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Global Research Trends on Exchange-Traded Funds and Index Funds: A Bibliometric Assessment and Implications for India

Anchal Juneja[1*] and Dr. Inderpal Singh[2]

[1*]Research Scholar, Department of Management, I.K. Gujral Punjab Technical University, Kapurthala, Punjab 144603
Email: anchaljuneja001@gmail.com
[2]Dean R and E/HOD Mgmt, LKCTC, Jalandhar,
Email: hod.management@kclimt.com

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ABSTRACT
This study conducts a comprehensive bibliometric analysis of 1,016 publications on Exchange-Traded Funds (ETFs) and index funds published between 2001 and 2025. Using performance indicators such as scientific production, citations, keyword co-occurrence, and collaboration networks, the study identifies dominant research regions, thematic clusters, emerging trends, and existing gaps. Results show that research output is heavily concentrated in advanced economies, with the United States, China, the United Kingdom, Australia, and Canada functioning as global knowledge hubs. Keyword clustering reveals five major research streams—risk-return metrics, algorithmic/AI-driven strategies, ESG and resilience factors, liquidity and market microstructure, and methodological limitations—highlighting both maturity and fragmentation within the field. Trend analysis indicates a shift from basic performance metrics to multidimensional evaluations involving risk-adjusted returns, tracking error, and liquidity measures. Notably, India remains underrepresented in global literature despite rising publication activity. The study concludes by identifying key research gaps and establishes a strong rationale for India-focused empirical investigations on ETFs and index funds.

Keywords: ETFs, Index Funds, Bibliometric Analysis, Tracking Error, Risk-Adjusted Performance, Liquidity, India.

1. INTRODUCTION

Exchange-Traded Funds (ETFs) and index funds have reshaped global investment patterns over the last two decades, offering low-cost and transparent access to diversified portfolios. Early research, particularly in the United States, laid the foundation for evaluating ETF performance and benchmark replication, highlighting the dominance of developed markets in both innovation and academic output (Elton et al., 2002). As ETFs expanded internationally, comparative studies examining performance, tracking efficiency, and investor benefits became more prominent, reinforcing their relevance within passive investment strategies (Agapova, 2011).

Despite the global growth of ETFs, research contributions from emerging economies remain limited. In India, academic work on ETFs and index funds is increasing but still narrow in scope, often focusing on basic performance and tracking error without addressing broader structural or market-specific factors (Bansal & Kumari, 2016). This gap underscores the need for deeper, context-specific studies that assess how ETFs and index funds perform within India's evolving financial landscape.

This paper provides a bibliometric analysis of global ETF and index fund research from 2001 to 2025 and identifies thematic clusters, emerging trends, and research gaps. The analysis provides the intellectual foundation for subsequent India-specific empirical work.

2. REVIEW OF LITERATURE

Recent research on ETFs and index funds has shifted from basic performance comparison to more sophisticated evaluations involving tracking efficiency, liquidity, and risk-adjusted returns. Studies in developed markets highlight that fund performance is strongly shaped by replication strategy, cost structure, and market conditions, with ETFs increasingly preferred for their trading flexibility and efficiency during volatile periods (Madhavan, 2016). More contemporary work reflects the influence of technology, automation, and data-driven approaches, showing that machine learning and algorithmic models are being integrated into portfolio construction and benchmarking processes (Li & Li, 2021).

Sustainability-linked products have also emerged as a major theme, with ESG-based indices and ETFs prompting new discussions about trade-offs between ethical screening and tracking performance (Le Sourd, 2019). Meanwhile, crisis-period studies—especially during COVID-19—demonstrate that ETFs can experience heightened volatility and wider deviations from NAV under stress, underscoring the importance of liquidity and market microstructure factors (Zhang & Hu, 2020).

In the Indian context, recent literature remains limited but growing. Findings indicate that ETFs generally replicate broad-market benchmarks reasonably well, though tracking deviations are influenced by fund size, liquidity, and market volatility (Bansal & Kumari, 2016; Narayan & Singh, 2020). Overall, existing research highlights the need for deeper India-specific performance analysis, especially incorporating newer metrics and post-pandemic behaviour across different benchmark categories.

3. Methodology

A bibliometric approach was employed to analyze 1,016 publications on ETFs and index funds indexed between 2001 and 2025. Data were extracted from major academic databases and analyzed using VOSviewer, enabling:

- Country-level contribution analysis
- Keyword co-occurrence and clustering
- Trend evolution analysis
- Research Gap Identification

The approach integrates performance indicators (publications, citations) with science-mapping techniques (network visualization, thematic clusters) to capture both quantitative and qualitative intellectual structures in the field.

4. RESULTS AND DISCUSSION

4.1 Country-Level Contribution and Collaboration

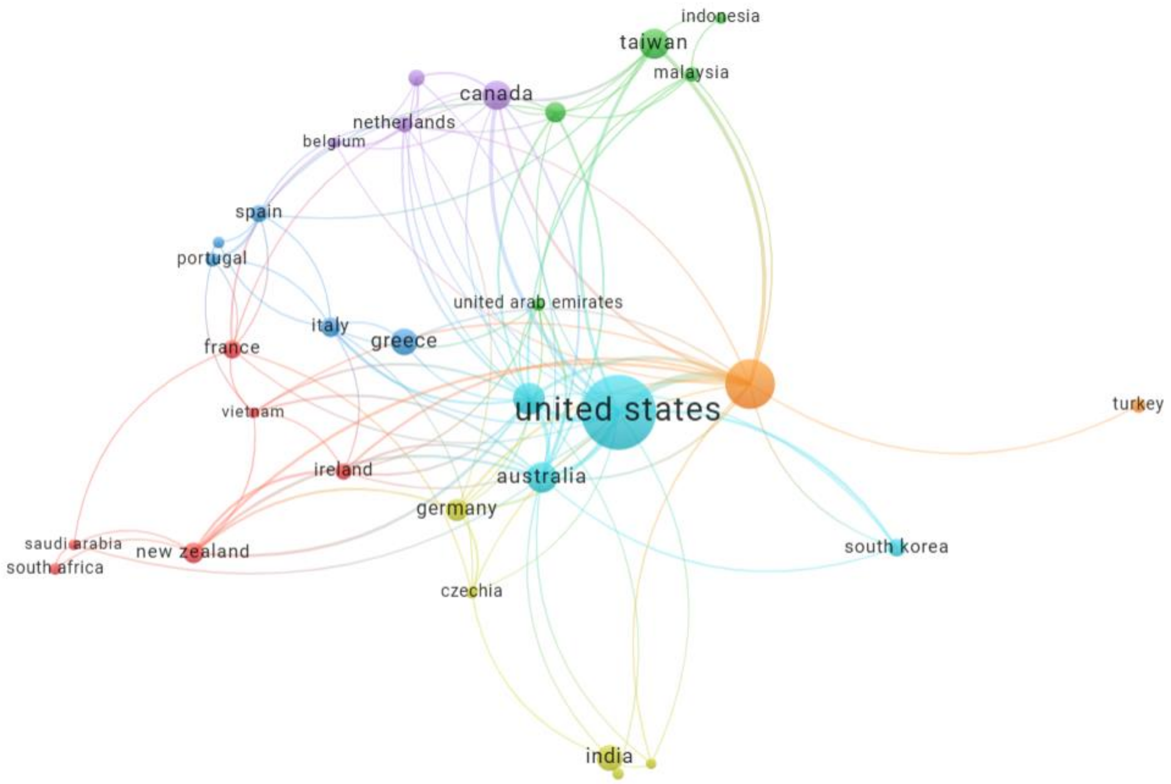

Figure 1: Global distribution of publications and citations on ETFs and index funds (2001–2025).

The analysis reveals a highly uneven global research landscape. Out of 1,016 articles, the United States dominates with 252 publications and 5,907 citations, reflecting its leadership in ETF market development and academic influence. China follows with 111 publications and 1,668 citations, signaling rapid growth but comparatively lower global impact. The United Kingdom, Australia, and Canada also contribute significantly with strong citation profiles.

Total Link Strength (TLS) values reinforce these patterns:

- United States: TLS = 67
- China: TLS = 55
- United Kingdom: TLS = 43

These nations function as central collaboration hubs. In contrast, India has only 30 publications, 165 citations, and TLS = 4, placing it on the periphery of global research networks. Despite India's increasing publication activity post-2020, weak collaboration and low citation impact expose a clear scholarly gap.

The analysis confirms a regional imbalance: advanced economies dominate the discourse, while emerging markets—India, Brazil, South Africa—are underrepresented. This validates the need for context-specific Indian research on ETF and index fund performance.

4.2 Keyword Co-Occurrence, Clusters, and Trends

4.2.1 Cluster Analysis

Five core research clusters emerged:

Cluster 1: Core Performance Metrics
Includes alpha, beta, abnormal returns, Sharpe ratio, Treynor ratio, tracking error, and expense ratio. This cluster forms the backbone of traditional ETF–index fund comparisons and aligns directly with performance evaluation objectives.

Cluster 2 & 3: Technological and Advanced Analytical Trends
Themes include algorithmic trading, machine learning, AI, portfolio optimization, resilience, and ESG. While globally prominent, these themes barely appear in Indian ETF studies, exposing a methodological lag.

Cluster 4: Liquidity and Market Microstructure
Focuses on bid-ask spreads, arbitrage, trading efficiency, and liquidity risk—critical for ETFs but often ignored in Indian studies.

Cluster 5: Methodological Limitations and Underexplored Determinants
Covers region-specific factors, determinants of fund performance, and unexplored structural dynamics.

Overall, the clusters show a mature global literature but highlight gaps in region-specific, advanced-method, and liquidity-driven studies in India.

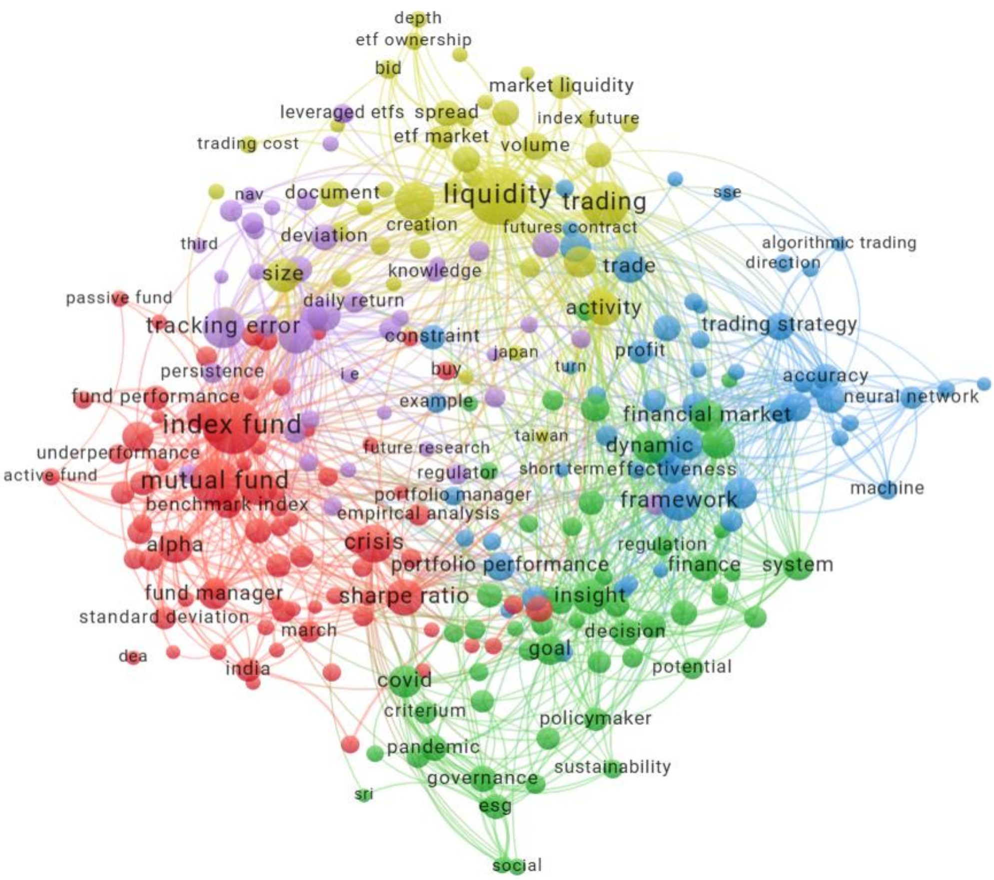

Figure 2: Keyword co-occurrence network highlighting research clusters in ETF and index fund studies.

4.2.2 Trend Analysis

Research volume accelerated significantly after 2012, reflecting the global expansion of passive investing. Early studies emphasize basic performance metrics—annualized returns, volatility—while recent work shifts toward:

- Risk-adjusted performance (Sharpe ratio, Jensen's alpha, Treynor ratio)
- Tracking error and benchmark replication
- Liquidity measures
- Comparative ETF vs. index fund evaluations

Emerging markets—particularly India—have shown increasing publication activity in the last decade, but contributions remain modest relative to developed markets.

The trend shift indicates growing sophistication and investor-centric evaluation frameworks. It also reinforces the opportunity for deeper India-specific performance studies.

4.3 Research Gaps Identified

The bibliometric mapping exposes several persistent gaps.

1. Weak integration of technological and ESG trends
AI, ML, algorithmic trading, ESG, and digital assets appear in keyword networks but remain virtually absent in Indian ETF literature.
2. Insufficient liquidity and microstructure analysis
Despite liquidity being a critical determinant of ETF performance, Indian studies rarely integrate it rigorously.
3. Lack of advanced bibliometric or network-based approaches
Most prior Indian studies rely on simple performance comparisons with minimal analytical depth.
4. Limited post-pandemic analysis
COVID-19's effects on tracking error, volatility, and investor behavior remain largely unexamined in India.
5. Poor benchmark-specific and sector-specific research
Differences across Nifty, Sensex, thematic, and sectoral ETFs are heavily underexplored.

These gaps justify the need for detailed, multidimensional performance analysis within the Indian ETF and index fund ecosystem.

CONCLUSION

The bibliometric analysis establishes that global research on ETFs and index funds is expansive but geographically imbalanced. Advanced markets dominate publications, citations, and collaborative networks, while India remains a peripheral contributor despite recent growth. Thematic clusters indicate rich scholarship in risk–return metrics, analytics-driven strategies, ESG, and liquidity, but Indian literature remains limited in depth, scope, and methodological rigor.

The identified gaps—especially those relating to liquidity, technology integration, post-pandemic dynamics, and benchmark-specific insights—provide strong justification for India-focused empirical research. The findings support the relevance of conducting a comprehensive comparative performance analysis of ETFs and index funds within the Indian context.

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