Comprehensive Valuation and Analysis of the Nifty 50 Index: Assessing Financial Health and Growth Prospects

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Abstract

This research originates from the increasing need for accurate and forward-looking valuation methods in dynamic and evolving markets like India. It focuses on the valuation of the Nifty50 Index, one of India's most prominent stock market benchmarks, using the Discounted Cash Flow (DCF) approach. By treating the index as a single entity, the valuation simplifies the analysis of its 50 constituent companies, aggregating their earnings, dividends, and buybacks to estimate the intrinsic value. The project aims to assess the financial health and future growth prospects of the Nifty50, providing actionable insights for investors and stakeholders.

The valuation employs the Base Valuation (Recent Data Approach), which integrates the latest financial and macroeconomic data to align with current market conditions. Key inputs include a risk-free rate of 6.92%, an equity risk premium of 1.43%, a 3-year average EPS CAGR of 12.47%, and a total yield of 1.44%. These inputs drive the projection of future cashflows, which are discounted using a cost of equity of 8.35% to derive the intrinsic value.

The analysis reveals an intrinsic value of 27,435, compared to the current Nifty50 level of 24,467.45, classifying the index as undervalued with a potential appreciation of 12.13%. This undervaluation is supported by robust earnings growth, stable shareholder returns, and favorable macroeconomic conditions. Sectoral diversity across Financial Services, Information Technology, and Consumer Goods further strengthens the index's growth prospects.

Scenario analysis demonstrates the sensitivity of valuations to assumptions. While the Base Valuation reflects optimism based on recent trends, a Historical Averages Valuation suggests overvaluation, emphasizing the importance of timeframe selection.

Keywords: Discounted Cash Flow Valuation, Free Cash Flow to Equity, Intrinsic Value, CAPM Model, Terminal Value, Nifty50 Index.

Introduction

The Nifty 50, introduced on April 22, 1996, is one of India's most prominent stock market indices, representing the weighted average of 50 of the largest and most liquid companies listed on the National Stock Exchange (NSE). Its inception marked a significant milestone in the evolution of India's capital markets, offering a comprehensive benchmark for gauging the performance of the nation's equity market. The base date of the Nifty 50 is November 3, 1995, with a base value set at 1,000 points, reflecting India's economic and financial development at that time. Over the years, the index has transitioned to a **free-float market capitalization methodology** in 2009, ensuring that only shares available for trading are considered in its calculation, enhancing its relevance for investors.

Historical Background and Evolution of the Nifty 50

The launch of the Nifty 50 coincided with India's economic liberalization in the early 1990s, a period marked by structural reforms aimed at integrating the Indian economy with global markets. The National Stock Exchange (NSE), established in 1992, sought to modernize the Indian financial markets, replacing traditional outcry systems with electronic trading platforms. The introduction of the Nifty 50 as NSE's flagship index addressed the need for a standardized measure to track the performance of India's largest companies across diverse sectors.

Initially, the Nifty 50 adopted a **full-market capitalization methodology**, calculating the index value based on the total market cap of constituent companies. However, in 2009, it transitioned to the **free-float methodology**, which considers only freely tradable shares, excluding promoter holdings. This change aligned the index with global standards, enhancing its reliability and accuracy as a market barometer.

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Today, the Nifty 50 covers a broad spectrum of industries, including financial services, information technology, consumer goods, pharmaceuticals, and energy. The index has become a benchmark for institutional and retail investors, reflecting over **50% of the total market capitalization** of all NSE-listed stocks.

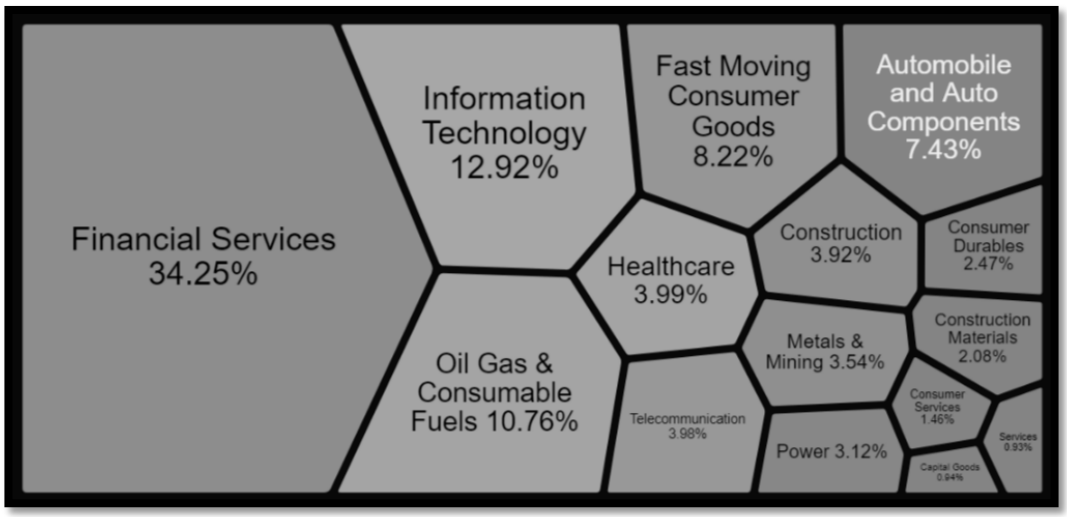

Fig. 3: Sector wise Free Float Market Capitalization in Nifty 50

The Role of Nifty 50 in the Indian Economy and Global Markets

The Nifty 50 has the dual function of measuring the Indian economic condition as well as helping the international investors to determine the trends of India's market. It is essentially an indicator of India's economic health and corporate performance and is commonly used as such globally.

As a Barometer of the Indian Economy

- The Nifty 50 provides a snapshot of India's largest companies that are instrumental to the country's economic output. Made up of sectors including financials, IT, energy and consumer goods, among others, it gives a snapshot of the overall health of the economy.
- When the economy is growing, the index usually shows strong performance while in a recession it usually underperforms hence it is a vital tool for policy makers and analysts.

Facilitating Investments and Risk Management:

- The Nifty 50 is used by mutual funds, portfolio managers and other institutional investors to compare the performance of their portfolio against a standard index. Some of the passive investment instruments like index funds and exchange traded funds (ETFs) follow it to provide diversified investment in the Indian market.
- Derivatives based on the Nifty 50 index like futures and options provide advanced tools for managing risk whereby investors can insure their portfolios or wager on the market's direction.

Global Appeal and Foreign Investments:

- As the economy of India becomes a significant force in the global market, Nifty 50 has been well received by Foreign Institutional Investors (FIIs). It is an efficient and dependable means of accessing the Indian stocks and particularly suits the needs of those who are interested in tapping into one of the most dynamic markets in the world

Context of Valuation

The valuation of the Nifty50 Index aims to provide a deeper understanding of its financial health and future growth potential. This is particularly important in a dynamic market environment characterized by global uncertainties, fluctuating interest rates, and sectoral shifts. By employing the Discounted Cash Flow (DCF) approach, the index is analyzed as a single entity, aggregating metrics such as earnings, dividends, and buybacks from its constituent companies. This approach aligns with global practices for index valuation and simplifies the process while ensuring meaningful insights.

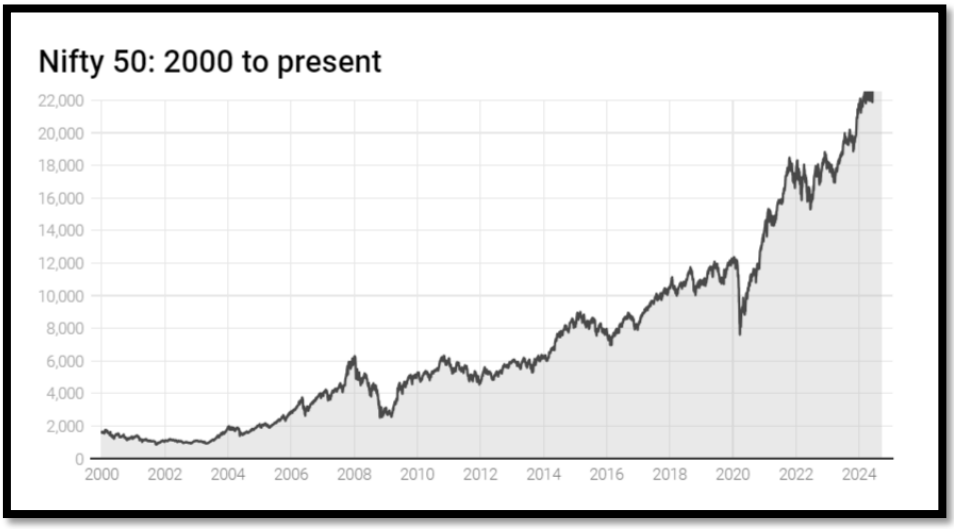

Fig. 4: Historical Performance of Nifty 50 Index (2000–2024)

The chosen valuation date is December 2024, with all data used up to this point. The focus is on estimating the Free Cash Flow to Equity (FCFE) for the index, projecting future cashflows, and discounting them to the present value to arrive at the intrinsic value. Key inputs include the risk-free rate (proxied by the 10-year Indian government bond yield), equity risk premium, and earnings growth rate based on historical trends. A constant terminal growth rate is also assumed for cashflows beyond the forecast period.

This valuation assesses whether the Nifty50 is currently overvalued, undervalued, or fairly valued by comparing its intrinsic value to its market value. It also provides a broader perspective on the sustainability of its returns, driven by macroeconomic factors and sectoral dynamics. The insights derived from this study can serve as a valuable tool for decision-making, enabling stakeholders to gauge the index's investment potential and understand its role in the evolving Indian financial landscape.

Literature Review

Oded, J., & Michel, A. (2007) examined and reconciled four common methods of valuing corporations: adjusted present value (APV), capital cash flows (CCF), cash flows to equity (CFE), and free cash flows to the firm (FCF). The authors argue that inconsistencies in valuation arise from differing assumptions about debt rebalancing policies. They demonstrate that each method can be adjusted for a firm that rebalances its debt and, when done so, all methods produce the same result. The authors conclude that, with consistent application of the debt rebalancing policy, any of the four methodologies can be used to determine a company's value accurately.

Cassia, L., Plati, A., & Vismara, S. (2007) emphasized the importance of carefully considering the length of the explicit forecast period in DCF models. The authors argue that analysts should ensure this period is long enough for a company to exhaust its competitive advantage, reaching a Steady-State where the return on capital equals its cost. They find that valuations can be overly sensitive to the perpetual growth rate used in the Terminal Value if the explicit forecast period doesn't adequately reflect this transition to Steady-State.

Steiger, F. (2010) examined the discounted cash flow (DCF) valuation method, a standard procedure in finance used to determine a company's worth by analyzing the net present value (NPV) of future free cash flows, discounted by the weighted average cost of capital (WACC). The paper explains the steps of the DCF method, using a case study of BASF to highlight the method's sensitivity to inputs like WACC and perpetual growth rate. The author concludes that while the DCF method is valuable, its accuracy depends on the validity of underlying assumptions and suggests using it with other valuation methods.

Panda, S. (2013) compares two common ways to figure out how much a company is worth: the Dividend Discount Model (DDM) and the Free Cash Flow Model (CFM). Researchers wanted to see how well these models work in different situations. They compared the calculated value of the company with the actual price of its stock. The study found that the DDM was better at figuring out the true value of a company than the CFM. However, these models might not work well for new or smaller companies, especially if they don't pay dividends.

Behr, A., Mielcarz, P., & Osiichuk, D. (2018) explored how to calculate the terminal value of a company using the discounted cash flow (DCF) method. The authors argue that traditional DCF models, which assume stable growth, might not be accurate because real-world business environments are very unpredictable. They tested this idea using data from companies listed on the Polish stock market and found that things like revenue, investments, and cash flows change a lot from year to year, making it hard to predict long-term value. The authors suggest that we need to find better ways to calculate terminal value that consider these real-world fluctuations.

Panigrahi, A., Vachhani, K., & Sisodia, M. (2021) examined the discounted cash flow (DCF) model and its application to Exide Industries, a company with potential in the batteryoperated electric vehicle market. The authors emphasize that while the DCF model is a useful tool for evaluating a company's financial health, it's important to be aware of its susceptibility to assumption bias. Even small changes in assumptions can greatly affect valuation outcomes. By adjusting growth and WACC values, the researchers generated bullish, base, and worst-case scenarios with target share prices. The authors highlight the DCF model's value in helping investors make sound trading decisions, despite its limitations.

Arora, T. (2021) explored the Capital Asset Pricing Model (CAPM) and its application to the Indian stock market, specifically the NIFTY 50 index. The study investigates the risk-return relationship of selected NIFTY 50 stocks and aims to determine if CAPM is a useful tool for identifying overvalued and undervalued stocks. The research analyzes stock data from January 2018 to December 2021 and examines the historical performance of individual companies like Adani Ports, Bajaj Finance, and Axis Bank. The paper concludes that CAPM is a valuable tool for investors in the NIFTY 50 market, offering insights into stock pricing and potential investment opportunities. The research also highlights the limitations of CAPM, acknowledging that it focuses solely on the NIFTY 50 and may not be generalizable to other stocks.

Wang, H. (2022) examines different business valuation models and uses the discounted cash flow (DCF) model to evaluate the company Netflix. The study used quantitative and qualitative data to predict financial information for the company over a six-year period, ultimately calculating the weighted average cost of capital (WACC) and the company's overall value. By comparing the calculated enterprise value with the official value, the authors find some differences, which they attribute to the inherent limitations of the DCF model, particularly its reliance on estimations. The paper concludes by suggesting that refining the model and using more precise numerical methods could improve the accuracy of the DCF model in business valuation.

Alfadilla, J., & Dalam, W. W. W. (2023) explored the intrinsic value of stocks in the property and real estate sector listed on the Indonesia Stock Exchange. The authors use two valuation methods: Discounted Cash Flow (DCF) and Relative Valuation (RV). The study analyzes six companies using historical financial data from 2015 to 2019 to project values from 2020 to 2024. The findings suggest that four companies (MTLA, JRPT, DMAS, and CTRA) were undervalued based on both DCF and RV methods. Two companies (MKPI and PPRO) were found to be overvalued. The authors recommend investors use multiple analyses and consider factors beyond financial data when making investment decisions.

Jagannayaki, K., & Lakshmi, T. V. (2024) used a Discounted Cash Flow (DCF) model to project the financial performance of Margin Sentiment Advisorys Limited over five years. The researchers use the company's past three years of financial data to model optimistic and pessimistic scenarios, finding that revenue is projected to increase in both. However, the company also faces rising operating expenses and cost of goods sold, suggesting a need to focus on both revenue growth and cost management strategies to ensure future financial health. The authors acknowledge the work of other researchers on topics like DCF analysis and target price accuracy in financial markets.

Objectives of the Study

1. To provide a comprehensive valuation of the Nifty 50 index using the Discounted Cash Flow (DCF) methodology.
2. To estimate the Intrinsic value of the Nifty 50 and compare it with its current market level.
3. To assess key market factors, including earnings growth, dividend yields, and risk premiums, influencing the valuation.
4. To evaluate the impact of macroeconomic variables such as government bond yields and market volatility on the index's performance.
5. To Compare Valuation Scenarios Using Different Timeframes.

Assumptions in the Valuation Methodology

1. Index Treated as a Collective Entity

- The Nifty 50 is treated as a single company for valuation purposes, aggregating metrics like earnings, dividends, and buybacks.

- Rationale: Simplifies the valuation process and aligns with methodologies used for index valuation.

2. **Proxy for FCFE**

- Free Cash Flow to Equity (FCFE) is approximated using dividends and buybacks, avoiding direct computation of FCFEs for each company.
- Reason: Calculating FCFE for 50 companies (or more in indices like S&P 500) is resource-intensive and less feasible.

3. **Risk-Free Rate**

- Assumed as the 10-year Indian government bond yield instead of adjusting for the country's default spread (CDS).
- Reason: CDS data is unavailable for extended periods (e.g., 15–20 years), and the adjustment's impact on valuation is deemed marginal.

4. **Buyback Data**

- Only 2024 buyback data is used instead of historical data spanning several years.
- Reason: Buybacks are rare in emerging markets like India, and their exclusion has minimal impact on valuation accuracy.

Limitations in the Valuation Methodology

1. **Exclusion of CDS Data**

   Ignoring the country's default spread means the **risk-free rate** might not fully account for sovereign risk, slightly overestimating or underestimating the discount rate.

2. **Terminal Growth Rate**

   Assumes a constant **long-term growth rate** (e.g., 6%) for cashflows after the forecast period. This simplification might not fully capture sectoral dynamics or macroeconomic changes.

Research Methodology

Research Design

The study follows a **descriptive research design**, which focuses on analyzing financial data and understanding patterns and trends in the Nifty50 Index. The research aims to evaluate the intrinsic value of the index using the **Discounted Cash Flow (DCF) model**. Both qualitative and quantitative methods are used, integrating macroeconomic indicators and company-specific metrics to assess financial health and future growth prospects.

Sample Design

The sample consists of financial and macroeconomic data related to the Nifty50 Index and its constituent companies. Key metrics include earnings per share (EPS) growth rate, risk-free rate, equity risk premium, dividend yield, and buyback data.

- **Time Period:** Data from the most recent 3 years was used for the base valuation, while data spanning the last 20 years was analyzed for historical comparisons.
- **Sectors:** The study focuses on the major contributing sectors within the Nifty50 Index, such as Financial Services, Information Technology, and Consumer Goods, to understand their role in the valuation process.

Sampling Method

The study uses a **purposive sampling method** to select relevant financial and economic data. This method ensures that only meaningful data that directly impacts the valuation of the Nifty50 Index is included.

- **Data Sources:** Information was collected from trusted sources like the National Stock Exchange (NSE) and secondary sources, including research articles, financial reports, and datasets from reliable online platforms.
- This approach ensures that the sample is highly specific to the research objectives, improving the reliability of the findings.

Valuation Methodology

Methodology for Valuation of Nifty50 Using the Discounted Cash Flow (DCF) Approach

The valuation of the Nifty50 Index applies the Discounted Cash Flow (DCF) approach, treating the index as a collective entity. This method determines the intrinsic value of the index by projecting future cashflows to equity holders and discounting them to their present value. The process is divided into the following steps:

Step 1: Define the Cashflows

- **Free Cash Flow to Equity (FCFE):** The cashflows available to equity shareholders are calculated. Instead of deriving FCFE for each individual company in the index, dividends and buybacks are used as proxies for cashflows.
- **Rationale:** Aggregating dividends and buybacks simplify the valuation and aligns with the long-term nature of shareholder returns.

Step 2: Estimate the Earnings Growth Rate

- **Growth Rate Determination:** The earnings growth rate is estimated based on historical data such as EPS growth trends or P/E ratio trends for the Nifty50 index.
- **Stable Projection:** Averages over different timeframes (e.g., 3, 5, 7, and 10 years) are considered to ensure reliable growth rate estimation.

Step 3: Determine the Discount Rate (Cost of Equity)

The **Capital Asset Pricing Model (CAPM)** is used to calculate the discount rate:

Cost of Equity = Risk-Free Rate + (Beta × Equity Risk Premium)

- **Risk-Free Rate:** The yield on the 10-year Indian government bond is used as a proxy for stable returns.
- **Beta:** The beta is set to 1, as the Nifty50 index represents the overall market.
- **Equity Risk Premium (ERP):** The ERP reflects the additional return required by investors for the risk of equity investments.

Step 4: Project Future Cashflows and Terminal Value

- **FCFE Forecast:** Future FCFEs are projected by applying the earnings growth rate to the base FCFE for a forecast period (e.g., 3–5 years).
- **Terminal Value:** After the forecast period, the terminal value is calculated using the **Gordon Growth Model:**

$$\text{Terminal Value} = \frac{\text{FCFE}_{(n+1)}}{\text{Cost of Equity} - \text{Terminal Growth Rate}}$$

- A constant long-term growth rate is assumed to project terminal cashflows.

Step 5: Discount the Cashflows to Present Value

- **Present Value of Cashflows:** All projected FCFEs and the terminal value are discounted to their present value using the Cost of Equity calculated earlier.
- **Formula:**

$$\text{PV} = \frac{\text{Cashflow}}{(1 + \text{Cost of Equity})^{t}}$$

Where t is the year in the forecast period.

Step 6: Compare Intrinsic Value to Current Index Value

- The intrinsic value of the Nifty50 index is obtained by summing the present values of projected FCFEs and the terminal value.
- **Classification:** The index is classified as:
  - **Overvalued:** If intrinsic value < current index value.
  - **Undervalued:** If intrinsic value > current index value.
  - **Fairly Valued:** If intrinsic value ≈ current index value.

Approach of the Valuation

The valuation of the Nifty50 Index is conducted using the Discounted Cash Flow (DCF) approach, treating the index as a single collective entity, similar to a company. The DCF methodology estimates the intrinsic value of the index by projecting its future cashflows (approximated as dividends and buybacks) and discounting them to the present value using the cost of equity. Below is the detailed breakdown of the valuation:

A. Treating Nifty50 as a Single Entity

The Nifty50 Index is considered as a single corporate entity to simplify the valuation process:

- **Index Level as Share Price**: The Nifty50 level (e.g., 24,467.45) is treated as the index's "share price."
- **Consolidated Financial Metrics**: Aggregated earnings, dividends, and buybacks of the index constituents are used as proxies for cashflows to equity holders.
- This approach aligns with global practices for index valuation and simplifies the analysis of 50 companies into a unified framework.

B. Historical Data Analysis and Key Inputs

To calculate the intrinsic value, detailed historical data from 1999 to 2024 was analyzed and processed. These inputs form the foundation of the valuation model:

1. EPS Growth

- **Calculation**: Using the Nifty50's historical yearly average levels and P/E ratios, the EPS for each year was calculated. The growth rates of EPS were determined over various periods to understand long-term trends.
- **Derived Data**:
  - **3-Year Average EPS CAGR**: 12.47%
  - **5-Year Average EPS CAGR**: 11.71%
  - **7-Year Average EPS CAGR**: 11.02%
  - **10-Year Average EPS CAGR**: 10.27%
- **Significance:** The 3-year average EPS CAGR (12.47%) is used as the expected growth rate for projecting future cashflows.

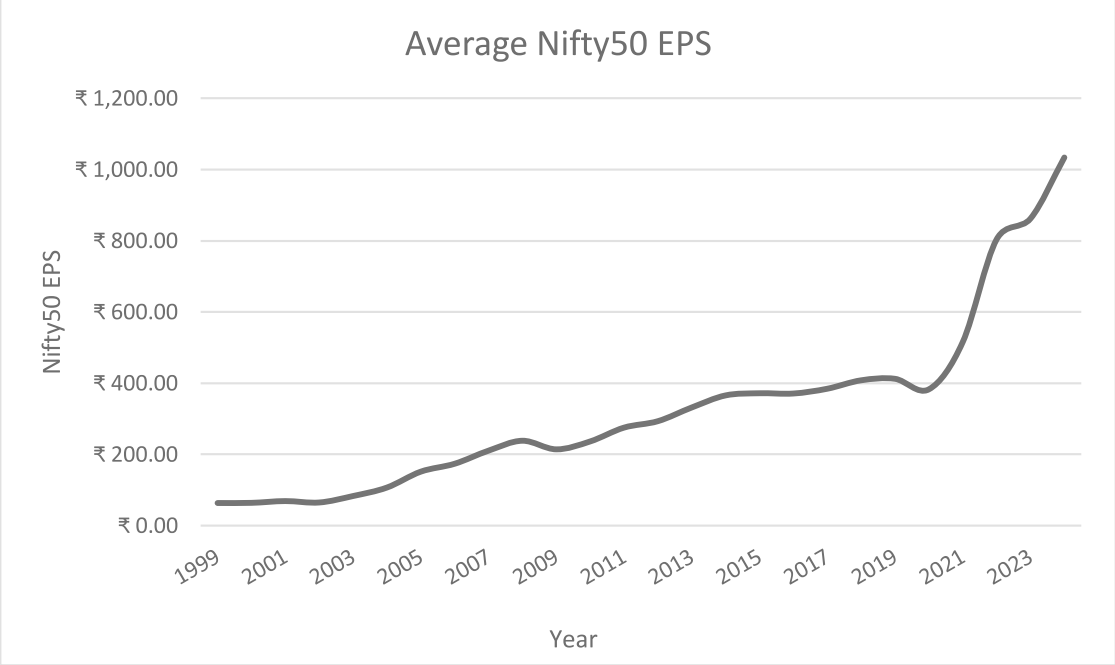

Fig. 5: Historical Growth of Nifty50 Earnings Per Share (EPS): 1999–2024

C. Earnings Yield (Dividends + Buybacks)

- **Calculation**:
  - Dividend data was sourced from NSE, and buybacks were calculated as 11.19% of dividends (based on data from Prof. Aswath Damodaran's website).
  - Total earnings = Dividends + Buybacks.
  - Nifty50 earnings yield was calculated as:

$$\text{Earnings Yield} = \frac{\text{Total Earnings}}{\text{Nifty50 Level}}$$

- **Derived Data**:
  - **3-Year Average Earnings Yield**: 1.44%\
  - **5-Year Average Earnings Yield**: 1.43%
  - **7-Year Average Earnings Yield**: 1.41%
  - **10-Year Average Earnings Yield**: 1.42%
  - **20-Year Average Earnings Yield**: 1.47%

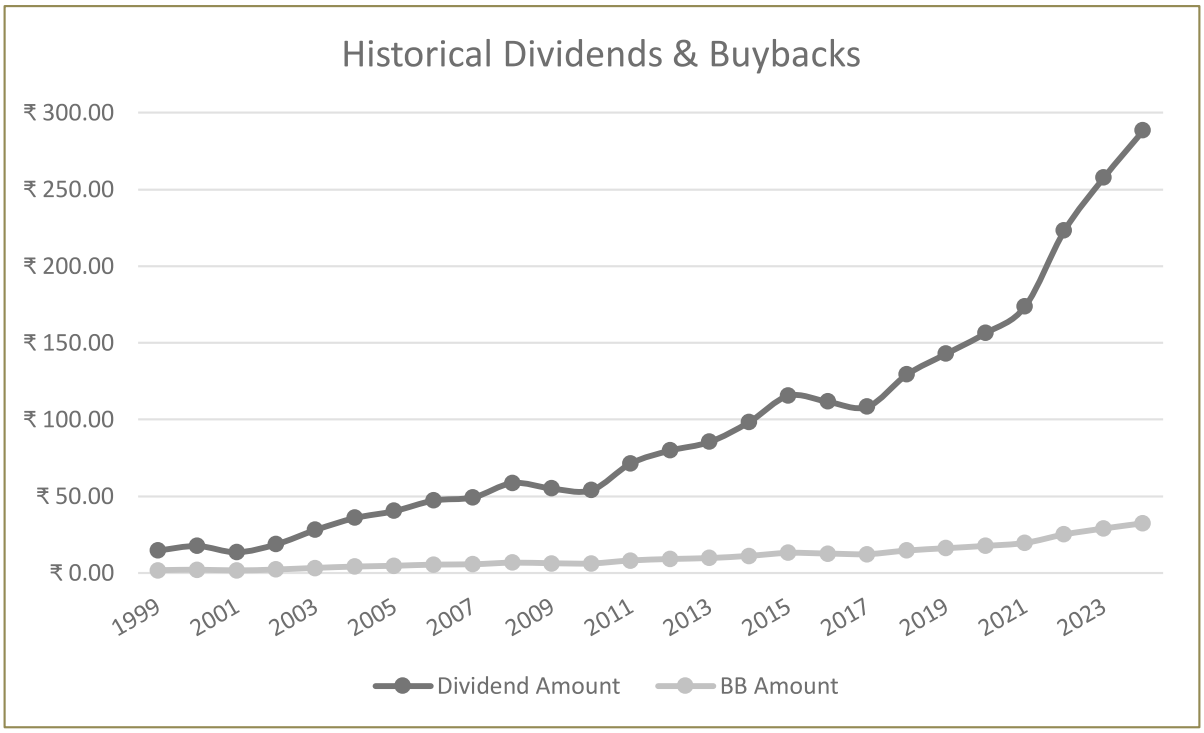

Fig. 6: Historical Trends in Nifty50 Dividends and Buybacks (1999–2024)

D. Risk-Free Rate

The risk-free rate represents the minimum return an investor expects from an investment with no risk of financial loss. It is typically based on the yield of long-term government bonds, such as the 10-year Indian Government Bond Yield, which is considered a reliable proxy for stable returns in the Indian context. In this valuation, the risk-free rate is 6.92%, reflecting current macroeconomic conditions. A lower risk-free rate reduces the cost of equity, increasing the present value of future cashflows and positively impacting the intrinsic value of the index.

- **Calculation**: The 10-year Indian government bond yield was analyzed using monthly data from 1999 to 2024.

Derived Data:

- **20-Year Average**: 7.43%
- **15-Year Average**: 7.41%
- **7-Year Average**: 6.90%
- **5-Year Average**: 6.73%
- **Latest (2024)**: 6.92%

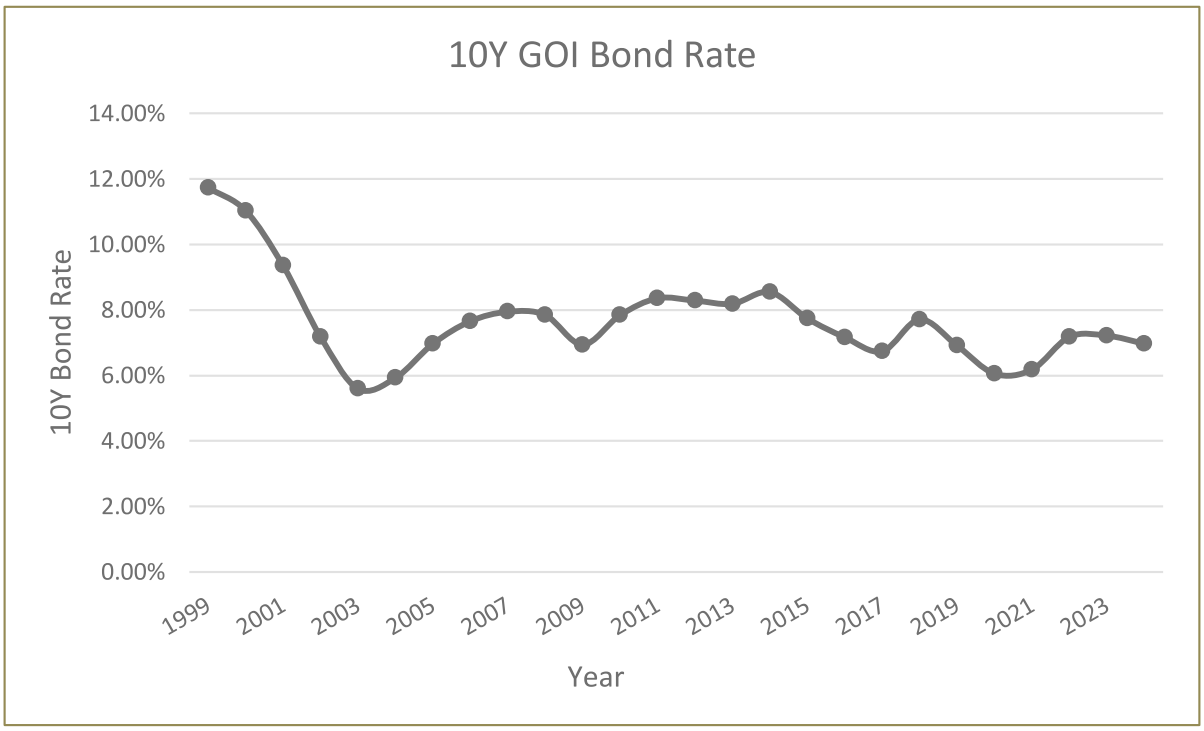

Fig. 7: Historical Trends in 10-Year GOI Bond Yields (1999–2024)

E. Equity Risk Premium (ERP)

The equity risk premium (ERP) is the additional return investors expect for investing in a riskier equity market instead of risk-free investments. It reflects the perceived riskiness of equities and varies depending on economic and market conditions. In this valuation, the latest implied ERP is 1.43%, indicating reduced market risk perception and strong investor confidence. A lower ERP decreases the cost of equity, enhancing the valuation of the Nifty50 Index by boosting the discounted value of projected cashflows.

Calculation: ERP was sourced from implied market risk premium data from 1999 to 2024.

Derived Data:

- **20-Year Average ERP**: 2.72%
- **15-Year Average ERP**: 2.30%
- **7-Year Average ERP**: 1.73%
- **5-Year Average ERP**: 1.70%
- **Latest ERP**: 1.43%

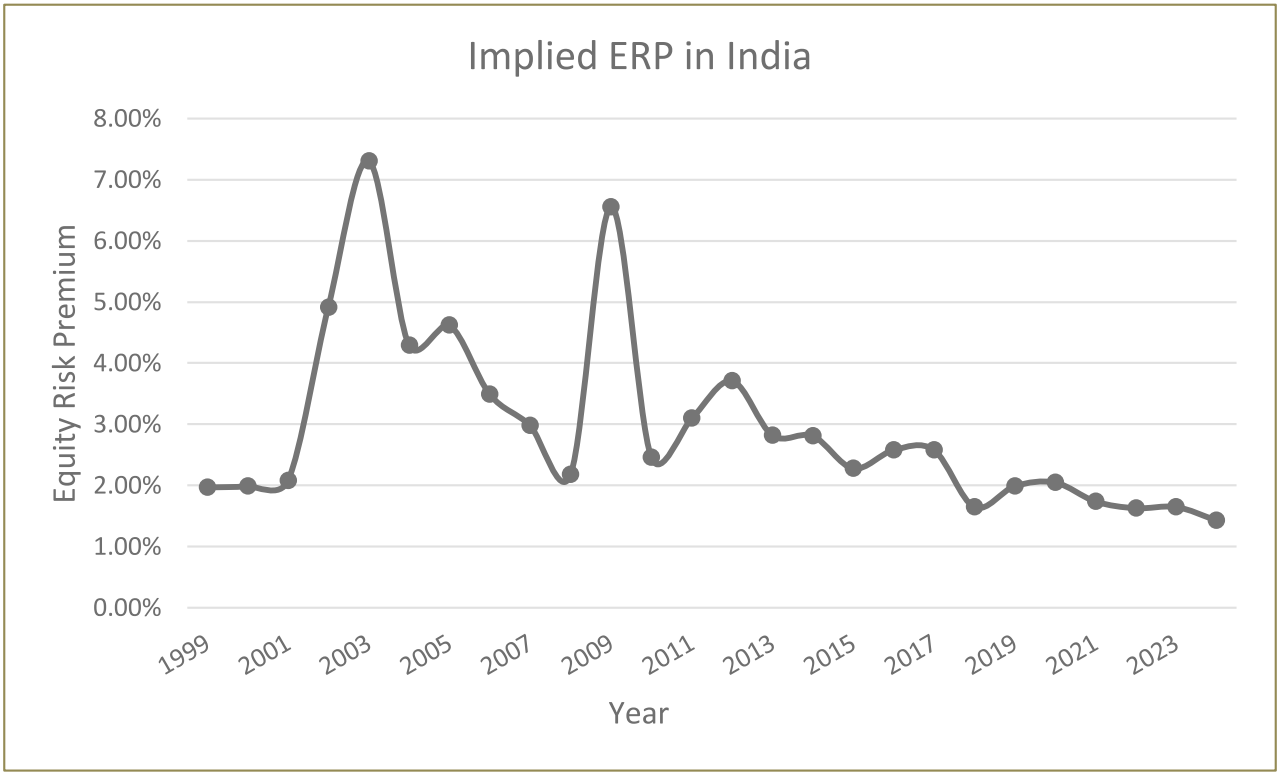

Fig. 8: Implied Equity Risk Premium Trends in India (1999–2024)

F. Beta

Beta measures the volatility of an asset or portfolio compared to the overall market. For the Nifty50 Index, Beta is assumed to be 1, as it represents the market as a whole. A Beta of 1 indicates that the index moves in tandem with the market, with no additional or reduced volatility. This assumption ensures the cost of equity calculation aligns with the Nifty50's role as a market benchmark.

G. Projection of Future Cashflows

Future cashflows were projected using the following methodology:

- **Formula for Cashflows:**
  Cashflows (Year t) = (Current Nifty50 Level x Total Yield) x (1 + Expected Growth)^t
- **Total Yield:** 3-Year Average Earnings Yield = 1.44%.
- **Expected Growth:** 3-Year Average EPS CAGR = 12.47%.
- **Projection Period:** Cashflows were projected for 10 years (2025–2034). Beyond 2034, the terminal value was calculated using the Gordon Growth Model.
- **Terminal Value Formula:**

$$\text{Terminal Value} = \frac{\text{Cashflows (2035)}}{\text{Cost of Equity} - \text{Perpetual Growth Rate}}$$

- **Perpetual Growth Rate:** 6% (aligned with India's long-term GDP growth).

Year	Projected Cashflows
2025	₹ 396.78
2026	₹ 446.25
2027	₹ 501.87
2028	₹ 564.43
2029	₹ 634.79
2030	₹ 713.92
2031	₹ 802.92
2032	₹ 903.00
2033	₹ 1,015.57
2034	₹ 1,142.16
Terminal Value	₹ 51,474.98

H. Discounting Cashflows to Present Value

The projected cashflows and terminal value were discounted to present value using the Cost of Equity as the discount rate:

- **Cost of Equity Formula (CAPM):**
  Cost of Equity = Risk-Free Rate + (Beta × Equity Risk Premium)
- Risk-Free Rate: 6.92%.
- Beta: 1 (market representative).
- ERP: 1.43%.
- **Discounting Formula:**

$$\mathbf{PV\left(Year\ t\right) = \frac{Cashflows\left(Year\ t\right)}{\left(1 + Cost\ of\ Equity\right)^{t}}}$$

Year	Projected Cashflows	Discount Factor	Present Value (PV)
2025	₹ 396.78	0.9229	₹ 366.20
2026	₹ 446.25	0.8518	₹ 380.10
2027	₹ 501.87	0.7861	₹ 394.53
2028	₹ 564.43	0.7255	₹ 409.51
2029	₹ 634.79	0.6696	₹ 425.06
2030	₹ 713.92	0.6180	₹ 441.19
2031	₹ 802.92	0.5704	₹ 457.94
2032	₹ 903.00	0.5264	₹ 475.33
2033	₹ 1,015.57	0.4858	₹ 493.37
2034	₹ 1,142.16	0.4484	₹ 512.10
2034 - ∞ (Terminal Value)	₹ 51,474.98	0.4484	₹ 23,079.52

I. Intrinsic Value and Comparison

- **Intrinsic Value Calculation**:
  Intrinsic Value = Sum of PV of Projected Cashflows + PV of Terminal Value
- **Intrinsic Value**: 27,435.
- **Current Nifty50 Level**: 24,467.45.
- **Result**: The index is undervalued by **12.13%**, indicating a potential appreciation.

J. Result Interpretation

The Base Valuation suggests that the Nifty50 is undervalued, with significant upside potential. This indicates favorable investment opportunities, driven by strong EPS growth and stable cashflows in the form of dividends and buybacks. The analysis also highlights the robustness of the Indian equity market, supported by its long-term GDP growth.

Valuing the NSC Nifty50 Index			27434.87
Key Inputs		**Assumptions**	
Date	04-12-2024	04-12-2024	
Current Nifty50 Level	24467.45	24467.45	**Undervalued**
Total Yield	3 Years	1.44%	**The market implied fair value of Nifty 50 is 27435. The Nifty50 is currently trading at 24468. A 12.13% appreciation is expected from this level.**
Expected Growth	3 Years	12.47%	
Risk-Free Rate	Latest	6.92%	
Equity Risk Premium	Latest	1.43%	
Cost of Equity		8.35%	
Year	**Expected Dividends and Buybacks**	**Cumulative PV factor (Risk-Free Rate + Equity Risk Premium)**	**Present Value of Expected Dividends and Buybacks**
2025	₹ 396.78	0.9229	₹ 366.20
2026	₹ 446.25	0.8518	₹ 380.10
2027	₹ 501.87	0.7861	₹ 394.53
2028	₹ 564.43	0.7255	₹ 409.51
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2034 - ∞	₹ 51,474.98	0.4484	₹ 23,079.52

Fig. 9: Excel Valuation Model for Nifty50 Index (Base Valuation)

Data/Valuation Analysis

The Base Valuation (Recent Data Approach) for the Nifty50 Index provides an in-depth understanding of its financial position and future growth potential. This analysis focuses on interpreting the valuation results, the factors driving the intrinsic value, and their implications for investors. By reflecting recent market conditions, this approach offers a forward-looking perspective.

A. Intrinsic Value vs. Current Index Level

- The intrinsic value of the Nifty50 Index is calculated as ₹27,435.
- The current Nifty50 level as of the valuation date is ₹24,467.45.
- Classification: The index is undervalued, with an expected potential appreciation of 12.13%.
    - This undervaluation signals that the market has not fully priced in the strong earnings growth and consistent shareholder returns of the Nifty50 companies.

B. Key Drivers of Intrinsic Value

The valuation results are primarily driven by the following factors:

1. **Earnings Growth (Expected Growth)**
    - The 3-year average EPS CAGR of 12.47% forms the cornerstone of this valuation.

- This high growth rate reflects strong financial performance and operational efficiency among Nifty50 companies, indicating their ability to generate increasing cashflows.
- Sectors such as Information Technology, Financial Services, and Consumer Goods have contributed significantly to this growth, driven by innovation, demand resilience, and macroeconomic factors.

Implication:

- A high expected growth rate enhances the intrinsic value, as it boosts projected cashflows over the forecast period.
- Investors can expect sustained earnings growth, making the Nifty50 a promising investment.

2. Total Yield (Dividends + Buybacks)

- The total yield, derived from the average dividend and buyback yields over the last three years, is 1.44%.
  - Dividend yields indicate the ability of companies to reward shareholders with consistent payouts.
  - Buybacks (11.19% of dividends) highlight management confidence in their companies' future prospects and contribute to shareholder value.

Implication:

- Although the total yield is modest compared to developed markets, it reflects the long-term potential of Indian companies to distribute earnings to shareholders.
- The combined yield strengthens the FCFE proxy, ensuring realistic cashflow projections.

3. Favorable Macroeconomic Conditions

- The latest risk-free rate of 6.92% reflects stable economic conditions and manageable inflation levels in India.
- A low equity risk premium (ERP) of 1.43% further underscores investor confidence in the Indian equity market.
  - The ERP's decline over time indicates reduced perception of risk and increased willingness of investors to participate in the market.

Implication:

- Favorable macroeconomic factors lower the discount rate (cost of equity = 8.35%), increasing the present value of future cashflows and driving up the intrinsic value.

4. Terminal Value Contribution

- The terminal value constitutes approximately 84% of the total intrinsic value of ₹27,435.
  - This highlights the importance of long-term growth assumptions in the valuation, especially for an index like Nifty50, where growth sustainability across sectors plays a vital role.

C. Comparison with Historical Averages

This valuation approach uses recent data, reflecting current market trends. Comparing it with historical averages highlights the following:

- Higher Expected Growth: Recent EPS growth (12.47%) outpaces the 10-year historical average of 10.27%, indicating stronger financial performance in the current period.
- Lower Discount Rate: The current risk-free rate (6.92%) and ERP (1.43%) are lower than their 20-year averages (7.43% and 2.72%, respectively), making valuations more optimistic.
- Improved Yield: Although the total yield (1.44%) aligns closely with historical averages, buybacks have gained prominence, signaling increased shareholder-centric policies.

Implication

- Recent data highlights a favorable market environment, with strong earnings growth, stable macroeconomic conditions, and increasing shareholder returns driving intrinsic value.

Scenario Analysis: Impact of Timeframe on Valuation Results

Comparing Valuations Based on Recent vs. Long-Term Historical Data

The valuation of the Nifty50 Index was conducted using two distinct scenarios to assess its intrinsic value under different assumptions. These scenarios are differentiated by the timeframes used for key inputs such as the risk-free rate, equity

risk premium, earnings growth, and total yield. The results highlight how changing the timeframe for historical data impacts the valuation outcome and the classification of the index.

Scenario 1: Base Valuation (Recent Data Approach)

This valuation approach represents an **ideal condition or a "Current Market Conditions Valuation"**. It uses the latest data from the past three years, reflecting the current economic environment and recent market trends. The objective is to determine the intrinsic value of the Nifty50 index based on the most up-to-date financial and macroeconomic inputs.

- **Inputs for Valuation:**
  - **Risk-Free Rate:** Latest 10-Year Government Bond Yield = 6.92%.
  - **Equity Risk Premium:** Latest Implied ERP = 1.43%.
  - **Expected Growth:** Average EPS CAGR (3 years) = 12.47%.
  - **Total Yield:** Average Nifty50 Earning Yield (3 years) = 1.44%.
- **Results:**
  - The intrinsic value of the Nifty50 index = ₹ 27,435.
  - Current Nifty50 Level = ₹24,467.45.
  - **Classification:** The index is undervalued, with a potential appreciation of **12.13%** from current levels.

This valuation is ideal for reflecting the present market conditions, providing investors with a forward-looking perspective based on recent financial and economic parameters.

Scenario 2: Historical Data Valuation (Long-Term Approach)

This alternative approach, referred to as the **"Historical Averages Valuation,"** uses the longest available historical data to represent a more conservative and long-term perspective of the Nifty50 index. This scenario incorporates 20 years of historical averages, smoothing out short-term fluctuations and focusing on long-term trends.

Valuing the NSC Nifty50 Index			12886.22
Key Inputs		**Assumptions**	
Date	04-12-2024	04-12-2024	
Current Nifty50 Level	24467.45	24467.45	**Overvalued**
Total Yield	20 Years	1.47%	**The market implied fair value of Nifty 50 is 12887. The Nifty50 is currently trading at 24468. A 47.33% correction is expected from this level.**
Expected Growth	10 Years	10.27%	
Risk-Free Rate	20 Years	7.43%	
Equity Risk Premium	20 years	2.72%	
Cost of Equity		10.15%	
Year	**Expected Dividends and Buybacks**	**Cumulative PV factor (Risk-Free Rate + Equity Risk Premium)**	**Present Value of Expected Dividends and Buybacks**
2025	₹ 395.45	0.9079	₹ 359.02
2026	₹ 436.08	0.8243	₹ 359.44
2027	₹ 480.88	0.7483	₹ 359.86
2028	₹ 530.29	0.6794	₹ 360.28
2029	₹ 584.77	0.6168	₹ 360.71
2030	₹ 644.85	0.5600	₹ 361.13
2031	₹ 711.11	0.5084	₹ 361.55
2032	₹ 784.17	0.4616	₹ 361.97
2033	₹ 864.73	0.4191	₹ 362.39
2034	₹ 953.58	0.3805	₹ 362.82
2034 - ∞	₹ 24,382.58	0.3805	₹ 9,277.04

Fig. 10: Excel Valuation Model for Nifty50 Index (Historical Data Valuation)

risk premium, earnings growth, and total yield. The results highlight how changing the timeframe for historical data impacts the valuation outcome and the classification of the index.

Scenario 1: Base Valuation (Recent Data Approach)

This valuation approach represents an **ideal condition or a "Current Market Conditions Valuation"**. It uses the latest data from the past three years, reflecting the current economic environment and recent market trends. The objective is to determine the intrinsic value of the Nifty50 index based on the most up-to-date financial and macroeconomic inputs.

- **Inputs for Valuation:**
  - **Risk-Free Rate:** Latest 10-Year Government Bond Yield = 6.92%.
  - **Equity Risk Premium:** Latest Implied ERP = 1.43%.
  - **Expected Growth:** Average EPS CAGR (3 years) = 12.47%.
  - **Total Yield:** Average Nifty50 Earning Yield (3 years) = 1.44%.
- **Results:**
  - The intrinsic value of the Nifty50 index = ₹ 27,435.
  - Current Nifty50

Inputs for Valuation:

- **Risk-Free Rate:** Average Rate (20 years) = 7.43%.
- **Equity Risk Premium:** Average Implied ERP (20 years) = 2.72%.
- **Expected Growth:** Average EPS CAGR (10 years) = 10.27%.
- **Total Yield:** Average Nifty50 Earning Yield (20 years) = 1.47%.
- **Results:**
  - The intrinsic value of the Nifty50 index = ₹12,887.
  - Current Nifty50 Level = ₹24,467.45.
  - **Classification:** The index is overvalued, with a potential correction of **47.33%** expected from current levels.

Interpretation and Implications

The two scenarios provide contrasting views of the Nifty50 Index valuation:

1. **Base Valuation (Current Market Conditions Valuation):** This approach assumes recent market trends and conditions as the basis, providing a forward-looking valuation ideal for short- to medium-term decision-making.
2. **Historical Averages Valuation:** This approach offers a more conservative, long-term perspective, accounting for historical cycles and broader trends. It helps investors understand the index's valuation under less optimistic assumptions.

The significant difference in results between the two scenarios demonstrates how market valuations can vary based on the chosen timeframe for key inputs. While the **Base Valuation** suggests the index is undervalued and presents growth potential, the **Historical Averages Valuation** indicates overvaluation, emphasizing the need for caution.

Findings and Interpretation

1. **Intrinsic Value vs. Current Market Value**
   - **Intrinsic Value of Nifty50 Index:** ₹27,435
   - **Current Market Level (as of the valuation date):** ₹24,467.45
   - **Result:** The index is undervalued, with a potential appreciation of **12.13%** from current levels.
     - This indicates that the market has not fully factored in the strong earnings growth and consistent shareholder returns of Nifty50 companies.

   Interpretation: The undervaluation presents an attractive investment opportunity, highlighting the index's potential for further growth.
2. **Robust Earnings Growth**
   - The **3-year average EPS CAGR** of the Nifty50 Index is **12.47%**, reflecting strong and consistent earnings growth over the recent period.

- This growth is driven by key sectors such as Financial Services, Information Technology, Consumer Goods, and Pharmaceuticals.

Interpretation: The high earnings growth rate indicates financial stability and operational efficiency across the index's constituent companies. This positions the index for sustained performance and value generation for investors.

3. **Stable Shareholder Returns (Dividends + Buybacks)**
   - **3-Year Average Total Yield:** 1.44%
     - **Dividend Yield:** Majority of the returns come from dividends, reflecting the companies' commitment to rewarding shareholders.
     - **Buybacks as a Percentage of Dividends:** 11.19%, highlighting management confidence in long-term growth.

   Interpretation: While modest compared to developed markets, the total yield showcases the index's ability to provide consistent returns to shareholders, enhancing its attractiveness as a long-term investment.

4. **Favorable Macroeconomic Environment**
   - **Risk-Free Rate:** Latest 10-Year Government Bond Yield = **6.92%**
   - **Equity Risk Premium (ERP):** Latest implied ERP = **1.43%**
   - **Cost of Equity (Ke):** Calculated at **8.35%**, reflecting a low discount rate.

   Interpretation: The stable macroeconomic environment, reflected in a low risk-free rate and ERP, reduces the cost of equity. This increases the present value of future cashflows, positively impacting the index's intrinsic value.

5. **Terminal Value Contribution**
   - The **terminal value** accounts for **83.97%** of the intrinsic value of ₹27,435.
   - This is based on a perpetual growth rate of **6%**, aligned with India's long-term GDP growth.

   Interpretation: The significant contribution of the terminal value highlights the importance of long-term growth assumptions. It reflects investor confidence in sustained economic expansion and the resilience of Nifty50 companies.

6. **Scenario Analysis**
   - **Base Valuation (Recent Data Approach):** Intrinsic value = ₹27,435; Current level = ₹24,467.45; Potential upside = **12.13%**.
   - **Historical Averages Valuation (Long-Term Data Approach):** Intrinsic value = ₹12,887; Current level = ₹24,467.45; Potential downside = **47.33%**.

Interpretation :

The contrasting results highlight the sensitivity of valuations to the choice of inputs and timeframes. While the **Base Valuation** aligns with current market conditions, the **Historical Averages Valuation** adopts a conservative, long-term perspective. This emphasizes the need for careful consideration of assumptions in investment decisions.

Conclusion

The valuation of the Nifty50 Index using the **Discounted Cash Flow (DCF) approach** provides a comprehensive understanding of its intrinsic value, financial health, and growth potential. By treating the index as a single entity, this project simplifies the complexities of analyzing 50 diverse companies while maintaining the robustness of the valuation process.

The **Base Valuation (Recent Data Approach)** reflects the current market conditions, incorporating the latest financial and macroeconomic data. The intrinsic value of the Nifty50 Index was determined to be **27,435**, compared to its current level of **24,467.45**, indicating that the index is **undervalued** with an expected potential appreciation of **12.13%**.

The analysis highlights a **3-year average EPS CAGR of 12.47%**, demonstrating strong and sustainable growth among the Nifty50 companies. The low **risk-free rate (6.92%)** and **equity risk premium (1.43%)** indicate stable economic conditions and reduced perceived market risk, resulting in a cost of equity of **8.35%** that supports the intrinsic value calculation.

The terminal value, contributing approximately **84%** to the intrinsic value, underscores the significance of long-term growth expectations. However, scenario analysis reveals the sensitivity of valuations to assumptions. While the Base Valuation indicates undervaluation, a Historical Averages Valuation using long-term data suggests overvaluation, emphasizing the importance of timeframe selection in investment decisions.

In conclusion, the Nifty50 Index reflects India's economic growth and resilience, offering a well-diversified portfolio with significant growth potential. This project reinforces the index's position as a key benchmark for the Indian equity market, providing valuable insights for investors and stakeholders seeking medium- to long-term returns in a dynamic market environment.

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