**Pidilite Industries Portfolio Management Report**

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Table of Contents

1. Strategic Vision

2. Resource Allocation and Risk Profile

3. Industry Analysis

4. Swot Analysis

5. Methodology

6. Findings

7. KPIs

8. Recommendations

1. Strategic Vision:

Pidilite Industries aims to be a market leader in adhesives and construction chemicals. The company focuses on innovation, customer-centric products, and expanding its market reach in India and globally. It aims to :

* Invite, invest, and embrace talented people and scientists for great challenges ahead
* Support, serve, and satisfy all valuable customers with our innovative products and excellent technical competency
* Innovate with our customers to provide total product satisfactions and business growths

1. Resource Allocation and Risk Profile:

Resource Allocation: INR 3,200 crores of which 60% equity, 40% debt - Risk Profile: Moderate risk, with a target standard deviation of 16% for the created portfolio

1. Industry Analysis:

**Specialty chemicals and adhesives industry in India**

**1.Understanding the Life Cycle of the Specialty Chemicals and Adhesives Industry in India**

The specialty chemicals and adhesives industry in India is experiencing significant growth, driven by urbanization, rising middle-income households, and increasing demand across various sectors. The life cycle of this industry can be broken down into four main stages:

1. Introduction: The Indian specialty chemicals sector is still evolving, with many companies focusing on innovation and developing products tailored to local needs. Government initiatives, such as the Production-Linked Incentive (PLI) scheme, aim to boost domestic production and attract investments.
2. Growth: This phase is characterized by rapid expansion, with the market projected to grow at a CAGR of approximately 4.8% from 2024 to 2033, reaching a market size of around USD 41.3 billion by 2033. The growth is fuelled by increasing demand in end-user industries such as construction, automotive, and consumer goods.
3. Maturity: As the market matures, competition intensifies. Companies focus on differentiation through innovation and sustainability. The Indian specialty chemicals market, which accounts for 18% of the total chemical industry, is experiencing a shift towards eco-friendly products and processes, reflecting global trends.
4. Decline: While the industry is currently in a growth phase, potential challenges such as regulatory pressures and competition from other countries, particularly China, could impact future growth. Companies may need to adapt to maintain market relevance.

**2.Key Players in the Specialty Chemicals and Adhesives Market in India**

1. **BASF India Ltd.**: A subsidiary of the global chemical giant BASF, this company is a leading player in the specialty chemicals market in India. BASF India focuses on innovation and sustainability, offering a wide range of products, including adhesives, coatings, and agricultural solutions.
2. **Pidilite Industries Ltd.**: Renowned for its adhesives and sealants, Pidilite is a major player in the Indian market. The company emphasizes brand strength and has a diverse product portfolio that includes construction chemicals and consumer products, catering to both industrial and retail segments.
3. **Huntsman Corporation**: A significant player in the specialty chemicals sector, Huntsman operates in various segments, including adhesives and coatings. The company is known for its technological advancements and commitment to sustainability, focusing on high-performance products that meet evolving market demands.

**3.Competitive Advantage of Key Players**

* **BASF India Ltd.**: The company's competitive advantage lies in its extensive R&D capabilities, allowing for continuous innovation and the development of sustainable solutions. BASF's global presence also enables it to leverage economies of scale and access diverse markets.
* **Pidilite Industries Ltd.**: Pidilite's strong brand recognition and customer loyalty provide a significant competitive edge. The company's focus on innovation, particularly in developing user-friendly and high-performance adhesives, helps it maintain a leading position in the market.
* **Huntsman Corporation**: Huntsman's competitive advantage stems from its commitment to sustainability and advanced technology. The company's investment in eco-friendly products and processes aligns with global trends, enhancing its appeal to environmentally conscious consumers.

**4.Industry Dynamics**

The specialty chemicals and adhesives industry in India is shaped by various dynamics:

* **Regulatory Environment**: The Indian government is implementing stricter regulations to ensure safety and environmental compliance. This includes initiatives to promote sustainable practices and reduce the environmental impact of chemical production.
* **Market Trends**: There is a growing demand for eco-friendly and high-performance products, driven by consumer awareness and regulatory pressures. Companies are increasingly focusing on developing bio-based and sustainable formulations to meet these demands.
* **Economic Factors**: The growth of the Indian economy, particularly in urban areas, is driving demand for specialty chemicals in construction, automotive, and consumer goods. Increased infrastructure spending by the government further supports market growth.
* **Technological Advancements**: Innovations in manufacturing processes and product formulations are enhancing efficiency and performance. Companies are investing in new technologies to improve product quality and reduce costs, enabling them to remain competitive in a rapidly evolving market.

Overall, the specialty chemicals and adhesives industry in India is positioned for continued growth, driven by innovation, sustainability, and increasing domestic and global demand.

1. Swot Analysis
2. **Astral Limited**

Strengths:

* Strong brand recognition in the piping and adhesive segment.
* Extensive distribution network across India.
* Innovative product portfolio with focus on new technology and sustainability.

Weaknesses:

* High dependence on the Indian market, making it vulnerable to regional economic downturns.
* Limited global presence compared to larger competitors.

Opportunities:

* Expansion into new markets, both domestic and international.
* Introduction of new products in the adhesive and piping segment.
* Strategic partnerships and acquisitions to enhance market share and product offerings.

Threats:

* Intense competition from established and emerging players.
* Volatile raw material prices affecting profit margins.
* Regulatory changes impacting operations and product approvals.

1. **Aarti Industries Limited**

Strengths:

* Diversified product portfolio spanning specialty chemicals, pharmaceuticals, and home and personal care.
* Strong R&D capabilities facilitating innovation and new product development.
* Robust financial performance with consistent revenue growth.

Weaknesses:

* High capital expenditure requirements for expansion and modernization.
* Exposure to foreign exchange fluctuations due to significant exports.

Opportunities:

* Expansion into high-growth segments like pharmaceuticals and specialty chemicals.
* Strategic collaborations with global companies to enhance technological capabilities.
* Increasing demand for specialty chemicals in emerging markets.

Threats:

* Stringent environmental regulations affecting operations.
* Volatility in raw material prices impacting cost structure.
* Geopolitical risks affecting global trade and supply chains.

1. **Vinati Organics Limited**

Strengths:

* Leadership position in niche specialty chemicals like IBB and ATBS.
* Strong focus on innovation and R&D.
* High profit margins due to efficient operations and premium product offerings.

Weaknesses:

* Concentration risk due to reliance on a few key products.
* Limited geographic diversification, with heavy dependence on the Indian market.

Opportunities:

* Introduction of new high-margin products to diversify revenue streams.
* Expansion into new geographies to reduce market concentration risk.
* Collaboration with global firms for technology and market access.

Threats:

* Intense competition from both domestic and international players.
* Regulatory changes impacting key products.
* Economic downturns affecting demand for specialty chemicals.

1. **Atul Limited**

Strengths:

* Diversified business segments including life sciences, performance chemicals, and polymers.
* Strong presence in both domestic and international markets.
* Robust R&D infrastructure supporting continuous innovation.

Weaknesses:

* High working capital requirements due to diverse operations.
* Exposure to currency fluctuations affecting export revenues.

Opportunities:

* Growth in global specialty chemicals market.
* Strategic alliances and joint ventures to enhance product portfolio and market reach.
* Investment in green technologies to cater to increasing environmental concerns.

Threats:

* Environmental regulations impacting manufacturing processes.
* Price volatility of raw materials affecting profitability.
* Intense competition in the specialty chemicals sector.

1. **Balaji Amines Limited**

Strengths:

* Leading manufacturer of aliphatic amines in India.
* Strong financial performance with consistent growth in revenue and profit margins.
* Focus on high-margin products.

Weaknesses:

* Dependence on a limited product range.
* Exposure to fluctuations in raw material prices.

Opportunities:

* Expansion into new chemical segments.
* Increasing demand for amines in pharmaceuticals and agrochemicals.
* Strategic collaborations for technology and market access.

Threats:

* Intense competition from both domestic and international manufacturers.
* Regulatory and environmental compliance costs.
* Economic slowdowns affecting industrial demand.

Conclusion:

Based on this SWOT analysis, three companies can be selected for potential investment: Astral Limited, Vinati Organics Limited, and Atul Limited. These companies demonstrate strong market positions, innovation capabilities, and growth opportunities, aligning well with the strategic vision and moderate risk profile of the MNC.

1. Methodology

**Data Collection**:

We gathered monthly stock price(Adjusted Close values) data for the past 5 years (60 months) for the three selected stocks: Aarti Industries Ltd., Atul Ltd., and Vinati Organics Ltd (BSE Index) from the Historical Data section of the website Yahoo Finance.

**Random Weight Combinations**:

We generated 100 random weight combinations for the three stocks, ensuring that the weights sum up to 1 (100%). These combinations represent different possible portfolio allocations.

**Portfolio Return Calculation**:

Firstly, from the stock price data, we calculated the average annual returns of these stocks. For each of the 100 random weight combinations, we will calculate the corresponding portfolio returns using the formula:

Where:

= *Portfolio Return*

= *Weight of Astral Ltd.*

= *Annual return of Astral Ltd.*

*= Weight of Atul Ltd.*

*= Annual return of Atul Ltd.*

*= Weight of Vinati Ltd.*

*= Annual return of Vinati Ltd.*

**Portfolio Volatility Calculation**:

We proceed to calculate the portfolio volatilities of each combination using the following formula:

Where:

*= Portfolio Volatility*

*= Weight of Astral Ltd.*

*= Standard deviation of Astral Ltd. Stock prices*

*= Weight of Atul Ltd.*

*= Standard deviation of Atul Ltd. Stock prices*

*= Weight of Vinati Ltd.*

*= Standard deviation of Vinati Ltd. Stock prices*

*= Correlation of Astral Ltd. Stock prices and Atul Ltd. Stock prices*

*= Correlation of Astral Ltd. Stock prices and Vinati Ltd. Stock prices*

*= Correlation of Atul Ltd. Stock prices and Vinati Ltd. Stock prices*

**Efficient Frontier Analysis**:

We plotted the 100 portfolios on a graph with portfolio returns on the y-axis and portfolio volatility on the x-axis. The efficient frontier is the curve that represents the portfolios with the highest returns for a given level of risk.

**Optimal Portfolio Selection**:

We chose the portfolio that aligns with Pidilite Industries' strategic vision, goals, and risk appetite. This portfolio is the one that is closest to parallel to the efficient frontier and meets the company's investment criteria.

**Value at Risk (VaR) Estimation**:

We estimated the Value at Risk (VaR) for the selected optimal portfolio using historical simulation. VaR represents the maximum expected loss for a given confidence level and time horizon.

**Key Performance Indicators**:

We will analyze relevant key performance indicators (KPIs) for the selected portfolio, such as expected return, volatility, Sharpe ratio, and diversification benefits, to assess its performance and risk-return profile.

By following this methodology, we will be able to construct an optimal portfolio for Pidilite Industries using the Efficient Frontier analysis, considering the company's strategic objectives and risk tolerance. The VaR estimation and KPI analysis will provide additional insights into the portfolio's risk and performance characteristics.

1. Findings
   1. Monthly Stock prices Data of last 5 years:



* 1. The mean and standard deviations of stock prices were taken from this table:



The Annual returns and standard deviations were calculated as follows:



The Correlation values calculated were as follows:



* 1. The 100 weight combinations for optimal portfolio selection are as follows:





* 1. Simulated Portfolio returns and Portfolio Volatilities



* 1. Efficient Frontier Analysis

We conducted the efficient frontier analysis by plotting the portfolio returns on the Y-axis and the portfolio volatilities on the X-axis. This is the graph we got:

* 1. Optimal portfolio selection

After the Efficient frontier analysis the portfolio combination that was decided to be optimal considering the risk appetite and the strategic visions and goals of Pidilite industries Ltd. was the following combination :



The estimated portfolio return for this combination is 22.8 %

The estimated portfolio volatility is 24.46%

* 1. Number of Shares Calculation:

The optimal portfolio combination selected was:

Astral ltd. = 0.39484167

Atul ltd. = 0.382374445

Vinati ltd. = 0.222783885

The Investment that needs to be done is Rs. 3200 Crores.

Therefore, the amount to be invested in each stock is as follows based on the above weights:

Astral ltd. = Rs. 126349334409.04

Atul ltd. = Rs. 122359822509.08

Vinati ltd. = Rs. 71290843082



The most recent stock prices of these stocks are as follows:

Astral ltd. = Rs. 2105.149902

Atul ltd. = Rs. 7703.450195

Vinati ltd. = Rs. 2173.600098

Therefore, the number of the Shares needed to be bought of each stock are as follows:

Astral ltd. = 60019162.67 shares

Atul ltd. = 15883768.88 shares

Vinati ltd. = 32798509.32 shares

* 1. VaR calculation from historical simulation

Based on the stock prices data these are the possible changes that could happen to the stock prices and the corresponding value of the portfolio.



Therefore the portfolio losses and sorted list of those losses are as follows:



The 95% confidence level Var position is calculated with the following formula:

Where:

= Number of Observations = 60

Therefore, the Calculated 95% VaR position is 3.

This means that the 95% Var value is the 3rd worst loss which in this case is =

Rs. 26101983088.49

Interpretation:

This means we are 95% confident/certain that the loss on this portfolio will not be more than Rs. 26101983088.49 over the next 30 days.

1. KPIs

Benchmarks:

Market Return

Risk Adjusted performance measure:

(Reward per unit of RISK)

Sharpe Ratio:

Monthly Risk free rate = 6.982/12 = 0.582

Sharpe Ratio: 0.908506013

We are considering the Sharpe Ratio as a KPI because the portfolio is not well diversified.

1. Recommendations

**Diversify the Portfolio**: While the current selection shows promising returns, consider further diversifying the portfolio by adding stocks from different sectors or industries to mitigate risk and enhance overall stability. The low Sharpe ratio is clearly indicating a need for more diversified portfolio.

**Implement Risk Management:** Use stop-loss orders and regularly review the portfolio's performance against established benchmarks. The VaR analysis indicates potential losses; therefore, it is crucial to have contingency plans in place to address adverse market movements.

**Evaluate Performance:** Regularly assess key performance indicators (KPIs) such as return on investment (ROI), Sharpe ratio, and alpha to ensure the portfolio continues to meet the desired performance metrics and risk tolerance levels.

**Invest in Innovation**: Given Pidilite's focus on innovation in the specialty chemicals space, consider investing in companies that demonstrate strong R&D capabilities and a commitment to sustainability to align with global trends toward eco-friendly products.

By implementing these recommendations, Pidilite Industries can enhance its investment strategy, manage risks effectively, and align its portfolio with its strategic goals, ultimately leading to sustainable growth and profitability.

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