Financial Modeling and Industry Insights in Investment in New Materials Industry

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Abstract: With the rapid development of the new materials industry, financial modeling has become particularly critical in investment decisions. This paper analyzes the optimization strategy of financial modeling, and proposes to enhance the accuracy of investment decisions by strengthening risk assessment, promoting the coordination between technological innovation and market demand, strengthening policy monitoring, improving information transparency and other measures. At the same time, it also explores the way of industry insight, focusing on the impact of technology trends, market demand, competitive situation and policy environment on investment. It aims to provide comprehensive decision-making reference and optimization strategy for investors in the new materials industry.

1. Introduction

As an important force to promote scientific and technological innovation and industrial upgrading, the new material industry has received extensive attention in recent years. The rapid progress of technology and the changing market demand make the investment decision of investors in the new materials industry more complicated. In this situation, financial model, as a core investment evaluation means, can effectively help investors evaluate potential risks and market opportunities, and optimize the decision-making process. However, in the face of rapid changes in the market, the traditional financial model method shows its limitations. In view of this, optimizing financial model strategies and enhancing in-depth understanding of the industry are at the core of improving the accuracy of investment decisions. The objective of this study is to analyze how to optimize the financial model strategy and deepen the industry cognition in the process of investment in the field of new materials, in order to provide more far-reaching decision-making reference for investors.

2. The importance of financial modeling in investment decision-making

By constructing digital models to predict the future financial direction of a business or project, financial modeling becomes an indispensable part of the investment decision process. In the new materials industry, financial modeling provides investors with detailed financial data and the basis

for risk assessment, helping to conduct a comprehensive analysis of the financial health of the enterprise, covering core financial indicators such as assets and liabilities, profitability and fund flow, so as to accurately assess profitability and capital needs, and support quantitative analysis of decision-making. The new materials industry faces multiple risk factors such as fluctuating market demand, technological innovation progress and policy uncertainty, which can affect investment returns. Financial modeling integrates variables to identify and quantify these risks. For example, through scenario analysis and sensitivity analysis, investment effectiveness under different market conditions can be simulated to help investors predict potential financial risks and make more prudent choices in an environment full of uncertainty. In addition, financial modeling plays a key role in project financing and funding. Projects in the new materials industry are usually large in scale and have high capital requirements. Reasonable financial models can show the profit prospects and feasibility of projects, improve the financing success rate and enhance investor confidence. Therefore, financial modeling not only helps investors assess risk and return, but also provides a theoretical basis for project financing and is a key tool in investment decisions in the new materials industry. Figure 1 below summarizes the architecture of the financial modeling and investment decision support system:
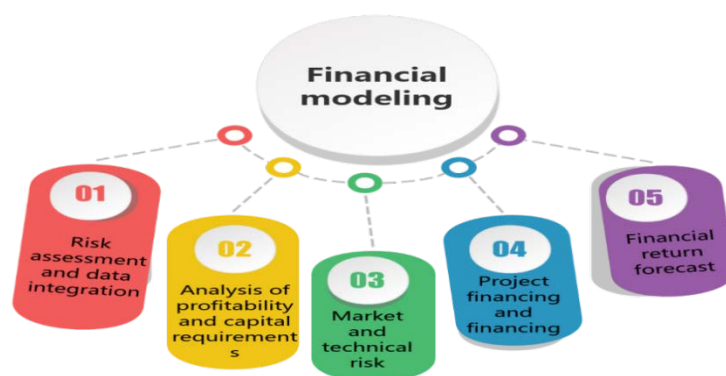
Figure 1. Architecture of financial modeling and investment decision support system

3. Optimization strategy of financial modeling in new material industry investment

3.1 Strengthen risk assessment and forecast market demand volatility

In the investment decision of the new materials industry, the volatility of market demand is the most critical risk factor, which is influenced by a variety of factors such as technological innovation, policy adjustments and consumer preferences. Therefore, the accurate prediction of market demand is extremely critical to the establishment of financial models. To optimize the financial modeling process, you must integrate multiple dimensions of data, including past sales records, market dynamics, industry competition, and policy directions. Through time series analysis and regression analysis, the long-term trend and short-term fluctuation of market demand can be effectively predicted. In addition, situational analysis and sensitivity analysis also play an important role in optimizing financial modeling. These analysis methods can simulate financial performance under different market demand scenarios and help investors identify potential risks. For example, sensitivity analysis can reveal changes in financial metrics such as revenue, profit, and cash flow under different demand scenarios, thus providing multiple possible financial outcomes for investment decisions. Through these methods, investors can better assess the impact of market fluctuations on the financial health of enterprises and make more accurate investment decisions. Table 1 below shows the changes of forecast financial indicators under different market demand

scenarios:

Table 1.Changes of predicted financial indicators under different market demand scenarios

Market demand scenario	Projected revenue growth rate	Expected profit rate	Expected cash flow changes
High demand	15%	10%	+12%
Medium demand	8%	5%	+3%
Low demand	-5%	-2%	-8%

As can be seen from Table 1, strengthening the forecast of market demand and risk assessment can effectively manage market fluctuations, reduce investment risks, and promote the growth of investment returns.

3.2 Promote the coordinated development of technological innovation and drive market demand
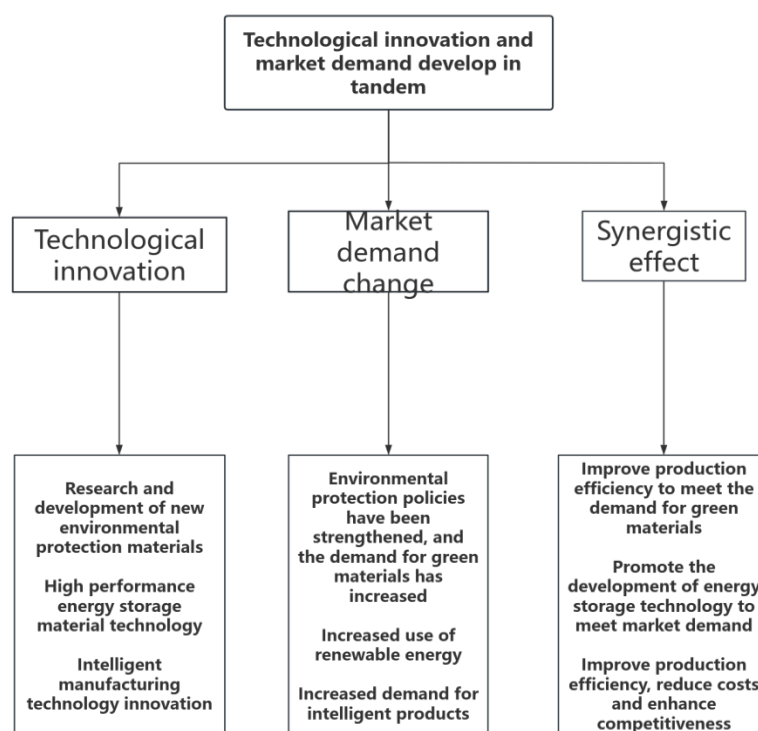
Figure 2. Technological innovation and market demand develop in tandem

In the investment decision of the new materials industry, the synergistic development of technological innovation and market demand is the core driving force to promote the continuous growth of the industry. Technological innovation can not only improve production efficiency and reduce costs, but also open up new market demand, and changes in market demand provide direction and impetus for technological innovation. The positive interaction between the two can enhance the market competitiveness of enterprises and bring more stable returns to investors. Technological innovation helps to open up the application field of new materials and meet the needs of different markets. For example, with the increasing awareness of environmental protection, the

demand for green materials has gradually increased, which has prompted the rapid development and wide application of related technologies. Advanced technology improves the performance and quality of products, while reducing production costs and enhancing the market competition of enterprises. At the same time, changes in market demand will directly affect the direction of technological innovation. When the demand for a new material grows, companies will increase investment in research and development, promote innovation in key technologies, and aim to meet market needs and expand market share. Under this mechanism of mutual promotion of technology and demand, enterprises continue to update their technology to adapt to market dynamics and stay at the forefront of market developments.

With the coordinated development of technological innovation and market demand, enterprises can not only enhance their market competitiveness, but also bring more lucrative returns to investors. Incorporating this interaction into financial modeling can help investors better understand market movements and thus improve their investment choices.

3.3 Strengthen policy monitoring and analysis of industry development trends

In the investment decision of the new materials industry, the policy environment and industry development trends have an important impact on the market. Policy changes, such as government support for new materials, the introduction of environmental regulations and the adjustment of import and export policies, will directly affect business operations and market competition. Therefore, strengthening policy monitoring and industry trend analysis is essential to optimize financial modeling and reduce investment risk. Financial modeling should consider the impact of policy changes on market demand, technological innovation and production costs. For example, government subsidies can reduce the cost of new materials and improve market competitiveness. In modeling, policy scenarios should be incorporated to simulate financial performance under different policies and assess their impact on earnings and cash flow. In addition, the industry development trend can not be ignored. With the continuous progress of technology, the competitive landscape and market demand of the new material industry are changing rapidly. Investors need to pay attention to these trends for a long time, and conduct comprehensive analysis combined with policy changes in order to predict the future development path, so as to seize investment opportunities. Table 2 below summarizes the application of policy impact and industry trend analysis to financial modeling:

Table 2. Application of policy impact and industry trend analysis in financial modeling

Policies/Trends	Influencing factor	Possible financial implications
The government subsidizes green materials	Costs go down, demand goes up	Increase revenue and reduce production costs
Strengthening environmental protection laws and regulations	Increase the demand for environmentally friendly materials	Increase market share and increase profitability
New technological breakthrough	Improve production efficiency	Increase profit margin and shorten payback period
Sustainable development trend	Demand for new energy materials is rising	Expand market scale and enhance competitiveness

It can be seen from Table 2 that by strengthening policy monitoring and industry trend analysis, investors can anticipate market changes and timely update financial strategies in order to effectively respond to policy adjustments and the evolution of industry trends, thus reducing investment risks and seizing potential profit opportunities in the market.

3.4 Improve information transparency and integrate industry data

In investment decisions in the new materials industry, information transparency and data integrity are critical to the accuracy of financial modeling. The industry technology update fast, the market competition is fierce, and the problem of information asymmetry is more prominent, which makes it difficult for investors to accurately evaluate the financial situation, market potential and competitive advantage of enterprises. Therefore, increasing information transparency and integrating industry data can help optimize financial modeling and make investment decisions more scientific. Increased transparency can be achieved by establishing standardized financial disclosure mechanisms, enhancing data sharing in supply chains, and introducing technologies such as blockchain. For example, companies should regularly disclose key financial indicators, research and development investment, market sales and other information to enhance investors' awareness of the market environment. In terms of industry data integration, big data analysis and artificial intelligence technology can be used to integrate multidimensional data such as market trends, technological innovation, and policy environment to build dynamic financial models and improve the accuracy of market forecasts. Table 3 below shows the role of different data types in financial modeling and their impact on investment decisions:

Table 3 .The role of different data types in financial modeling and their impact on investment decisions

Data type	Main source	Role in financial modeling	Impact on investment decisions
Enterprise financial data	Annual reports, financial statements, audit reports	Assess profitability and financial health	Improve the accuracy of investment feasibility analysis
Supply chain data	Raw material suppliers, manufacturers, distribution channels	Monitor cost structure, inventory management	Forecast production cost and market supply and demand changes
Market data	Industry reports, market research, transaction data	Analyze market trends and forecast demand	Assess industry growth potential and return on investment
Technological innovation data	Patent database, R&D investment, publication number	Predict the direction of the industry	Identify potential investment opportunities
Policy and regulatory data	Government announcements, industry regulations, policy documents	Evaluate policy impact and compliance requirements	Avoid policy risks and improve investment stability

Table 3 shows that by improving information transparency and integrating industry data, investors can build more complete financial models, reduce uncertainty in decision-making, improve return on investment, and enhance the ability to adapt to market changes.

4. Industry insight approach for investment in new materials industry

4.1 Technology trend analysis

In investment decisions in the new materials industry, technology trend analysis is a key method to identify potential investment opportunities and predict the direction of industry development. With the acceleration of technological progress, innovations in the field of new materials emerge

endlessly, and technological updates and breakthroughs determine the competitive landscape of the market and the future development potential of enterprises. Through in-depth analysis of technology trends, investors can take the pulse of future developments and make forward-looking investment decisions. An important tool for Technology trend analysis is the Technology Readiness Level (TRL). It quantifies the maturity of the technology to help investors judge the feasibility of the technology from laboratory development to practical application. TRL is typically represented on a scale from 1 to 9, where 1 represents the basic research stage and 9 indicates that the technology is fully mature and ready for market application. Investors can evaluate the TRL value of the technology, analyze the stage of development of the technology, and predict the market acceptance of the technology in the next few years. To further quantify the impact of technology trends on a firm's financial performance, the potential return on technological innovation can be calculated using the following formula:

$$IRR = (\frac{R_t - C_t}{I}) \times 100$$

(1)

Among them, IRR Represents the internal rate of return formula, R_t Represents the expected revenue generated by technological innovation in year t, including increased market demand, increased sales, etc. C_t It is the operating cost of year t, covering production costs, research and development expenses, marketing expenses, etc. I It is the initial investment in technological innovation, including research and development, equipment procurement, market expansion, etc. By calculating IRR, investors can assess the financial return of a technological innovation and determine whether the innovation is worth investing in.

4.2 Market demand and supply forecast

In the investment decision of the new materials industry, the forecast of market demand and supply is a key step to evaluate the industry prospects and make strategic decisions. By forecasting market demand and supply, investors can better understand market changes and supply and demand relations, and timely adjust production and sales strategies. Market demand is usually influenced by a variety of factors, such as the economic environment, consumer preferences, technological advances, etc. Common demand forecasting methods include time series analysis and regression model. By analyzing historical data and market trends, future demand changes can be predicted. Market supply is affected by factors such as production capacity, raw material supply, and technological development. Through supply forecasting, investors can determine whether there is a risk of imbalance between supply and demand in the market. To quantify the relationship between Demand and Supply, the supply-demand Gap (SDG) is an important indicator. Its calculation formula is as follows:

$$SDG_t = D_t - S_t$$

(2)

Among them, SDG_t Represents the difference between supply and demand at point t in time, D_t It's market demand, S_t It's the market supply.if $SDG_t > 0$ The demand is greater than the supply and there is a gap in the market. if $SDG_t < 0$ Indicates that supply is greater than demand, and there may be a risk of oversupply. Through this formula, investors can more clearly assess whether the market is in a growth stage, or whether it is facing a dilemma of oversupply, so as to make investment adjustments accordingly.

4.3 Competition situation and industry chain analysis

In the investment decision of new material industry, competition situation and industry chain analysis are very important. Understanding the competitive landscape of the industry, the strategies of major competitors and the changes in the upstream and downstream of the industrial chain can help investors identify market opportunities and potential risks. Competitive situation analysis helps understand the intensity of competition in an industry by assessing factors such as market share, technological advantage, and cost structure. Porter's Five Forces model is often used to analyze the bargaining power of existing competitors, potential entrants, substitutes, buyers and suppliers, and to evaluate the profit potential and market barriers of the industry. Industrial chain analysis focuses on the whole process from raw material supply to product sales, covering costs, technical barriers and market concentration. Fluctuations in raw material prices, technological advances and changes in market demand will affect the performance of each link in the industrial chain. Investors can use the chain profit margin (ICPM) to assess the profitability of each link:

$$ICPM = \frac{TP}{TR} \times 100\%$$

(3)

Among them, TP Represents the total profit, is the total profit of each link in the industrial chain, TR Represents the total agent revenue, which is the total sales revenue of each link. By calculating the profit rate of the industrial chain, investors can identify which links in the industrial chain have strong profitability and which links may be at risk of profit compression.

4.4 Policy and regulatory environment analysis

When making investment decisions in the new materials industry, changes in the policy and regulatory environment have a significant impact on business operations and market performance. Government policy support, environmental regulations, tax policies and other factors directly affect technological progress, production costs and market demand. Therefore, analyzing the policy and regulatory environment helps investors to assess the potential impact of external factors on the financial health of a company, thereby optimizing investment decisions. Policy analysis includes the assessment of government support policies, subsidies and tax incentives. Such as green materials or new energy materials policy support to promote technological development and market demand growth. At the same time, the government may introduce environmental regulations, requiring enterprises to increase compliance investment, which will affect operating costs and market competitiveness. Regulatory environment analysis focuses on environmental standards, safety standards and intellectual property protection. Such as strict environmental regulations increase costs, but also create opportunities for the green materials market. Enhanced intellectual property protection promotes technological innovation, thereby enhancing the market position of enterprises. To quantify the impact of policy changes on financial performance, investors can use the Policy Impact Index (PII) :

$$PII = \frac{S_p \times St_p \times A_i}{C_r + R_p}$$

(4)

Among them, S_p Indicates policy support, St_p Denotes policy stability, A_i Industry adaptability assessment of the enterprise's ability to adapt to the new policy, C_r Represents the cost of regulatory compliance, R_p Represents the uncertainty and potential volatility associated with regulatory

changes. Through this index, investors can quantify the impact of policies and regulations on business operations and predict their specific impact on investment returns.

5. Conclusion

As a technology-driven industry, the new materials industry faces a complex and changing market environment and policy impacts, and financial modeling plays a crucial role in investment decisions. By strengthening risk assessment, forecasting market demand volatility, strengthening policy monitoring and analyzing industry trends, as well as improving information transparency and integrating industry data, investors can effectively improve the scientific and accurate decision-making. These optimization strategies not only help to identify potential financial risks, but also help to capture investment opportunities in the development of the industry, reduce investment risks, and improve investment returns.

References

[1] *Floros C, Gkillas K, Kountzakis C. Generalized Stochastic Integration and Financial Modeling. Annals of Financial Economics, 2024, 19(03).*

[2] *Peng C, Simon C . Financial Modeling with Geometric Brownian Motion. Open Journal of Business and Management, 2024, 12(2):11.*

[3] *Gevorkova V, Sangiorgi I, Vogt J, et al. Cleansing Investor Conscience: The Effects of Incidental Guilt on Socially Responsible Investment Decisions. Journal of Business Ethics, 2024, 193(1).*

[4] *Yanti F, Endri E. Financial Behavior, Overconfidence, Risk Perception and Investment Decisions: The Mediating Role of Financial Literacy. International Journal of Economics & Financial Issues (IJEFI), 2024, 14(5).*

[5] *J. Huang, "Research on Multi-Model Fusion Machine Learning Demand Intelligent Forecasting System in Cloud Computing Environment, " 2025 2nd International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS), Hassan, India, 2025, pp. 1-7.*

[6] *X. Liu, "Research on User Preference Modeling and Dynamic Evolution Based on Multimodal Sequence Data, " 2025 2nd International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS), Hassan, India, 2025, pp. 1-7.*

[7] *D. Shen, "Complex Pattern Recognition and Clinical Application of Artificial Intelligence in Medical Imaging Diagnosis, " 2025 International Conference on Intelligent Communication Networks and Computational Techniques (ICICNCT), Bidar, India, 2025, pp. 1-8.*

[8] *Q. Hu, "Research on Dynamic Identification and Prediction Model of Tax Fraud Based on Deep Learning," 2025 2nd International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS), Hassan, India, 2025, pp. 1-6.*

[9] *F. Liu, "Architecture and Algorithm Optimization of Realtime User Behavior Analysis System for Ecommerce Based on Distributed Stream Computing, " 2025 International Conference on Intelligent Communication Networks and Computational Techniques (ICICNCT), Bidar, India, 2025, pp. 1-8.*

[10] *F. Liu, "Transformer XL Long Range Dependency Modeling and Dynamic Growth Prediction Algorithm for E-Commerce User Behavior Sequence, " 2025 2nd International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS), Hassan, India, 2025, pp. 1-6.*

[11] Su H, Luo W, Mehdad Y, et al. Llm-friendly knowledge representation for customer support[C]//Proceedings of the 31st International Conference on Computational Linguistics: Industry Track. 2025: 496-504.

[12] Zhu, P. (2025). The Role and Mechanism of Deep Statistical Machine Learning In Biological Target Screening and Immune Microenvironment Regulation of Asthma. arXiv preprint arXiv:2511. 05904.

[13] Liu, B. (2025). Design and Implementation of Data Acquisition and Analysis System for Programming Debugging Process Based On VS Code Plug-In. arXiv preprint arXiv:2511. 05825.

[14] Zou, Y. (2025). Design and Implementation of a Cloud Computing Security Assessment Model Based on Hierarchical Analysis and Fuzzy Comprehensive Evaluation. arXiv preprint arXiv:2511. 05049.

[15] K. Zhang, "Optimization and Performance Analysis of Personalized Sequence Recommendation Algorithm Based on Knowledge Graph and Long Short Term Memory Network, " 2025 2nd International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS), Hassan, India, 2025, pp. 1-6.

[16] Ding, J. (2025). Research On CODP Localization Decision Model Of Automotive Supply Chain Based On Delayed Manufacturing Strategy. arXiv preprint arXiv:2511. 05899.

[17] Chen M. Research on Automated Risk Detection Methods in Machine Learning Integrating Privacy Computing. 2025.

[18] Ding, J. (2025). Intelligent Sensor and System Integration Optimization of Auto Drive System. International Journal of Engineering Advances, 2(3), 124-130.

[19] Mingjie Chen. (2025). Exploration of the Application of the LINDDUN Model in Privacy Protection for Electric Vehicle Users. Engineering Advances, 5(4), 160-165.

[20] Liu, X. (2025). Research on Real-Time User Feedback Acceleration Mechanism Based on Genai Chatbot. International Journal of Engineering Advances, 2(3), 109-116.