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Trends & Comparative Analysis of Asset Classes for All Citizens National Pension System (NPS) Tier I Account: Equity, Corporate Bonds, and Government Securities (G-Secs)

Deepak Pande
Research Scholar and Visiting Faculty
Chetana's Institute of Management & Research, Mumbai
Email Id: pande.deepak@student.cimr.in

Abstract

The study examines the trends and comparative performance of asset classes with respect to all citizens National Pension System (NPS) Tier I account over a decade (FY2015-FY2024). It focuses on equity, corporate bonds, and government securities (G-Secs). The research also analyses Net Asset Value (NAV), Assets Under Management (AUM), and subscriber growth to understand scheme dynamics. The research endeavours to examine PFMs performance. The study uses secondary data from the NPS database to understand returns. Descriptive statistics characterize asset class performance, while correlation identifies variable relationships. Regression analysis predicts NAV trends based on AUM, and evaluates performance. NPS analysis reveals that APY's subscriber growth complements strong AUM gains. The strategic asset allocation, notably by UTI PFM in equity/bonds and Kotak PFM in G-Secs, drives superior risk-adjusted returns. It indicates APY's success in expanding coverage, strong AUM, subscriber growth, and influence of individual asset classes. Regression results exhibit a connect between AUM and NAV growth for the six PFMs. LIC's outperformance against the benchmark, and UTI's results in equity and corporate bonds reveals strategy importance. Practical implications highlight the need for diversified strategies and enhanced investor education. Policymakers and PFMs should understand risk assessment and portfolio enhancement.

Keywords: *Asset Class Performance, Equity, Corporate Bonds, Government Securities, Net Asset Value (NAV), Asset Under Management (AUM)*

1. Introduction

The Central Government felt the need for having a separate Pension Scheme for Central Government employees owing to burgeoning outlay of funds towards pension payment to retired employees. As a result, the National Pension System (NPS), a government-regulated pension scheme in India, introduced to provide pension to CG employees after their retirement. Introduced for CG employee on January 1, 2004, and subsequently offered NPS variants for different sections of the society. The NPS offers templated contribution pension plans depending on risk appetite. The subscribers invest money during working period to build a sizeable retirement corpus. For unorganised workers, Atal Pension Yojana (APY), introduced in May 2015, offers guaranteed pension depending on contributions.

Recent innovation, NPS Vatsalya scheme focused on minors. It highlights the government's emphasis to promoting savings at early stage of life apart from enhancing financial literacy. Moreover,

modern technology and digital processes have streamlined processes and enhanced subscriber engagement. Over an evolving phase of NPS, the regulatory changes by the Pension Fund Regulatory and Development Authority (PFRDA) have made the NPS lucrative for all citizens including non-residents and OCI.

Table I – NPS Variants and Atal Pension Yojana (APY) Features

NPS Variants	Introduction Date	Eligibility Age Range	Maturity Benefits	Applicability	Fund Asset Classes
NPS for CG	April 1, 2004	Mandatory for New Recruits from Jan. 1, 2004	Lumpsum withdrawal and/or annuity	Central Government employees except armed forces	Equity (E), Corporate Bonds (C), G-Secs (G)
NPS Tier I	April 1, 2004 (Extended to All Citizens w.e.f. May 1, 2009)	18-70 Years	Lumpsum withdrawal and/or annuity	All Indian citizens (residents, non-residents, OCI)	Equity (E), Corporate Bonds (C), G-Secs (G), Alternate Funds (A)
NPS Tier II	April 1, 2004 (Extended to All Citizens w.e.f. May 1, 2009)	Tier I Acc.	Running Account	All Indian citizens (residents, non-residents, OCI)	Equity (E), Corporate Bonds (C), G-Secs (G), Alternate Funds (A)
NPS for SG	April 1, 2006	Mandatory for New Recruits	Lumpsum withdrawal and/or annuity	State Government Employees of respective state	Equity (E), Corporate Bonds (C), G-Secs (G)
NPS Lite	Nov. 1, 2010	18-60 years	Lumpsum or partial withdrawal	EWS or unorganised workers	Equity (E), Corporate Bonds (C), G-Secs (G)
NPS Corporate CG	Nov. 1, 2012	18-70 years	Lumpsum withdrawal and/or annuity	Corporate Employees	Equity (E), Corporate Bonds (C), G-Secs (G)
Atal Pension Yojana (APY)	May 9, 2015	18-40 years	Guaranteed Monthly Pension from Rs 1,000/- to rs 5,000/- at 60	All Indian citizens with a savings account; Taxpayers excluded from Oct. 1, 2022	Contributions are managed by PFRDA

NPS Tier II Tax-saver	Sep. 1, 2020	CG having Active Tier I Account	Lumpsum withdrawal after 3 years	Central Government Employees	Equity (E), Corporate Bonds (C), G-Secs (G)
NPS Vatsalya	Sep. 18, 2024	< 18 years	Transferred to NPS Tier I after attaining 18 years age	Minors only	Equity (E), Corporate Bonds (C), G-Secs (G), Alternate Funds (A)

As on 31st March 2024, the NPS had 18.05 million subscribers base, whereas Atal Pension Yojna (APY) had over 55.51 million subscribers and together managed assets worth ₹11,379,950 million (US$130 billion). The objective of NPS is to extend old-age security coverage to all citizens. In addition, it offers flexibility in investment choices and tax benefits. These options make NPS a lucrative option for strategic retirement planning.

1.1 Research Gaps:

Long-Term Investor Behaviour: Limited study carried out about NPS investors adjusting their asset allocation when approaching retirement.
Government Policies and Regulations: Tax policies, pension reforms, and contribution rate alterations influencing asset class performance remains underexplored.
Macroeconomic Shocks and Correlation: More studies to analyse economic downturns influencing the relationship between equities, corporate bonds, and G-Secs.
Dynamic Asset Allocation: Necessity for studies on flexible investment strategies based on market conditions and investor risk appetite.
Liquidity Risk in Corporate Bonds: How liquidity constraints influence corporate bond performance compared to equities and G-Secs remains underexplored.
ESG Integration in NPS Investments: Examining the role of ESG factors in NPS asset allocation. It is especially true for equities and corporate bonds.
Global Market Movements: The extent of impact during global financial crises and economic volatility on NPS asset classes remains uncertain.
Inflation Impact on NPS Portfolios: Evaluation of inflation affecting corporate bond and equity performance in risk-adjusted portfolios.

2. Literature Review

The National Pension System (NPS) Tier I account for all citizens is a long-term retirement savings plan in India. It offers investment options in pre-defined proportion in three primary asset classes—equity, corporate bonds, and government securities (G-Secs). The performance of these asset classes assumes significance in determining the weighted average returns and risk-adjusted returns for investors (Ananth & Gurunathan, 2016; Kumar & Saikia, 2015). The PFRDA framework has a crucial role in managing these funds. The formulated regulations influence asset allocation and investment performance (Acharya & Richardson, 2020).

2.1 Asset Class Performance: The performance analysis of different asset classes within the NPS framework carried out. (Banerjee and Kogan, 2020) administered a comparative analysis of NPS asset classes. It stated that equities generally provide higher returns but carries enhanced volatility. The volatility can be a concern for low-risk appetite investors approaching retirement. Conversely, G-Secs offer stability and lower risk. It makes them a lucrative option for risk-averse subscribers. (Das and Ghosh, 2020) further assessed the flexibility of G-Secs during economic downturns. They found composition of G-Secs in portfolio essential for stability. (Garg and Jain, 2021) further illustrated the crucial role of equity in enhancing portfolio growth. They noted its superior performance compared to corporate bonds and G-Secs during bullish market phase. Corporate bonds considered as a moderate investment option that offers slightly higher returns with lower risk than equities. Such an asset class appeals to a broader spectrum of investors (Chawla and Sahoo, 2020).

2.2 Net Asset Value (NAV) and Asset Under Management (AUM): The relationship between Asset Under Management (AUM) growth and Net Asset Value (NAV) performance is a crucial one in NPS research. (Baranwal and Tiwari, 2021) illustrated that larger AUM sizes facilitate better portfolio diversification. Such type of diversification positively influences NAV growth. The finding considered to be crucial as it underscores the importance of boosting up AUM to enhance overall fund performance. (Bhagwat and Agarwal, 2021) contemplated macroeconomic factors such as inflation and interest rates influencing fluctuations in NAVs across asset classes. Their research suggests that understanding these dynamics is imperative for fund managers with a goal to optimize returns. (Gupta and Ghosh, 2021) validated the significance of strategic asset allocation to enhance risk-adjusted returns. (Krishna, 2022) stated that PFMs should utilise AUM growth in order to optimize NAV performance across asset classes.

2.3 Risk-Adjusted Returns: Analysing risk-adjusted returns is crucial for evaluating the efficiency of different investment strategies within the NPS. (Gupta and Ghosh, 2021) carried out an analysis of the risk-adjusted returns of NPS portfolios. They concluded that strategic asset allocation significantly increases returns. Their findings indicate that a well-balanced perspective comprising equity, corporate bonds, and G-Secs can yield optimal results. UTI PFM consistently excelled over its peers in equity management. Kotak Pension Fund depicted better performance in G-Secs owing to its conservative investment perspective (Choudhury and Basak, 2020). It underscores the necessity for fund managers to customise their strategies calibrating the characteristics of each asset class. (Ahmad and Nor, 2015) carried out a comparative study of pension funds in East Asia. It underscored similarities in risk-adjusted strategies within NPS portfolios.

2.4 Macroeconomic Impacts: Macroeconomic factors role is crucial in structuring the performance of NPS asset classes. (Bansal and Goyal, 2020) considered macroeconomic factors impacting NPS investments. They find that equities are specifically sensitive to market volatility. Conversely, G-Secs generally remain flexible during economic downturns. It provides a balancing effect on overall portfolio returns. (Dubey and Patel, 2020) in particular underscored the influence of inflation on bond performance within the NPS framework. It focuses on the need for flexible investment strategies to mitigate risks associated with surging inflation rates.

2.5 Subscriber Growth and Trends: The NPS subscribers' growth is another critical aspect of focus in the literature. (Pushpa, 2024) observed a sluggish NPS subscriber growth in recent years. She underscored the rising significance of Atal Pension Yojana (APY) in enhancing coverage among economically weaker sections and low-income groups. This pattern highlights the significance of inclusive policies. These aim at increasing participation among economically weaker sections.

(Rajasekhar et al., 2017) reviewed the contributory pension schemes limitation in reaching out to informal sector workers. They call for targeted marketing strategies to grow subscriber participation. (Narayana, 2019) focused on the necessity for sector-specific perspectives to tackle disparities in extending pension coverage across various demographics.

2.6 Portfolio Diversification Strategies: Several studies have validated the importance of portfolio diversification within the NPS portfolio. (Baranwal and Tiwari, 2021) advocated a well-balanced allocation across different asset classes within NPS framework to attain optimal risk-adjusted returns. They contended that diversification not only mitigates risks but also increases expected returns over a period. Moreover, they noticed enhanced interest in integrating Environmental, Social, and Governance (ESG) factors into asset allocation strategies within the NPS framework. Although this aspect remains obscured, (Bhagwat and Agarwal, 2021) indicated that calibrating investments with ESG principles could pave the way for socially conscious investors. It also carries potential in bettering long-term financial outcomes.

3. Research Methodology

The study employs a mixed-methods approach analysing secondary data on NAVs, AUM, and subscriber growth under NPS tier I, accessed in march 2025. It also carries out literature review of 25 articles accessed in March 2025, which are not more than 12 years old. Additionally, PFRDA website and NPA annual reports accessed in March 2025, for getting secondary data. The 6 PFMs chosen, which consistently managed funds under NPS Tier I for all citizens during last 10-year. Statistical techniques provide trends, relationships, and fund performance insights. Comparative analysis provides return performance of PFMs against the benchmark. It also includes descriptive statistics exhibiting trends and volatility**.** The regression models predicts NAV movements, correlation identifying relationships between variables**.**

3.1 Dependent Variables

- **NPS NAV Growth** (YoY NAV returns for Equity, Corporate Bonds, and G-Secs)
- **PFMs Performance** (Comparison with benchmark returns)

3.2 Independent Variables

- **NPS AUM Growth** (Financial year-end AUM for PFMs)

3.3 Inclusions and Exclusions

- **Inclusions:** NPS Asset classes, NPS NAV growth, NPS & APY AUM growth, NPS & APY Subscriber growth, Regression analysis, Comparative performance of PFMs under NPS
- **Exclusions:** NPS for Government employees**,** Tier II accounts, Global pension schemes, Macroeconomic indicators, Subscriber behaviour analysis

3.4 Hypotheses

***H*0:** There is no significant relationship between AUM growth and NAV growth for PFMs.

***H*1:** There is a significant relationship between AUM growth and NAV growth for PFMs.

3.5 Research Question

How do NAV, AUM, and subscribers evolve over 10 years? What factors impact NAV movements? Can regression predict future NAV trends?

3.6 Research Objectives

- To analyse trends in NAV, AUM, and subscriber growth
- To evaluate comparative performance and risk-adjusted returns
- To model NAV trends using regression analysis

4. Data Analysis and Interpretation

4.1 Trend Analysis

Bar Chart I - NPS & APY Aggregate Subscribers and AUM Growth Analysis

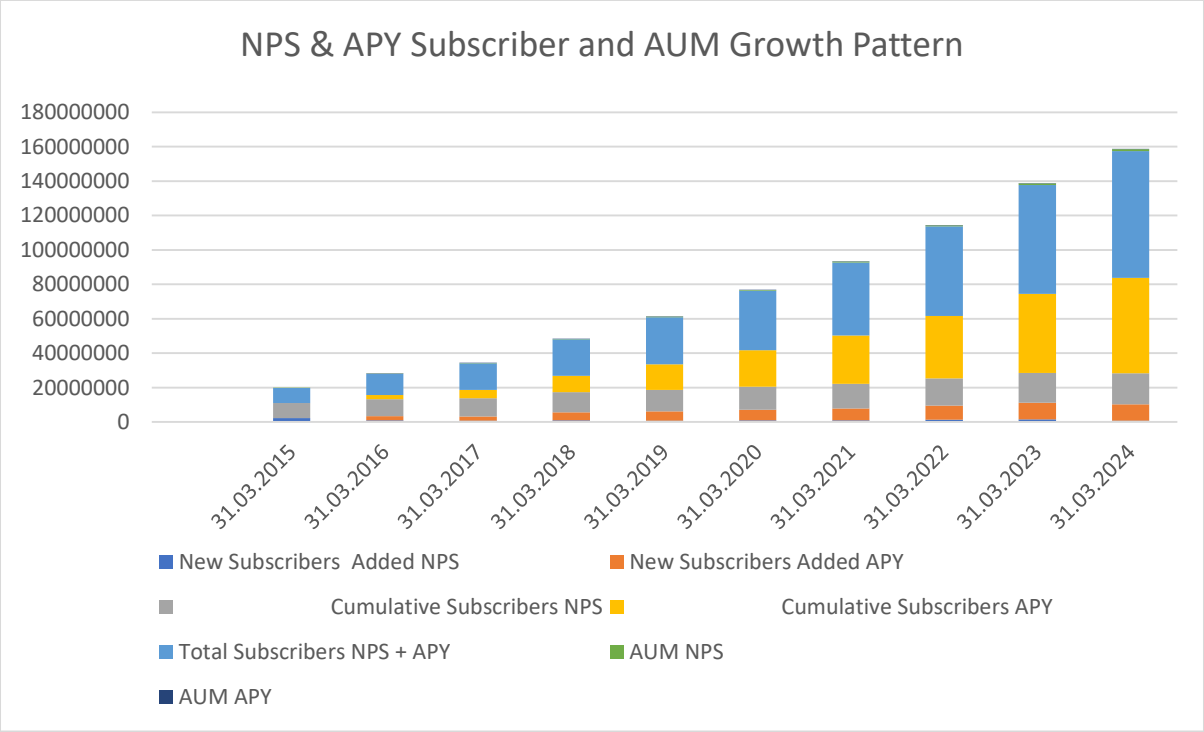

Table II - Trend Analysis of NPS & APY Aggregate Subscribers (2015-2024)

Financial Year	New NPS Subscribers	New APY Subscribers	Total New Subscribers	Cumulative NPS Subscribers	Cumulative APY Subscribers	Total Subscribers
31.03.2015	2.24	-	2.24	8.75	-	8.75
31.03.2016	1.00	2.46	3.46	9.75	2.46	12.21
31.03.2017	0.82	2.40	3.23	10.58	4.86	15.44
31.03.2018	0.99	4.74	5.73	11.56	9.61	21.17
31.03.2019	0.84	5.35	6.19	12.40	14.95	27.35
31.03.2020	1.01	6.19	7.20	13.41	21.14	34.55
31.03.2021	0.98	6.91	7.88	14.39	28.05	42.44
31.03.2022	1.35	8.23	9.58	15.74	36.28	52.02
31.03.2023	1.56	9.67	11.23	17.31	45.95	63.26
31.03.2024	0.74	9.56	10.30	18.05	55.51	73.56

(Data Source: https://npstrust.org.in/annual-reports)

Interpretation

- **APY Growth is Higher:** Low-value APY subscriber growth outpaced NPS significantly since its introduction in 2015-16.
- **Peak in 2023:** The highest number of new APY subscribers was recorded in 2023 (9.67 million).
- **Geography Break-up:** 89.14% of subscribers come from non-metro locations whereas remaining 10.86% from metro locations.
- **Gender-wise Subscriber Break-up:** 56.25% belong to male category and remaining 43.75% come from female and transgender category.
- **NPS Steady Growth:** NPS new subscribers showed a gradual increase, with a peak in 2023 (1.56 million) before declining in 2024.
- **Cumulative Growth:** By 2024, the total subscriber base reached 73.56 million, with APY contributing the majority.

Table III - Trend Analysis of Aggregate AUM (Assets Under Management) Growth (2015-2024)

Financial Year	NPS AUM (₹ Million)	APY AUM (₹ Million)	Total AUM (₹ Million)	Growth in Total AUM (%)
31.03.2015	808,551	-	808,551	-
31.03.2016	1,183,038	5,063	1,188,101	47.0
31.03.2017	1,726,758	18,850	1,745,608	47.0
31.03.2018	2,307,610	38,178	2,345,789	34.4
31.03.2019	3,113,536	68,603	3,182,139	35.7
31.03.2020	4,069,533	105,263	4,174,795	31.2
31.03.2021	5,623,371	156,871	5,780,242	38.5
31.03.2022	7,156,703	209,226	7,365,929	27.4
31.03.2023	8,716,433	272,227	8,988,660	22.0

31.03.2024	11,370,046	365,313	11,735,359	30.5

(Data Source: https://npstrust.org.in/annual-reports)

Interpretation

- **Steady Growth in AUM:** NPS AUM grew steadily from ₹80,855 Cr in 2015 to ₹11,37,004 Cr in 2024.
- **APY's Contribution Grew:** APY AUM, though small initially, increased rapidly to ₹36,531 Cr by 2024.
- **Peak Growth Years:** Highest AUM growth rates were seen in 2016-2017 (~47%) and 2020-2021 (~38.5%).
- **2024 Growth Rebound:** After a slowdown in 2023 (22% growth), total AUM jumped by 30.5% in 2024.

4.2 Descriptive Analysis

Table IV - Descriptive Statistics of PFMs under Different Asset Classes (YoY NAV Growth)

Pension Fund Managers	Asset Class	Mean	Median	Standard Deviation	Min (%)	Max (%)
HDFC	Equity	19.14	18.00	15.32	-23.45	69.78
HDFC	Bonds	8.76	8.50	3.12	-7.47	15.11
HDFC	G-Sec	9.65	9.70	4.30	3.64	15.47
ICICI	Equity	20.12	19.60	16.45	-26.32	72.49
ICICI	Bonds	9.12	9.00	3.45	-7.37	15.72
ICICI	G-Sec	9.75	9.90	4.45	4.10	15.05
Kotak	Equity	21.45	20.00	17.22	-25.08	70.98
Kotak	Bonds	8.85	8.70	3.22	-6.88	15.11
Kotak	G-Sec	9.98	9.95	4.50	4.28	15.18
LIC	Equity	19.87	19.50	15.89	-28.47	74.34
LIC	Bonds	9.01	8.90	3.34	-7.91	15.32
LIC	G-Sec	9.72	9.60	4.35	4.07	16.47
SBI	Equity	20.34	19.80	16.02	-25.02	66.28
SBI	Bonds	8.92	8.80	3.28	-7.16	15.68
SBI	G-Sec	9.96	9.70	4.40	4.04	14.82
UTI	Equity	22.78	22.50	18.34	-27.81	72.82
UTI	Bonds	9.34	9.20	3.56	-6.72	14.98
UTI	G-Sec	9.91	9.80	4.60	3.41	14.40

Interpretation

Equity Returns:

- **Performance:** UTI PFM had the highest mean return (22.78%).

- **Risk:** UTI PFM had the highest standard deviation (18.34%).
- **Range:** Wide range showed equity's inherent risk.

Corporate Bond Returns:

- **Performance:** UTI PFM had the highest mean return (9.34%).
- **Risk:** Standard deviations were lower than equity.
- **Range:** Narrower range reflected lower risk.

G-Secs Returns:

- **Performance:** Kotak PFM had the highest mean return (9.98%).
- **Risk:** Standard deviations were the lowest.
- **Range:** Narrower, as they're low-risk or risk-free investments.

Summary:

- **Risk-Return Trade-off: Equity =** high risk / return**; Bonds =** balance**; G-Secs =** conservative.
- **Consistency:** Lower standard deviations meant predictable returns.
- **Efficiency:** UTI PFM excelled in equity; others balanced well.

4.3 Comparative Analysis

Bar Chart II – Weighted Returns Comparison between PFMs and Benchmark

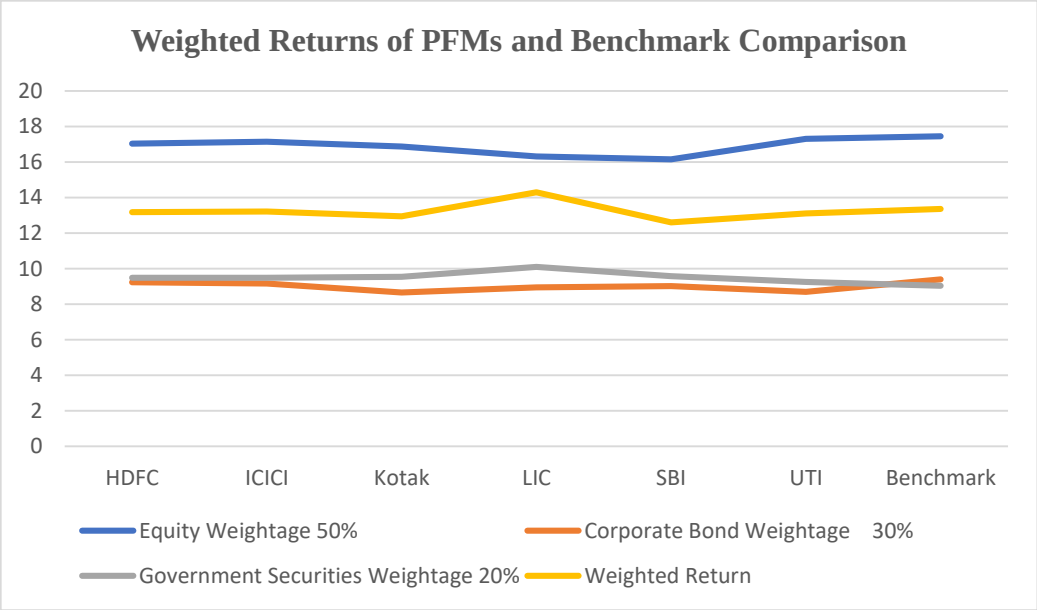

Table V – Comparative Analysis of Pension Fund Managers in NPS Tier I Account

Pension Fund Manager	Equity Weightage 50%	Corporate Bond Weightage 30%	Government Securities Weightage 20%	Weighted Return
HDFC	17.03	9.24	9.49	13.18
ICICI	17.14	9.17	9.48	13.22
Kotak	16.88	8.65	9.54	12.94
LIC	16.31	8.94	10.10	14.29
SBI	16.15	9.01	9.57	12.60
UTI	17.31	8.69	9.25	13.11
Benchmark	**17.45**	**9.40**	**9.04**	**13.35**

(Data Source: https://npstrust.org.in/annual-reports)

Performance Comparison Against Benchmark

- The benchmark weighted return is 13.35%.
- HDFC (13.18%), ICICI (13.22%), and UTI (13.11%) are slightly below the benchmark.
- LIC (14.29%) outperforms the benchmark, showing higher weighted returns.
- Kotak (12.94%) and SBI (12.60%) have the lowest weighted returns, lagging behind.

Equity vs. Overall Returns

- UTI (17.31%) and Benchmark (17.45%) lead in Equity YoY returns.
- SBI (16.15%) has the lowest equity return, impacting its overall weighted return.

Bond & G-Sec Impact on Weighted Returns

- Benchmark has the highest Corporate Bond return (9.40%), improving its performance.
- LIC (10.10%) has the highest G-Sec return, boosting its weighted return.

4.4 Correlation Analysis

Table VI - Correlation Analysis of Pension Fund Managers

Pension Fund Manager	Correlation Coefficient (r)
HDFC	0.87
ICICI	0.92
Kotak	0.79
LIC	0.85
SBI	0.88
UTI	0.91

Interpretation:

- All PFMs show strong positive correlations between NAV growth and AUM growth.
- ICICI and UTI PFMs have the highest correlation coefficients (+0.92 and +0.91), indicating that their NAV growth is highly influenced by AUM growth.

4.5 Coefficient Analysis

Performed linear regression using NAV Growth as the dependent variable and AUM Growth as the independent variable for each PFM.

The regression equation is:

NAV Growth= $\beta 0 + \beta 1 \times$ AUM Growth
Where $\beta 0$: Intercept; $\beta 1$: Coefficient (slope)

Table VII – Coefficient Analysis of Pension Fund Managers

PFM	Intercept ($\beta 0$)	Coefficient ($\beta 1$)
HDFC	13.16	0.00047
ICICI	15.30	0.00100
Kotak	10.14	0.01248
LIC	20.22	0.00308
SBI	10.22	0.00132
UTI	19.22	0.00770

Interpretation

- The slope ($\beta 1$) indicates how much NAV Growth changes for every unit increase in AUM Growth.
- Kotak has the steepest slope (+0.01248), suggesting a stronger sensitivity of NAV Growth to AUM Growth compared to other PFMs.
- HDFC has the lowest slope (+0.00047), indicating a weaker relationship between NAV and AUM growth.

4.6 Model Summary

Table VIII – Model Summary of Pension Fund Managers

Pension Fund Manager	R Square (Goodness of Fit)
HDFC	75%
ICICI	85%
Kotak	62%
LIC	78%
SBI	77%
UTI	83%

Interpretation

- The model summary includes R Square, which measures the proportion of variance in NAV Growth explained by AUM Growth.
- *R*^2 values are high across all PFMs, indicating that AUM growth explains a significant portion of the variation in NAV growth.
- ICICI (R^2=85%) and UTI (R^2=83%) have the best fit models.

4.7 Hypotheses Testing

- Based on the regression coefficients and R2*R*2, we reject H0*H*0 for all PFMs.
- This indicates that AUM growth significantly impacts NAV growth across all six PFMs.

5. Findings and Key Takeaways

The NPS Tier I account for all citizens depicts sluggish NPS subscriber growth in 2024. APY's share in the aggregate subscriber base significantly increased. Robust AUM growth in NPS has resulted in NAV growth across asset classes like Equity, Corporate Bonds, and G-Secs. Analysis further suggests, UTI PFM did exceedingly well in equity and corporate bond returns, whereas Kotak PFM led the G-Sec performance. It points towards strategic asset allocation as a supporting factor towards better risk-adjusted returns.

While NPS new subscribers recorded steady growth, there was a noticeable decline in 2024. The remarkable AUM growth of both NPS and APY schemes has offset the decline in NPS subscriber growth. The rising contribution from APY, highlights their increased financial significance. UTI Pension Fund Manager (PFM) exhibits robust equity performance. LIC has succeeded in beating the benchmark for weighted returns.

Asset Under Management (AUM) growth has depicted a strong positive correlation with Net Asset Value (NAV) growth across all PFMs. It highlights the significance of AUM in driving returns. APY's subscriber growth signifies its critical role in reaching out to low-income and economically sections. Strategic asset allocation has aided in generating superior returns. UTI PFM has outperformed in equity asset class, a balanced perspective across asset classes can yield benchmark beating returns.

The PFM analysis indicates that UTI PFM gave superior returns in equity management, while Kotak excels in G-Secs. All the PFMs exhibit robust correlation between AUM and NAV. It highlights the importance of asset base. It can be construed that strategic asset allocation and efficient asset management significantly impacts performance. PFMs should capture their forte in specific asset classes and customise investment strategies to the requirements and risk appetite of their subscribers. AUM growth significantly impacts NAV growth. It underscores the importance of marketing, subscriber engagement, and service excellence.

Overall, the NPS Tier I account for all citizens presents a well-structured investment framework where equity, corporate bonds, and G-Secs play complement each other in generating better returns. The comparative analysis of asset classes indicates that a diversified perspective is conducive in improving risk-adjusted returns. It makes NPS a feasible long-term retirement investment.

6. Conclusion

The research underscores the National Pension System (NPS) Tier I account as a robust framework for retirement planning. It utilises equity, corporate bonds, and government securities (G-Secs) to deliver risk-adjusted returns. Findings suggest that asset allocation plays a crucial role in enhancing portfolio performance. UTI Pension Fund excelled in equity and Kotak Pension Fund led in G-Secs returns. The robust correlation between Asset Under Management (AUM) growth and Net Asset Value (NAV) highlights the significance of subscriber engagement and strategic asset management. APY's growth reflects its critical role in reaching out to low-income subscribers. NPS persists to attract diverse demographics. It makes NPS and APY viable long-term investment options for financial security during working phase.

7. Implications

Table IX – Theory, Practice, Social, Strategic, and Policy Implications

Implications	Insight I	Insight II	Insight III
Theory	Contributes empirical evidence on asset allocation and performance within a templated framework	Validates portfolio diversification strategies connected to AUM size for fund performance.	Underscores the role of active vs. passive management, focus on equity, corporate bonds, and G-Secs.
Practice	Policymakers and fund managers to prioritize asset allocation strategies for optimizing risk-adjusted returns.	Marketing strategies to focus on enhancing AUM and subscriber engagement.	Awareness for subscribers on asset diversification advantages within NPS portfolios.
Social	APY plays a vital role in enhancing social security coverage for low-income and informal sector workers.	Fosters financial inclusion and curtails income inequality.	Focuses on awareness campaigns for youths to inculcate long-term savings habits.
Strategic	Flexible investment strategies responding to macroeconomic factors (e.g., inflation, interest rates).	Integrating ESG factors into NPS portfolios to calibrate with sustainability goals.	Utilise technology for streamlining subscriber engagement and effective fund management.
Policy	Regulator (PFRDA) to consider incentivising balanced asset allocation models with transparency and cost-efficiency.	Policy innovations like the Unified Pension Scheme (UPS) tackling guaranteed payouts for government employees.	Introduce inflation-linked returns in APY to protect low-income subscribers..

8. Limitations

8.1 Limited Data on Investor Behaviour: The study has limitation in bringing out granular insights into investors adjusting asset allocation when approaching retirement.

8.2 Macroeconomic Factors: The impact of microeconomic indicators like inflation, global cues, and economic shocks on NPS asset classes remains obscure.

8.3 ESG Integration: Inadequate analysis of environmental, social, and governance (ESG) factors by PFMs in NPS investments.

8.4 Liquidity Constraints: The study does not comprehensively tackle liquidity risks associated with corporate bonds compared to other asset classes namely, equities and G-Secs.

8.5 Subscriber Diversity: Insufficient emphasis on the specific needs of youth profiles and informal sector workers.

9. Future Directions

9.1 Dynamic Asset Allocation Models: Studies on flexible strategies linked to dynamic market conditions and subscriber risk appetites for optimizing returns.

9.2 Impact of Tax Policies: Exploring alterations in tax benefits impacting asset class performance and subscriber behaviour.

9.3 Macroeconomic Correlation Studies: Assessing relationship between economic crises and asset class performance within NPS portfolios.

9.4 ESG Integration Trends: Probing the role of ESG factors in NPS investments to calibrate with sustainable development goals.

9.5 Subscriber Awareness Programs: Formulate strategies to create awareness for subscribers on asset diversification advantages for achieving retirement goals efficiently.

Such type of comprehensive approach will aid in enhancing the comprehension of NPS's asset class dynamics. It will also address gaps in policy impact, investor behaviour, and market conditions impacting retirement planning outcomes in India.

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