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COMPARATIVE PERFORMANCE ANALYSIS OF NIFTY 50 EXCHANGE TRADED FUNDS (ETFS) AND THE BENCHMARK INDEX: A STUDY OF VOLATILITY AND RECOVERY (2020-2025)

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ABSTRACT

This study examines the performance of **Nifty 50 Exchange Traded Funds (ETFs)** in comparison with the **Nifty 50 benchmark index** during the period 2020–2025. The Nifty 50, representing 50 large-cap companies listed on the **National Stock Exchange of India**, serves as a key indicator of India's equity market performance. With the growing popularity of passive investing, ETFs tracking this index have become increasingly important for both retail and institutional investors.

The study adopts a quantitative research design using secondary data, including daily closing prices of selected ETFs—Nippon India ETF Nifty BeES, SBI ETF Nifty 50, and ICICI Prudential Nifty ETF—and the benchmark index. Key performance metrics such as Compound Annual Growth Rate (CAGR), tracking error, expense ratio, and liquidity indicators were analyzed to evaluate the efficiency of ETFs in replicating the benchmark.

The findings reveal that Nifty 50 ETFs closely tracked the benchmark, delivering returns in the range of 11.9% to 12.5% compared to the benchmark return of approximately 12.8%. However, minor underperformance was observed across all ETFs, primarily due to tracking error, expense ratios, and liquidity constraints. Among the selected ETFs, Nippon India ETF Nifty BeES demonstrated the highest efficiency, with the lowest tracking error (0.12%), minimal expense ratio (0.05%), and superior liquidity.

The study concludes that while ETFs are not perfect substitutes for the benchmark index, they provide a reliable and cost-effective means of achieving diversified market exposure. The results also highlight the importance of liquidity and cost considerations in ETF selection. These findings are particularly relevant for investors seeking passive investment strategies in India, as well as for policymakers

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aiming to enhance market efficiency and investor participation.

Overall, the research contributes to the understanding of ETF performance in emerging markets, especially during periods of significant market volatility such as the COVID-19 pandemic and subsequent recovery phase.

KEYWORDS: Nifty 50; Exchange Traded Funds (ETFs); Benchmark Index; Tracking Error; Expense Ratio; Liquidity; Market Volatility; Passive Investing; India

Chapter 1: Introduction

1.1 Background

The Nifty 50 index, launched by the National Stock Exchange of India (NSE), is widely regarded as the benchmark for the Indian equity market. It represents the performance of 50 large-cap companies across diverse sectors, serving as a barometer of India's economic and financial health. With the rise of passive investing globally, Exchange Traded Funds (ETFs) tracking the Nifty 50 have gained significant traction in India. These instruments allow investors to replicate index performance at relatively low cost, while offering the flexibility of trading like individual stocks.

Between 2020 and 2025, the Indian equity market experienced unprecedented volatility and transformation. The COVID-19 pandemic triggered sharp declines in early 2020, followed by a rapid recovery fueled by liquidity inflows, digital adoption, and resilience in banking and IT sectors. Subsequent years saw inflationary pressures, global geopolitical tensions, and policy reforms shaping market dynamics. Against this backdrop, Nifty 50 ETFs became a preferred vehicle for retail investors seeking diversified exposure to the benchmark index.

1.2 PROBLEM STATEMENT

Although ETFs are designed to mirror the benchmark index, they are not perfect substitutes. Tracking errors, expense ratios, liquidity constraints, and dividend distribution mechanisms can cause deviations in performance. For investors, understanding the extent of these deviations is crucial in evaluating whether ETFs truly deliver benchmark-like returns. This thesis investigates whether Nifty 50 ETFs provided comparable performance to the underlying index during 2020–2025, a period marked by both extreme volatility and strong recovery.

1.3 Objectives of the Study

The study aims to:

1. Compare the performance of Nifty 50 ETFs with the Nifty 50 benchmark between 2020 and 2025.
2. Analyze the impact of tracking error, expense ratios, and liquidity on ETF performance.

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3. Identify which ETF most closely replicated the benchmark during the study period.
4. Assess the implications for retail and institutional investors in India.

1.4 Research Questions

- To what extent did Nifty 50 ETFs replicate the benchmark index during 2020–2025?
- What factors contributed to deviations in ETF performance?
- Which ETF demonstrated the lowest tracking error and highest efficiency?
- How do these findings inform investor decision-making in the Indian context?

1.5 Significance of the Study

This research contributes to the growing body of literature on passive investing in India. By analyzing ETF performance during a period of heightened market uncertainty, the study provides insights into the reliability of ETFs as benchmark substitutes. The findings will benefit retail investors seeking cost-effective exposure, fund managers evaluating ETF efficiency, and policymakers aiming to strengthen India's capital markets.

Chapter 2: LITERATURE REVIEW

2.1 Global Context of ETF Performance

- **U.S. and European Markets:** Numerous studies show ETFs replicate benchmark indices effectively, but small deviations arise from management costs, tracking errors, and dividend timing.
- **Efficient Market Hypothesis (EMH):** ETFs are often cited as practical tools for passive investing, aligning with EMH principles that markets are difficult to outperform consistently.
- **Liquidity Factor:** Global evidence suggests that ETFs with higher trading volumes exhibit lower bid-ask spreads and closer benchmark tracking.

2.2 Indian Studies on Nifty 50 ETFs

- **Kurian et al. (2023):** A comparative performance analysis of Nifty 50 ETFs and index mutual funds (2016–2023) found ETFs delivered benchmark-like returns but lagged slightly due to expense ratios and tracking error. Data from SEBI, AMFI, NSE, and RBI confirmed ETFs as cost-efficient but not flawless substitutes.
- **Juneja & Singh (2023):** Evaluated selected Nifty 50 ETFs using performance indicators such as Sharpe ratio and tracking error. Results showed ETFs were effective in providing diversified exposure but liquidity differences impacted investor outcomes.
- **Kittur & Shivappa (2021):** Studied ETFs alongside mutual funds, noting that ETFs offered intraday tradability and transparency but faced challenges in replicating benchmark returns precisely due to market frictions.

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Key Themes Emerging from Literature

- **Tracking Error:** Consistently identified as the main source of deviation between ETF and benchmark performance.
- **Expense Ratios:** Though low (0.05–0.2%), they contribute to marginal underperformance.
- **Liquidity:** Larger ETFs like Nippon India ETF Nifty BeES show tighter spreads and better replication compared to smaller ETFs.
- **Investor Implications:** ETFs remain the most accessible way for retail investors to gain benchmark exposure, despite minor inefficiencies.
- **Comparative Advantage:** ETFs outperform index mutual funds in terms of tradability and transparency, though both lag slightly behind the benchmark.

2.4 Research Gap

While existing studies provide valuable insights, most focus on **shorter timeframes (2016–2023)** or compare ETFs with mutual funds. Few have comprehensively analyzed ETF performance during **2020–2025**, a period marked by extreme volatility (COVID-19 crash, inflation shocks) and strong recovery. This thesis addresses that gap by offering a focused comparative analysis of Nifty 50 ETFs against the benchmark during this transformative period.

Chapter 3: METHODOLOGY

3.1 Research Design

This study adopts a **quantitative comparative research design** to evaluate the performance of Nifty 50 ETFs against the Nifty 50 benchmark index during the period 2020–2025. The approach involves statistical analysis of historical price data, return calculations, and performance metrics to identify deviations between ETFs and the benchmark.

3.2 Data Sources

- **Benchmark Data:** Daily closing prices of the Nifty 50 index, obtained from the National Stock Exchange of India (NSE).
- **ETF Data:** Daily closing prices of major Nifty 50 ETFs, including:
  - Nippon India ETF Nifty BeES
  - SBI ETF Nifty 50
  - ICICI Prudential Nifty ETF
- **Supplementary Data:** Expense ratios, assets under management (AUM), and liquidity statistics collected from ETF fact sheets, SEBI filings, and NSE reports.

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3.3 Period of Study

The analysis covers **January 2020 to December 2025**, a period chosen for its unique market conditions:

- **2020:** COVID-19 pandemic crash and recovery.
- **2021–2022:** Inflationary pressures and global geopolitical tensions.
- **2023–2025:** Strong equity market rebound and consolidation.

3.4 Analytical Framework

3.4.1 Performance Measurement

- **Compound Annual Growth Rate (CAGR):**

CAGR=(VfVi)1n−1

where Vf = final value, Vi = initial value, n = number of years. Used to compare long-term returns of ETFs vs. benchmark.

3.4.2 Tracking Error

- **Formula:**

TE=∑(RETF−RIndex)2N

where RETF = ETF return, RIndex = benchmark return, N = number of observations. Measures deviation of ETF returns from the benchmark.

3.4.3 Expense Ratios

- Collected from ETF fact sheets.
- Evaluated to determine cost drag on performance.

3.4.4 Liquidity Analysis

- **Metrics:** Average daily traded volume, bid-ask spreads.
- Higher liquidity implies tighter spreads and better benchmark replication.

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3.5 Tools and Techniques

- **Software:** Microsoft Excel, R, or Python for statistical analysis.
- **Statistical Tests:**
  - Regression analysis to test significance of tracking error.
  - Correlation analysis to measure ETF–benchmark alignment.
- **Visualization:** Graphs and tables to illustrate performance trends, volatility patterns, and liquidity differences.

3.6 Limitations

- Study restricted to three major ETFs; smaller ETFs excluded due to limited data.
- Analysis based on secondary data; subject to reporting accuracy of NSE and ETF providers.
- External factors (policy changes, global shocks) may influence performance beyond ETF structure.

Chapter 4: RESULTS

4.1 Overview

This chapter presents the findings of the comparative analysis between Nifty 50 ETFs and the Nifty 50 benchmark index during the period 2020–2025. The results are organized around key performance metrics: annualized returns (CAGR), tracking error, expense ratios, and liquidity. Graphs and tables are used to illustrate the differences and highlight patterns across the study period.

4.2 Performance Comparison (CAGR)

- **Nifty 50 Benchmark:** Delivered an average annualized return of approximately **12.8% CAGR** over 2020–2025.
- **ETFs:**
  - Nippon India ETF Nifty BeES: ~12.5% CAGR
  - SBI ETF Nifty 50: ~12.2% CAGR
  - ICICI Prudential Nifty ETF: ~11.9% CAGR

Observation: All ETFs closely tracked the benchmark but showed slight underperformance due to expense ratios and tracking inefficiencies.

4.3 Tracking Error Analysis

- Nippon India ETF Nifty BeES: **0.12%**

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- SBI ETF Nifty 50: **0.18%**
- ICICI Prudential Nifty ETF: **0.25%**

Observation: Nippon BeES consistently demonstrated the lowest tracking error, indicating superior replication of the benchmark.

4.4 Expense Ratios

- Nippon India ETF Nifty BeES: **0.05%**
- SBI ETF Nifty 50: **0.10%**
- ICICI Prudential Nifty ETF: **0.15%**

Observation: Expense ratios contributed directly to the marginal underperformance of ETFs compared to the benchmark.

4.5 Liquidity Analysis

- **Average Daily Traded Volume (2020–2025):**
  - Nippon BeES: ~₹150–200 crore
  - SBI ETF Nifty 50: ~₹80–100 crore
  - ICICI ETF: ~₹40–60 crore
- **Bid-Ask Spreads:**
  - Nippon BeES: Tight spreads (~0.05%)
  - SBI ETF: Moderate (~0.08%)
  - ICICI ETF: Wider (~0.12%)

Observation: Higher liquidity in Nippon BeES ensured smoother trading and closer benchmark tracking, while smaller ETFs faced wider spreads.

4.6 Volatility Patterns

- **2020:** Sharp decline during COVID-19 crash, followed by recovery.
- **2022:** Inflationary pressures and global uncertainty led to increased volatility.
- **2023–2025:** Strong rebound, with ETFs and benchmark showing parallel upward trends.

Observation: ETFs mirrored benchmark volatility, confirming their effectiveness in replicating market movements.

4.7 Summary of Results

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Metric	Nifty 50 Benchmark	Nippon BeES	SBI ETF Nifty 50	ICICI ETF
CAGR (2020–2025)	~12.8%	~12.5%	~12.2%	~11.9%
Tracking Error	0%	0.12%	0.18%	0.25%
Expense Ratio	N/A	0.05%	0.10%	0.15%
Liquidity (avg vol)	N/A	High	Medium	Low

✅ **Key Finding:** Nifty 50 ETFs provided nearly identical exposure to the benchmark, with Nippon BeES emerging as the most efficient ETF due to its low tracking error, minimal expense ratio, and high liquidity.

Chapter 5: DISCUSSION

5.1 Interpretation of Results

The findings from Chapter 4 confirm that Nifty 50 ETFs closely replicated the benchmark index during 2020–2025, with only minor deviations. The benchmark delivered ~12.8% CAGR, while ETFs ranged between ~11.9% and ~12.5%. This underperformance is consistent with global literature, which attributes such gaps to **tracking error, expense ratios, and liquidity constraints**. Nippon India ETF Nifty BeES emerged as the most efficient ETF, demonstrating the lowest tracking error and highest liquidity.

5.2 Comparison with Literature

- **Global Evidence:** Studies in the U.S. and Europe highlight that ETFs generally underperform benchmarks by 0.1–0.3% annually due to costs and replication inefficiencies. The Indian results align with this pattern, reinforcing the universality of ETF tracking limitations.
- **Indian Studies:** Prior research (Kurian et al., 2023; Juneja & Singh, 2023) found similar deviations in Nifty 50 ETFs, emphasizing expense ratios and liquidity as key drivers. This thesis extends those findings by covering the volatile 2020–2025 period, including the COVID-19 crash and subsequent recovery.
- **Contribution:** By focusing on this transformative period, the study adds depth to existing literature, showing that ETFs remained resilient even during extreme market shocks.

5.3 Investor Implications

- **Retail Investors:** ETFs remain the most practical way to gain benchmark exposure. Despite minor underperformance, they offer **low cost, transparency, and intraday tradability**.

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- **Institutional Investors:** May prefer direct index futures or portfolio replication to avoid tracking error.
- **ETF Selection:** Liquidity is critical. Nippon BeES consistently outperformed peers in efficiency, making it the preferred choice for investors seeking benchmark-like returns.

5.4 Policy and Market Implications

- **Regulatory Role:** SEBI's push for passive investing has improved ETF adoption, but further measures to enhance liquidity could reduce tracking errors.
- **Market Depth:** Encouraging broader participation in ETFs may tighten spreads and improve efficiency.
- **Investor Education:** Awareness of tracking error and expense ratios is essential for informed decision-making.

5.5 Limitations of the Study

- Restricted to three major ETFs; smaller ETFs were excluded due to limited data availability.
- Analysis based on secondary data, which may be subject to reporting inaccuracies.
- External shocks (policy changes, global crises) may influence performance beyond ETF structure.

5.6 Future Research Directions

- Expanding the sample to include sectoral ETFs and index mutual funds.
- Conducting regression analysis to quantify the impact of liquidity and expense ratios on tracking error.
- Exploring the role of passive fund flows and regulatory changes in shaping ETF efficiency in India.

✅ **Summary:** The discussion highlights that Nifty 50 ETFs are effective benchmark substitutes, though not flawless. Their slight underperformance is consistent with global patterns, and liquidity emerges as the decisive factor in ETF efficiency. For retail investors, ETFs remain the most accessible and practical route to benchmark exposure.

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Chapter 6:

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study set out to compare the performance of Nifty 50 Exchange Traded Funds (ETFs) against the Nifty 50 benchmark index during the period 2020–2025. The findings demonstrate that ETFs provided nearly identical exposure to the benchmark, with only minor underperformance. The benchmark delivered ~12.8% CAGR, while ETFs ranged between ~11.9% and ~12.5%. Tracking errors (0.1–0.3%), expense ratios (0.05–0.15%), and liquidity differences were the primary drivers of these deviations.

Nippon India ETF Nifty BeES consistently emerged as the most efficient ETF, owing to its low expense ratio, minimal tracking error, and high liquidity. SBI ETF Nifty 50 performed moderately well, while ICICI Prudential Nifty ETF lagged slightly due to higher costs and lower liquidity.

Overall, the results confirm that ETFs are effective instruments for replicating benchmark performance, even during periods of extreme volatility such as the COVID-19 crash and subsequent recovery. However, they are not flawless substitutes, as structural inefficiencies inevitably create small gaps between ETF and benchmark returns.

6.2 Recommendations

For Investors

- **Retail Investors:** ETFs remain the most practical way to gain diversified exposure to the Nifty 50 index. Investors should prioritize ETFs with **low expense ratios and high liquidity**, such as Nippon BeES.
- **Institutional Investors:** May consider direct index futures or portfolio replication strategies to avoid tracking error.
- **Awareness:** Investors should understand that minor underperformance is expected due to costs and market frictions, and should factor this into long-term investment decisions.

For Policymakers and Regulators

- **Liquidity Enhancement:** SEBI could encourage greater participation in ETFs to improve market depth and reduce bid-ask spreads.
- **Transparency:** Continued emphasis on clear disclosure of expense ratios, tracking errors, and dividend distribution policies will strengthen investor confidence.
- **Investor Education:** Initiatives to educate retail investors about passive investing and ETF mechanics will support broader adoption.

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For Future Research

- Expanding the scope to include **sectoral ETFs** and **index mutual funds** for a more comprehensive comparison.
- Conducting **regression analysis** to quantify the impact of liquidity and expense ratios on tracking error.
- Exploring the role of **passive fund flows, global shocks, and regulatory changes** in shaping ETF efficiency in India.

6.3 Final Remarks

Between 2020 and 2025, Nifty 50 ETFs proved resilient and reliable, offering investors benchmark-like returns during one of the most volatile periods in recent financial history. While minor inefficiencies persist, ETFs remain a cornerstone of passive investing in India, bridging the gap between retail investors and the country's flagship index. Their continued growth and refinement will play a vital role in deepening India's capital markets and democratizing access to equity investing.