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**INTERNATIONAL JOURNAL OF
MULTIDISCIPLINARY RESEARCH & REVIEWS**

journal homepage: www.ijmrr.online/index.php/home

**AUTOMATION OF INVESTOR RISK PROFILING AND PORTFOLIO
ALLOCATION USING ADAPTIVE HYBRID ASSET ALLOCATION
MODEL (AHAM) – A STUDY AT ITI SECURITIES BROKING LTD.,
COIMBATORE**

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How to Cite the Article: Satishkumar V, Karthikeyan K. (2026). *Automation Of Investor Risk Profiling and Portfolio Allocation Using Adaptive Hybrid Asset Allocation Model (Aham) – A Study at Iti Securities Broking Ltd., Coimbatore*, International Journal of Multidisciplinary Research & Reviews, Vol. 5, Special Issue-1, pp. 121-125.



<https://doi.org/10.56815/ijmrr.v5si1.2026.121-125>

Keywords

*Financial Technology,
Portfolio
Optimization,
Risk Profiling,
Asset Allocation,
Monte Carlo
Simulation,
ITI Securities,
AHAM Model, Fintech
Analytics,
Robo-Advisory,
SEBI Compliance*

Abstract

The rapid evolution of financial technology has transformed investment advisory services, shifting from traditional manual practices to automated, data-driven frameworks. This study aims to design and demonstrate an automated investor risk profiling and portfolio allocation framework at ITI Securities Broking Ltd., Coimbatore, using the Adaptive Hybrid Asset Allocation Model (AHAM). The model integrates Modern Portfolio Theory (MPT), Strategic Asset Allocation (SAA), and Monte Carlo Simulation to balance risk and return for investors across three risk categories—Conservative, Moderate, and Aggressive. The research, based on secondary data and analytical simulations, enhances advisory efficiency, regulatory compliance, and scalability. Findings show that automation reduces human bias, standardizes advisory services, and improves investor experience, paving the way for future robo-advisory integration within mid-sized brokerage firms.



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1. INTRODUCTION

The financial services sector in India has undergone a paradigm shift driven by rising digital adoption, growing financial literacy, and stronger regulatory frameworks. Traditionally, investment advisory relied on personal judgment and qualitative assessment. However, the emergence of artificial intelligence, analytics, and algorithmic modeling has revolutionized this process.

At **ITI Securities Broking Ltd.**, advisory operations were primarily manual and focused on high-net-worth clients (HNIs), often leaving retail investors underserved. To address this imbalance, the study proposes automating investor risk profiling and portfolio construction using the **Adaptive Hybrid Asset Allocation Model (AHAM)**. This approach ensures consistent, data-driven recommendations aligned with **SEBI's suitability norms**, democratizing access to personalized investment strategies. Automation through AHAM enables efficient client onboarding, risk classification, and optimized portfolio generation across varying investor profiles.

2. REVIEW OF LITERATURE

AIMultiple (2025) explored generative AI applications in finance, identifying frameworks that enhance investor profiling and portfolio customization, improving both efficiency and scalability.

Acropolium (2025) analyzed AI integration in portfolio management at global firms like Goldman Sachs, noting up to 75% reduction in losses through predictive analytics and real-time optimization.

Koelbl (2024) examined the role of machine learning in investor risk perception, emphasizing adaptability to behavioral patterns.

Kattoura (2023) highlighted behavioral finance approaches in automated profiling, stressing that hybrid human–AI models reduce bias and improve psychological alignment.

Vanguard (2025) reviewed multi-asset allocation strategies and concluded that models like AHAM and Black-Litterman frameworks maximize risk-adjusted returns while adhering to investor preferences.

SUMMARY:

Across 2023–2025, literature consistently supports the integration of AI and automation to improve accuracy, consistency, and compliance in advisory services. Collectively, these studies validate AHAM's capability to modernize and enhance financial advisory systems.

3. RESEARCH METHODOLOGY

The study follows a **descriptive and analytical research design**, focusing on the transformation of advisory operations at ITI Securities through technology.

Data Source:

Secondary data were collected from NSE indices, mutual fund databases, and ETF market data.



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Tools Used:

- **Python (pandas, numpy, plotly)** – for quantitative modeling and visualization
- **n8n Automation Platform** – for digital workflow and client communication
- **Monte Carlo Simulation** – for performance projection under uncertainty
- **Dash & Bootstrap Frameworks** – for dashboard development and automation interface

Process Flow:

- Digital investor onboarding and risk questionnaire collection
- Risk-based investor classification (Conservative / Moderate / Aggressive)
- Portfolio allocation using AHAM
- Monte Carlo simulation for expected returns and risk profiles
- Automated visualization and reporting

Expected Outcome

Automation minimizes manual intervention, ensures data consistency, enables real-time decisioning, and improves overall efficiency and scalability in investment advisory services

4. ANALYSIS AND INTERPRETATION

Overall Portfolio Asset Analysis (2020–2025)

Asset Class	CAGR (%)	Volatility (%)	Sharpe Ratio	Max Drawdown (%)	Risk Category Suitability
NIFTY 50 (Equity)	14.29	18.33	0.57	-38.44	Moderate to Aggressive
Corporate Bond Funds	8.20	5.10	0.46	-9.70	Conservative to Moderate
Gold BEES ETF	12.19	14.50	0.58	-26.41	All categories (Hedge Asset)

Interpretation

NIFTY 50 (Equity):

The NIFTY 50 index displayed robust long-term performance with a CAGR of **14.29%** and moderate volatility of **18.33%**, making it a suitable growth component in all portfolio categories. Despite short-term drawdowns (notably -38.44% during 2020), it remains a core asset for wealth accumulation

Corporate Bond Funds:

Corporate bonds yielded an average CAGR of **8.2%** with low volatility, offering consistent and stable returns. These are ideal for **defensive and income-oriented** investors, ensuring capital preservation and predictable income streams.

Gold BEES ETF:

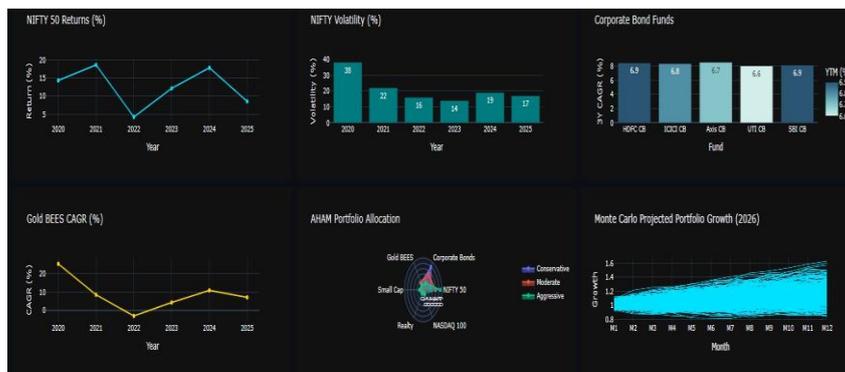


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With a **12.19% CAGR** and **Sharpe ratio of 0.58**, Gold BEES effectively hedged against inflation and market volatility. It plays a critical role in portfolio diversification and downside risk management, especially during equity market turbulence.

Overall Insight:

The AHAM model efficiently integrates these three key asset classes—equity (growth), bonds (stability), and gold (hedge)—to create balanced portfolios tailored to investor risk preferences. The strategic blend enhances overall **risk-adjusted performance** while maintaining flexibility across market cycles.



5. FINDINGS

- Automation through the AHAM model reduces manual errors and enhances accuracy in risk profiling.
- Risk-based asset allocation ensures compliance with **SEBI suitability standards**.
- Monte Carlo simulations generate realistic forecasts of expected returns and portfolio risk.
- Integration of Python and n8n improves workflow efficiency and digital client experience.
- The AHAM framework establishes a scalable foundation for future **AI-powered robo-advisory solutions** at ITI Securities.

6. SUGGESTIONS

- Expand AHAM implementation across all ITI branches to standardize digital advisory.
- Incorporate behavioral finance metrics into the investor profiling process for greater personalization.
- Strengthen advisor training in data interpretation and automated model usage.
- Develop a **mobile-first investor app** for self-profiling and instant portfolio recommendations.
- Collaborate with fintech startups to evolve AHAM into a fully autonomous robo-advisory platform



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7. CONCLUSION

The study concludes that automating investor risk profiling and portfolio allocation using the **Adaptive Hybrid Asset Allocation Model (AHAM)** enhances transparency, consistency, and scalability in advisory operations.

By combining modern portfolio theory, strategic asset allocation, and simulation-based forecasting, the model bridges the service gap between retail and HNI clients. The implementation at ITI Securities demonstrates that AI-driven automation can deliver world-class, data-backed advisory outcomes aligned with regulatory standards. AHAM stands as a robust foundation for digital transformation and robo-advisory innovation in India's evolving financial ecosystem.

8. AUTHOR(S) CONTRIBUTION

The writers affirm that they have no connections to, or engagement with, any group or body That provides financial or non-financial assistance for the topics or resources covered in this Manuscript.

9. CONFLICTS OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, And/or publication of this article.

10. PLAGIARISM POLICY

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11. SOURCES OF FUNDING

The authors received no financial aid to support for the research.

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