

MODERN PORTFOLIO THEORY

Using Markowitz Model

By Aradhy Jain & Ayush Dadhich



WHAT IS THE MODERN PORTFOLIO THEORY (MPT)?

The modern portfolio theory (MPT) is a practical method for selecting investments in order to maximize their overall returns within an acceptable level of risk. This mathematical framework is used to build a portfolio of investments that maximize the amount of expected return for the collective given level of risk.

American economist Harry Markowitz pioneered this theory in his paper "Portfolio Selection," which was published in the Journal of Finance in 1952. He was later awarded a Nobel Prize for his work on modern portfolio theory.

A key component of the MPT theory is diversification. Most investments are either high risk and high return or low risk and low return. Markowitz argued that investors could achieve their best results by choosing an optimal mix of the two based on an assessment of their individual tolerance to risk.

The modern portfolio theory argues that any given investment's risk and return characteristics should not be viewed alone but should be evaluated by how it affects the overall portfolio's risk and return. That is, an investor can construct a portfolio of multiple assets that will result in greater returns without a higher level of risk.

As an alternative, starting with a desired level of expected return, the investor can construct a portfolio with the lowest possible risk that is capable of producing that return.

Based on statistical measures such as variance and correlation, a single investment's performance is less important than how it impacts the entire portfolio.





THE MARKOWITZ MODEL

The theory is based on Markowitz's hypothesis that it is possible for investors to design an optimal portfolio to maximize returns by taking on a quantifiable amount of risk. Essentially, investors can reduce risk through diversification using a quantitative method.

Consider a portfolio that holds two risky stocks: one that pays off when it rains and another that pays off when it doesn't rain. A portfolio that contains both assets will always pay off, regardless of whether it rains or shines. Adding one risky asset to another can reduce the overall risk of an all-weather portfolio.

Markowitz argued that investors could achieve their best results by choosing an optimal mix of the two based on an assessment of their individual tolerance to risk.

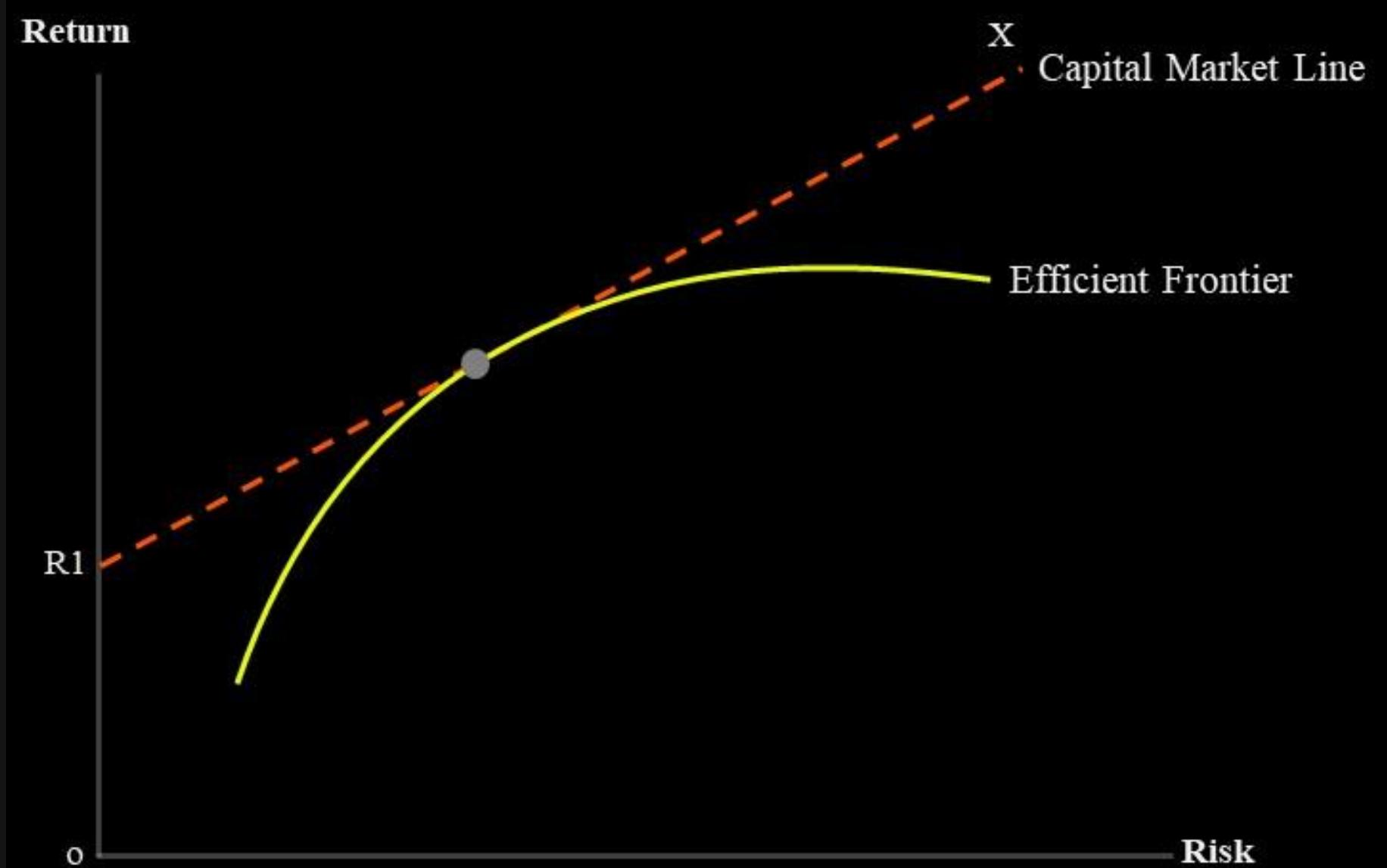


WHAT IS THE EFFICIENT FRONTIER?

The efficient frontier is the set of optimal portfolios that offer the highest expected return for a defined level of risk or the lowest risk for a given level of expected return.

A security's standard deviation is synonymous with risk. Ideally, an investor seeks to fill a portfolio with securities offering exceptional returns but with a combined standard deviation that is lower than the standard deviations of the individual securities.

In the attached iPy Notebook, we have calculated all the metrics for both our portfolios, that is maximum sharpe and minimum risk.

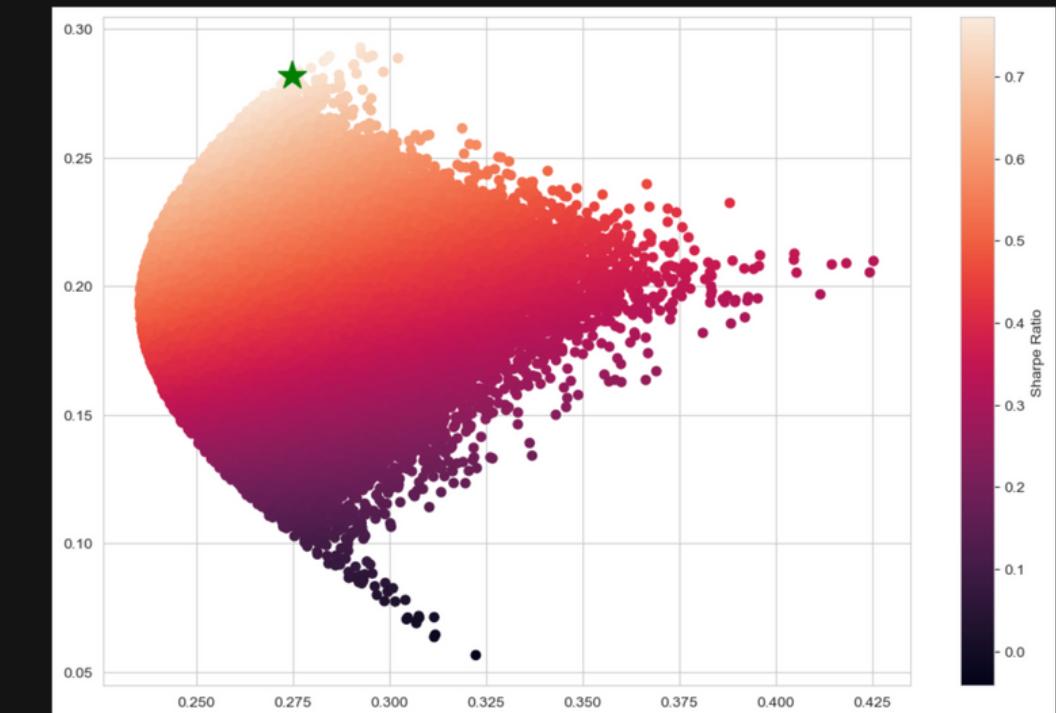


OUR RESULTS

Max Sharpe Portfolio

GHCL.NS : 0.19588064851621614
IDFCFIRSTB.NS : 0.09811734264821069
TATAMOTORS.NS : 0.061323705563560565
NH.NS : 0.6433191512756689
EMAMILTD.NS : 0.0013591519963437604

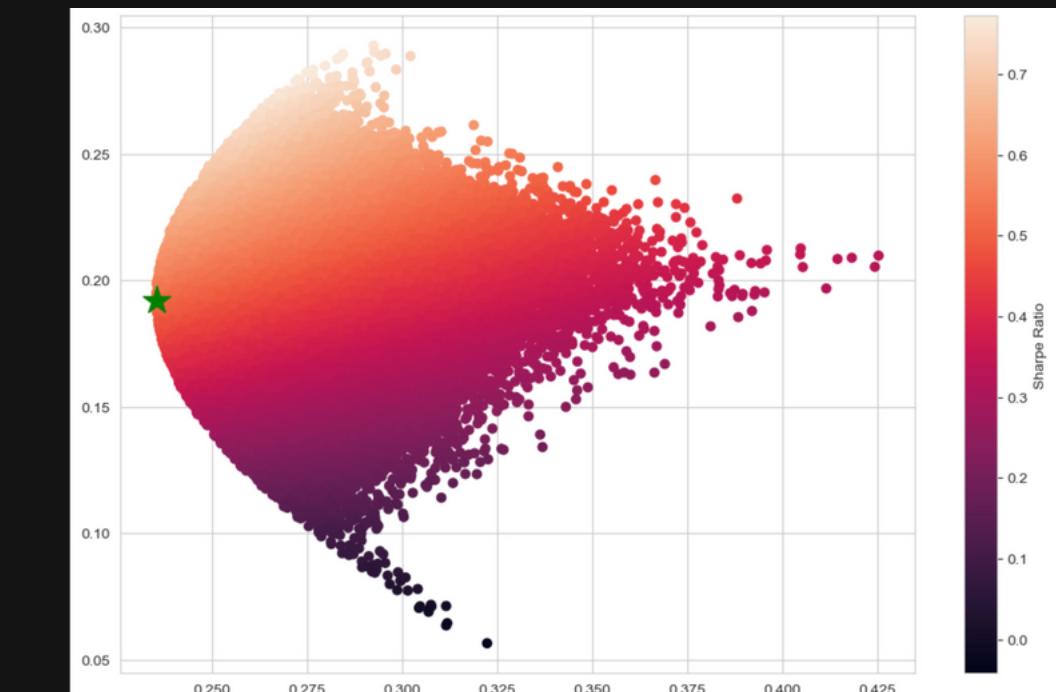
Maximum Sharpe Ratio = 0.7721042062371952
Corresponding Return = 0.2821008312369937
Corresponding Risk = 0.27470492910620753



Min Risk Portfolio

GHCL.NS : 0.1480305870486368
IDFCFIRSTB.NS : 0.12002862612820217
TATAMOTORS.NS : 0.045002861605437
NH.NS : 0.3598654270133556
EMAMILTD.NS : 0.32707249820436846

Minimum Risk = 0.2352762617405453
Corresponding Return = 0.19220847014047585



SELECTION OF STOCKS

In the following slides, we will introduce and elaborate on the five fundamentally strong stocks that we've meticulously selected. These stocks span various sectors, offering a diverse mix that underpins our commitment to the principles of MPT.

Our reasoning for choosing these particular stocks and the insights into their unique attributes will be presented in the upcoming slides. We aim to demonstrate how diversification plays a crucial role in optimizing our portfolio's risk and return trade-offs.

The Selected Stocks include:

- 1) TATA MOTORS
- 2) NARAYANA HRIDALAYA
- 3) IDFC FIRST BANK
- 4) EMAMI
- 5) GHCL



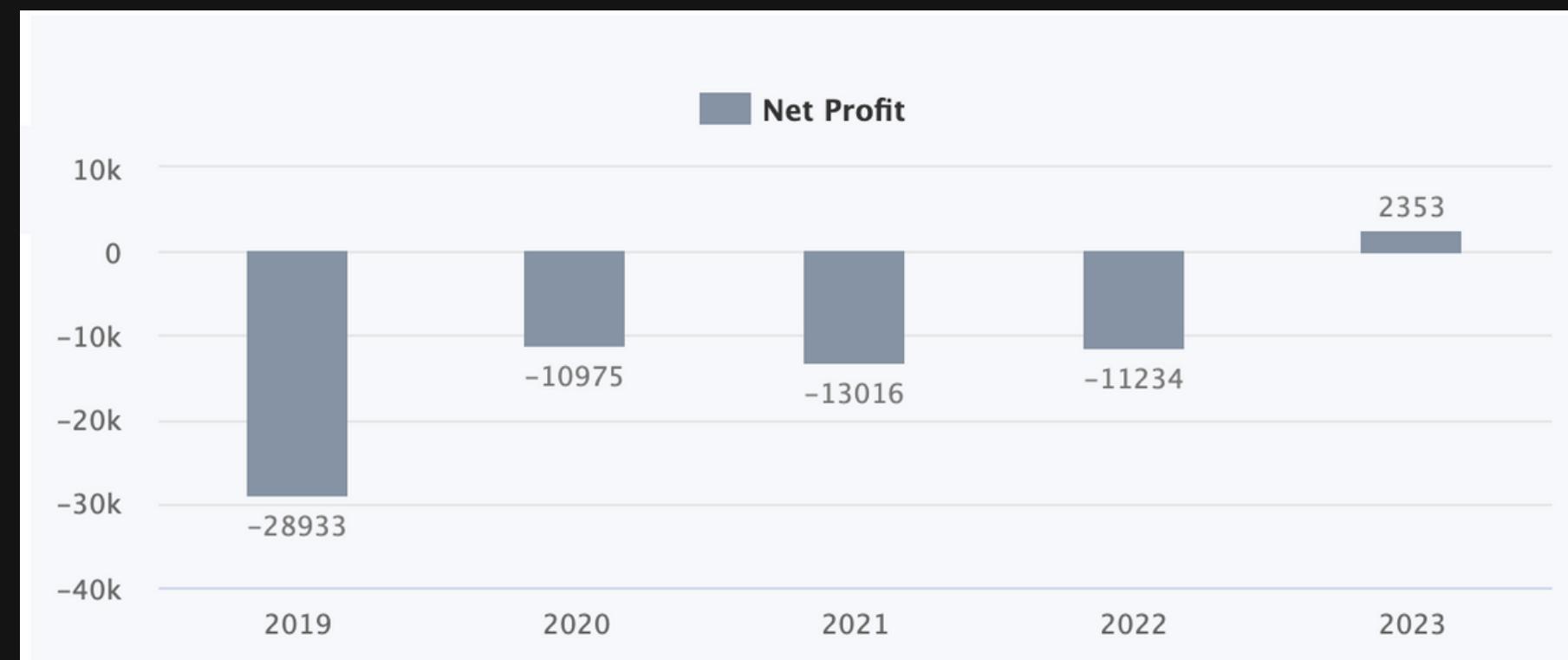
TATA MOTORS

- 1. Global Presence:** Tata Motors has a significant global footprint, with operations in various international markets. This geographic diversification reduces its dependency on a single market, enhancing stability.
- 2. Strong Brand Portfolio:** The company owns well-recognized brands like Jaguar and Land Rover, which cater to the luxury car segment. This diversification in product offerings allows for tapping into different market segments.
- 3. Robust Financials:** Tata Motors has exhibited steady revenue growth and improved profitability over the years, reflecting a sound financial position. This stability can be appealing to long-term investors.
- 4. Research and Development (R&D) Focus:** The company invests significantly in research and development, leading to innovation in electric and sustainable vehicle technologies. This positions them well in the rapidly evolving automotive industry.
- 5. Economic Recovery Potential:** As economies recover from downturns, the automotive industry tends to benefit. Tata Motors, with its extensive product range, can capitalize on the resurgence of consumer demand.
- 6. Dividend Payments:** The company has a history of paying dividends to shareholders, making it an attractive option for income-oriented investors.
- 7. Low Valuation Metrics:** Tata Motors has often been valued at relatively lower Price-to-Earnings (P/E) and Price-to-Book (P/B) ratios, which can suggest that it may be undervalued compared to its peers.



FUNDAMENTALS

- Stock Returns is greater than Nifty by 45.03 % in last one year
- Stock Returns is greater than Nifty returns for consecutive last five years
- Piotroski F Score – Excellent Value of 8.0
- Altman Z Score of 7.98 suggests good Stability
- Undervalued – Price to Intrinsic Value of 0.943
- Paid More Than 50% of Debt, Heading towards debt free
- Debt to equity ratio has decreased and is lowest in last three years
- Net profit has jumped from negative to positive
- During the past twelve months, the company has given a strong Return On Equity of 28.32%



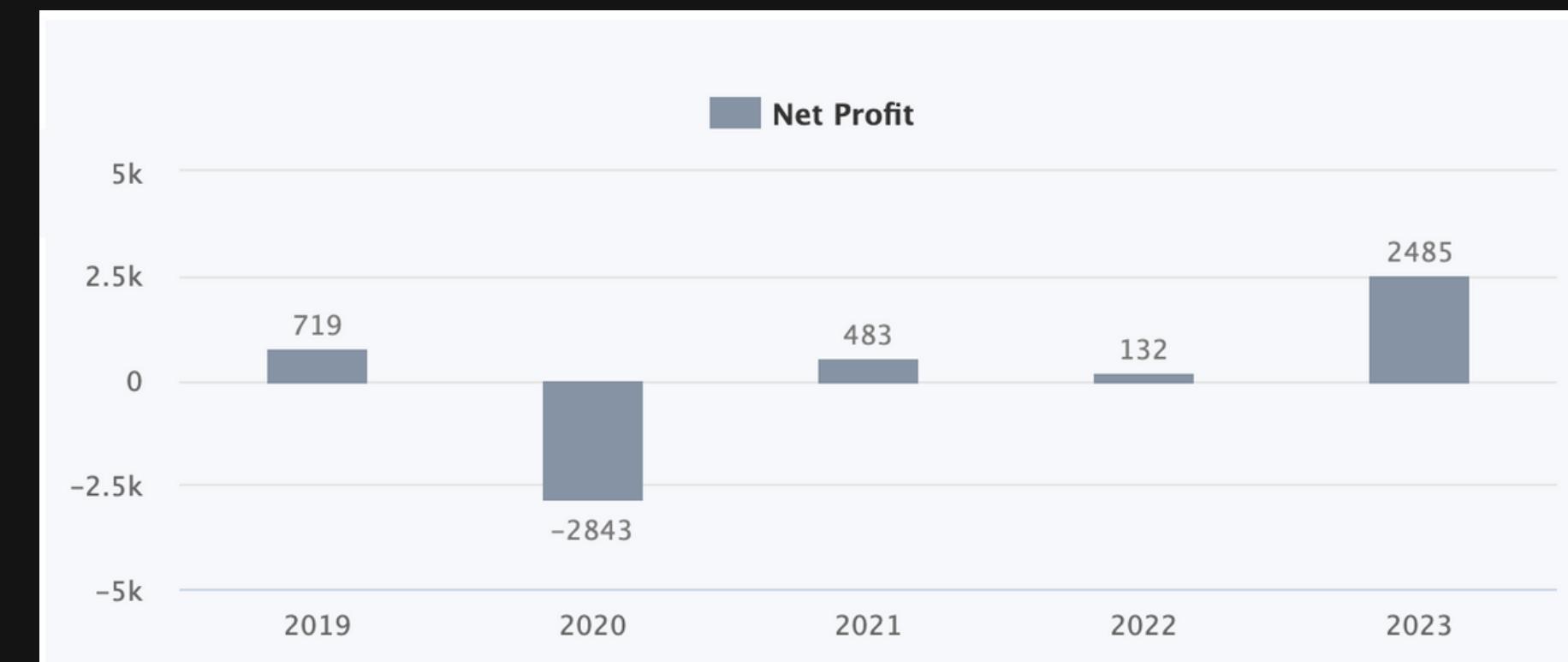
IDFC FIRST BANK

- 1. Robust Financials:** The bank boasts a healthy balance sheet with strong capital adequacy and liquidity ratios. It has steadily improved its financial position over the years.
- 2. Growing Customer Base:** IDFC First Bank has been successful in expanding its customer base. The bank's ability to attract and retain customers is a positive sign for its growth potential.
- 3. Diverse Product Portfolio:** The bank offers a wide range of financial products and services, including retail and corporate banking, making it well-positioned to cater to various customer segments.
- 4. Strong Leadership:** The bank is led by a capable management team with a proven track record in the banking and financial industry. Their strategic vision and experience contribute to the bank's strength.
- 5. Focus on Retail Banking:** With a shift towards retail banking, IDFC First Bank is reducing its dependence on corporate loans, making it more stable and less vulnerable to economic downturns.
- 6. Asset Quality Improvement:** The bank has been working diligently to improve its asset quality and reduce non-performing assets (NPAs). This reflects a commitment to maintaining a healthy loan book.
- 7. Potential for Growth:** As India's economy continues to grow, the banking sector, including IDFC First Bank, stands to benefit from increased financial inclusion and lending opportunities.



FUNDAMENTALS

- The company has been consistently maintaining a NIM of 5.28% since last 3 years.
- CASA stands at 49.77% of total deposits.
- Good Capital Adequacy Ratio of 16.82%
- The company has delivered good Profit growth of 41.79% over the past 3 years.
- Strong Advances growth of 21.04% in the last 3 years.
- **MD and CEO**, Mr. V. Vaidyanathan is the current MD and CEO of IDFC First Bank. With over 30 years of experience in the banking sector, he has transformed the bank's fortunes and made it one of the fastest-growing banks in India.



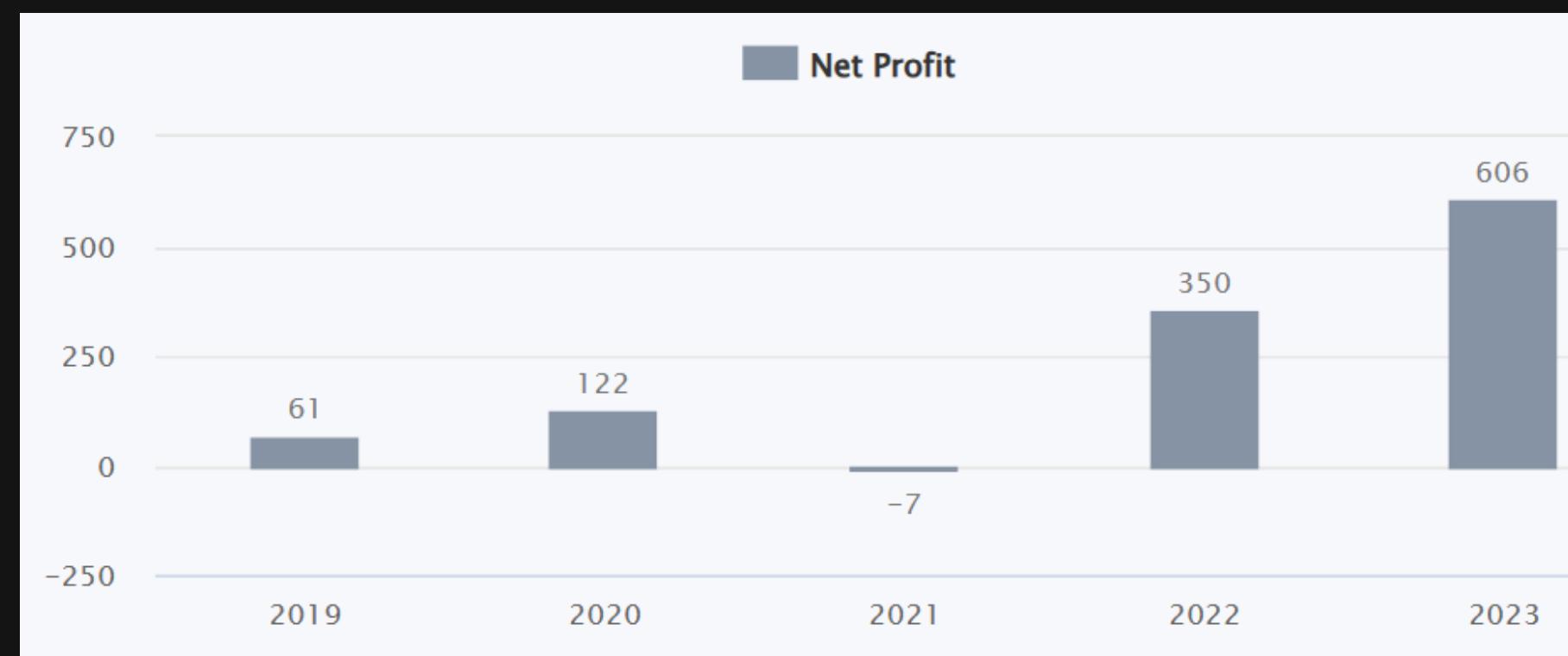
NARAYANA HRUDAYALAYA

1. Growing Healthcare Industry: The healthcare sector in India has shown steady growth due to increasing healthcare needs and a growing middle-class population. Narayana Hrudayalaya's focus on cardiac care services could position it well to benefit from this trend.
2. Established Presence: Narayana Hrudayalaya had a significant presence in India with a network of hospitals and clinics. This established presence may provide stability and opportunities for expansion.
3. Specialized Services: The company's specialization in cardiac care and multispecialty healthcare services could give it a competitive advantage in a specific niche of the healthcare market.
4. Reputable Management: The company was founded by Dr. Devi Prasad Shetty, a renowned cardiac surgeon, and it has a reputable management team with expertise in healthcare operations.
5. Financial Health: Strong financials, including revenue growth and profitability, are essential indicators of a fundamentally strong stock. Be sure to analyze the company's financial statements for a better understanding of its financial health.
6. Expansion Plans: If the company had expansion plans, this could indicate growth potential. Expanding into new geographic regions or offering new services could drive revenue growth.



FUNDAMENTALS

- The company has shown a good profit growth of 57.69% for the Past 3 years.
- Company has a healthy Interest coverage ratio of 8.15.
- Company's PEG ratio is 0.74.
- The company has an efficient Cash Conversion Cycle of -161.84 days.
- The company has a good cash flow management; CFO/PAT stands at 3.15.
- The company has a high promoter holding of 63.85%.



EMAMI

- **Strong Financial Performance:** Emami Ltd has demonstrated consistent revenue growth over the years, reflecting its ability to generate and maintain healthy sales figures. This financial stability indicates a resilient business model.
- **Robust Profitability:** The company's profitability metrics, such as operating profit margins and return on equity (ROE), are impressive. A high ROE indicates efficient use of shareholders' equity, translating to higher returns for investors.
- **Diverse Product Portfolio:** Emami operates in various sectors, including healthcare and personal care, offering a diverse range of products. This diversification helps mitigate risks associated with economic fluctuations in specific industries.
- **Strong Brand Presence:** Emami has established strong brand equity with a significant market presence in both domestic and international markets. A recognizable brand often leads to customer loyalty and pricing power.
- **Solid Balance Sheet:** The company maintains a healthy balance sheet with manageable levels of debt, reducing financial risk. This financial stability positions Emami well to weather economic downturns.
- **Dividend Payments:** Emami has a history of consistent dividend payments, making it an attractive choice for income-oriented investors. Dividends provide stability and enhance the overall return on investment.
- **Innovative Research and Development:** Emami has shown a commitment to research and development, consistently introducing new products. Innovation is a key driver of growth in the consumer goods industry.
-



FUNDAMENTALS

- The company has shown a good profit growth of 25.65% for the Past 3 years.
- The company has significantly decreased its debt by 201.85 Cr.
- Company has been maintaining healthy ROE of 32.43% over the past 3 years.
- Company has been maintaining healthy ROCE of 30.52% over the past 3 years.
- Company is virtually debt free.
- Company has a healthy Interest coverage ratio of 163.76.
- The Company has been maintaining an effective average operating margins of 28.77% in the last 5 years.
- The company has an efficient Cash Conversion Cycle of -28.03 days.
- Company has a healthy liquidity position with current ratio of 2.24.
-



GHCL

GHCL is a diversified company with an established footprint in chemicals, textiles and consumer products segment.

GHCL Ltd. (GHCL) is a diversified conglomerate with a rich history spanning several decades. Headquartered in India, GHCL has emerged as a prominent player in various sectors, with a strong presence both domestically and internationally.

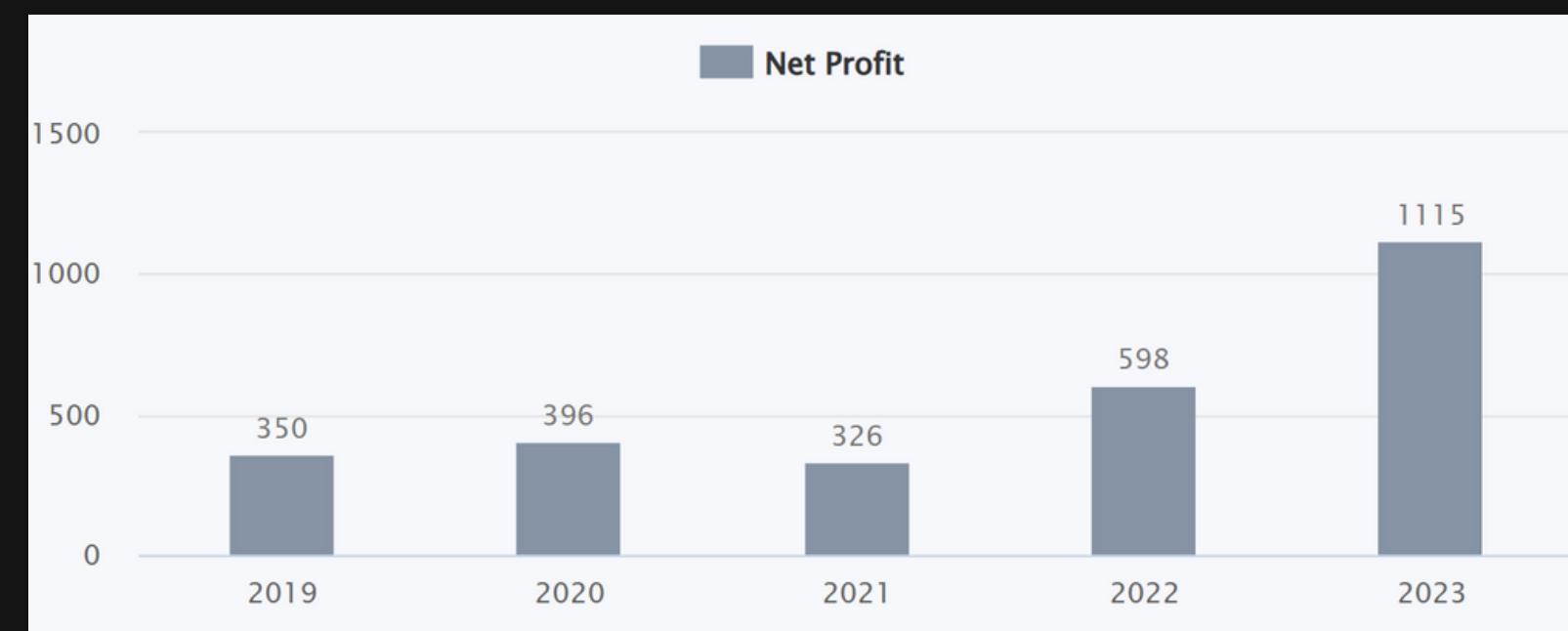
GHCL operates across multiple business segments, which include:

- Chemicals: GHCL is a leading manufacturer and exporter of various chemicals, catering to industries such as textiles, pharmaceuticals, and agriculture. The company's commitment to sustainability is reflected in its eco-friendly chemical solutions.
- Textiles: GHCL's textile division is renowned for its high-quality yarns and home textile products.
- Consumer Products: GHCL's consumer products division encompasses a range of products, including home textiles, home décor, and personal care items. These products are marketed under well-known brands and have a strong presence in domestic and international markets.



FUNDAMENTALS

- The company has shown a good profit growth of 39.03% for the Past 3 years.
- The company has significantly decreased its debt by 419.93 Cr.
- Company has been maintaining healthy ROE of 21.65% over the past 3 years.
- Company has been maintaining healthy ROCE of 24.99% over the past 3 years.
- Company is virtually debt free.
- Company has a healthy Interest coverage ratio of 38.30.
- The Company has been maintaining an effective average operating margins of 25.60% in the last 5 years.
- Company's PEG ratio is 0.05.





THANK YOU