firm in the sample. The cost of equity for each firm is estimated as the risk-free rate plus the product of the firm's beta and the equity risk premium, following the approach advocated by Koller et al. (2020). Second, the CAPM provides the conceptual foundation for the Sharpe ratio, one of the three dependent variables in this study, which measures the excess return per unit of total risk borne by the investor.

Despite its widespread use, the CAPM has been subject to significant empirical criticism. Banz (1981) demonstrated that small capitalization. firms earned returns that were too high to be explained by their CAPM betas alone, a finding later incorporated into multi-factor models. Black (1972) questioned the realism of the model's assumptions, particularly the assumption of unlimited borrowing at the risk-free rate. These critiques gave rise to the multi-factor extensions described in the following section.

2.3.2 The Fama-French Three-Factor Model

Fama and French (1993) extended the CAPM by adding two factors to the model i.e. a size factor, defined as the return differential between small- capitalization. and large-capitalization stocks (SMB - Small Minus Big), and a value factor, defined as the return differential between high book-to-market and low book-to-market stocks (HML - High Minus Low). Their empirical study of the US stock market data from 1964 to 1991 showed that these two factors along with the market excess return factor of the CAPM model enhanced the cross-sectional variation in stock returns.

There has been a debate on the theoretical interpretation of the Fama-French factors. Fama and French actually claimed that the size premium and value premium are due to systematic risk factors that are not accounted for by the CAPM. Lakonishok, Shleifer, and Vishny (1994), however, suggested that the value premium is due to irrationality of investors, and they extrapolated the past bad performance of value stocks into the future. In any case, the three factor model is now the standard set by which to compare the performance of investment strategies—including the portfolio sorting approach used in this study.

2.3.3 The Fama-French Five-Factor Model

The five-factor model is particularly relevant to the present study because its profitability factor conceptually overlaps with the ROIC-WACC SPREAD. However, there is an important distinction: the profitability measures used by Fama and French (2015) and Novy-Marx (2013) are gross of the cost of capital. They measure how much a firm earns, but not whether those earnings exceed the cost of generating them. The SPREAD, by contrast, explicitly incorporates the cost of capital through the WACC, thereby providing a more complete measure of economic profitability. As Koller et al. (2020) argue, ROIC is the superior metric for measuring a firm's value-creating capacity precisely because it is evaluated in relation to its cost of capital. This distinction constitutes one of the key theoretical motivations for the present study.

2.3.4 The Carhart Four-Factor Model

Carhart (1997) extended the Fama-French three-factor model by adding a momentum factor (WML — Winners Minus Losers), based on the empirical finding by Jegadeesh and Titman (1993) that stocks that have performed well over the past three to twelve months tend to continue outperforming in the short run, and vice versa. The Carhart model has become a standard tool for performance evaluation in empirical asset pricing research and is relevant to the present study as a reference framework for interpreting portfolio returns. While the present study does not employ multi-factor regressions, the existence of the momentum effect provides a cautionary note: any observed return differential between high-SPREAD and low-SPREAD portfolios must be interpreted with the awareness that other systematic factors may be driving the results.

56 **2.4 Value-Based Performance Measures**

56 2.4.1 Economic Value Added

The theoretical antecedents of EVA trace back to Alfred Marshall's concept of economic rent (1890) and were articulated in modern form by writers including Peter Drucker (1964), who argued that a business does not create profit until it has covered all of its costs, including the cost of capital. Drucker's formulation is essentially identical to the value-creation concept that underpins both EVA and the ROIC-WACC SPREAD framework examined in the present study.

81 Empirical evidence on the relationship between EVA and stock returns is mixed.
139 Biddle, Bowen, and Wallace (1997) conducted one of the most comprehensive early tests and found that traditional earnings measures, particularly operating cash flow and
30 net income, had greater explanatory power for stock returns than EVA. However, Bell (2004) found that firms adopting EVA-based compensation frameworks experienced significant abnormal outperformance over a three-year period, suggesting that the adoption of value-based management disciplines, rather than EVA as a static metric, is what drives performance improvements. Subedi and Farazmand (2020) found similar results in the context of Chinese state-owned enterprises, where EVA adoption led to improved managerial discipline and capital allocation.

A key limitation of EVA as an empirical tool is that it is an absolute measure, making cross-firm comparisons difficult. The ROIC-WACC SPREAD, being a ratio-based measure expressed in percentage points, circumvents this limitation. As Leitner and Olofsson (2025) observe, the SPREAD allows for meaningful comparison across firms of different sizes and capital structures, which is essential for the portfolio sorting methodology employed in the present study.

2.4.2 The ROIC-WACC Framework

The ROIC-WACC framework, as articulated by Koller, Goedhart, and Wessels (2020),
70 holds that the fundamental drivers of firm value are: the return on invested capital, the

cost of capital, and the rate of growth. The SPREAD between ROIC and WACC captures the first two of these drivers in a single metric. When a firm's ROIC consistently exceeds its WACC, every unit of capital reinvested in the business creates value, and growth enhances that value creation. When ROIC falls below WACC, growth destroys value, as each additional unit of capital invested generates a return that is insufficient to cover its cost.

This formulation follows the simplified but widely used approach described in Koller et al. (2020) and adopted in prior empirical studies on this topic.

10 In the present study, the cost of equity component of WACC is estimated using the CAPM, with a fixed equity risk premium of 7.0 percent applied consistently across all firms and all years. This approach follows the recommendation of Koller et al. (2020) that a long-run, normalised equity risk premium be used rather than a year-specific premium, which can produce implausible estimates in years of extreme market returns.

The SPREAD itself, defined as ROIC minus WACC, measures the excess return earned on each unit of invested capital above the cost of that capital. Research from McKinsey, summarised in Koller et al. (2020), demonstrates that industries and firms with higher ROIC-WACC spreads command higher market valuation multiples, a finding that is consistent across geographies and time periods. This connection between the SPREAD and valuations suggests that the market does price the SPREAD into current stock prices, creating the efficiency-consistent expectation that the SPREAD should not predict future returns. However, it also creates the possibility that the SPREAD carries information about the stability of a firm's competitive position, which may in turn be associated with lower return volatility — the key empirical question examined in this study.

2.5 Prior Empirical Studies on the ROIC-WACC Spread and Stock Returns

A small but growing body of empirical literature has examined whether the ROIC-WACC SPREAD has predictive power for stock returns. Steen and Turesson (2021), in a bachelor's thesis conducted at the Stockholm School of Economics, investigated this relationship using data from companies listed on the OMX Stockholm Large Cap exchange over the period 2004 to 2020. Their study sorted companies into five portfolios based on their three-year Average SPREAD and examined whether higher-

88 SPREAD portfolios generated higher monthly returns, lower Standard Deviation of returns, and higher Sharpe ratios. Their central finding was that the SPREAD did not significantly correlate with monthly stock returns, a result that they interpreted as 34 consistent with the Efficient Market Hypothesis. However, they found a significant negative correlation between the SPREAD and the Standard Deviation of returns, indicating that firms with higher excess returns on capital exhibited lower return volatility. Their finding on the Sharpe ratio was not statistically significant.

21 Leitner and Olofsson (2025), in a master's thesis conducted at the University of Gothenburg, examined a related but distinct research question, focusing on whether capital allocation activities including capital expenditure, mergers and acquisitions, and dividend payments generate shareholder value, and how this relationship is moderated by the ROIC-WACC SPREAD. Using a balanced panel of 262 Nordic firms from 2004 to 2023, they found that capital allocation activities were, on Average, negatively associated with stock returns in isolation, but became positively associated with returns when the firm possessed a positive ROIC-WACC SPREAD. Their finding underscored the conditionality of value creation: capital allocation strategies are effective only when they are undertaken by firms that already demonstrate the capacity 43 to generate returns above their cost of capital.

Studies examining EVA, the closest conceptual cousin to the SPREAD, have produced 114 similarly mixed results. Biddle et al. (1997) found that EVA had limited incremental explanatory power over traditional earnings metrics. Aravind and Ramya (2015) 20 examined the relationship between EVA and share prices of six companies listed on the BSE Sensex over the period 2008 to 2013 and found no significant positive relationship, concluding that investors in Indian markets did not appear to incorporate EVA information in their investment decisions. Khan, Shah, and Rehman (2012), studying 60 firms on the Karachi Stock Exchange from 2004 to 2010, found that 30 operating cash flow and net income had greater explanatory power for stock returns than EVA, and that EVA in fact exhibited a negative correlation with stock returns in their sample. These findings from South Asian markets are particularly relevant to the 38 present study, as they suggest that in markets with characteristics similar to India, the relationship between economic value added measures and stock returns may be weaker than theory would predict.

94 In contrast, Awan, Siddique, and Sarwar (2014) found a positive association between EVA and stock returns in a sample of 59 companies on the Karachi Stock Exchange 18 100 index, significant at the ten percent level. This study, while methodologically limited, provides some support for the view that value-based metrics carry information content relevant to stock pricing in South Asian markets. The contradictory results across these studies highlight the context-dependence of the relationship and reinforce the need for a rigorous study specifically designed for the Indian equity market.

2.6 ROIC Characteristics in Indian and Emerging Markets

Indian listed firms, particularly those in the non-financial sector, have historically exhibited relatively high ROIC levels compared to developed market peers. This reflects several structural factors specific to the Indian economy. Capital-light business 85 models are prevalent in high-ROIC sectors such as information technology, fast-moving consumer goods, and pharmaceuticals, where firms generate substantial operating profits from relatively modest investments in fixed assets. India's demographic dividend, expanding middle class, and rapidly growing domestic consumption provide a sustained demand tailwind that supports above-Average returns for well-positioned firms. The presence of strong brand equity and distribution networks in sectors such as FMCG and consumer staples creates durable competitive advantages that sustain high ROIC over extended periods.

At the same time, capital-intensive sectors in India, including metals and mining, cement, energy, and infrastructure, face the typical challenges of commodity pricing cycles, high capital expenditure requirements, and significant financial leverage, resulting in compressed and volatile ROIC. The cross-sectional variation in ROIC across sectors in India is therefore substantial, making the Indian market a particularly appropriate setting for portfolio studies that rely on ranking firms by their SPREAD. Koller et al. (2020) note that ROIC tends to be persistent over time, a property described as ROIC stickiness, which provides theoretical support for the use of historical Average SPREAD as a portfolio sorting variable, since past ROIC levels have informational value for predicting future ROIC.

Research on capital efficiency in Indian firms has been limited but growing. Jaisinghani, Tandon, and Batra (2018) examined capital expenditure and firm 9 performance in the Indian automobile sector and found a persistently negative relationship between CAPEX intensity and firm performance, consistent with the view that overinvestment relative to the cost of capital destroys value. Venugopal, Reddy, and Sharma (2018) studied shareholder value creation in Indian firms and found that ROIC-based measures were more strongly associated with market value added than traditional earnings-based metrics. These studies, while not directly testing the SPREAD-return relationship, provide supporting evidence that capital efficiency metrics carry relevant information in the Indian corporate context.

2.7 Reconciling EMH with Profitability Premiums

A recurring challenge in the literature is reconciling the existence of return premiums associated with profitability measures - as documented by Novy-Marx (2013) and Fama and French (2015) - with the predictions of the EMH. Two broad explanations have been offered. The first is a risk-based explanation: firms with high profitability may be exposed to systematic risks that are not captured by conventional factors such as market beta and size. Under this interpretation, the profitability premium is compensation for bearing an identifiable but difficult-to-specify risk factor.

The second explanation is a behavioural one: investors systematically underweight fundamental information about firm quality, leading to mispricing that is eventually corrected by the market. This explanation is consistent with the evidence from Lakonishok, Shleifer, and Vishny (1994) and with broader findings from the behavioural finance literature, suggesting that cognitive biases and institutional constraints prevent arbitrageurs from fully eliminating mispricings in the short run.

For the present study, both explanations are relevant. If high-SPREAD firms in India are genuinely less risky businesses - owing to their stable competitive positions, durable earnings, and lower financial leverage - then the lower return volatility observed in such firms (if confirmed by the data) is consistent with the risk-based explanation. The market correctly prices such firms at a premium, but this premium is compensation for the lower risk borne by their shareholders, not evidence of mispricing. If, on the other hand, high-SPREAD firms generate comparable or lower raw returns than low-SPREAD firms, this would be consistent with the EMH: the market fully prices in the superior capital efficiency, leaving no abnormal return available to investors who sort on the basis of the SPREAD.

2.8 Research Gap and Contribution of the Present Study

The review of literature reveals several important gaps that the present study is positioned to address. First, while the ROIC-WACC SPREAD framework has been tested in the context of Swedish and Nordic firms, no study to the knowledge of the present researchers has specifically applied this framework to the Indian equity market using a rigorous portfolio sorting methodology. The Indian market is distinct from developed European markets in terms of its growth rate, sector composition, level of retail investor participation, and degree of market efficiency, making a direct replication in this context a valuable contribution.

Second, the study period of FY2017 to FY2025 encompasses the COVID-19 pandemic and its aftermath, a period of exceptional market dislocation that has not been covered in prior studies on this topic. Testing whether the SPREAD-based portfolio properties hold across this unusual period adds to the robustness of the international evidence on this relationship.

Third, prior studies on EVA and stock returns in South Asian markets have been limited in scope, covering small samples over short time horizons, and have produced mixed and sometimes contradictory findings. The present study addresses these limitations by employing a larger and more diverse sample of sixty firms across nine years, using a systematic portfolio construction methodology, and applying regression analysis to test the significance of the SPREAD-return relationship at both the portfolio and firm levels.

Fourth, the present study explicitly examines all three dimensions of portfolio performance: Average return, return volatility, and risk-adjusted return through the Sharpe ratio. Prior studies on the Indian market have typically focused on a single dimension of performance, usually raw returns, without examining whether differences in risk characteristics across SPREAD-sorted portfolios offer a more robust and practically meaningful finding. The multi-dimensional approach of this study provides a more complete picture of the investment implications of the ROIC-WACC framework in the Indian context.

2.9 Summary

This chapter has reviewed the theoretical and empirical literature most relevant to the present study. The Efficient Market Hypothesis provides the theoretical benchmark, predicting that the SPREAD should not predict excess returns if it is publicly available information. The evolution of asset pricing models from the CAPM to the Fama-French five-factor model establishes the importance of profitability as a return-relevant characteristic, while highlighting that prior models have not accounted for the cost of capital. The value-based performance literature, centred on EVA and the ROIC-WACC framework, provides the conceptual foundation for the SPREAD measure and establishes its connection to long-run value creation. Prior empirical studies, including those by Steen and Turesson (2021) and Leitner and Olofsson (2025), provide a methodological blueprint and establish baseline findings from developed markets, against which the results of the present study can be compared.

The literature review identifies a clear gap: the ROIC-WACC SPREAD has not been systematically tested in the Indian equity market context using a portfolio sorting methodology. The present study fills this gap using a sample of sixty NSE-listed non-financial firms over the period FY2017 to FY2025, contributing new evidence on the applicability of the ROIC-WACC framework in one of the world's largest and fastest-growing emerging markets.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design and methodology employed in the present study. It covers the research approach adopted, the process of sample selection, the definitions and computation of all key variables, the sources from which data was collected, the portfolio construction methodology, and the regression models used to test the study's hypotheses. The methodology closely follows the approach of Steen and Turesson (2021), with adaptations necessary to account for the Indian market context, the annual rather than monthly return frequency, and the study period of FY2017 to FY2025.

39

3.2 Research Design

The present study adopts a quantitative, empirical research design. The research question — whether the ROIC-WACC SPREAD is associated with differences in stock returns, return volatility, and Sharpe ratio across portfolios of Indian firms — is fundamentally empirical in nature and requires the systematic collection, computation, and statistical testing of numerical data. The study is deductive in its approach, 83 beginning from established theoretical frameworks and testing specific hypotheses derived from those frameworks against observed market data.

The core analytical approach is portfolio sorting followed by regression analysis, a 95 methodology that has a long tradition in empirical asset pricing research dating back to the foundational work of Fama and French (1992, 1993). In this approach, firms are ranked each year based on a sorting variable — in the present study, the three-year Average ROIC-WACC SPREAD — and divided into equal-sized groups, or 134 portfolios. The portfolio-level values of the dependent variables (Average return, Standard Deviation of returns, and Sharpe ratio) are then regressed on the portfolio-level sorting variable to test for a statistically significant relationship.

This design has several methodological advantages. By aggregating individual firm returns into portfolios, it reduces the influence of idiosyncratic, firm-specific noise on the measured relationship between the SPREAD and stock performance. It also 46 generates a panel of portfolio-year observations that can be used in regression analysis to test the direction and significance of the association. Furthermore, the portfolio approach facilitates intuitive comparison of performance across SPREAD quintiles, providing a descriptive complement to the formal regression results.

44 3.3 Sample Selection

The sample consists of sixty non-financial companies listed on NSE. The companies were selected from the NSE 500 index. The NSE 500 was chosen as the sampling universe because it provides a representative cross-section of large and mid-capitalization Indian firms with established financial reporting histories, ensuring the availability of reliable data across the full study period.

The following criteria were applied in selecting the sample:

i. The company must have been continuously listed on the NSE from at least April 2016 (the base year required for calculating FY2017 returns) through March 2025.

26 ii. The company must not be classified in the financial sector, including banks, non-banking financial companies (NBFCs), insurance companies, and housing finance
42 companies. This exclusion follows the convention established by Fama and French (1992), on the grounds that financial firms operate with inherently high leverage as part of their core business model, making standard ROIC and WACC computations non-comparable with non-financial firms.

iii. The company must have complete and consistent data available on Screener.in for all required financial variables across the full study period.

iv. The company must have stock price data available on the National Stock Exchange of India for all March 31 closing dates from 2016 to 2025.

Table 3.1: Sector-wise Companies

S.No.	Sector	Sub-sectors Included	No. of Firms
1	Information Technology	IT Services	8
2	FMCG	Consumer Staples, Food & Beverages, Oral Care, Ayurveda	9
3	Pharmaceuticals	Generics, API & CRAMS, Branded Generics	7
4	Automobile	Passenger Vehicles, Two-Wheelers, Auto Components	7
5	Capital Goods	Engineering & Construction, Industrial Automation, Electricals	6
6	Metals & Mining	Steel, Aluminium, Diversified Metals	4
7	Cement	Cement & Building Materials	4
8	Specialty Chemicals	Adhesives, Fluorochemicals	2
9	Consumer Discretionary	Paints, Jewellery, White Goods, Apparel	6

10	Energy	Oil & Gas, Oil Refining & Marketing	3
11	Telecom	Telecom Services, Tower Infrastructure	2
12	Infrastructure	Rail Logistics, Ports & SEZ	2
	Total		60

Source: Own compilation based on NSE 500 constituent list (March 2024).

3.4 Study Period

The study covers nine financial years from FY2017 (April 2016 to March 2017) to FY2025 (April 2024 to March 2025). The financial year ending in March is used throughout, consistent with the Indian regulatory and reporting convention. Stock prices are measured at the March 31 closing price for each year, with March 31, 2016 serving as the base-year price from which FY2017 returns are calculated.

The portfolio sorting exercise requires a minimum of three years of SPREAD data to compute the three-year rolling Average SPREAD used as the sorting variable. The first year for which a three-year Average SPREAD can be computed using data from FY2017, FY2018, and FY2019 is therefore FY2019. Accordingly, portfolios are constructed and stock return data is collected for the seven-year period from FY2019 to FY2025, yielding seven annual portfolio observations for each of the five portfolios, for a total of thirty-five portfolio-year observations in the regression analysis.

The study period encompasses a wide range of macroeconomic conditions in India. The early part of the period (FY2017–FY2019) was characterised by moderate GDP growth, the implementation of the Goods and Services Tax reform, and a period of monetary policy normalisation. FY2020 saw a significant economic slowdown driven by global trade tensions and domestic consumption weakness. FY2021 recorded a sharp economic contraction of approximately 6.6 percent due to the COVID-19 pandemic and associated lockdowns. FY2022 saw a strong recovery of approximately 8.7 percent as the economy reopened. The subsequent years from FY2023 to FY2025 saw continued growth, albeit at a more moderate pace, with India maintaining its position as one of the fastest-growing major economies. This diversity of macroeconomic conditions strengthens the external validity of the study's findings.

3.5 Variable Definitions and Computation

3.5.1 Return on Invested Capital (ROIC)

ROIC is defined as NOPAT divided by Invested Capital, expressed as a percentage.

$$ROIC\ (\%) = (NOPAT\ /\ Invested\ Capital) \times 100$$

NOPAT is computed as EBIT multiplied by one minus the effective tax rate. This formulation isolates the profitability generated from core operations, independent of the firm's financing structure.

$$NOPAT = EBIT \times (1 - Effective\ Tax\ Rate)$$

Invested Capital is calculated as the sum of Net Fixed Assets (Net Block) and Net Working Capital. Net Fixed Assets represent the book value of the firm's property, plant, equipment, and other tangible and intangible assets net of accumulated depreciation.

$$Invested\ Capital = Net\ Fixed\ Assets + Net\ Working\ Capital$$

All ROIC inputs were sourced from Screener.in, which aggregates financial statement data from company annual reports filed with the Registrar of Companies and stock exchanges. EBIT and tax data were sourced from the Profit and Loss statement, while Net Fixed Assets and Working Capital were sourced from the Balance Sheet.

3.5.2 Weighted Average Cost of Capital (WACC)

The WACC represents the minimal return that a firm must earn on its invested capital to satisfy the return requirements of all of its capital providers. It is calculated as the weighted Average of the cost of equity and the after-tax cost of debt.

$$WACC\ (\%) = [Ke \times E/(E+D)] + [Kd \times (1 - Tax\ Rate) \times D/(E+D)]$$

The cost of equity is estimated using CAPM:

53 $$Ke\ (\%) = Rf + \beta \times ERP$$

where Rf is the risk-free rate, β is the firm's equity beta coefficient, and ERP is the
91 equity risk premium. The risk-free rate is specified as the annualised yield on ten-year
Government of India securities as at March 31 of each financial year, sourced from the
2 Reserve Bank of India's database on government securities. The equity risk premium
is fixed at 7.0 percent for all firms and all years, following the recommendation of Koller et al. (2020) that a long-run normalised equity risk premium be used to avoid implausible estimates in years of extreme market performance. This value is broadly consistent with estimates of the India equity risk premium published by Damodaran (2024) and used in prior studies of Indian firms.

16 The beta coefficient for each firm was obtained from the National Stock Exchange of
India and MoneyControl, which compute equity betas using historical regression of
38 the firm's monthly returns against the Nifty 500 index. The cost of debt is estimated as
the ratio of interest expense (finance costs) to total debt outstanding, expressed as a
31 percentage, consistent with the approach used by Steen and Turesson (2021). The
after-tax cost of debt adjusts for the tax deductibility of interest payments.

Table 3.2 presents the risk-free rates used for each financial year of the study period.

126 **Table 3.2: Risk-Free Rate (10-Year G-Sec Yield) by Financial Year**

Financial Year	G-Sec Yield on March 31(%)	ERP(%)
FY2017	6.68	7.0
FY2018	7.40	7.0
FY2019	7.35	7.0
FY2020	6.14	7.0
FY2021	6.17	7.0
FY2022	6.84	7.0
FY2023	7.31	7.0
FY2024	7.05	7.0

FY2025	6.85	7.0

Source: Reserve Bank of India — Database on Indian Economy; Government Securities Yields.

3.5.3 ROIC-WACC Spread

The ROIC-WACC SPREAD (referred to hereafter as SPREAD) is the difference between a firm's ROIC and WACC, both expressed in percentage points. A positive SPREAD indicates that the firm is generating returns above its cost of capital, creating economic value for its shareholders. A negative SPREAD indicates value destruction.

$$SPREAD\ (\%) = ROIC\ (\%) - WACC\ (\%)$$

For the purpose of portfolio sorting, a three-year rolling Average of the SPREAD is computed for each firm at each portfolio construction date. For the portfolio year 2019, for example, the sorting variable is the Average of the firm's SPREAD in FY2017, FY2018, and FY2019. This rolling Average approach serves two purposes. First, it reduces the impact of year-specific shocks on the sorting variable, providing a more stable and long-run measure of a firm's capital efficiency. Second, it ensures that the portfolio sorting is based on information that is already available to investors at the time of portfolio construction, avoiding any look-ahead bias. This approach follows the methodology of Steen and Turesson (2021).

3.5.4 Annual Stock Return

The annual stock return for each firm is the percentage change in the stock's closing price between March 31 of the prior year and March 31 of the current year. Stock prices are sourced from the National Stock Exchange of India's historical price data and Yahoo Finance. Price-only returns are used, consistent with the approach of Mauboussin and Callahan (2023), who argue that dividend reinvestment returns may not reflect actual investor experience and that using total shareholder returns introduces endogeneity when dividends are also a variable of interest.

$$Annual\ Return\ (\%) = [(P_t - P_{t-1}) / P_{t-1}] \times 100$$

3.5.5 Standard Deviation of Returns

The Standard Deviation of annual returns is computed at the portfolio level for each portfolio year as the cross-sectional Standard Deviation of the annual returns of the twelve firms within the portfolio for that year. This measure captures the dispersion of returns within the portfolio and serves as a proxy for the portfolio's risk or volatility. A lower Standard Deviation for high-SPREAD portfolios, if observed, would indicate that firms with greater capital efficiency exhibit more stable and predictable returns, consistent with the proposition that sustained competitive advantage reduces earnings volatility.

3.5.6 Sharpe Ratio

The Sharpe ratio is the Average excess return of the portfolio above the risk-free rate, divided by the Standard Deviation of returns of the portfolio for that year.

$$\textit{Sharpe Ratio} = (\textit{Portfolio Return} - \textit{Rf}) \, / \, \textit{Standard Deviation of Portfolio Returns}$$

The Sharpe ratio measures the risk-adjusted return earned per unit of total risk, providing a basis for comparing portfolio performance across different levels of the SPREAD while accounting for differences in risk.

3.6 Data Sources

Table 3.3 provides a consolidated summary of the data sources used for each variable in the study.

Table 3.3: Summary of Data Sources

Variable	Specific Data Item	Source
ROIC	EBIT, Tax Rate, Net Fixed Assets, Working Capital	Screener.in — Company P&L and Balance Sheet (Consolidated)
WACC	Interest Expense, Total Debt (Borrowings)	Screener.in — P&L and Balance Sheet
WACC	Market Capitalisation (for equity weight)	Screener.in — Company overview page
WACC	Equity Beta	NSE India (nseindia.com) and MoneyControl

WACC	Risk-Free Rate (10-yr G-Sec yield)	RBI - Database on Indian Economy
Returns	Stock Closing Price (March 31 each year)	NSE Historical Data and Yahoo Finance
Macro	India GDP Growth Rate	Ministry of Statistics & Programme Implementation (MOSPI)

Source: Own compilation.

3.7 Data Treatment and Quality

Prior to analysis, the data underwent a systematic process of quality checking and cleaning. All 540 firm-year observations (60 firms × 9 years) were reviewed for completeness and internal consistency. The following issues were identified and addressed.

First, one data entry error was identified in which the ROIC for Bajaj Auto in FY2024 was recorded as a highly implausible value. This observation was replaced with the median ROIC of the same firm across the remaining eight years of the study period. Second, a small number of observations across three firms - Bajaj Auto, Abbott India, and Eicher Motors - contained ROIC values that appeared to have been entered in percentage form rather than decimal form for selected years. These observations were addressed through winsorization.

9 All continuous variables — ROIC, WACC, SPREAD, and annual return — were winsorized at 1st and 99th percentiles. This procedure reduces the influence of outliers on the regression results without discarding observations entirely, consistent with the approach adopted by Leitner and Olofsson (2025). After winsorization, all variable distributions were inspected visually and statistically, and no further anomalies were detected.

3.8 Portfolio Construction

The portfolio construction follows a systematic annual procedure. At the beginning of each portfolio year from FY2019 to FY2025, all sixty sample firms are ranked in descending order based on their three-year Average SPREAD, computed using the most recently available three years of SPREAD data. The sixty firms are then divided into five equally sized portfolios of twelve firms each. Portfolio 1 consists of the twelve firms with the highest three-year Average SPREAD; Portfolio 5 consists of the twelve firms with the lowest three-year Average SPREAD. This procedure is repeated each year, allowing firms to move between portfolios as their capital efficiency changes over time.

90 For each portfolio and each year, three performance metrics are computed: the
132 weighted Average annual return of the twelve firms in the portfolio, the Standard Deviation of those twelve annual returns, and the Sharpe ratio. This procedure yields seven observations per portfolio (one for each year from FY2019 to FY2025), for a total of thirty-five portfolio-year observations in the regression dataset.

An equal-weighting scheme is used, consistent with the approach of Steen and Turesson (2021) and with the objective of testing whether the SPREAD-based sorting variable, rather than firm size or market capitalization, is the driver of any observed return differential. Value-weighting would give disproportionate influence to the largest firms in each portfolio and would make it difficult to distinguish the effect of the SPREAD from the effect of firm size.

3.9 Regression Models

99 Three simple ordinary least squares (OLS) regression models are estimated to test the study's hypotheses. In each model, the independent variable is the Average three-year SPREAD of the portfolio for the given year, and the dependent variable is one of the
11 three portfolio performance metrics: Average annual return, Standard Deviation of returns, or Sharpe ratio. The regression models are specified as follows:

Model 1 — Annual Return and SPREAD:

$$r_i = \alpha_i + \beta_i \times SPREAD_i + \varepsilon_i$$

Model 2 — Standard Deviation of Returns and SPREAD:

$$STD_i = \alpha_i + \beta_i \times SPREAD_i + \varepsilon_i$$

Model 3 — Sharpe Ratio and SPREAD:

$$Sharpe_i = \alpha_i + \beta_i \times SPREAD_i + \varepsilon_i$$

In each model, i indexes the portfolio-year observation. The SPREAD variable is the equal-weighted Average three-year Average SPREAD of the firms in portfolio i in the given year. The coefficient β captures the direction and magnitude of the association between the SPREAD and the dependent variable; a statistically significant positive β in Model 1 would indicate that higher-SPREAD portfolios earn higher Average returns, and a statistically significant negative β in Model 2 would indicate that higher-SPREAD portfolios exhibit lower return volatility.

The models are estimated using 35 portfolio-year observations (five portfolios over seven years). Statistical significance is assessed at the five percent level ($p < 0.05$) as the primary threshold, with findings at the ten percent level ($p < 0.10$) also noted where relevant. The coefficient of determination (R^2) is reported as a measure of the explanatory power of the SPREAD for each dependent variable.

In addition to the portfolio-level regressions, the study also conducts a firm-level regression using all 540 individual firm-year observations, with the three-year Average SPREAD as the independent variable and the annual stock return as the dependent variable. This regression, while not the primary test of the study's hypotheses, provides a check on whether the portfolio-level findings are consistent with the underlying firm-level data, and increases the number of observations available for the return-SPREAD relationship.

A disaggregated regression is also conducted in which the SPREAD is separated into its two components, ROIC and WACC, which are entered as independent variables simultaneously. This model mirrors the approach of Steen and Turesson (2021) and examines whether returns are more sensitive to the ROIC component or the WACC component of the SPREAD.

3.10 Limitations of the Methodology

The Limitations of Methodology are as follows:

First, the sample is restricted to only 60 large and mid-capitalization firms from the NSE 500. It limits the applicability of the findings to smaller firms and to companies outside the NSE 500 universe, which may exhibit different capital efficiency characteristics.

Second, the study uses annual stock returns rather than the monthly returns used by Steen and Turesson (2021). While this adaptation is necessitated by the practical constraints of data collection for the Indian market and is academically defensible, it reduces the number of observations available for each portfolio year from twelve monthly observations to a single annual observation. The use of annual returns also means that the study captures only one data point per firm per year, reducing the power of the statistical tests.

Third, the WACC calculation involves several assumptions - including the use of a fixed equity risk premium, book-value-based debt weights, and beta estimates from historical regressions - that may introduce measurement error. The fixed equity risk premium of 7.0 percent, while grounded in long-run estimates, may not accurately reflect investors' required return in each specific year of the study period. Similarly, beta estimates from historical data may be poor proxies for forward-looking systematic risk, a limitation acknowledged in all CAPM-based research.

Fourth, the portfolio sorting approach uses equal-weighted returns, which implicitly treats each firm within a portfolio as an equally important contributor to the portfolio's performance. In practice, investors would typically weight holdings by market capitalization or according to their own risk preferences. The equal-weighting assumption may therefore not reflect the experience of actual investors.

Fifth, the study does not control for sector effects. Given that the SPREAD varies systematically across sectors - being generally higher in IT and FMCG and lower in metals and cement - the observed portfolio performance differences may in part reflect sector-level factors rather than purely the SPREAD itself.

3.11 Summary

This chapter has described the quantitative, portfolio-sorting methodology employed in the present study. A sample of sixty NSE-listed non-financial firms was selected from the NSE 500, covering thirteen sectors over the period FY2017 to FY2025. Key variables are ROIC, WACC, SPREAD, annual stock return, Standard Deviation of returns, and Sharpe ratio were defined, computed, and sourced from publicly available financial databases. Portfolios were constructed annually by sorting firms into five equal groups based on their three-year Average SPREAD, and three OLS regression models were estimated to test the hypotheses relating the SPREAD to each of the three dependent variables. Data quality was ensured through systematic outlier treatment.

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CHAPTER 4: ANALYSIS, DISCUSSION AND RECOMMENDATIONS

4.1 Introduction

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This chapter discusses the empirical results of this study. The analysis is explained as follows. Section 4.2 presents descriptive statistics for the key variables. Section 4.3 discusses portfolio construction & its composition. Section 4.4 analyses portfolio-level performance, including Average returns, Standard Deviation, and Sharpe ratios across the five SPREAD-sorted portfolios. Section 4.5 presents results of three regression models. Section 4.6 presents additional analyses, including a firm-level regression, a disaggregated regression separating ROIC and WACC, and a year-wise examination of portfolio returns. Section 4.7 discusses the findings. Section 4.8 presents the implications of the findings, and Section 4.9 discusses the limitations of analysis.

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4.2 Descriptive Statistics

Table 4.1 presents the descriptive statistics for the five key variables used, computed across all 540 firm-year observations. All values are expressed in percentage terms.

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Table 4.1: Descriptive Stats. of Key Variables (FY2017–FY2025, N = 540)

Statistic	ROIC	WACC	Spread	3-yr average spread	Annual Return
Observations	540	540	540	540	540
Mean	32.92	11.51	21.20	21.34	22.08
Median	21.78	11.50	9.87	10.04	13.39
Std Deviation	38.91	1.55	38.94	36.58	44.75
Minimum	1.70	8.30	-11.77	-11.77	-65.75
25th Pctile	12.73	10.50	0.93	1.08	-6.01
75th Pctile	35.64	12.50	24.29	24.34	39.76
Maximum	244.66	16.00	231.82	231.82	253.55

Source: Own analysis. Data sourced from Screener.in, NSE India, and RBI.

Several noteworthy observations emerge from the descriptive statistics. The mean ROIC of 32.92 percent across the sample is substantially higher than the mean WACC of 11.51 percent, yielding an Average SPREAD of 21.20 percent. This indicates that, on Average, the sample firms are significant value creators, generating returns well above their cost of capital. This finding is consistent with the general characterization of large-cap Indian non-financial firms, many of which benefit from dominant market positions, capital-light business models, and India's high nominal growth environment. The median ROIC of 21.78 percent, being considerably lower than the mean, indicates positive skewness in the ROIC distribution, driven by a small number of firms with exceptionally high capital returns where most notably in the information technology and fast-moving consumer goods sectors.

The mean WACC of 11.51 percent with a very low Standard Deviation of 1.55 percent confirms that cost of capital is relatively uniform across firms in the sample. This finding is consistent with observation of Steen and Turesson (2021) that WACC is more stable than ROIC, and it implies that cross-sectional variation in the SPREAD is driven primarily by differences in ROIC rather than by diff. in cost of capital. The narrow WACC range of 8.30 percent to 16.00 percent reflects the relatively stable monetary conditions in India during the study period which is moderated by the use of firm-specific beta estimates and the fixed equity risk premium assumption.

The mean annual return of 22.08 percent with a Standard Deviation of 44.75 percent reflects both the strong long-run performance and the significant volatility experienced, specially during COVID-19 pandemic in FY2021 and its aftermath. The variety of annual returns, from a min. of negative 65.75 percent to a maximum of 253.55 percent indicates the substantial year-to-year variation in individual firm returns, which is expected in a study including a nine-year period that includes a major event.

Table 4.2 presents the correlation matrix for the key variables at the portfolio-year level, providing an initial indication of the bivariate relationships between the SPREAD and the dependent variables.

Table 4.2: Correlation Matrix — Portfolio-Year Level (N = 35)

Variable	Spread	Average Return	Standard Deviation	Sharpe Ratio
SPREAD	1.0000	-0.0922	-0.0697	-0.0313
Avg Return	-0.0922	1.0000	0.7211	0.8768
Std Dev	-0.0697	0.7211	1.0000	0.4640
Sharpe Ratio	-0.0313	0.8768	0.4640	1.0000

Source: Own analysis. Correlation computed at portfolio-year level (5 portfolios × 7 years = 35 observations).

The correlation matrix reveals that the SPREAD is negatively correlated with all three dependent variables i.e. Average return (-0.0922), Standard Deviation (-0.0697), and Sharpe ratio (-0.0313) at the portfolio level. However, all three correlations are very small in magnitude, suggesting that the linear association between the SPREAD and portfolio performance metrics is weak. Notably, Average return and Sharpe ratio are highly positively correlated (0.8768), which is expected given that the Sharpe ratio is largely driven by the raw return when the Standard Deviation does not vary greatly across portfolios. The correlation between ROIC and WACC at the firm level is negative (-0.1047, p = 0.0149), indicating that firms with higher capital returns tend to operate with lower costs of capital, possibly reflecting the lower perceived risk of firms with strong competitive positions.

4.3 Portfolio Construction and Composition

Portfolios were constructed annually for the seven-year period from FY2019 to FY2025, yielding a balanced panel of 35 portfolio-year observations (5 portfolios × 7 years), with 12 firms in each portfolio each year. The portfolio sorting variable is the three-year rolling Average SPREAD for each firm, computed using the current and two prior years of SPREAD data.

Table 4.3 presents the Average ROIC, WACC, and three-year Average SPREAD for each of the five portfolios across the full seven-year study period. The portfolios are ordered from Portfolio 1 (highest Average SPREAD) to Portfolio 5 (lowest Average SPREAD).

Table 4.3: Portfolio Composition — Average ROIC, WACC and SPREAD (FY2019–FY2025)

Portfolio	Average ROIC	Average WACC	Average 3-yr Spread	Interpretation
1 (Highest)	85.84	11.24	75.75	Strongest capital efficiency
2	32.03	11.39	20.03	Above-Average capital efficiency
3	21.89	11.38	10.31	Moderate capital efficiency
4	15.40	12.00	3.24	Below-Average capital efficiency
5 (Lowest)	9.22	12.52	-3.23	Value-destroying firms

Source: Own analysis. Averages computed across all seven portfolio years (FY2019–FY2025), 12 firms per portfolio per year.

The portfolio composition reveals a clear and economically meaningful monotonic pattern in both ROIC and SPREAD across the five portfolios. Portfolio 1 firms earn an Average ROIC of 85.84 percent, nearly ten times the Average ROIC of Portfolio 5 firms (9.22 percent). This dramatic difference reflects the presence of highly capital-efficient businesses in Portfolio 1, including information technology firms such as Tata Consultancy Services and Infosys, FMCG leaders such as Hindustan Unilever, Nestle India, and Colgate-Palmolive India, and consumer discretionary companies such as Page Industries, all of which consistently generate very high returns on invested capital due to their asset-light operating models and strong brand advantages.

Portfolio 5 consistently contains firms from capital-intensive sectors. The sector composition analysis reveals that across all seven portfolio years, the metals and mining sector accounted for 18 of the 84 observations in Portfolio 5, followed by energy (17 observations), cement (13 observations), infrastructure (9 observations), and telecom (6 observations). By contrast, Portfolio 1 was dominated by FMCG (32 observations), information technology (14 observations), automobiles (22 observations, reflecting high-ROIC companies such as Bajaj Auto and Eicher Motors), and pharmaceuticals (7 observations). This sector-level polarization is consistent with the widely observed pattern in global markets, whereby capital-light, brand-driven businesses consistently outperform capital-intensive commodity businesses on returns-based metrics.

The Average WACC shows a modest but monotonically increasing pattern from Portfolio 1 (11.24 percent) to Portfolio 5 (12.52 percent). This indicates that low-SPREAD firms tend to bear a somewhat higher cost of capital, likely reflecting higher perceived financial and business risk. However, the difference in WACC across portfolios is modest relative to the difference in ROIC, confirming that the SPREAD variation is driven predominantly by the ROIC component.

4.4 Portfolio Performance Analysis

4.4.1 Average Annual Returns

37 Table 4.4 presents the Average annual stock return, Standard Deviation, and Sharpe ratio for each portfolio, Averaged across the seven portfolio years. These figures provide a descriptive overview of how the three performance dimensions vary across the SPREAD-sorted portfolios.

Table 4.4: Portfolio Performance Summary (FY2019–FY2025, Average across 7 Years)

11 Portfolio	Average Annual Return	Average Standard deviation	Average Sharpe Ratio	3-yr Average Spread
1 (Highest)	16.31	29.66	0.19	75.75
2	22.98	30.72	0.38	20.03
3	20.22	26.52	0.41	10.31
4	26.39	36.39	0.31	3.24
5 (Lowest)	24.82	32.79	0.17	-3.23

Source: Own analysis. Performance metrics are equal-weighted Averages computed across all 12 firms within each portfolio for each year, then Averaged over seven years.

The most striking observation from Table 4.4 is that Portfolio 1, with by far the highest SPREAD (75.75 percent), earned the lowest Average annual return of 16.31 percent among the five portfolios. Portfolio 4, with a near-zero Average SPREAD of 3.24 percent, earned the highest Average return of 26.39 percent. Portfolio 5, with a negative Average SPREAD of -3.23 percent, earned the second-highest Average return of 24.82 percent. There is no monotonic positive relationship between the SPREAD and Average annual return; if anything, the pattern is weakly negative, with higher-SPREAD portfolios earning lower raw returns on Average.

This result, while counterintuitive from a value-creation perspective, is precisely what the Efficient Market Hypothesis would predict. If capital markets are efficient, the superior capital efficiency of Portfolio 1 firms is already fully incorporated into their current market prices. High-SPREAD firms trade at premium valuations i.e. high price-to-earnings multiples and high enterprise value to invested capital ratios which ultimately leaving less room for future price appreciation. Low-SPREAD firms, by contrast, are priced at lower multiples, and any mean reversion in their capital efficiency, or any macroeconomic tailwind that disproportionately benefits capital-intensive sectors, can generate substantial price appreciation from a depressed base.

The year-by-year analysis in Table 4.5 illuminates this dynamic further. In FY2019 and FY2020, Portfolio 1 outperformed Portfolio 5 by 15.41 percentage points and 19.84 percentage points respectively. These were years characterized by a global growth slowdown and initial signs of the COVID-19 pandemic, during which defensive, high-quality firms with strong balance sheets and predictable earnings outperformed cyclical, capital-intensive firms. However, in FY2021, Portfolio 5 dramatically outperformed Portfolio 1 by 67.68 percentage points (121.50 percent return for Portfolio 5 versus 53.82 percent for Portfolio 1), as the post-COVID economic recovery disproportionately benefited beaten-down cyclical stocks in metals, energy, and infrastructure. This pattern of reversal recurred in FY2022, when Portfolio 5 again outperformed Portfolio 1 by 26.64 percentage points, driven by a commodity cycle and the reopening of capital-intensive sectors.

Table 4.5: Annual Returns by Portfolio (%), FY2019–FY2025

Year	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	P1 minus P5
FY2019	11.32	18.06	7.78	13.23	-4.09	+15.41
FY2020	1.54	-14.12	-16.66	-16.93	-18.30	+19.84
FY2021	53.82	78.38	73.31	98.59	121.50	-67.68
FY2022	8.84	18.26	34.06	31.49	35.48	-26.64
FY2023	3.71	2.56	3.48	-0.52	-5.74	+9.45
FY2024	36.20	54.98	39.87	50.32	48.55	-12.35
FY2025	-1.25	2.72	-0.30	8.58	-3.63	+2.38
Average	**16.31**	**22.98**	**20.22**	**26.39**	**24.82**	**-8.51**

Source: Own analysis. Returns are equal-weighted Averages of annual stock returns of the 12 firms in each portfolio.

4.4.2 Standard Deviation of Returns

Table 4.6 presents the Standard Deviation of returns for each portfolio for each year of the study. The Standard Deviation is computed as the cross-sectional Standard Deviation of the twelve individual firm returns within each portfolio.

Table 4.6: Standard Deviation of Annual Returns by Portfolio (%), FY2019–FY2025

Year	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	P1 minus P5
FY2019	25.40	17.00	19.84	20.29	23.54	+1.86
FY2020	45.75	22.66	29.49	31.08	39.41	+6.34
FY2021	39.67	69.18	30.78	63.80	81.46	-41.79
FY2022	19.02	24.31	47.06	45.40	24.12	-5.10
FY2023	17.30	35.67	27.42	19.59	13.75	+3.55
FY2024	44.44	26.96	20.15	44.89	31.67	+12.77

FY2025	16.02	19.26	10.94	29.66	15.60	+0.42
Average	**29.66**	**30.72**	**26.52**	**36.39**	**32.79**	**-3.13**

Source: Own analysis. Standard Deviation computed as cross-sectional Standard Deviation of the 12 firm returns within each portfolio.

42 The Standard Deviation results are less consistent than the return results, and do not exhibit a clear monotonic pattern across the portfolios in most individual years. However, Portfolio 5 exhibits the highest Average cross-sectional Standard Deviation of 32.79 percent per year, while Portfolio 3 (moderate SPREAD) exhibits the lowest Average of 26.52 percent. The FY2021 year is particularly striking: Portfolio 5 recorded a Standard Deviation of 81.46 percent, reflecting the extreme heterogeneity of returns among low-SPREAD, cyclical firms as the post-COVID recovery generated enormous but highly uneven returns across sectors such as metals, infrastructure, and energy. Portfolio 1, by contrast, recorded a more contained Standard Deviation of 39.67 percent in the same year, as high-SPREAD firms generated broadly positive but less dispersed returns.

24 4.4.3 Sharpe Ratio

60 Table 4.7 presents the Sharpe ratio for each portfolio by year. The Sharpe ratio is computed as the Average annual return minus the risk-free rate (the 10-year G-Sec
97 yield for the respective year), divided by the Standard Deviation of returns for that portfolio in that year.

Table 4.7: Sharpe Ratio by Portfolio, FY2019–FY2025

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Year	Portfolio 1	Portfolio 2	Portfolio 3	Portfolio 4	Portfolio 5	P1 minus P5
FY2019	0.156	0.630	0.022	0.290	-0.486	+0.642
FY2020	-0.101	-0.894	-0.773	-0.742	-0.620	+0.519
FY2021	1.201	1.044	2.182	1.449	1.416	-0.215
FY2022	0.105	0.470	0.578	0.543	1.188	-1.083
FY2023	-0.208	-0.133	-0.140	-0.400	-0.949	+0.741

FY2024	0.656	1.778	1.629	0.964	1.310	-0.654
FY2025	-0.506	-0.214	-0.654	0.058	-0.672	+0.166
Average	**0.186**	**0.383**	**0.406**	**0.309**	**0.170**	**+0.016**

Source: Own analysis. Sharpe Ratio = (Portfolio Return − Rf) / Std Dev of Portfolio Returns. Rf = year-specific 10-year G-Sec yield.

The Sharpe ratio results do not reveal a monotonically positive relationship between the SPREAD and risk-adjusted performance. Portfolio 3 (moderate SPREAD) earned the highest Average Sharpe ratio of 0.406, followed by Portfolio 2 (0.383) and Portfolio 4 (0.309). Portfolio 1 (0.186) and Portfolio 5 (0.170) earned the two lowest Average Sharpe ratios. This non-monotonic, inverted-U shaped pattern in the Sharpe ratio suggests that neither the highest nor the lowest SPREAD firms are the best performers on a risk-adjusted basis. Mid-range SPREAD firms appear to strike the most favourable balance between return and risk.

4.5 Regression Results

Table 4.8 presents the results of the three OLS regression models estimated at the portfolio-year level. Each model regresses one of the three dependent variables - Average annual return, Standard Deviation of returns, and Sharpe ratio on the portfolio's Average three-year SPREAD. All regressions use 35 portfolio-year observations.

Table 4.8: OLS Regression Results — Portfolio-Year Level (N = 35)

	Model 1: Return vs Spread	Model 2: Standard deviation vs Spread	Model 3: Sharpe ratio vs Spread
α (Intercept)	24.4239	32.0458	0.3105
β (SPREAD coeff)	-0.1074	-0.0391	-0.0009
Std Error of β	0.2017	0.0974	0.0052
t-statistic	-0.5321	-0.4014	-0.1801
p-value	0.5982	0.6907	0.8582

R-squared	0.0085	0.0049	0.0010
Adj. R-squared	-0.0215	-0.0253	-0.0293
Significant (5%)	No	No	No

*Source: Own analysis. OLS regression. Dependent variables computed at portfolio-year level. SPREAD is the equal-weighted Average three-year rolling SPREAD of the portfolio. *** p<0.01; ** p<0.05; * p<0.10.*

The regression results indicate that the SPREAD does not significantly predict any of the three dependent variables at the portfolio level. In Model 1, the coefficient on SPREAD is -0.1074 with a p-value of 0.598, well above the five percent threshold for statistical significance. The R-squared of 0.0085 indicates that the SPREAD explains less than one percent of the variation in Average annual portfolio returns. The null hypothesis H(NULL) - that there is no significant correlation between SPREAD and annual stock returns. Therefore it cannot be rejected.

In Model 2, the coefficient on SPREAD is -0.0391 with a p-value of 0.691, again far from statistical significance. The R-squared of 0.0049 is negligible. The null hypothesis H(NULL) - that there is no significant correlation between SPREAD and the Standard Deviation of returns. It also cannot be rejected at the portfolio level. However, it is noteworthy that the coefficient is negative, consistent with the direction predicted by H(ALTERNATE): higher-SPREAD portfolios exhibit, on Average, slightly lower return volatility. The lack of significance is attributable in part to the small number of observations (35) and the high variability of within-portfolio return dispersion across years, particularly in the exceptional conditions of FY2021.

In Model 3, the coefficient on SPREAD is -0.0009 with a p-value of 0.858, the least significant of the three models. The Sharpe ratio shows essentially no linear relationship with the SPREAD at the portfolio level. The null hypothesis H(NULL) cannot be rejected.

4.6 Additional Analyses

4.6.1 Firm-Level Regression

To complement the portfolio-level regressions and to increase statistical power, a firm-level OLS regression was also estimated, using all 540 individual firm-year observations. The dependent variable is the annual stock return of the individual firm, and the independent variable is the firm's three-year rolling Average SPREAD.

The firm-level regression yields a coefficient of -0.0698 (t-statistic = -1.326, p-value = 0.185, R^2 = 0.003). While the direction of the coefficient is consistent with the portfolio-level result - higher SPREAD is associated with slightly lower returns - the relationship remains statistically insignificant even at the ten percent level. This finding reinforces the conclusion from the portfolio-level regressions that the SPREAD does not exhibit a significant linear relationship with stock returns in the Indian market over the study period.

4.6.2 Absolute Return Volatility and SPREAD

A supplementary firm-level regression was conducted using the absolute value of annual stock return as the dependent variable, as a proxy for firm-level return volatility. This specification tests whether higher-SPREAD firms exhibit lower absolute return magnitudes, regardless of the direction of the return. The result is a coefficient of -0.0954 (t-statistic = -2.186, p-value = 0.029, R^2 = 0.009). This finding is statistically significant at the five percent level and indicates that firms with a higher three-year Average SPREAD tend to experience smaller absolute annual return movements - that is, their returns are more contained and less extreme in both directions.

This finding provides the most statistically robust result of the study. It is consistent with the interpretation that high-SPREAD firms, by virtue of their stable competitive positions and predictable earnings, exhibit lower return volatility at the individual firm level. This result echoes the finding of Steen and Turesson (2021) in the Swedish market, who found a significant negative correlation between the SPREAD and the Standard Deviation of monthly returns.

4.6.3 Disaggregated Regression: ROIC and WACC

Following the approach of Steen and Turesson (2021), a disaggregated regression was estimated in which the SPREAD is separated into its two components - ROIC and

12 WACC - which are entered as independent variables simultaneously in a multiple regression at the portfolio-year level.

The disaggregated regression yields a ROIC coefficient of -0.138, a WACC coefficient of -2.552, and an intercept of 56.56, with an R^2 of 0.015. Both coefficients are negative. The negative WACC coefficient is theoretically expected: a higher cost of capital, holding ROIC constant, reduces the SPREAD and would be associated with lower returns. The negative ROIC coefficient is counterintuitive and mirrors the finding of Steen and Turesson (2021), who also found a negative ROIC coefficient in their disaggregated regression. As those authors noted, this result may reflect the fact that firms with extremely high ROIC - particularly asset-light IT and FMCG firms - are already priced at very high valuation multiples, leaving limited upside for stock price appreciation. The negative coefficient on ROIC at the portfolio level is therefore a valuation effect rather than a contradiction of the value-creation premise.

80 4.7 Discussion of Findings

The results of this study are discussed below in relation to each of three hypotheses and existing literature.

4.7.1 Hypothesis 1 - Annual Return and SPREAD

The evidence does not support the alternative hypothesis H(ALTERNATE) that higher SPREAD portfolios generate significantly higher annual stock returns. The regression coefficient is negative and statistically insignificant ($p = 0.598$). High-SPREAD firms command premium valuations that limit future return potential, while low-SPREAD firms, particularly cyclical companies in metals, energy, and infrastructure, are susceptible to large rerating events driven by commodity cycles, policy shifts, and macroeconomic recoveries.

This result closely mirrors the finding of Steen and Turesson (2021) in the Swedish market, who similarly found no positive correlation between the SPREAD & monthly stock returns. It is also consistent with the empirical evidence from South Asian
96 markets on EVA and stock returns, including the studies by Aravind and Ramya (2015) and Khan et al. (2012), which found no positive association between excess capital returns and stock prices. The year-by-year analysis adds important nuance: the SPREAD-return relationship is context-dependent, with high-SPREAD firms

outperforming during defensive market environments (FY2019 and FY2020) and significantly underperforming during cyclical recovery periods (FY2021 and FY2022).

4.7.2 Hypothesis 2 - Standard Deviation and SPREAD

The portfolio-level regression for Standard Deviation does not yield a statistically significant result (p = 0.691). However, the direction of the coefficient is negative, consistent with the alternative hypothesis H(ALTERNATE). Furthermore, the supplementary firm-level regression on absolute return volatility yields a statistically significant negative result (p = 0.029), providing partial support for the notion that higher-SPREAD firms exhibit lower return volatility.

The descriptive evidence is also suggestive: Portfolio 5 (lowest SPREAD) exhibits the highest Average Standard Deviation of 32.79 percent, compared to Portfolio 3's 26.52 percent. Portfolio 1's Average Standard Deviation of 29.66 percent is somewhat elevated compared to Portfolios 2 and 3, which may reflect the presence of a few highly volatile individual firms within the high-SPREAD portfolio (as seen in FY2021, when returns within Portfolio 1 ranged from negative to strongly positive). Overall, the evidence points to a directional association between higher SPREAD and lower return volatility, though this relationship is not statistically significant at the portfolio level within the constraints of the study's sample size.

This finding aligns with the results of Steen and Turesson (2021), and with Fama and French (2015), who documented that portfolios of highly profitable firms exhibited lower Standard Deviations of returns (a difference of 2.13 to 2.88 percentage points between the most and least profitable portfolios). The present study finds a difference of approximately 6.27 percentage points between Portfolio 5 and Portfolio 3, a result that is economically meaningful even if it falls short of statistical significance.

4.7.3 Hypothesis 3 - Sharpe Ratio and SPREAD

The evidence does not support hypothesis H(ALTERNATE) that higher SPREAD portfolios deliver better risk-adjusted returns. The regression coefficient is effectively zero (-0.0009) and statistically insignificant (p = 0.858). The descriptive analysis reveals an inverted-U pattern in the Sharpe ratio, with Portfolios 2 and 3 achieving the highest risk-adjusted returns (0.383 and 0.406 respectively), while Portfolios 1 and 5 are at the lower end (0.186 and 0.170 respectively). This non-linear pattern suggests that extreme SPREAD positions - both very high and very low - are associated with suboptimal risk-adjusted performance, while moderate-SPREAD firms offer the best balance of return and risk.

This result differs from the original paper's finding by Steen and Turesson (2021), who also found no significant positive Sharpe-SPREAD correlation but observed a linear (rather than inverted-U) pattern. The inverted-U pattern observed in the Indian data suggests an additional layer of complexity: very high-SPREAD firms are, as argued above, already priced at a premium that limits return potential, while very low-SPREAD firms experience high return volatility that diminishes their Sharpe ratio despite occasionally delivering high raw returns.

4.8 Implications of the Findings

65 The findings of this study carry several practical and theoretical implications.

For equity investors, the study suggests that using the ROIC-WACC SPREAD as a stock-picking tool in the Indian market does not generate systematically superior returns. High-SPREAD firms, while undeniably superior businesses from a capital efficiency standpoint, are typically priced at valuations that already reflect this quality. Investors who construct portfolios exclusively on the basis of high SPREAD risk paying too much for quality and missing the mean-reversion upside of cyclical, lower-SPREAD firms. However, for investors who are risk-averse or prioritize capital preservation, the study provides evidence that high-SPREAD firms exhibit lower absolute return volatility, making them relatively defensive holdings during market downturns and periods of uncertainty. The FY2020 data is instructive in this regard: Portfolio 1 returned a positive 1.54 percent during the COVID-induced crash year, while Portfolio 5 returned negative 18.30 percent.

For corporate managers, the findings reinforce the value of the ROIC-WACC framework as an internal management tool. The study confirms that high-SPREAD firms generate more predictable and stable operating returns, which is reflected in their lower return volatility. Managers who target a sustained positive SPREAD are, in effect, building businesses with more durable competitive advantages, which benefits shareholders through lower downside risk even if it does not generate excess stock returns in the short run.

124 For academic researchers, the study contributes to the growing body of evidence that
1 the ROIC-WACC SPREAD is a meaningful measure of economic quality but not a reliable predictor of future stock returns in efficient markets. The Indian evidence is broadly consistent with findings from the Swedish and Nordic markets, suggesting that this relationship may be robust across different market environments. The significant finding on absolute return volatility points to a promising direction for future research on the role of capital efficiency in risk management.

4.9 Limitations of the Analysis

Several limitations of the analysis deserve acknowledgement. First, the use of annual returns rather than monthly returns reduces the number of observations per portfolio from eighty-four monthly data points to seven annual data points, substantially limiting the statistical power of the portfolio-level regressions. With 35 observations, the regression analysis is underpowered relative to studies such as Steen and Turesson (2021), which used 75 monthly portfolio observations. This may partly explain the lack of statistical significance in the Standard Deviation and Sharpe ratio regressions despite the directionally consistent results.

Second, the extraordinary market conditions of FY2021 - in which low-SPREAD, cyclical firms generated some of the highest returns in recent Indian market history due to the commodity cycle and economic recovery - exert a disproportionate influence on the seven-year Average results. Excluding this year would materially change the return comparison across portfolios, suggesting that the Average results are significantly influenced by a single exceptional year.

Third, the study does not control for sector effects, which are substantial in this dataset. The near-complete separation of sectors between Portfolio 1 (dominated by IT, FMCG, and pharma) and Portfolio 5 (dominated by metals, energy, cement, and infrastructure) means that the portfolio return differences may in large part reflect sector-level return differentials rather than purely the SPREAD itself. Future research could address this by constructing sector-neutral SPREAD portfolios.

67 # CHAPTER 5: CONCLUSION

5.1 Summary of the Study

3 This study examined whether the ROIC-WACC SPREAD - the difference between a
18 firm's Return on Invested Capital and its Weighted Average Cost of Capital has a statistically significant association with annual stock returns, return volatility, and the
98 Sharpe ratio of portfolios of NSE-listed non-financial firms in India. The study was motivated by the theoretical proposition of Koller, Goedhart, and Wessels (2020) that

10 value creation in a firm is determined by its ability to generate returns above the cost of capital, and by the empirical work of Steen and Turesson (2021), who applied this framework to the Swedish equity market and found results consistent with market efficiency.

A sample of sixty companies from the NSE 500, spanning thirteen sectors, was examined over the period FY2017 to FY2025. Firms were sorted annually into five equal portfolios based on their three-year rolling Average SPREAD, and three performance metrics i.e. Average annual return, Standard Deviation of returns, and Sharpe ratio - were computed for each portfolio over a seven-year period from FY2019 to FY2025. OLS regression models were estimated at the portfolio-year level to test the significance of the SPREAD-performance relationship. Supplementary firm-level regressions and additional analyses were also conducted.

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5.2 Summary of Findings

Findings of this study are as follows.

First, ROIC-WACC SPREAD does not significantly predict annual stock returns at the portfolio level. The regression coefficient is negative and statistically insignificant ($\beta = -0.107$, $p = 0.598$, $R^2 = 0.009$), the null hypothesis H(NULL) can't be rejected. High-SPREAD firms in Portfolio 1 earned an Average return of 16.31 percent over study period, compared to 24.82 percent for Portfolio 5 firms. This counterintuitive result is consistent with the Efficient Market Hypothesis: firms with high capital efficiency are already priced at premium valuations, and the SPREAD contains no information about future returns beyond what is already reflected in prices.

33 Second, the SPREAD does not significantly predict the Standard Deviation of portfolio returns at the portfolio level ($\beta = -0.039$, $p = 0.691$, $R^2 = 0.005$), and the null hypothesis H(NULL) cannot be rejected. However, directional evidence is consistent with alternative hypothesis: Portfolio 5 (lowest SPREAD) exhibits the highest Average Standard Deviation of 32.79 percent, while Portfolio 3 (moderate SPREAD) exhibits the lowest at 26.52 percent. At the firm level, a statistically significant negative relationship is found between the SPREAD and absolute return volatility ($\beta = -0.095$, $p = 0.029$), providing partial support for the view that higher-SPREAD firms are less volatile investments.

13 Third, the SPREAD does not significantly predict the Sharpe ratio (β = -0.001, p = 0.858, R^2 = 0.001), and the null hypothesis H(NULL) cannot be rejected. The Sharpe ratio exhibits an inverted-U pattern across the five portfolios, with Portfolio 3 (moderate SPREAD, 0.406) and Portfolio 2 (0.383) achieving the best risk-adjusted returns, and Portfolios 1 and 5 achieving the lowest risk-adjusted returns (0.186 and 0.170 respectively). This pattern suggests that neither extreme high-SPREAD nor extreme low-SPREAD portfolios offer the best risk-adjusted performance.

Fourth, the YOY analysis reveals that the SPREAD-return relationship is context-dependent and cyclical. During market downturns and defensive environments, such as FY2019 (India growth slowdown) and FY2020 (COVID-19 onset), Portfolio 1 outperformed Portfolio 5 by 15.41 and 19.84 percentage points respectively. During cyclical recoveries, such as FY2021 (post-COVID rebound) and FY2022 (commodity cycle), Portfolio 5 dramatically outperformed Portfolio 1 by 67.68 and 26.64 percentage points respectively. This cyclical reversal pattern is a significant finding in its own right, suggesting that the investment value of high-SPREAD firms is most evident during periods of market stress rather than economic expansion.

77 5.3 Contributions of the Study

This study makes several contributions to the existing body of knowledge. First, it provides the first systematic application of the ROIC-WACC portfolio-sorting methodology to the Indian equity market. Prior studies examining this relationship have been conducted in developed market contexts, specifically Sweden and the Nordic region. The Indian evidence extends the international literature and demonstrates that the EMH-consistent findings of prior studies are also applicable to a large, rapidly growing emerging market with distinct structural characteristics.

13 Second, the study covers the period FY2017 to FY2025, which includes the COVID-19 pandemic and its aftermath - a period of exceptional market dislocation not covered in prior studies on this topic. The finding that high-SPREAD firms demonstrated relative resilience during the pandemic year while significantly underperforming during the subsequent cyclical recovery adds a new temporal dimension to the understanding of the SPREAD-return relationship.

Third, the study's finding that the SPREAD is significantly negatively associated with absolute return volatility at the firm level (p = 0.029) represents an empirical contribution to the literature on capital efficiency and investment risk. While prior studies, including Steen and Turesson (2021), have found similar directional results for Standard Deviation at the portfolio level, the firm-level evidence from the Indian market strengthens the case that the SPREAD functions as a meaningful risk indicator, even when it does not predict excess returns.

Fourth, the sector composition analysis reveals a near-complete polarization of sectors across portfolios, with IT, FMCG, and pharmaceuticals consistently populating the high-SPREAD portfolios and metals, energy, cement, and infrastructure populating the low-SPREAD portfolios. This finding reinforces the structural basis of the SPREAD-return dynamics and highlights the importance of sector-level factors in interpreting portfolio sorting results in the Indian context.

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5.4 Implications for Theory and Practice

5.4.1 Implications for Investors

For equity investors, this study's findings suggest that using the ROIC-WACC
1 SPREAD as a standalone stock-selection criterion does not generate excess returns in the Indian market. The superior fundamentals of high-SPREAD firms are well known to market participants and are reflected in elevated valuation multiples, effectively neutralizing any return advantage that fundamental quality would otherwise confer. Investors who pay a premium for quality risk underperforming during cyclical recovery phases, when beaten-down, low-SPREAD firms experience dramatic price re-ratings.

However, investors with a focus on capital preservation and downside protection may find value in SPREAD-based portfolio construction. The evidence that high-SPREAD firms exhibit lower absolute return volatility and outperform during market downturns suggests that a portfolio tilted toward high-SPREAD firms can serve as a defensive strategy. The FY2020 data, in which Portfolio 1 delivered a positive return of 1.54 percent while Portfolio 5 fell 18.30 percent, illustrates the defensive quality of high-SPREAD firms in an adverse condition.

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5.4.2 Implications for Corporate Managers

For corporate managers and boards, this study reinforces the value of the ROIC-WACC framework as an internal performance measurement and capital allocation tool. While maintaining a high SPREAD does not directly translate into higher stock returns - since the market already prices in superior capital efficiency - it does appear to confer lower return volatility, suggesting that high-SPREAD businesses are more stable and resilient. Managers who prioritize returns above the cost of capital are building businesses that are less susceptible to extreme return swings, which benefits all stakeholders including long-term shareholders, employees, and creditors.

The finding that Portfolio 5 firms - those consistently failing to cover their cost of capital - exhibit the highest return volatility (Average Standard Deviation of 32.79 percent) underscores the risk embedded in persistent value destruction. Capital-intensive firms in sectors such as metals, energy, and infrastructure that operate with negative SPREAD over extended periods face not only economic value destruction but also elevated market risk, as their stock prices are more sensitive to commodity cycles, macroeconomic conditions, and financing costs.

5.4.3 Implications for Theory

23 For academic researchers, the study provides additional evidence in support of the
57 semi-strong form of the Efficient Market Hypothesis in the context of an emerging
market. The finding that a publicly available, fundamental-based metric such as the
1 SPREAD has no systematic predictive power for stock returns in the Indian market
over a nine-year period suggests that Indian large-cap equity markets are at least partially efficient in incorporating fundamental valuation information into prices. This is a meaningful finding for the literature on emerging market efficiency, which has historically found more evidence of anomalies and mispricings in developing markets than in developed ones.

At the same time, the cyclical reversal pattern documented in the year-by-year analysis - with high-SPREAD firms outperforming in downturns and underperforming in recoveries - suggests that the relationship between fundamentals and returns is not static. This temporal variation deserves further investigation in future research, particularly in the context of factor-timing models and macroeconomic regime-switching frameworks.

59 **5.5 Limitations of the Study**

The present study is subject to several limitations. First, the sample of sixty firms from
34 the NSE 500 represents a narrow segment of the Indian equity market, and the findings may not be generalizable to smaller companies, recently listed firms, or firms in sectors not represented in the sample. The NSE 500 universe is characterized by large, well-established firms with strong financial reporting, which may make it a particularly efficient sub-market.

23 Second, the use of annual rather than monthly returns limits the statistical power of the portfolio-level regressions. With only 35 portfolio-year observations, the regressions may lack sufficient power to detect modest but economically meaningful associations between the SPREAD and portfolio performance. Future studies with access to monthly return data for a larger set of Indian firms could address this limitation.

Third, the WACC calculation involves assumptions regarding the equity risk premium (fixed at 7.0 percent) and beta estimation that may not accurately reflect the true cost of capital for individual firms in specific years. The sensitivity of results to alternative WACC specifications is not tested in the present study and represents a limitation.

Fourth, the study does not control for sector effects. The strong sector-level polarization of the five portfolios means that the observed return and volatility differences across portfolios may partly reflect sector-level factors rather than purely the SPREAD. A sector-neutral portfolio construction methodology would help isolate the pure SPREAD effect.

Fifth, the study period includes an exceptional year i.e. FY2021 - in which the COVID-19 pandemic and subsequent economic recovery generated extreme and unusual return patterns. This single year exerts a disproportionate influence on the seven-year Averages and may distort the overall conclusions. Future research covering a longer time period would mitigate this concern.

49 **5.6 Directions for Future Research**

The findings of this study open several avenues for future research. First, the study could be extended to a larger sample of Indian firms, including mid-cap and small-cap companies, to test whether the EMH-consistent findings observed for large-cap firms also hold for less efficiently priced segments of the Indian market. The SPREAD-return relationship may be stronger in smaller and less-followed firms where information asymmetry is greater.

Second, future research could construct sector-neutral SPREAD portfolios by sorting firms within each sector rather than across the full sample. This would isolate the SPREAD's effect from sector-level return factors and provide a cleaner test of the relationship between capital efficiency and stock performance.

Third, the temporal variation in the SPREAD-return relationship documented in this study - with high-SPREAD firms outperforming in defensive markets and underperforming in cyclical recoveries - could be examined more rigorously using regime-switching models or macroeconomic conditioning variables. Understanding when the SPREAD-based investment strategy is most effective could have significant practical value for institutional investors.

Fourth, as suggested by Leitner and Olofsson (2025), incorporating the growth dimension of value creation alongside the SPREAD could enhance the predictive power of the model. Firms that combine a high SPREAD with high reinvestment rates may exhibit a distinctively superior return profile that is not captured by the SPREAD alone. A three-dimensional framework incorporating ROIC, WACC, and growth rate could be tested in the Indian context.

Fifth, the behavioural dimensions of the SPREAD-return relationship deserve investigation. If high-SPREAD firms are consistently trading at premium valuations, the question of whether investors systematically over-extrapolate the persistence of superior capital efficiency - and are subsequently disappointed when ROIC reverts toward the mean - could be examined using sentiment data, analyst forecast revisions, and earnings surprise data.

5.7 Concluding Remarks

This study set out to test whether the ROIC-WACC SPREAD is associated with differences in stock returns, return volatility, and risk-adjusted performance among NSE-listed non-financial firms in India. The evidence, drawn from sixty firms across thirteen sectors over nine financial years, indicates that the SPREAD does not significantly predict stock returns or the Sharpe ratio, consistent with the efficient pricing of fundamental quality in the Indian large-cap market. However, the SPREAD appears to be a meaningful indicator of return stability, with higher-SPREAD firms exhibiting lower absolute return volatility at the firm level.

The study's findings carry an important message for the financial community: the ROIC-WACC framework is a powerful tool for assessing the economic quality of a business and for guiding capital allocation decisions internally, but it should not be expected to generate excess stock market returns when deployed as a mechanical investment screen in an efficient market. The quality of a business and the quality of an investment at a given price are not the same thing - a lesson that the SPREAD-return results of this study illustrate with clarity.

As the Indian equity market continues to deepen and mature, and as retail investor
30 participation expands, understanding the relationship between fundamental value creation and stock market performance becomes increasingly important. This study contributes to that understanding and provides a foundation for future empirical work on capital efficiency, risk, and investor returns in one of the world's most dynamic emerging markets.