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A Study on Rupee Cost Averaging Through Flexible SIPs

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Abstract - This research provides an expert-level evaluation of Rupee Cost Averaging (RCA) and its evolution into flexible and value-based Systematic Investment Plan (SIP) models within the Indian equity market from 2000 to 2025. While traditional SIPs have democratized equity participation through a fixed-amount approach, this study analyses the quantitative efficiency of adaptive models that leverage valuation triggers like Price-to-Earnings (P/E) ratios and the Yield Gap. Through an empirical lens, the study identifies a significant "behaviour gap" of 1.5% to 2% annually, wherein retail investors often sabotage mathematical cost-averaging benefits by pausing SIPs during market downturns. Analysis of a 22-year dataset (2003–2024) reveals that intra-month timing specifically aligning SIPs with Futures and Options (F&O) expiry volatility yields a tactical advantage of 0.5% to 2.5% annually. Furthermore, while Value Averaging (VA) generated higher returns in 352 out of 359 analysed Indian companies, the study highlights the practical liquidity constraints that make it more suitable for high-net-worth individuals than salaried retail investors. The findings challenge the industry narrative of consistent 12–15% returns, revealing an empirical 20-year pre-tax CAGR of 6.7% for Nifty 50 SIPs, and provide strategic recommendations for navigating volatility through systematic automation and regime-aware asset allocation.

Key Words: *Systematic Investment Plan, Price-to-Earnings, Value Averaging, Future and Options, Volatility*

1. Introduction

The Indian financial ecosystem has undergone a paradigm shift over the last quarter-century, transitioning from a landscape dominated by physical assets primarily gold and real estate to one characterized by robust retail participation in capital markets. Central to this transformation is the Systematic Investment Plan (SIP), which operationalizes the principle of Rupee Cost Averaging (RCA). RCA is a strategy designed to mitigate the risks associated with market timing by spreading investments over a long-term horizon, thereby lowering the average cost of acquisition through both bull and bear phases.

As the market has matured, the mutual fund industry has introduced sophisticated variants, such as Flex-SIPs and Value Averaging Investment Plans (VIPs). These models move away from the passive "set and forget" nature of traditional RCA, instead utilizing quantitative triggers to dynamically adjust investment amounts based on market valuations. This research aims to provide a comprehensive evaluation of these models, mapping their efficiency against historical Indian economic cycles and the psychological biases that influence investor outcomes.

2. Statement of the Problem

Despite the theoretical and mathematical elegance of Rupee Cost Averaging, retail investors in India frequently experience a "return gap" between their actual portfolio performance and the fund's reported returns. This discrepancy is primarily driven by "investor volatility" the tendency of individuals to make emotion-led decisions during market extremes.

The core problem is twofold. First, there is a lack of alignment between the "Buy Low" principle of RCA and actual investor behaviour; data from NSE and SEBI (2023) indicate that many retail investors increase SIP contributions during market peaks and terminate or pause them during crashes, exactly when the averaging benefit is highest. Second, the industry often markets SIPs using simplified historical return narratives (12–15%), while empirical data for the Nifty 50 suggests a 20-year pre-tax CAGR closer to 6.7%, creating a mismatch in expectations. Furthermore, while flexible and value-based models offer superior theoretical "alpha," their practical implementation is hindered by unpredictable cash flow requirements and a lack of awareness regarding complex triggers like the Yield Gap and P/E multipliers. This research seeks to determine which systematic models truly provide the best risk-adjusted outcomes across Indian economic cycles.

3. Objectives of the Study

The primary objectives of this research are:

1. To evaluate the mathematical efficiency of Rupee Cost Averaging in minimizing the average cost of acquisition within the volatile context of the Indian Nifty 50 index.
2. To compare the performance of traditional fixed-amount SIPs against Flexible SIPs and Value Averaging models, specifically analyzing risk-

adjusted returns using Sharpe, Treynor, and Information Ratios.

3. To identify the impact of quantitative valuation triggers (P/E ratio, P/B ratio, and Yield Gap) on the success of systematic investment plans.
4. To investigate the "Behaviour Gap" among Indian retail investors, focusing on how cognitive biases like loss aversion and herd behaviour sabotage cost-averaging efficiency.
5. To assess the tactical advantage of intra-month timing, particularly comparing the performance of first-trading-day SIPs versus those aligned with F&O expiry price distortions.

4. Review of Literature

The theoretical roots of systematic investing lie in Dollar Cost Averaging (DCA), a concept popularized by Benjamin Graham in *The Intelligent Investor* (1949). Graham posited that consistent investing eliminates the psychological burden of trying to "beat the market". However, early academic responses were mixed. Constantinides (1979) argued that DCA is technically suboptimal in a rational expectations framework because it fails to incorporate all available information at each decision point.

In the Indian context, literature on SIPs is broadly categorized into three dimensions: adoption and awareness, investor behaviour, and performance outcomes.

- **Performance:** Empirical studies by Majumdar et al. (2021) compared RCA with Value Averaging (VA) using a dataset of 359 companies and found that VA yielded higher returns in 352 instances, especially in the consumer goods and financial services sectors. Parulekar (2025) noted that while lump-sum investments (LSI) may outperform SIPs in runaway bull markets, SIPs exhibited lower risk parameters in 19 out of 21 tested scenarios.
- **Investor Behaviour:** Behavioural finance provides critical insights into why RCA often fails in practice. Kahneman and Tversky's Prospect Theory (1979) highlights "loss aversion," which explains why investors feel the pain of market drops more intensely than the pleasure of gains, leading to premature SIP termination during bear markets. Morningstar India (2023) quantified this "behaviour gap" as a 1.5% to 2% annual drag on returns.
- **Timing and Microstructure:** Recent research by Gavhale (2025) has explored the microstructure of the Indian market, finding that SIPs executed on F&O expiry days (last Thursday of the month) outperformed traditional first-day-of-the-month SIPs by 0.5–2.5% annually due to predictable price distortions near option expirations.

5. Mathematical Foundations of Rupee Cost Averaging

Rupee Cost Averaging utilizes market volatility as a tool for cost reduction. Unlike a lump-sum investment where the purchase price is fixed, RCA spreads the investment, ensuring the investor buys more units when prices are low and fewer when prices are high.

5.1 The Harmonic Mean Advantage

Mathematically, the average cost per unit in an RCA strategy is the harmonic mean of the asset prices during the investment period. The arithmetic average of prices is always greater than or equal to the harmonic mean of those prices (). This difference constitutes the "averaging alpha".

Consider a scenario where an investor allocates ₹3,000 monthly for six months in a fluctuating market:

Month	Investment (₹)	NAV per Unit (₹)	Units Purchased
1	3,000	25.00	120.00
2	3,000	22.00	136.36
3	3,000	28.00	107.14
4	3,000	20.00	150.00
5	3,000	23.00	130.43
6	3,000	26.00	115.38
Total	18,000	Average NAV: 24.00	759.31

In this simulation, the average cost per unit is:

The arithmetic average of the NAVs is ₹24.00. The systematic approach saved the investor ₹0.29 per unit, or approximately 1.2% in acquisition costs, purely through the mechanism of price-sensitive unit accumulation.

6. Analysis of Indian Economic Cycles and Market Volatility (2000–2025)

The efficiency of RCA is best evaluated across distinct market regimes. The Indian equity market, as tracked by the Nifty 50, has Delivered a 14.2% annualized total return since 1999, but with a standard deviation (volatility) of 22.9%.

6.1 The Dot-com Bubble and Recovery (2000–2003)

Following the peak in 2000, the Nifty entered a correction phase, hitting a low of approximately 1,000–1,200 points. Investors who started SIPs during this period were accumulating units at historical lows, providing the "base" for the massive wealth creation seen in the subsequent 2003–2007 rally.

6.2 The Global Financial Crisis (2008–2009)

The most severe bear market for Indian equities in the 21st century saw the Sensex plummet from 21,000 to under 9,000 in less than a year. The Nifty 50 drawdown was 51.93% over 408 days. RCA efficiency peaked during this phase; an investor maintaining discipline could double their unit count in early 2009 compared to early 2008, benefiting from the V-shaped recovery where the market doubled again by late 2010.

6.3 The Sideways Consolidation (2010–2013)

During this period, the Nifty remained range-bound (the "lost years"), often making no progress for hundreds of trading sessions. While SIP returns on paper appeared stagnant, RCA was quietly reducing the average purchase price, allowing for significant profit realization when the market finally "broke out" in 2014.

6.4 The COVID-19 Pandemic (2020)

This event was a unique volatility shock, with the Nifty dropping 33.9% in just 33 days. This phase highlighted the "Behaviour Gap" most acutely. Fear led to a record number of SIP cancellations, preventing investors from capturing the lowest NAVs of the decade just before a massive retail-led bull run began in late 2020.

6.5 The 2024–2025 Correction

As of mid-2025, the market has entered a corrective phase. From the September 2024 peak to March 2025, the Nifty 50 has lost 14.6%, with small caps losing up to 24.3%. Alarmingly, half of the SIP accounts opened in 2023 were closed by 2024, representing a continued lack of investor maturity regarding market cycles.

Phase/Metric	2008 GFC	2020 COVID	2022 Inflation	2024-25 Correction
Drawdown	-51.9%	-33.9%	-25.4%	-14.6% (Ongoing)
Duration (Days)	408	33	282	~180
Nifty P/E at Bottom	12.69	~18.0	~20.0	~21.8
SIP Behaviour	High Fear	Extreme Panic	Moderate Worry	Record Closures (48%)

7. Evolution of Systematic Strategies

The limitations of traditional fixed SIPs in optimizing for valuation extremes led to the emergence of flexible models.

7.1 Flexible SIP (Flex-SIP) Mechanics

Flex-SIPs allow investors to vary their contributions based on affordability or market outlook. Major Indian AMCs like SBI, HDFC, and Nippon offer versions where the investor can increase or decrease instalments with short notice.

- **Multiplier Effect:** For example, Nippon India SIP+ uses a proprietary quant model to allocate between 0.3x and 3x of the base amount based on whether the market is bullish or bearish.

7.2 Value Averaging Investment Plan (VIP)

VIPs, based on Michael Edleson's work, aim for a target portfolio value rather than a target investment amount.

- **Scenario A (Market Falls):** If the portfolio value is below the target path, the investor must contribute a much larger sum to close the gap.
- **Scenario B (Market Rises):** If the portfolio exceeds the target, the investor contributes less or potentially redeems units. While VIPs provide superior returns by forcing aggressive buying at the bottom, they require substantial liquid cash buffers, making them more suited for high-net-worth individuals (HNIs).

8. Valuation-Based Triggers and Quantitative Models

The efficiency of flexible models is contingent on the accuracy of the "triggers" used to modify contributions.

8.1 The Price-to-Earnings (P/E) Ratio Trigger

The P/E ratio is the primary barometer for identifying over- or undervaluation in the Nifty 50.

- **Overvalued (>26-28):** Historically, a Nifty P/E above 26 indicates a bubble phase (e.g., 2000, 2007, 2019),

where flexible models would recommend reducing SIP amounts.

- **Undervalued (<15-18):** A P/E below 18 represents high margins of safety (e.g., 2002, 2008, 2011), triggering higher systematic allocations.

8.2 The Yield Gap Model

A more advanced trigger is the Yield Gap, which compares the Equity Earnings Yield (the reciprocal of the P/E ratio) with the 10-year Government Securities (G-Sec) yield.

A positive yield gap suggests equities are cheap relative to bonds, while a negative ("reverse") yield gap indicates that the risk-free return of bonds is more attractive than the earnings potential of stocks.

9. Empirical Performance Evaluation

Analysing performance requires looking beyond simple CAGR to metrics like XIRR and risk-adjusted ratios.

9.1 XIRR: The Definitive Metric

For systematic plans with multiple cash flows, the Extended Internal Rate of Return (XIRR) is the only accurate measure of return, as it accounts for the specific timing and amount of each instalment.

9.2 Fund Comparisons: HDFC vs. Kotak vs. SBI

Data from various Flexi-cap and Value funds illustrates the "alpha" generated by active management of a flexible mandate. For instance, the HDFC Flexi Cap Fund has delivered an XIRR of 21.26% since its inception in 1995, significantly outperforming its benchmark.

Fund	3Y XIRR (%)	Sharpe Ratio	Beta	Alpha
HDFC Flexi Cap Fund	21.78%	1.40	0.78	6.05
ICICI Pru Flexicap Fund	18.52%	1.04	0.89	3.19
Kotak Flexicap Fund	15.47%	0.85	0.93	0.41
SBI Flexicap Fund	12.51%	0.73	0.83	-0.98

The HDFC fund's high alpha (6.05) and low beta (0.78) suggest that active rebalancing across market caps significantly added value over a purely passive systematic index approach.

9.3 The F&O Expiry Timing Advantage

Recent empirical analysis of 22 years of Nifty 50 data (2003–2024) reveals a robust timing advantage. SIPs scheduled on F&O expiry days (typically the last Thursday of the month) outperformed traditional first-trading-day SIPs by 0.5% to 2.5% annually over 1-5year horizons. This outperformance is attributed to institutional position adjustments and temporary liquidity imbalances that often depress prices on expiry days.

10. Behavioural Finance and the "Behaviour Gap"

The primary obstacle to RCA efficiency in India is not market volatility, but "investor volatility."

10.1 Cognitive Biases

- **Loss Aversion:** Investors feel the pain of a 10% drop more than the pleasure of a 10% gain. In 2020, this led to massive redemptions that caused investors to miss the subsequent recovery.
- **Herd Behaviour:** The "IPO rush" for companies like Zomato and Paytm highlights how retail investors ignore research to follow mass sentiment, often entering the market at valuation peaks.
- **Mental Accounting:** Indian investors often categorize money into subjective "buckets," treating bonuses as "free money" for high-risk trading while remaining overly conservative with regular savings.

10.2 The Role of FinTech

Platforms like Groww and Zerodha have democratized access but also introduced "gamified" interfaces that can increase behavioural susceptibility. However, they also offer "nudges" like SIP automation and mandates (OTBM) that help curb these biases.

11. Economic Correlates and Macro Factors

The long-term success of systematic investing in India is tied to the nation's structural growth. India is projected to become the world's third-largest economy with a GDP of $7.3 trillion by 2030.

- **Sectoral Shift:** The Nifty 50 has evolved from being energy-heavy to being dominated by Financial Services (37.4%) and Information Technology (11.2%), making it more reflective of the modern service-oriented economy.
- **Currency Impact:** Depreciation of the Indian Rupee (INR) has historically increased short-term volatility but can boost the performance of export-oriented

sectors like Pharma and IT, providing a natural hedge for diversified SIPs.

12. Practical Challenges in Advanced Systematic Models

While flexible and value-based models are theoretically superior, they face practical hurdles:

1. **Cash Flow Mismatch:** A Value SIP might require a ₹30,000 contribution during a market crash, but a salaried individual may only have a ₹10,000 surplus, leading to a "failed" instalment.
2. **Complexity and Monitoring:** Unlike the "set and forget" fixed SIP, flexible models require more hands-on monitoring or trust in black-box algorithmic triggers.
3. **Risk Over-Averaging:** Aggressive cost-averaging in an underperforming fund (e.g., a thematic fund at a peak) can lead to "throwing good money after bad" if the sector enters a structural decline.

13. Conclusions and Strategic Recommendations

Rupee Cost Averaging remains the most powerful tool for long-term wealth creation for the Indian middle class. However, its effectiveness is more dependent on investor discipline than market movements.

1. **Prioritize Duration Over Entry Points:** The "Cost of Delay" is significantly higher than the impact of starting at a market peak. Investors should start early and stay invested through multiple cycles to benefit from compounding.
2. **Utilize Valuation Triggers for Surplus Capital:** For sophisticated investors with variable income, flexible SIPs with P/E or Yield Gap triggers offer a demonstrable alpha, particularly in the mid-cap and small-cap segments.
3. **Optimize Intra-Month Timing:** Tactical investors should consider scheduling their SIP debits toward the end of the month to capture F&O expiry price distortions.
4. **Combat the Behaviour Gap through Automation:** Use One-Time Bank Mandates (OTBM) to automate investments and remove the temptation to "time the market" based on news or social media trends.
5. **Focus on Asset Allocation:** Combine fixed SIPs for core life goals with flexible models for tactical wealth accumulation, ensuring a balance between stability and growth.

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