Investment Value Analysis of SMIC Based on The CAPM Model

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Abstract. Amidst the global semiconductor landscape and China's strategy for technological independence, SMIC, as a leading wafer foundry in mainland China, has attracted attention. This article analyzes its investment value using the CAPM model and financial data. The findings indicate that its revenue has continued to grow over the past two years, while net profit initially declined and then rebounded. Its Sharpe ratio of 6.81 demonstrates high value for money. However, its risk assessment is limited in scope and lacks analysis of value drivers. Future work will expand the risk assessment framework to quantify the impact of external demand. Its development also benefits from market demand, domestic substitution, and policy support for AI.

Keywords: SMIC; Investment Value; CAPM Model; Semiconductor Industry; Sharpe Ratio.

1. Introduction

Against the backdrop of the global semiconductor industry landscape and the accelerated advancement of China's independent scientific and technological innovation strategy, semiconductor companies, as core forces in the industry chain, are attracting market attention for their development momentum and investment value. As mainland China's largest and most technologically advanced integrated circuit wafer foundry, SMIC is not only a powerful force in the domestic semiconductor industry chain, but also a vital link connecting the supply and demand of the global chip market. In recent years, the global consumer electronics market has grown, with demand for products such as smartphones and IoT devices, as well as demand for technological upgrades, driving the chip industry chain. At the same time, domestic policy support for the semiconductor industry has continued to increase, providing a favorable development environment for local companies such as SMIC. However, the semiconductor industry faces multiple challenges, including rapid technological iteration, high R&D investment, fierce market competition, and an uncertain international trade environment. These factors are transmitted to the stock market through corporate operating performance, resulting in stock price volatility and investment risks significantly higher than the market average. Against this backdrop, scientifically assessing SMIC's stock risk and expected returns, and exploring the growth logic and potential risks behind its operating performance, will not only provide important reference value for investors, but also allow the market to understand the investment value of leading semiconductor companies.

The artificial intelligence industry has developed rapidly in recent years, with increased government support. However, from the perspective of the entire industry, the technology content of artificial intelligence is extremely high, while the overall industrial foundation is relatively weak. High-tech content does not necessarily lead to higher returns [1]. China's high-tech industry is experiencing rapid development, which has greatly promoted the development of productivity. New technologies such as artificial intelligence are also constantly emerging [2]. Chinese artificial intelligence companies are in a rapid development stage. A large proportion of these companies are listed on the Growth Enterprise Market. Currently, there are relatively few comprehensive studies on the systems and fundamentals of companies in this emerging industry. This article conducts a comprehensive analysis of the business, financial indicators, and company valuation of SW artificial intelligence company. Because artificial intelligence is a sunrise industry, this research has strong forward-looking. At the same time, SW artificial intelligence company has a good development momentum and a sound financial situation, making it highly representative [3]. First, artificial intelligence is in an ascending period and has many future applications. In recent years, the

development momentum of artificial intelligence has been rapid, and its practicality has been enhanced. However, as mentioned earlier, artificial intelligence is still in the stage of perceptual intelligence and is still quite far from the stage of cognitive intelligence. There are still many breakthroughs in technology. In terms of application, artificial intelligence has many potential application scenarios. With the improvement of technology, these application scenarios have the possibility of being transformed into daily life scenarios [4]. Secondly, the artificial intelligence industry is still in its early stage of development, and its future development has many uncertainties. We will conduct more in-depth analysis and research in the future to provide investors with more scientific and reasonable investment advice [5]. In recent years, the country has paid close attention to the development of the artificial intelligence chip industry and issued a series of industrial support policies, creating a favorable policy environment for the artificial intelligence chip industry and promoting its development [6].

The CAPM model is an important model in modern finance used to describe the relationship between the expected return of an asset and its risk. It was independently proposed by William Sharpe, John Lintner, and Jan Mossin in the 1960s. The core formula of the CAPM model is:

$$E(Ri) = Rf + BETAi\ [E\ (Rm - Rf)] \quad (1)$$

The CAPM model can help investors provide a quantitative method for assessing the risk and expected return of an asset. Through this model, investors can determine the risk characteristics of an asset based on its beta coefficient and combine the risk-free rate and the expected return of the market to determine a reasonable expected return.

From the market situation, it can be seen that as a technology stock, SMIC has a relatively high investment risk. Investors need to bear a higher level of volatility risk than the market average when considering investing in SMIC. This may be due to factors such as the rapid technological updates and fierce competition in the semiconductor industry.

2. Company Profile

SMIC is a leading enterprise in the field of integrated circuit foundry in Chinese mainland. Since its registration and establishment in the Cayman Islands on April 3, 2000, SMIC has been committed to promoting the development of the domestic semiconductor manufacturing industry. The founder is Zhang Rujing and the current chairman is Liu Xunfeng. The company's headquarters is located in Pudong New Area, Shanghai. It has established a layout of wafer fabrication plants with Shanghai, Beijing, Tianjin and Shenzhen as the core in China. Meanwhile, to expand the global market, it has set up marketing offices in the United States, Europe, Japan and Taiwan, China, building an integrated operation network covering R&D, production and sales.

In terms of development trends and planning, SMIC invests 7 to 8 billion US dollars annually in base expansion, continuously increasing its production capacity. At the same time, benefiting from the domestic semiconductor industry's policy support for domestic substitution, a 30% subsidy can be obtained for the purchase of semiconductor equipment. The proportion of domestic customers has exceeded 60%, providing a solid guarantee for business growth. In addition, the company has performed outstandingly in the field of environment, society and governance (ESG). Its ESG report released in 2024 has been rated as "five-star" for three consecutive years, and it has successfully been selected as one of the top 30 ESG technology innovation pioneers in China, demonstrating the company's emphasis on sustainable development while pursuing economic benefits.

3. Financial Analysis

This article focuses on the investment value of SMIC's stocks. By applying the core CAPM model of modern finance, it quantitatively analyzes the risk characteristics of SMIC's stocks relative to the overall market through the calculation of the Sharpe ratio. At the level of business performance analysis, it takes the publicly available financial data of the enterprise as the core, selects key

indicators such as operating income, net profit, total assets, and capacity utilization rate, and systematically reviews the business conditions and development trends of SMIC from 2023 to 2025, while correlating external factors such as global consumer electronics and smartphone market demands to analyze the changes. The research results show that: from the perspective of business performance, the operating income has been continuously rising in the past two years. In 2024, the operating income reached 57.796 billion yuan (a year-on-year increase of 27.7%), and the growth trend continued in the first half of 2025 (operating income of 32.348 billion yuan, a year-on-year increase of 23.14%). The net profit showed a "first decline then rise" recovery trend (net profit of 3.699 billion yuan in 2024, a year-on-year decrease of 23.3%; net profit of 3.81 billion yuan in the first half of 2025, a year-on-year increase of 99.4%). The capacity utilization rate increased from 75% in 2023 to 85.6% in 2024. The improvement in production efficiency has driven revenue growth, and the consumer electronics and smartphone sectors have been the main contributors to revenue growth.

4. Data Analysis

As shown in Figure 1, SMIC's stock price has experienced significant fluctuations over the past year and a half, especially with a sharp rise in late 2024.

Figure 1. SMIC's Closing Stock Price from December 2023 to August 2025.

According to the data, SMIC's Sharpe ratio is 6.81. It can be seen that SMIC's Sharpe ratio is relatively large, indicating that this stock has a good cost-performance ratio and high capital efficiency. The Sharpe ratio is calculated as (r - rf) / sigma.

In 2024, SMIC's revenue was 57.796 billion yuan, representing a year-on-year growth of 27.7%. In the first half of 2025, its revenue was 32.348 billion yuan, a year-on-year increase of 23.14%. In 2024, SMIC's net profit was 3.699 billion yuan, a year-on-year decrease of 23.3%. In the first half of 2025, its net profit was 470 million US dollars (approximately 3.81 billion yuan), a year-on-year increase of 99.4%. At the end of 2024, SMIC's total assets were 49.2 billion US dollars, and by the end of June 2025, they had reached 49.446 billion US dollars.

From the data, it can be seen that SMIC's revenue has been on the rise in the past two years. Among various business segments, consumer electronics and smartphones have made significant contributions to revenue growth. Firstly, this may be attributed to the global consumer electronics market and the smartphone market's upgrade cycle, which has increased the demand for chips. SMIC has precisely met this market demand. Moreover, the capacity utilization rate was approximately 75% in 2023 and reached 85.6% throughout 2024. The increase in capacity utilization means that more products can be produced and sold, directly promoting revenue growth. Secondly, the NVIDIA H20

chip was exposed to have security risks such as "tracking and positioning" and "remote shutdown", which has led domestic companies to actively seek domestic chip alternatives to NVIDIA chips, reducing the domestic market's purchasing intention for NVIDIA chips. To ensure data security and supply chain stability, domestic enterprises will seek domestic alternatives. As a domestic high-end chip foundry, the demand for SMIC's chips has accordingly increased, which has become the reason for the growth in demand. Furthermore, China has issued a policy on artificial intelligence, stating: "Drive technological research and development model innovation and efficiency improvement. Promote the integrated and coordinated development of artificial intelligence-driven technological research and development, engineering implementation, and product application. Accelerate the "from 1 to N" technological application and iterative breakthroughs, and promote the efficient transformation of innovation achievements. Support the promotion and application of intelligent research and development tools and platforms, and strengthen the collaborative innovation of artificial intelligence with biomanufacturing, quantum technology, and sixth-generation mobile communication (6G) and other fields. Use new scientific research achievements to support the application of scenarios and new application demands to drive technological innovation breakthroughs." This indicates that China is comprehensively promoting the development of artificial intelligence, and the development of artificial intelligence has become a "strategic blueprint" for the comprehensive transformation of the economy and society. Therefore, under the support of policies, the value of SMIC will increase sharply. However, this also reflects its uncertainty. Because the development of policies and innovations is unpredictable, the risks are very high. Compared with basic financial products such as stocks, options are more complex and riskier, and their prices are affected by multiple factors.

5. Discussion

The findings of this analysis suggest that SMIC's investment value is driven by a combination of strong financial performance and significant market opportunities, but is also tempered by high volatility and policy-related uncertainties. The high Sharpe ratio indicates that investors have been well-compensated for the risks taken, a characteristic feature of high-growth technology stocks. The value of SMIC will likely increase sharply under the support of policies promoting domestic substitution and artificial intelligence. However, this also reflects its uncertainty. Because the development of policies and innovations is unpredictable, the risks are very high. Compared with basic financial products such as stocks, options are more complex and riskier, and their prices are affected by multiple factors. Therefore, individual investors should have a systematic understanding of the principles, pricing methods, and trading rules of options before investing to better achieve the purpose of risk diversification and profit acquisition [7]. Companies listed on the STAR Market have fast technological iterations, long investment cycles, and high uncertainties, thus requiring higher standards from investors [8]. It is also closely related to factors such as their technological innovation capabilities, market expansion strategies, industry development trends, and macroeconomic environments [9]. The operation of artificial intelligence companies is subject to high risks and uncertainties, and this uncertainty and risk will bring uncertain value to the company, that is, potential value or implicit value [10].

6. Conclusion

In summary, this analysis indicates that SMIC presents a compelling, albeit high-risk, investment opportunity. The company has demonstrated robust revenue growth and a strong recovery in net profit, supported by a high Sharpe ratio of 6.81, suggesting high capital efficiency. Key drivers for this performance include rising market demand, the trend towards domestic substitution, and significant national policy support.

Despite these positive indicators, the present study has certain limitations. First, the risk assessment dimension is relatively single. It only uses the CAPM model to analyze the stock risk from the perspective of market systematic risk, without considering non-systematic risk factors. For example, in the risk assessment of the Sino-US game, the lack of such assessment may lead to an incomplete risk assessment. Second, the depth of analysis of value drivers is insufficient. The correlation between the demand for consumer electronics and smartphones and the revenue growth of SMIC is only matched by trend, without explaining the specific impact of external market demand on the enterprise.

Future research should be advanced from two aspects. First, expand the risk assessment framework. On the basis of the CAPM model, introduce a multi-dimensional risk assessment system to more comprehensively identify the investment risks of SMIC. Second, analyze the driving factors. By collecting data on the global and domestic consumer electronics and smartphone markets (such as terminal product shipments, chip purchase volumes), statistical methods such as regression analysis can be used to quantify the impact coefficient of external demand on enterprise revenue.

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