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"Analysis of Stock Price Trends by Polynomial Models: Empirical Study of Indian Banking, Auto, and Pharma Sectors"

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Abstract - *This research paper analyzes the stock price behavior of three major Indian companies — State Bank of India (SBI), Maruti Suzuki India Ltd., and Sun Pharmaceutical Industries Ltd. — through the application of mathematical modeling techniques. Historical stock price data was studied using Excel-based trendline tools to identify best-fit equations that represent the movement of each stock over time. The analysis revealed that SBI and Maruti stocks followed quadratic trends, reflecting steady growth patterns influenced by macroeconomic factors and sectoral stability. In contrast, Sun Pharma followed a cubic trend, indicating more complex fluctuations shaped by global pharma dynamics, regulatory events, and market cycles. The study further examines the relevance of the Efficient Market Hypothesis (EMH) in the context of these stocks, suggesting that while SBI and Maruti largely align with semi-strong market efficiency, Sun Pharma reflects partial inefficiency due to information asymmetry and event-driven volatility. By combining quantitative modeling with theoretical finance, this paper provides insights into how different sectors behave in the Indian equity market and how mathematical tools can aid in forecasting and investment decisions*.

Key Words: Stocks, trends, EMH, Mutual funds

1. INTRODUCTION:

The stock market in India acts as a barometer for the economy and gauges investor confidence. It is one of the fastest-growing economies in the world, having achieved a remarkable milestone in the capital markets since the economic liberalization in the 1990s. The two principal stock exchanges - Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) serve as India's financial system backbone as they facilitate the seamless flow of funds, liquidity provision to every sector, and foster corporate growth. India's stock market has transformed from fragmented manual trading to an electronically linked, sophisticated system with global integration and stringent regulations.

Agencies like SEBI have responsive policies that support enhanced transparency, protective measures for investors, and overall increased efficiency of the market aid greatly to regulating agency effectiveness. As such, diverse categories of investors—retail, institutional, and foreign—have been drawn to the Indian markets, which now feature various financial instruments such as equities, derivatives, mutual funds, and exchange-traded funds (ETFs).

In addition, with the growth of retail investors, increased levels of digitalization, and integration into global markets, the Indian stock market is poised for phenomenal growth in the coming years. It still needs to deal with issues related to volatility, the unpredictability of macroeconomic factors, and global financial influences. The focus of this paper stems from a historical and contemporary lens on the Indian stock market concerning its structure, performance, regulatory framework, and emerging trends, and covers both sides of the analysis.

The stock market is a complex system influenced by various factors such as economic conditions, political events, and investor sentiment, making stock price prediction a challenging task. Accurate forecasting, however, is essential for investors and financial institutions aiming to make informed decisions.

To address this, mathematical models have been developed to analyze historical price data and identify patterns such as ARIMA or LSTM, which offer a structured approach to predicting future stock prices based on past trends.

This paper explores the effectiveness of the [insert model] in forecasting stock prices using historical data. The goal is to understand how the model works and evaluate its accuracy in real-world financial scenarios.

2. BANKING SECTOR IN THE STOCK MARKET:

Bank stocks are a major segment of the Indian stock market as they indicate the level of economic stability and liquidity, as well as credit activity within the country. The stocks signify equity stakes in banking companies and are subdivided into public sector banks (PSBs) and private sector banks. PSBs are state-owned banks incorporated in India, which dominate

because they have been the main drivers since they were created to follow government policies in lending, particularly to farmers and in neglected regions. On the other hand, private sector banks are more efficient because of their better management systems, aggressive digital focus, strong profit orientation, and excellent customer care service rivaling international players. Investors often evaluate bank stocks based on industry-specific benchmarks like Net Interest Margin (NIM), gross and net non-performing asset (NPA) ratios, Capital Adequacy Ratio (CAR), along with return on assets RoA). The perception of specific bank stocks is shaped by their performance relative to key operational factors, along with broader economic elements like interest rate trends or monetary policy stance. Some major players include:

- Public Sector Banks (PSBs):

  State Bank of India (SBI)
  Bank of Baroda or Punjab National Bank (PNB)

- Private Sector Banks:

  HDFC Bank or ICICI Bank
  Axis Bank or Kotak Mahindra Bank

These banks are part of the Nifty Bank Index, which acts as a sectoral benchmark for banking stocks listed on the National Stock Exchange of India (NSE). There have been some meaningful changes in the sector, such as digitalization, stricter recognition norms for NPAs by the Reserve Bank of India, and the consolidation of weak Public Sector Banks (PSBs) into stronger ones. As a result, bank equities are not only important for assessing the health of financial services and serves as an investment opportunity for those looking to hold stocks over a period of time. Due to these investments being long-term in nature, they seek continuous spendable income in dividends. However, due to their cyclical nature, regulatory and economic trends need to be closely monitored.

3. AUTOMOTIVE SECTOR IN THE STOCK MARKET:

The automotive industry is central to India's industrial development, along with its socio-economic advancement, gross domestic product (GDP), employment opportunities, as well as earnings from exports. It includes different segments such as two-wheelers, passenger and commercial vehicles, and auto components. The sector is deemed cyclical due to its dependence on economic activity, fuel prices, interest rates, consumer spending patterns, and overall market sentiment. There have been great changes in India's automotive industry over the years. It has transformed from a protected license-driven system into a modern, competitive, innovation-based industry. Government support through initiatives like Make in India FAME(Mastering Electric Vehicles) program for faster adoption of hybrids or electric vehicles, and production-linked incentive schemes for the automobile industry have aided in growth and modernization. Factors affecting investor interest in automobile stocks include sales data regionally or globally, capacity utilization metrics for plants, input costs of steel or aluminium, fuel prices, EV trends, along other emerging technologies centered on autonomous mobility.

Key players in the Indian automobile sector include:

1. **Passenger Vehicles:**

   - Maruti Suzuki India Ltd
   - Tata Motors
   - Mahindra & Mahindra

2. **Two-Wheelers and Three-Wheelers:**

   - Hero MotoCorp
   - Bajaj Auto
   - TVS Motor Company

3. **Commercial Vehicles:**

   - Ashok Leyland
   - Eicher Motors (also known for Royal Enfield bikes)

4. **Auto Components and Ancillaries:**

- Bosch Ltd
- Motherson Sumi Systems
- Bharat Forge

A good portion of these companies also form part of key indices such as the Nifty Auto Index that tracks the performance of top automotive sector stocks.

Given the accelerated push towards electric-powered mobility (mobility), increased urbanization, accompanied by rising income levels, has had a positive long-term outlook for stock price appreciation.

4. PHARMACEUTICAL SECTOR IN THE STOCK MARKET:

The pharmaceutical industry in India is one of the most crucial and strategically important sectors of the economy, significantly enhancing the country's healthcare ecosystem and contributing to global supply chains. Nicknamed "Pharmacy of the World", India is the largest supplier of generics and ranks third globally in terms of volume production of pharmaceuticals. This includes generic medicines, active pharmaceutical ingredients (APIs), OTC drugs, vaccines, biosimilars, and other healthcare products. The sector is supported by robust R&D infrastructure with an effective, skilled workforce, low-cost manufacturing facilities, and supportive policies. There have been advancements within the sector owing to subsidized programs like Pharma Vision 2020, PLI Scheme for Pharmaceuticals, as well as regulatory bodies like CDSCO, which encouraged innovation through supportive frameworks.

These businesses are the key constituents of the Nifty Pharma Index, which indicates how well the listed companies in the pharmaceutical sector are performing. During the COVID-19 pandemic, India's pharma industry helped global public health by producing and exporting vaccines. There is sustained expected growth in Indian pharmaceutical firms due to increased global demand, advancements in biotechnology, increased funding for R&D and clinical trials, and growing investment opportunities. On the other hand, pricing pressure in export markets, compliance issues with regulations on governance systems or business practices, and over-dependence on supply chains excluding China are a few of the challenges that these companies could face.

Pharmaceutical companies have been strategically positioned worldwide, and thus, the purchases from India's specialized Capsule Pharmacies are not a random occurrence. It has shown stable growth owing to its diverse product range, increased focus on specialty drugs, and robust financials. Their stock price is currently hovering around ₹1,700 with a 21% increase YoY return as of May 2025.

Its revenue is projected to rise at a compound annual growth rate (CAGR) of roughly 20% until FY27. Owing to strong regulatory pressures like the USFDA examination of the Halol facility, Sun Pharma still operates in key markets such as Tildrakizumab and Sonidegib. We also observe revision in corporate governance via adding MDs for North America, which lets them deepen their global reach.

Lastly, their total revenues translated into ₹52,578 crore and net profits at trackable ₹10,980 crore by FY25. Sun Pharma currently possesses an advanced debt equity ratio alongside an adequate return on equity figure of 0.015 due to recent strategic, hefty acquisitions that support innovation, making it an attractive long-term hold in India's pharma market

5. STOCK OF INDIAN BRANDS:

5.1 Maruti Suzuki Ltd:

Maruti Suzuki, India's biggest carmaker, has been navigating a patchy economic landscape, and its latest results paint a mixed picture. In the fourth quarter of FY25, the firm posted a consolidated net profit of ₹3,911 crore, down slightly 1 from ₹3,952 crore a year earlier. Revenue, however, climbed 6.4 and reached ₹40,920 crore, but rising costs squeezed the EBITDA margin, which slipped from 13 to 12.

For the full fiscal year FY25, Maruti Suzuki netted about ₹14,500 crore, a 7.5% increase over the previous year's ₹13,488 crore. Total revenue grew nearly 8, reaching ₹152,913 crore, and the board rewarded investors with a record dividend of ₹135 a share, pushing the total outlay past ₹4,200 crore.

Maruti Suzuki confronted multiple headwinds over the past year. In the fourth quarter, stand-alone profit slipped 4.3 percent to ₹3,711 crore, primarily because the company deepened discounts, stepped up marketing, and incurred pre-launch costs linked to upcoming electric vehicles. At the same time, the price of raw materials climbed roughly 20 percent, and other operating expenses rose 14.5 percent, placing additional strain on profit margins. As a result, the firm's operational margin eased from about 10.8 percent to 8.7 percent, signalling tightening control over costs.

Looking forward, Maruti is pursuing decisive, long-term investments. Suzuki, the group's parent, has pledged to devote roughly half its worldwide capital spending to India, a vote of confidence in Maruti's growth story. The carmaker intends to raise annual output capacity to four million vehicles by 2030 and will focus on rural demand, exports, and expanded electric-vehicle supply. Key initiatives include commissioning a new Haryana plant and rolling out a ₹7,000-crore roadmap dedicated to EV development and supporting infrastructure.

On the market side, Marutis shares change hands at about 26 times earnings and 4.2 times book value, while return on equity sits near 16 percent. The firm carries no debt, further reinforcing an already solid balance sheet and leaving room for continued long-term funding.

5.2 State Bank of India(SBI):

State Bank of India (SBI), India’s biggest public lender, delivered a mixed set of numbers for the fourth quarter of FY25. The headline net profit came in at ₹18,643 crore, down nearly 10% from ₹20,698 crore a year earlier, mainly because the lender set aside more money to cover bad loans. Provisions jumped over 20% to ₹3,964 crore, and the net interest margin, or NIM, contracted 32 basis points to 3.15%. On a brighter note, net interest income rose 2.7% to ₹42,775 crore, thanks to steady credit off-take and a calm rate climate. Shareholders will receive a dividend of ₹15.90 a share.

For the full fiscal year, the bank still chalked up a record net profit of over ₹70,900 crore, marking a healthy 16% increase from FY24. Operational profit in the final quarter climbed 8.8% on a year-on-year basis to ₹31,286 crore. Asset quality also improved, with gross NPAs falling to 1.82% and net NPAs retreating to just 0.47%.

Market experts are broadly positive in their outlook for SBI. Brokerages like Motilal Oswal and Kotak Securities have given "Buy" calls with prices between ₹925 and ₹975, based on robust fundamentals, enhancing asset quality, and steady credit growth. ICICI Securities upgraded its target price to ₹950, suggesting upbeat medium-term growth. UBS is more downbeat in its assessment, with a neutral call having a target of ₹840. Technical analysts point to a short-term support range between ₹793 and ₹781, with resistance points at ₹834.

In the future, SBI's strategy involves bolstering its balance sheet by raising up to ₹25,000 crore of capital through qualified institutional placement (QIP) or follow-on public offer (FPO). This capital increase should enable its credit growth and digital drive. Although margin pressure from possible rate cuts and decelerating loan growth are issues of concern, expected stability in interest rates and continuous upgrade in asset quality can serve as positive drivers. Furthermore, the bank's solid retail and corporate banking units place it in good standing to capitalize on the recovery in the economy and rising credit demand.

5.3 Sun Pharmaceuticals:

Sun Pharma Industries Ltd., India's largest and most internationally known pharmaceutical firm, posted a mixed Q4 FY25 performance. Its consolidated net profit fell 19% year-on-year at ₹2,154 crore largely because of higher input costs and exceptionals on restructuring of its US businesses. On an exceptional item-adjusted net profit growth basis, however, the firm actually increased 4.8% to ₹2,889 crore, which indicates operational strength at its core. Revenue in the quarter grew by about 8.5% year-on-year to nearly ₹12,958 crore due to robust growth in domestic formulation and its specialty product division. The company also enhanced its EBITDA margin to 28.7%, with EBITDA growing 22.4% at ₹3,716 crore.

For FY25, Sun Pharma had an adjusted net profit of ₹11,984 crore, with a 19% increase from the last year, and overall consolidated revenue of ₹52,041 crore. Sales in India were the highlight, growing by 13.7% from the previous year to ₹16,923 crore. The specialty division too witnessed good performance with revenues of more than US\$1.2 billion, which contributed to approximately 20% of the firm's overall sales. Externa Active Pharmaceutical Ingredient (API) business also saw healthy growth, both on a year-on-year basis and in the last quarter, adding to the revenue diversification of the company.

Market response to the Q4 performance was subdued. The stock fell by close to 5% in intraday trade after the result announcement, amid fears of a decline in reported profit. Nevertheless, most analysts pointed out the underlying resilience evidenced in adjusted profits and better margins. The group declared a final dividend of ₹5.50 per share, taking the FY25 total dividend to ₹16 per share, maintaining its trend of shareholder return.

Strategically, Sun Pharma is building more emphasis on specialty treatment, particularly in oncology and dermatology. The Checkpoint Therapeutics takeover, which adds the skin cancer treatment UNLOXCYT, should help bolster its oncology pipeline as well as fund its international specialty growth. However, the firm is beset by near-term issues such as more than ₹800 crore of anticipated marketing costs, increased tax outgo, and possible margin squeezes. A few brokerages have adjusted their earnings estimates a bit lower based on these considerations, but the long-term perspective remains optimistic.

In short, Sun Pharma remains well-placed in the pharma space with a diversified portfolio, stable specialty growth, and strong R&D investment. Short-term profitability could take some hit from increasing costs and strategic outlays, but the company's long-term fundamentals remain sound. Its steady emphasis on innovation, specialty medicine growth, and international footprint make it a stalwart player in domestic as well as overseas pharma markets.

6. EFFICIENT MARKET HYPOTHESIS (EMH) IN THE CONTEXT OF MARUTI, SBI, AND SUN PHARMA:

The Efficient Market Hypothesis (EMH) posits that all available information is already reflected in a stock's price, making it impossible to consistently achieve returns higher than the market average through technical or fundamental analysis. Under EMH, stock price movements are largely random and react immediately to new information.

1. *SBI (State Bank of India):*

   As a public sector banking giant, SBI operates in a highly regulated environment with substantial government influence. Most of its financial data — such as quarterly earnings, interest rate impacts, and regulatory changes — is publicly available. Under EMH, this transparency means SBI's stock price quickly incorporates macroeconomic and policy-related information. However, in reality, market overreactions to budget announcements or RBI policy hints suggest that semi-strong efficiency (where prices reflect all publicly available info but not private/internal information) may better apply.

2. *Maruti Suzuki:*

   Maruti, being India's largest car manufacturer, is influenced by consumer demand, input costs, fuel prices, and regulatory shifts in the automobile sector. These are typically well-covered in the media and by analysts, so under EMH, its stock price should adjust rapidly to such changes. However, investor sentiment, festive season sales expectations, and policy speculation sometimes cause delayed or exaggerated price reactions, again aligning more with semi-strong form EMH. Short-term inefficiencies may persist due to behavioural biases and market speculation.

3. *Sun Pharmaceuticals:*

   A company in the pharmaceutical industry, like Sun Pharma, establishes a relationship with EMH that is definitely more complicated. Although the public is disclosed with the financial results and performance, some significant events like clinical trial outcomes, FDA news, or trades in the patent market are not always equally known. These events may result in unexpected price changes that are not necessarily predicted by the market, thus indicating weaker efficiency or transitional inefficiency in the short period of time. But the prices usually return to the level consistent with the main news in the long run.

7. WHY I CHOSE THESE STOCKS:

SBI, Maruti, and Sun Pharma have been selected as the focus of this finance, economic, and mathematical research paper due to their significance in India's stock market, their representation of major industry sectors, and the richness of available quantitative data. By analyzing these three companies, valuable insights can be gained into their financial health, sectoral trends, and broader macroeconomic linkages.

- **SBI** represents the banking and financial services sector, a barometer for India's economy and credit environment.
- **Maruti Suzuki** is a leader in automotive manufacturing, indicative of consumer demand cycles, manufacturing trends, and sectoral reforms.
- **Sun Pharma** stands out in pharmaceuticals, known for its specialty generics and branded formulations leadership, reflecting healthcare trends, R&D expansion, and export dynamics.

Diversity and Comparative Modelling

- Studying these companies enables cross-sector comparisons—banking (SBI), manufacturing (Maruti), and healthcare (Sun Pharma)—allowing analysis of sector-specific financial strategies, growth drivers, and resilience during macroeconomic shifts.
- Each company provides year-wise quantitative data, facilitating advanced regression, time-series, and optimization modelling carried out using real stock prices, balance sheet figures, and industry indexes.

Data Availability and Analytical Depth

- These stocks are widely tracked in both academic and investment communities, yielding high-quality historical financials, ESG profiles, and global-comparable financial ratios (P/E, growth, margins, debt levels).

Insights into Financial Health and Sector Trends

- By studying SBI, Maruti, and Sun Pharma, researchers can identify how industry leaders respond to market shocks, sector reforms, policy changes, and global supply challenges.
- For Sun Pharma, the investigation can highlight the impact of product mix shifts, specialty launches, and cost management on margins and share price.

Application of Advanced Mathematical Techniques

- The data richness supports regression (linear, polynomial), logistics modelling (growth plateaus, carrying capacity), and time-series analysis (cyclic sales and price movement), all vital for researching economic cycles and stock market behaviours.

Application of Advanced Mathematical Techniques

- The data richness supports **regression** (linear, polynomial), **logistics modelling** (growth plateaus, carrying capacity), and **time-series analysis** (cyclic sales and price movement), all vital for researching economic cycles and stock market prediction.
- **Sectoral modelling and optimization** (e.g., portfolio construction, risk-reward quantification) become feasible with varied dataset attributes from these companies.
- The companies' performances are often correlated with broader economic indicators such as GDP growth, credit cycles (SBI), consumer demand (Maruti), and healthcare infrastructure (Sun Pharma).

Data Availability and Analytical Depth

- These stocks are widely tracked in both academic and investment communities, yielding high-quality historical financials, ESG profiles, and globally comparable financial ratios (P/E, growth, margins, debt levels).
- **Sun Pharma's** well-documented expansion in specialty products, **Maruti's** consumer sales cycles, and **SBI's** regulatory-driven financials allow for robust mathematical investigation—such as regression analyses, sectoral correlation studies, and predictive modelling.

8. CALCULATIONS:

a. Stock Price of SBI Bank:

After drawing a number of curves on the graph for SBI.

Curve fitting by taking values of 2012, 2013, and 2025.

X = 3,4,16

Y = 210, 209, 768 (rounded off)

In $y = ax^2 + bx + c$

$$210 = 9a + 3b + c$$

$$209 = 16a + 4b + c$$

$$768 = 256a + 16b + c$$

Using a calculator, we calculated,

Formula: $y = 5.012x^2 - 53.03x + 327.94$

(And)

In the graph, the x-axis as years from 2010 to 2025, and the Y-axis shows the SBI Bank stock price (in rupees)

Let's consider 2010 as 1, 2011 as 2……..2025 as 16.

After manually drawing a graph on Excel.

We concluded quadratic equation covers the maximum number of plots, considering

$$y = ax^2 + bx + c$$

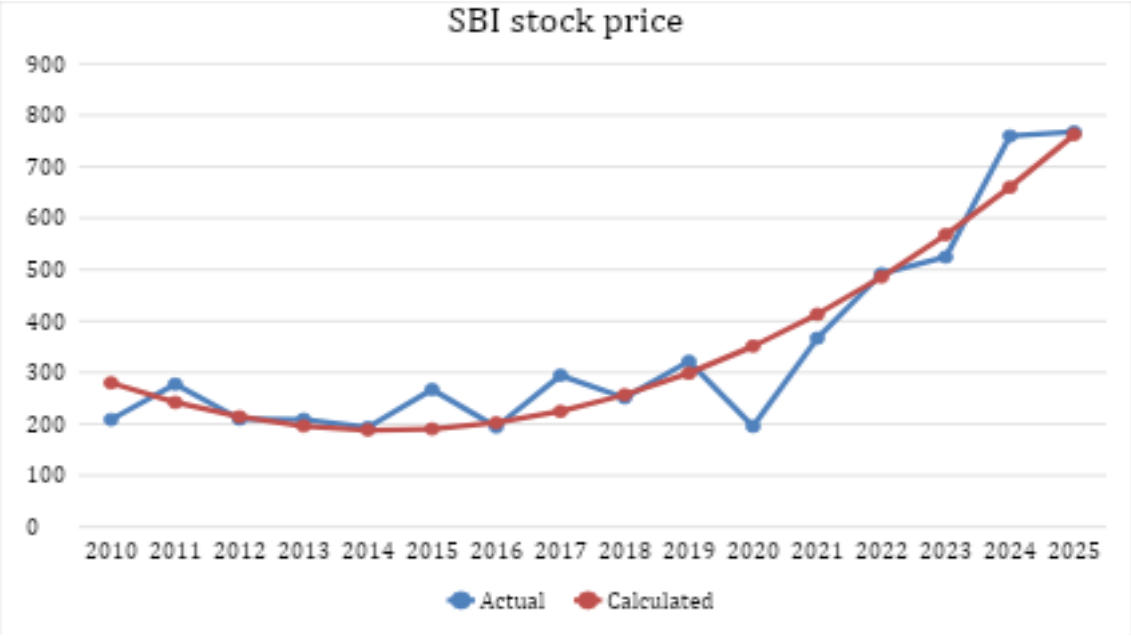

Chart -1: Actual Data vs Calculated Equation of SBI stock price

Formula: $y = 5.012x^2 - 53.03x + 327.94$

Where "y" represents SBI Bank stock price (in rupees) and "x" represents 1, 2, 3..... (1 represents 2010, 2 represents 2011, and so on)

b. Stock Price of Maruti Suzuki:

After drawing a number of curves on the graph for SBI.

Curve fitting by taking values of 2012, 2013, and 2025.

X = 4,5,13

Y = 1280, 1976, 7574 (rounded off)

In $y = ax^2 + bx + c$

$$1280 = 16a + 4b + c$$

$$1976 = 25a + 5b + c$$

$$7574 = 169a + 13b + c$$

Using a calculator, we calculated,

Formula: $y = 18.695x^2 + 391.73x - 411.63$

(And)

In the graph, the x-axis as years from 2010 to 2025, and the Y-axis shows Maruti Suzuki's stock price (in rupees)

Let's consider 2010 as 1, 2011 as 2.....2025 as 16.

After manually drawing a graph in Excel.

We concluded quadratic equation covers the maximum number of plots, considering

$$y = ax^2 + bx + c$$

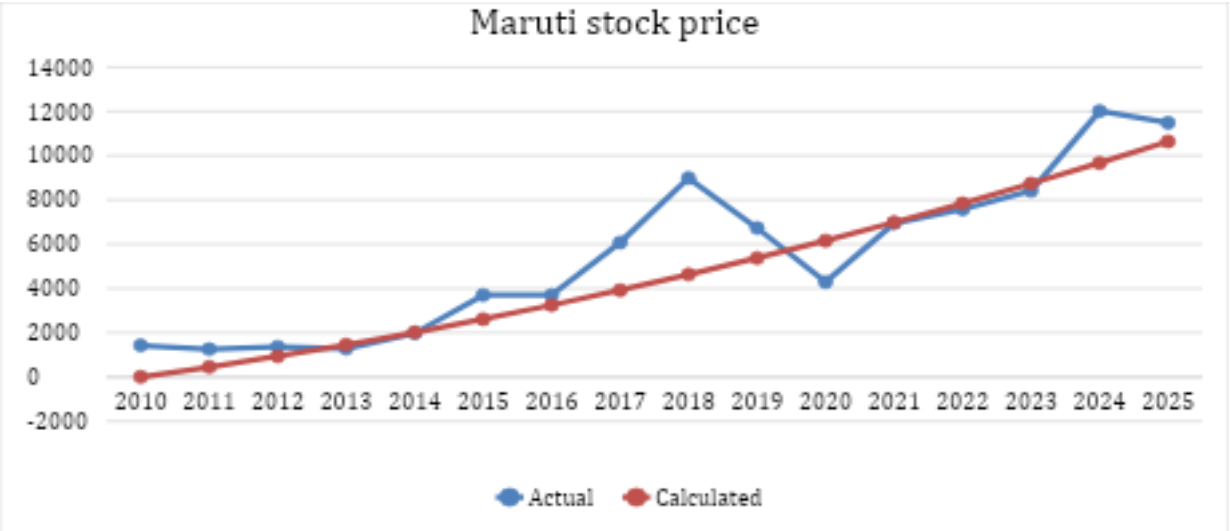

Chart -2: Actual Data vs Calculated Equation of Maruti Suzuki stock price

Formula: $y = 18.695x^2 + 391.73x - 411.63$

Where "y" represents Maruti Suzuki stock price (in rupees) and "x" represents 1, 2, 3..... (1 represents 2010, 2 represents 2011, and so on)

c. Stock Price of Sun Pharma:

After drawing a number of curves on the graph for SBI.

Curve fitting by taking values of 2012, 2013, and 2025.

X = 4,5,13

Y = 221.15, 575, 500.9, 688.75 (rounded off)

In $y = ax^3 + bx^2 + cx + d$

Using a calculator, we calculated,

Formula: $y = 2.786x^3 - 64.94x^2 + 466.78x - 404.68$

(And)

In the graph, the x-axis as years from 2010 to 2025, and the Y-axis shows Sun Pharmaceutical's stock price (in rupees)

Let's consider 2010 as 1, 2011 as 2.....2025 as 16.

After manually drawing a graph on Excel.

We concluded cubic equation covers the maximum number of plots considering

$$y = ax^3 + bx^2 + cx + d$$

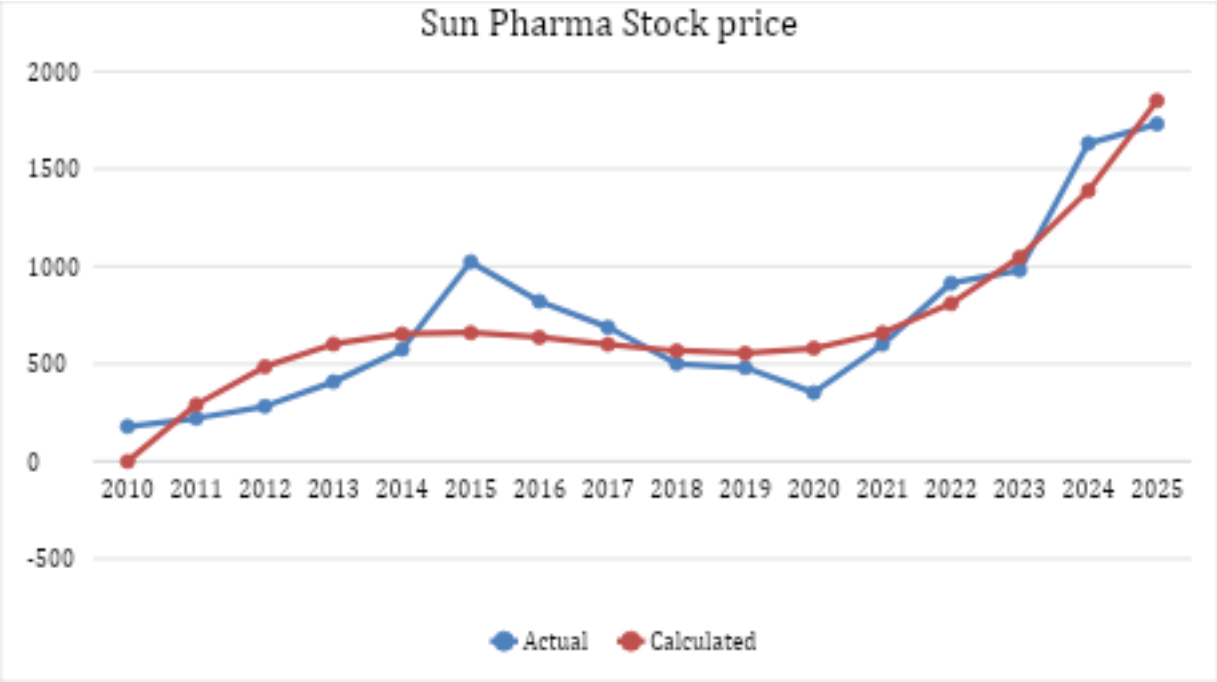

Chart -3: Actual Data vs Calculated Equation of Sun Pharma stock price

Formula: $y = 2.786x^3 - 64.94x^2 + 466.78x - 404.68$

Where "y" represents Sun Pharmaceutical's stock price (in rupees) and "x" represents 1, 2, 3…… (1 represents 2010, 2 represents 2011, and so on).

9. CONCLUSION:

This research analyzed stock price trends of three major Indian companies — State Bank of India (SBI), Maruti Suzuki, and Sun Pharma — using mathematical models to identify underlying growth patterns and interpret sector-specific behavior. By fitting trendlines to historical price data, it was found that SBI and Maruti followed quadratic models, while Sun Pharma exhibited a cubic trend.

The quadratic trends in SBI and Maruti stocks suggest a parabolic growth pattern, characterized by steady acceleration or deceleration over time. SBI's performance aligns with macroeconomic factors such as interest rates, government policies, and financial sector reforms, which influence its stable and structured price movement. Similarly, Maruti's trend reflects demand dynamics in the automobile sector, consumer confidence, and fuel pricing, which contribute to its predictable growth pattern with occasional corrections. These stocks demonstrate that large-cap, sector-leading firms in the banking and auto sectors often display symmetric growth that can be modeled effectively by second-degree polynomials.

On the other hand, Sun Pharma's cubic model implies a more complex, asymmetrical trend with inflection points indicating shifts in momentum. This is characteristic of the pharmaceutical sector, which is influenced by multiple variables such as R&D outcomes, regulatory approvals, global market exposure, and patent lifecycles. A cubic model allows for a more nuanced understanding of Sun Pharma's stock, capturing both upward and downward trends over different periods with varying intensity.

From a theoretical perspective, the study integrates elements of technical analysis and financial mathematics, demonstrating how polynomial regression can be used to identify meaningful trends in stock behavior. While the Efficient Market Hypothesis (EMH) suggests that all known information is reflected in stock prices, the modeling reveals that sector-specific fundamentals and external shocks can produce identifiable and statistically significant patterns over time.

In conclusion, this study highlights the value of mathematical modeling in equity research. By applying quadratic and cubic functions, we gain a deeper understanding of how companies from different sectors behave in the market, offering investors and analysts a tool for interpreting past trends and anticipating future movement with greater precision.

From modelling data of SBI, Maruti, and Sun Pharma, I learned how different sectors exhibit unique patterns and behaviours. The banking sector (SBI) showed sensitivity to economic indicators, while the automobile sector (Maruti) reflected consumer demand trends. Pharmaceutical data (Sun Pharma) highlighted innovation and regulation impacts. Quadratic and cubic fitting helped capture non-linear trends effectively in each sector's data. Different models suited each sector differently, showing the importance of choosing the right approach. Challenges included handling noisy and seasonal data across sectors. The models revealed correlations within sector-specific variables. Predictive accuracy varied, with some sectors more predictable than others. This work enhanced my knowledge of sector dynamics and mathematical modelling techniques. Overall, quadratic and cubic fitting proved valuable for understanding complex market behaviours.

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