Frontiers in Economics and Management Volume 6 Issue 12, 2025
ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

Performance Evaluation Analysis of Gree Electric Appliances based on Economic Value Added

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Abstract

In today's fiercely competitive business environment, scientifically and accurately assessing a company's true value creation capability is crucial. Traditional accounting profit indicators, which do not account for the cost of equity capital, struggle to reflect the real value creation. Economic Value Added (EVA), as a modern performance evaluation tool, more accurately reflects a company's value creation ability by measuring the portion of its after-tax operating profit that exceeds the total cost of capital. This study takes Zhuhai Gree Electric Appliances Inc. (000651.SZ) as a case study, systematically evaluating its operating performance from 2020 to 2023 using the EVA model. Employing case study and quantitative analysis methods, and based on the company's annual report data, the study calculates Net Operating Profit After Tax (NOPAT), Total Capital (TC), and Weighted Average Cost of Capital (WACC) to derive the EVA values for each year and conducts an in-depth analysis. The results show that Gree Electric Appliances demonstrated strong value creation capability between 2020 and 2023. EVA grew continuously from RMB 6.053 billion in 2020 to RMB 25.839 billion in 2023, a cumulative increase of 327%; NOPAT reached RMB 36.192 billion in 2023, with a capital cost rate of 5.48%. This indicates that the company not only created economic profits exceeding the cost of capital for shareholders for four consecutive years but also continuously improved its value creation efficiency. The growth in EVA is primarily attributed to the stable profitability of its core air conditioning business, continuous R&D investment, and excellent operational efficiency. Compared to the traditional net profit indicator, EVA more rigorously reveals the company's true profitability level: the 2023 EVA was lower than net profit, indicating that net profit includes a portion of the necessary return on shareholder capital. Notably, the growth rate of EVA exceeded that of net profit, suggesting improved marginal returns on newly invested capital and enhanced capital allocation efficiency. This study validates the applicability of the EVA indicator in large manufacturing enterprises, provides a theoretical basis and practical reference for Gree Electric Appliances to optimize resource allocation and improve capital efficiency, and also offers valuable insights for performance evaluation in other manufacturing companies.

Keywords

Economic Value Added (EVA); Gree Electric Appliances; Performance Evaluation.

1. Introduction

In today's competitive and changing business environment, how to scientifically and accurately evaluate a company's true operating performance and value creation capability remains a focal point for managers, investors, and academia. Traditional financial performance evaluation

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

systems primarily rely on accounting profit indicators such as net profit and earnings per share. However, these indicators have inherent limitations: they only consider the cost of debt capital but fail to deduct the opportunity cost of shareholder-invested capital, which may lead to a situation where a company shows accounting profits while actually eroding shareholder wealth[1]. Economic Value Added (EVA), as a modern corporate performance evaluation indicator, is based on the core concept that capital has a cost. A company only truly creates value for shareholders when its after-tax operating profit exceeds the total cost of capital. Therefore, EVA can measure a company's value creation ability more comprehensively and authentically, overcoming the shortcomings of traditional indicators[2].

Gree Electric Appliances (000651.SZ), as a leading enterprise in China's home appliance industry and a benchmark in manufacturing, has a development history and operating performance of high research value[3]. According to its annual reports from 2020 to 2023, the company is undergoing profound transformation and change: transitioning from "Good Air Conditioners, Gree Makes" to "Good Appliances, Gree Makes" through diversification, expanding its industrial coverage from household air conditioners and lifestyle appliances to high-end equipment, precision molds, new energy, semiconductors, energy storage, and other industrial fields; in terms of marketing models, it actively promotes the deep integration of online and offline "new retail" transformation[4]; technologically, it adheres to an R&D strategy of "investment based on demand without an upper limit," possessing multiple "internationally leading" technologies[5]. In 2023, the company's total operating revenue exceeded RMB 205 billion, and its net profit attributable to shareholders reached RMB 29 billion, both hitting record highs. Behind this series of impressive financial data, a key question needs answering: have these strategic initiatives, under massive R&D investment and extensive capital expenditure, been effectively translated into real economic profit for Gree Electric Appliances, i.e., are they creating value for its shareholders that exceeds the cost of capital?

Against this background, this study holds significant theoretical and practical importance. Theoretically, applying the EVA model to the classic case of Gree Electric Appliances can validate the applicability and effectiveness of the EVA indicator in large, complex, and diversely operated manufacturing enterprises, enrich case studies in the field of corporate performance evaluation, and provide practical evidence from Chinese manufacturing for the development of EVA theory[6]. Practically, for Gree's management, EVA-based performance analysis can help scrutinize the true returns of various businesses and investments, optimize resource allocation, and guide management decisions to focus more on long-term value creation rather than short-term accounting profits. For investors and creditors, this study provides an analytical perspective beyond traditional financial reports, helping them more accurately assess Gree's intrinsic investment value and potential risks[7]. Furthermore, for other manufacturing enterprises seeking transformation and high-quality development, the evolution path of Gree's EVA performance can offer valuable experience, insights, and inspiration.

2. Overview of Economic Value Added (EVA) Theory

2.1. Basic Concept of EVA

Economic Value Added (EVA) is not a complex new concept; its core idea points directly to the essence of business activity: for any investment or operation to truly create value, the return it generates must exceed the cost of all capital invested. It is a corporate performance evaluation system proposed and promoted by the American consulting firm Stern Stewart & Co., aiming to correct the flaw of traditional accounting profit indicators ignoring the cost of equity capital. Simply put, EVA measures the difference between a company's after-tax net operating profit and the cost of all invested capital[8]. Its most fundamental calculation formula can be

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

expressed as:EVA = Net Operating Profit After Tax (NOPAT) - Total Capital (TC) × Weighted Average Cost of Capital (WACC).

This concise formula contains profound management philosophy. Traditional profit indicators, like net profit, only deduct interest on debt when calculating, as if shareholder-invested capital is "free." EVA explicitly states that shareholder funds also have an opportunity cost; by investing in the enterprise, shareholders forgo the return they could have obtained from investing in other projects with similar risk[9]. Therefore, even if a company shows profits on its financial statements, if those profits do not cover the total cost of capital including equity, the company is, in economic terms, actually destroying shareholder wealth. To more accurately reflect the company's core operating performance and true economic profit, calculating EVA usually requires a series of adjustments to the financial statement data prepared according to accounting standards. These adjustments aim to eliminate the effects of accounting conservatism and reduce opportunities for management earnings manipulation[10]. Therefore, EVA is essentially a concept of economic profit, not accounting profit. It answers the question managers should care about most: "After deducting all operating expenses and capital costs, how much money have we actually earned for shareholders?" A positive EVA indicates the company has created new value, while a negative EVA means enterprise value has been impaired. Linking managerial compensation to EVA growth can effectively align their interests with those of shareholders, guiding them to make decisions more conducive to the company's long-term value creation[11].

2.2. Advantages and Limitations of EVA Performance Evaluation

Although Economic Value Added (EVA) is widely used and recognized globally as a performance evaluation tool, like any methodology, it is not perfect. Objectively understanding its advantages and limitations is crucial for correctly comprehending and effectively applying EVA.

The core value of EVA lies in introducing the economists' concept of "opportunity cost" into daily management practice[12]. Its advantages are mainly reflected in the following aspects. First, it more truly and comprehensively reflects value creation. This is EVA's most fundamental advantage. It considers the cost of all capital, including equity, clearly stating that a company only truly creates wealth for shareholders when its earnings exceed the total cost of capital. This corrects the defect of traditional accounting profit indicators treating shareholder investment as a "free lunch," forcing managers to focus on the efficiency of capital use[13]. For example, Gree's 2023 net profit was as high as RMB 29 billion, but only after it far exceeded the cost generated by its massive equity and debt capital did its economic profit (EVA) become positive, representing the real growth in shareholder wealth. Second, it guides and optimizes resource allocation, promoting long-term value creation. The EVA mechanism encourages managers to think like owners. Since EVA is directly linked to shareholder wealth growth, it can effectively curb short-term managerial behavior. For instance, EVA capitalizes strategic investments like R&D expenses and brand building, encouraging managers to make investments beneficial for long-term development, rather than cutting these key investments to meet short-term net profit targets[14]. This is particularly important for innovation-driven companies like Gree, which invests over RMB 7 billion annually in R&D and emphasizes "mastering core technologies." Third, EVA also highly unifies performance evaluation with the goal of shareholder wealth maximization. Improvement in EVA directly means an increase in shareholder wealth. This allows for establishing an incentive system centered on EVA improvement from top to bottom within the company, ensuring all departments' efforts align with the overall corporate goal, reducing goal conflicts and agency costs that traditional financial indicators might cause[15].

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Despite its significant advantages, EVA faces some challenges and limitations in practical application. First, the calculation process is complex, and adjustments involve subjectivity. The accounting adjustments necessary for calculating "economic" profit, while necessary, often rely on professional judgment in selecting adjustment items and determining the extent of adjustment, which somewhat undermines objectivity. Different adjustment methods may lead to different EVA values, potentially causing controversy and increasing implementation cost and difficulty. Second, estimating the cost of capital is challenging[16]. Calculating WACC, especially estimating the cost of equity capital, is a technical difficulty in EVA application. When using the Capital Asset Pricing Model (CAPM) to estimate the cost of equity, the choices of risk-free rate, market risk premium, and beta coefficient all involve assumptions and expectations. Slight changes in these parameters can significantly impact the final EVA result, affecting the stability of the evaluation outcome. Third, EVA remains a financial indicator based on historical information. EVA is essentially still a financial concept, primarily calculated based on past financial statement data. While it measures past performance well, it cannot directly reflect the company's future growth potential, the value of intangible assets, or potential industry competitive advantages[17].

In summary, EVA is a powerful and effective performance management tool, but it is not a "master key." When applying it, enterprises should fully understand the economic logic behind it, prudently perform calculation adjustments and parameter selection, and ideally combine it with other financial and non-financial indicators to form a comprehensive and balanced performance evaluation system, thereby more accurately guiding and managing value creation activities[18].

3. Case Background of Gree Electric Appliances

3.1. Company Profile and Development History

Zhuhai Gree Electric Appliances Inc. (Stock Code: 000651.SZ) was established in 1991. It is a diversified, technology-based global industrial group integrating R&D, production, sales, and service. Headquartered in Zhuhai, Guangdong Province, its development history is a classic epitome of Chinese manufacturing catching up with and leading the world. Gree's development history is a history of struggle marked by continuous innovation and constant surpassing. The company initially started by assembling household air conditioners but soon established the strategic direction of "mastering core technologies," embarking on a path of independent innovation. In 1994, Gree pioneered the "year-end rebate" marketing model, an industry first, laying a strong channel foundation. In 1995, Gree's air conditioner production and sales volume ranked first in China, and it has maintained the leading position in the domestic air conditioner market for 28 consecutive years since, becoming the well-known "Air Conditioner King." Entering the 21st century, Gree's development pace accelerated. In 2005, Gree's household air conditioner production and sales exceeded 10 million units, becoming the "single champion" in global household air conditioners; in 2012, the company reached a milestone, with total operating revenue exceeding RMB 100 billion for the first time. Ms. Dong Mingzhu officially assumed the position of Chairman, leading Gree into a new stage of development. Subsequently, Gree, not content with success in a single product, began a strategic diversification layout. The company successively launched brands like TOSOT lifestyle appliances and Jinghong refrigerators, expanding its product line from household and commercial air conditioners to refrigerators, washing machines, water heaters, kitchen appliances, environmental appliances, and other whole-house appliances.

In recent years, Gree Electric's transformation and upgrading have been particularly profound. In the industrial sector, the company has aggressively expanded into high-end equipment, precision molds, new energy, semiconductors, energy storage, and renewable resources

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

through independent R&D and mergers and acquisitions. It is committed to building an industrial group that covers the entire industrial chain, from upstream to downstream. In 2019, the company completed its mixed-ownership reform, with Zhuhai Mingjun Investment Partnership becoming its new largest shareholder. This marked the beginning of a new phase of market-oriented and professional development for Gree Electric, with no controlling shareholder. Even amid the challenges of the global pandemic in 2020, Gree once again secured a spot on the Fortune Global 500 list, thanks to its strong comprehensive capabilities. According to its 2023 annual report, Gree Electric now operates three major brands-Gree, TOSOT, and Jinghong-with products exported to over 190 countries and regions, serving more than 600 million users worldwide. In 2023, the company achieved an operating revenue of 205.018 billion yuan and a net profit attributable to shareholders of 29.017 billion yuan, both reaching historic highs. Today, Gree Electric has successfully transformed from a specialized air conditioning manufacturer into a global industrial group spanning household consumer goods and industrial equipment. It is steadily advancing toward its vision of "building a world-class enterprise and establishing Gree as a century-old brand."

3.2. Financial Overview of the Past Four Years

To gain a macro and quantitative understanding of Gree's value creation capability and provide a clear data foundation for subsequent EVA calculations, this section compiles key financial indicators based on its annual reports from 2020 to 2023. The table below summarizes the core operating and financial data over these four years, visually presenting the company's development trajectory and financial characteristics.

Table 1. Gree Electric's Financial Status from 2020 to 2023

Financial Indicator (Unit: RMB 100 million)	2020	2021	2022	2023
Total Operating Revenue	1701.97	1878.69	1889.88	2050.18
Net Profit Attributable to Shareholders	221.75	230.64	245.07	290.17
Net Cash Flow from Operating Activities	192.39	18.94	286.68	563.98
R&D Investment Amount	62.14	62.97	64.30	70.06
Total Assets	2798.18	3195.98	3550.25	3680.54
Shareholders' Equity Attributable to the Company	1151.90	1036.52	967.59	1167.94

Data Source: Compiled based on Gree Electric Appliances' 2020-2023 Annual Reports (same below)

By analyzing the table above, we can form the following overall understanding of Gree's financial status over the past four years. First, sustained growth in revenue and profitability. The company's total operating revenue declined in 2020 due to the pandemic but achieved restorative growth in 2021. Although growth slowed in 2022, it maintained a robust scale and successfully broke the RMB 200 billion mark in 2023, reaching a record high. More importantly, its net profit growth curve is steeper, increasing continuously from RMB 22.175 billion in 2020 to RMB 29.017 billion in 2023, indicating the company's continuous enhancement of profitability, providing a solid profit foundation for value creation. Second, strong cash flow generation capability. Net cash flow from operating activities showed significant fluctuations over the four years, hitting a low in 2021 but rebounding strongly in 2022 and reaching an

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

impressive RMB 56.398 billion in 2023. This reflects the company's strong bargaining power in the industrial chain and excellent working capital management efficiency. Ample cash flow is the fundamental guarantee for the company's R&D investment, capital expenditure, and shareholder returns. Third, steadfast innovation investment. R&D investment increased steadily from RMB 6.214 billion in 2020 to RMB 7.006 billion in 2023, with the absolute amount continuously rising. This indicates that Gree consistently adheres to the R&D strategy of "investment based on demand without an upper limit," viewing technological innovation as the core driver, which aligns highly with its annual report emphasis on "mastering core technologies." Continuous R&D investment is also key to maintaining product competitiveness and exploring new business areas. Fourth, asset scale expansion and shareholder returns. The company's total assets continued to expand, growing from RMB 279.818 billion in 2020 to RMB 368.054 billion in 2023, reflecting continuous investment and accumulation during its diversification transformation. Notably, shareholders' equity attributable to the company decreased in 2022, mainly due to the implementation of a high cash dividend that year (RMB 2 per 10 shares), returning profits to shareholders rather than retaining them entirely for reinvestment.

In summary, Gree has demonstrated the financial resilience of an industry leader over the past four years. Revenue and profit scales have steadily climbed, cash flow conditions were exceptionally strong in 2023, and investment in the future continues to increase. These financial characteristics provide a rich background and solid data foundation for subsequently calculating its Economic Value Added (EVA) and evaluating its true value creation capability.

4. EVA Performance Evaluation Analysis of Gree Electric Appliances

4.1. EVA Calculation Process

(1) Calculation and Adjustment of Net Operating Profit After Tax (NOPAT)

Net Operating Profit After Tax (NOPAT) is a core component in the Economic Value Added (EVA) calculation. It measures the economic profit generated by a company's main business operations using all capital. The purpose of calculating NOPAT is to more accurately reflect the company's sustainable operating profitability, excluding the impact of non-recurring gains/losses and accounting policies, thereby providing a reliable basis for EVA analysis[19].

The basic calculation formula for NOPAT is: NOPAT = Net Profit + (Interest Expense + R&D Expense Adjustment Item) × (1 - Income Tax Rate)[20]. Based on Gree's annual report data from 2019-2024, we use 2023 as an example to detail the NOPAT calculation and adjustment process. In 2023, Gree achieved a total operating revenue of RMB 205.018 billion and a net profit of RMB 27.719 billion, providing the base data for NOPAT calculation.

First, for interest expense, we use the interest expense under financial costs. According to the 2023 annual report, Gree's interest expense under financial costs was RMB 2.962 billion. Second, for the R&D expense adjustment item, it refers to the "R&D expenses" under "period expenses" in the financial statements and development expenditures capitalized as intangible assets in the current period. According to the 2023 annual report, its R&D expenses under period expenses were RMB 6.762 billion, and development expenditures capitalized as intangible assets in the current period were RMB 0.244 billion. Third, based on income tax expense and total profit, its corporate income tax rate is calculated to be around 15%. For conservatism and considering Gree's status as a high-tech enterprise, we adopt a corporate income tax rate of 15% in the calculation. Finally, the adjusted NOPAT is calculated as: 277.19 + (29.62 + 67.62 + 2.44) × (1 - 0.15) = 361.92 billion.

The above adjustment process ensures that NOPAT more accurately reflects the economic profit of Gree's core business. Similarly, we performed the same adjustments for the 2020-2022 data. The calculation results are shown in the table below.

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Table 2. Calculation of Gree Electric's NOPAT from 2020 to 2023

Financial Indicator (Unit: RMB 100 million)	2020	2021	2022	2023
Net Profit	222.79	228.32	230.11	277.19
Interest Expense	10.88	17.52	28.37	29.62
R&D Expenses	60.53	62.97	62.81	67.62
Capitalized Development Expenditure	1.61	2.32	1.50	2.44
Net Operating Profit After Tax (NOPAT)	284.86	298.71	308.89	361.92

(2) Calculation and Adjustment of Total Capital (TC)

Total Capital (TC) is another core element in the Economic Value Added (EVA) calculation. It represents all capital invested in the business, including equity capital and debt capital, and requires adjustments to reflect economic reality rather than accounting book value[21]. The purpose of calculating TC is to accurately measure the scale of capital truly employed by the enterprise, thereby providing the basis for calculating the cost of capital. Under the EVA framework, adjustments to TC ensure consistency with the NOPAT calculation. The basic formula for TC is: TC = Average Equity Capital + Average Interest-Bearing Debt Capital - Average Construction in Progress[22].

Table 3. Calculation of Gree Electric's TC from 2020 to 2023

Financial Indicator (Unit: RMB 100 million)	2020	2021	2022	2023
Average Owners' Equity	1144.64	1124.03	1049.01	1112.61
Average Interest-Bearing Debt	2535.2	293.9	601.3	850.1
Average Construction in Progress	32.24	52.49	62.24	59.69
Adjusted Total Capital (TC)	3647.6	1365.44	1588.07	1889.29

Based on Gree Electric Appliances' annual report data from 2020-2023, we use 2023 as an example to detail the TC calculation and adjustment process. Average equity capital and average construction in progress typically use the annual average of the book value of shareholders' equity, but need to be adjusted for the impact of average interest-bearing liabilities. According to the 2023 annual report, Gree's shareholders' equity was RMB 120.646 billion, and construction in progress was RMB 6.564 billion. The 2022 shareholders' equity was RMB 101.876 billion, and construction in progress was RMB 5.969 billion. Thus, the average shareholders' equity is (120.646 + 101.876)/2 = RMB 111.261 billion, and the average construction in progress is (6.564 + 5.969)/2 = RMB 6.2665 billion. Interest-bearing debt capital includes all liabilities requiring interest payments, such as short-term loans, long-term loans, and bonds payable. According to the 2023 annual report, the composition of Gree's interest-bearing debt is as follows: short-term loans RMB 26.443 billion, long-term loans RMB 39.036 billion, bonds payable RMB 0 billion, and the current portion of non-current liabilities (mainly long-term loans due within one year) RMB 20.606 billion. Therefore, the total interest-bearing debt capital = 26.443 + 39.036 + 20.606 = RMB 86.085 billion. According to the 2022 annual report, the composition is: short-term loans RMB 52.896 billion, long-term loans RMB 30.784 billion, bonds payable RMB 0 billion, and the current portion of non-current liabilities

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RMB 0.255 billion. Therefore, the total interest-bearing debt capital = 52.896 + 30.784 + 0.255 = RMB 83.935 billion. The 2023 average interest-bearing debt is (86.085 + 83.935)/2 = RMB 85.01 billion. The 2023 adjusted capital = Average Shareholders' Equity + Average Interest-Bearing Debt - Average Construction in Progress = 111.261 + 85.01 - 6.2665 = RMB 188.929 billion. Similarly, we performed the same adjustments for the 2020-2022 data. The calculation results are shown in the table below.

(3) Estimation of Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital (WACC) is the minimum rate of return required by all capital providers (creditors and shareholders)[23]. It is a key parameter in calculating Economic Value Added (EVA). WACC reflects the overall cost of using capital for the enterprise and is the weighted average of the cost of debt capital and the cost of equity capital, with weights based on their respective proportions in market value[24].

The formula for WACC is:

$$\text{WACC} = \frac{E}{V} \times r_e + \frac{D}{V} \times r_d \times (1 - T)$$

Where:

E = Market value of equity capital

D = Market value of debt capital

V = E + D = Total market value of capital

re = Cost of equity

rd = Cost of debt

T = Corporate income tax rate

Based on Gree Electric Appliances' annual report data from 2020-2023, we use 2023 as an example to detail the WACC estimation process. All data are sourced from Gree's public annual reports and public market data to ensure authenticity and reliability.

The cost of debt is the interest rate paid by the enterprise for debt capital, usually calculated based on interest expense and interest-bearing debt. According to the 2023 annual report, Gree's interest expense under financial costs was RMB 2.962 billion, and the total interest-bearing debt was RMB 85.01 billion. Therefore, the pre-tax cost of debt is calculated as follows: rd = 29.62 / 850.1 = 3.48%.

The cost of equity is the minimum rate of return required by shareholders, usually calculated using the Capital Asset Pricing Model (CAPM):

$$r_e = r_f + \beta \times (r_m - r_f)$$

Where:

rf = Risk-free rate, using the yield on China's 10-year government bond. According to Wind data, it was approximately 2.5% at the end of 2023.

beta = Beta coefficient, measuring the stock's volatility relative to the market. Based on historical data estimates from financial platforms like Bloomberg or Tonghuashun, Gree's beta coefficient is taken as 0.8.

rm - rf = Market risk premium. For the Chinese market, 5.5% is commonly used in academia.

Therefore: re = 2.5% + 0.8 *5.5% = 2.5% + 4.4% = 6.9%

The corporate income tax rate uses the effective tax rate calculated from the annual report. In 2023, Gree's income tax expense was RMB 5.097 billion, and total profit was RMB 32.816 billion,

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

so the effective tax rate was: T = 50.97 / 328.16 = 15.53%. However, for conservatism and considering Gree's status as a high-tech enterprise, we adopt an approximate value of 15% based on historical average and industry practice, consistent with the NOPAT calculation.

Capital weights are calculated based on market value:

Market value of equity (E): Gree's total shares at the end of 2023 were 5.631 billion shares, and the year-end stock price was RMB 26.85 per share. Therefore: E = 5.631 * 26.85 = RMB 151.192 billion.

Market value of debt (D): The market value of debt is usually approximated by its book value, so the book value of interest-bearing debt, RMB 85.01 billion, is used.

Total market value of capital (V): V = E + D = 151.192 + 85.01 = RMB 236.202 billion.

Weights:

E/V = 151.192 / 236.202 = 0.64, D/V = 85.01 / 236.202 = 0.36

WACC Calculation:

Substituting into the formula: WACC = 0.64 * 0.069 + 0.0348 * (1 - 0.15) * 0.36 = 5.48%

Similarly, we estimated the WACC values for 2020-2022 based on the corresponding years' annual report data and market data:

Table 4. Calculation of Gree Electric's WACC from 2020 to 2023

Financial Indicator (Unit: RMB 100 million)	2020	2021	2022	2023
Debt Capital Proportion (D/V)	0.39	0.12	0.25	0.36
Cost of Debt Capital (rd)	4.29%	6%	4.7%	3.48%
Equity Capital Proportion (E/V)	0.61	0.88	0.75	0.64
Cost of Equity Capital (re)	7.75%	7.28%	7.21%	6.09%
Corporate Income Tax Rate (T)	15%	15%	15%	15%
Weighted Average Cost of Capital (WACC)	6.15%	7.02%	6.41%	5.48%

These estimated values reflect the trend of Gree's cost of capital, mainly influenced by market interest rates, stock price fluctuations, and changes in capital structure. However, WACC estimation relies on market data and assumptions, which involve a degree of subjectivity and volatility. Secondly, using the book value to approximate the market value of debt may underestimate or overestimate the true cost. Furthermore, while the effective income tax rate is calculated based on the annual report, a uniform rate of 15% is adopted for simplicity. Finally, when WACC is used for EVA calculation, it should be regarded as an estimate aimed at providing a reasonable benchmark for the cost of capital.

(4) Final Calculation of EVA Value

After completing the separate calculation and adjustment of Net Operating Profit After Tax (NOPAT), Total Capital (TC), and the Weighted Average Cost of Capital (WACC)[25], we can proceed to the final calculation of Economic Value Added (EVA). The core formula for EVA is concise and profound:

$$EVA = NOPAT - TC \times WACC$$

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

This formula quantifies the real economic profit created by the enterprise, i.e., the net wealth added for shareholders after the company's after-tax operating profit has covered the cost of all invested capital[26]. A positive EVA indicates the company has created excess returns, while a negative value means its value has been impaired. The detailed calculation process uses 2023 as an example: Substituting the measured values for 2023 NOPAT (RMB 36.192 billion), TC (RMB 188.929 billion), and WACC (5.48%) into the formula:

Capital Cost = TC × WACC = 188.929 × 0.0548 = RMB 10.353 billion

EVA = NOPAT - TC × WACC = 36.192 - 10.353 = RMB 25.839 billion

Based on Gree Electric Appliances' annual report data from 2020-2023 and the detailed measurement results from the previous sections, we summarize the key input parameters for the four years as follows and complete the final calculation:

Table 5. Calculation of Gree Electric's EVA from 2020 to 2023

Financial Indicator (Unit: RMB 100 million)	2020	2021	2022	2023
NOPAT	284.86	298.71	308.89	361.92
TC	3647.6	1365.44	1588.07	1889.29
WACC	6.15%	7.02%	6.41%	5.48%
TC * WACC (Capital Charge)	224.33	95.85	101.8	103.53
EVA	60.53	202.86	207.09	258.39
NOPAT	284.86	298.71	308.89	361.92

4.2. EVA Result Analysis and Trend Interpretation

Based on the detailed calculation of Gree Electric Appliances' Economic Value Added (EVA) from 2020 to 2023, we obtained the following EVA results: RMB 6.053 billion in 2020, RMB 20.286 billion in 2021, RMB 20.709 billion in 2022, reaching RMB 25.839 billion in 2023. An in-depth analysis of this dynamic change trend can reveal the internal logic and driving factors of Gree's value creation capability.

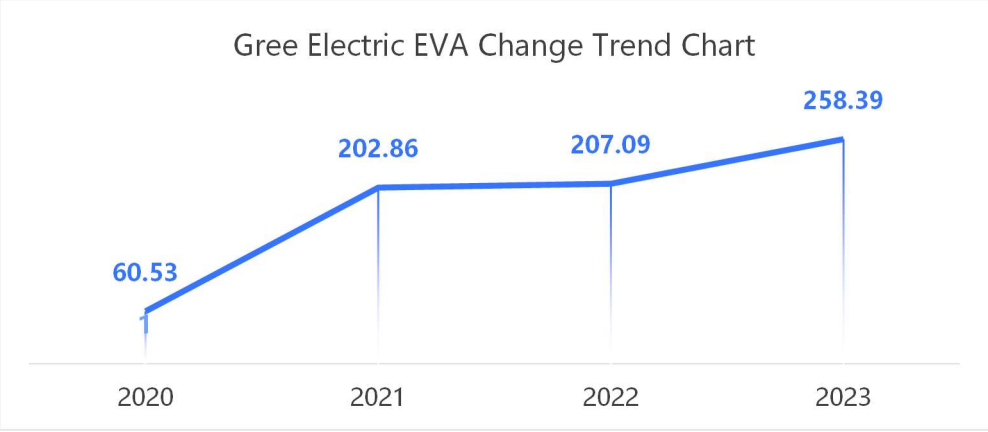

Figure 1. Gree Electric's EVA Trend Chart (2020-2023)

First, from an overall trend perspective, Gree's EVA showed significant and sustained growth over the past four years. The EVA value was RMB 6.053 billion in 2020 and had grown to RMB

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

25.839 billion by 2023, with a cumulative increase of 327% and a significant compound annual growth rate. This trend clearly indicates that Gree not only created economic profits exceeding the total cost of capital for shareholders for four consecutive years but also continuously improved the efficiency and scale of its value creation. Particularly noteworthy is the substantial 235% year-on-year increase in EVA in 2021 compared to 2020, reflecting a rapid and strong rebound in the company's operational capability and profitability after effectively responding to the impact of the pandemic. The stable growth maintained on a high base from 2022 to 2023 indicates that the company's value creation has entered a more robust and healthy upward trajectory, which corroborates the record-high performance of both operating revenue and net profit in 2023.

Second, the sustained growth of EVA primarily stems from the steady increase in Net Operating Profit After Tax (NOPAT) and effective control of the cost of capital. Specifically, NOPAT grew continuously from RMB 28.486 billion in 2020 to RMB 36.192 billion in 2023, becoming the core driver pushing EVA upward. This is attributable to several core advantages of Gree: Firstly, the leading position of its core air conditioning business provides a stable and substantial cash flow and profit foundation. Secondly, the company adheres to the R&D strategy of "investment based on demand without an upper limit," with a cumulative investment exceeding RMB 26 billion over four years, transforming technological innovation into product premiumization and cost advantages. Thirdly, excellent working capital management and strong channel bargaining power are reflected in the net cash flow from operating activities reaching RMB 56.398 billion in 2023, providing strong support for operational efficiency.

Third, the company's capital cost management also played a key leveraging role. Although to support diversification and transformation, Total Capital (TC) decreased from RMB 364.76 billion in 2020 to RMB 188.929 billion in 2023, mainly because the company began reducing interest-bearing debt in 2021. Through a robust financial structure, the Weighted Average Cost of Capital (WACC) was controlled at a relatively low and slightly decreasing level. This is mainly due to its low cost of interest-bearing debt (rd) and a stable cost of equity capital (re). Effective capital cost management alleviated the pressure brought by the expansion of the capital scale, ensuring that the growth in NOPAT could be effectively translated into growth in EVA.

However, the analysis also identified some noteworthy aspects. Although EVA grew continuously, its absolute value was lower than the accounting net profit in each respective year. For example, the 2023 EVA was RMB 25.839 billion, while net profit was RMB 27.719 billion. This gap intuitively reveals the extent to which traditional net profit indicators overestimate the true economic profit of an enterprise because they fail to deduct the opportunity cost of shareholder capital. Furthermore, while the active diversification strategy cultivates future growth points, it also brings substantial capital occupation. Currently, the sustained growth of EVA is primarily driven by the strong profitability of the traditional core business and overall operational efficiency. Whether the emerging business segments have begun to contribute positively to EVA still requires ongoing observation. This means the company needs to pay more attention to the return efficiency of newly invested capital in the future, ensuring that strategic investments can be transformed into genuine value creation as scheduled.

4.3. Comprehensive Performance Evaluation of Gree Electric Appliances based on EVA

Based on the aforementioned calculation and analysis of Gree Electric Appliances' Economic Value Added (EVA) from 2020-2023, we can conduct a comprehensive and integrated evaluation of the company's overall performance. The core of the EVA indicator lies in measuring whether the enterprise has created real value for shareholders that exceeds the cost

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

of capital. Gree's EVA performance clearly reveals its value creation capability and management efficiency as an industry leader.

First, Gree Electric Appliances is an excellent value creator and an effective manager. The significantly positive and continuously growing EVA for four consecutive years is the most powerful proof of Gree's outstanding performance. This not only means the company has created substantial social wealth but also that it has genuinely brought net wealth increase to its shareholders. Management has successfully translated the company's strategic layout, technological advantages, and market position into tangible economic profits. Especially under the complex environment of pandemic impact and industry transformation, the company's ability to maintain strong EVA growth highlights its strong risk resilience and exceptional management level. The simultaneous record highs of EVA, net profit, and revenue confirm the effectiveness of the company's "high-quality development" strategy.

Second, its core business is the "ballast" and "engine" of value creation. The analysis shows that the primary driving force behind Gree's EVA growth comes from the strong profitability (NOPAT) brought by its core air conditioning business and mature appliance products. The company's profound brand heritage, technological barriers, and channel control constitute its inimitable core competitiveness, ensuring excess returns from the main business. This provides a solid financial foundation and risk buffer for the company's forward-looking R&D investments and strategic diversification expansion.

Third, EVA provides a more rigorous and authentic performance perspective than traditional profits. This study demonstrates that focusing solely on net profit overestimates Gree's profitability. The EVA indicator, by deducting the cost of equity capital, reveals the essential difference between "profitability" and "value creation." More importantly, the recent growth rate of EVA has been higher than that of net profit, indicating that the marginal return on newly invested capital is improving, and management's capital allocation decisions are becoming more refined and value-oriented. This perspective prompts management and investors to look beyond accounting figures and focus more on the efficiency of capital use and the quality of investments.

Fourth, seeking balance during transformation, challenges and opportunities coexist. Gree is transforming from a specialized air conditioner enterprise into a technology-based global industrial group. The current EVA performance proves that the company has initially successfully navigated the challenges of transformation, achieving a balance between stable operation and forward-looking investment. However, the key to the future lies in how to quickly transform emerging businesses like new energy, intelligent equipment, and energy storage from current "capital consumers" into future "value contributors." This requires management to adhere to strict capital discipline, use EVA as the core standard for investment decisions and performance assessment, and ensure that massive capital investments bring corresponding value returns.

In summary, the performance evaluation based on EVA indicates that Gree Electric Appliances is a deserved benchmark enterprise for value creation. Its strong operational capability, and clear strategic direction have jointly forged its continuously growing economic profits. For management and investors, EVA, as a core performance indicator, can more effectively guide decisions, evaluate value, and propel the company steadily forward towards long-term sustainable high-quality development.

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5. Research Conclusion and Recommendations

5.1. Research Conclusion

This study systematically calculated and analyzed the operating performance of Gree Electric Appliances from 2020 to 2023 based on the Economic Value Added (EVA) model, aiming to evaluate its true value creation capability. The main conclusions are as follows:

First, Gree Electric Appliances demonstrated strong and sustainable value creation capability during the observation period. The calculation results show that the company's EVA increased significantly from RMB 6.053 billion in 2020 to RMB 25.839 billion in 2023, maintaining a significantly positive value for four consecutive years, with a cumulative increase of 327%. This trend clearly indicates that Gree not only created economic profits exceeding the total cost of capital for shareholders every year but also continuously improved the efficiency and scale of its value creation. Particularly in 2023, EVA, operating revenue, and net profit all reached record highs simultaneously, confirming the effectiveness of the company's "high-quality development" strategy. Second, the core driver of EVA growth stems from the company's excellent operational efficiency and the profitability of its main business. The continuous growth in Net Operating Profit After Tax (NOPAT) was the primary force driving the increase in EVA. This reflects Gree's deep accumulation in its core business, manifested in the leading position of its air conditioning business providing stable cash flow; continuous R&D investment and technological innovation translating into product premiumization and cost advantages; and excellent working capital management efficiency enhancing operational efficiency. Third, compared with the traditional net profit indicator, EVA provides a more rigorous and authentic perspective on performance. The study found that although net profit continued to grow, the absolute value of EVA was always lower than net profit. This reveals that a considerable portion of net profit actually represents the "necessary return" covering the cost of shareholder capital, rather than genuine economic profit. More importantly, the growth rate of EVA in recent years has been higher than that of net profit, indicating that the marginal return on Gree's newly invested capital is improving, and management's capital allocation decisions are becoming more refined and value-oriented. Fourth, this study also objectively identified the challenges facing the company. The active diversification strategy, while cultivating future growth points, also brings substantial capital occupation. However, judging from the continuous growth of EVA, the company has effectively managed these challenges by leveraging the strong profitability of its core business and overall operational efficiency, achieving a balance between transformation and growth. Nevertheless, whether the emerging business segments have begun to contribute positively to EVA still requires ongoing observation, meaning the company needs to pay more attention to the return efficiency of newly invested capital in the future.

In summary, this study, through the EVA indicator, confirms that Gree Electric Appliances is an excellent value creator. Its strong core competencies in brand, technology, channels, etc., have been successfully translated into continuously growing economic profits, effectively increasing shareholder wealth. EVA analysis not only verifies the effectiveness of the company's current strategy but also provides investors and management with a performance evaluation tool superior to traditional accounting profits, highlighting the solid intrinsic value of Gree Electric Appliances as a benchmark in Chinese manufacturing.

5.2. Recommendations

(1) Recommendations for Gree Electric Appliances Management

First, optimize capital allocation efficiency and focus on the core of value creation. Strengthen return constraints for new business investments: Strategic investments in emerging areas such as new energy, intelligent equipment, semiconductors, and energy storage are key to future growth but also involve significant capital occupation. It is recommended that management,

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

when making decisions, more strictly use the project's expected EVA as the core evaluation criterion, rather than just revenue scale or strategic synergy. Set clear EVA improvement timelines for new investment projects to ensure capital input is timely transformed into positive economic profit, avoiding long-term "value-destroying" investments.

Second, improve the operational efficiency of existing assets. Conduct regular EVA assessments of existing businesses and assets. For non-core or inefficient business units that continuously drag down the overall EVA level, consider strategic adjustments through optimization, divestiture, or cooperation, and reallocate the released capital to core advantage areas with higher returns, thereby enhancing the overall capital return rate.

Third, deepen refined management of costs and expenses to continuously enhance NOPAT. Against the backdrop of fluctuating raw material costs and intensifying industry competition, maintaining and enhancing the profitability of the main business is the cornerstone supporting EVA. It is recommended to build upon the achieved cost control results, further optimize costs across the entire chain from procurement and production to sales through digital and intelligent means, strictly control operating expenses, and direct more saved resources towards R&D and marketing to consolidate and expand NOPAT, the core source of EVA.

(2) Recommendations for Gree Electric Appliances Investors

First, use an EVA perspective for long-term value judgment. When evaluating Gree Electric Appliances, investors should look beyond traditional short-term indicators such as P/E ratios and net profit growth rates, and pay more attention to the absolute value and trend of its EVA. A consistently growing positive EVA is the most powerful proof of the increase in the company's intrinsic value. It is recommended to use EVA and its driving factors (NOPAT, TC, WACC) as the core analytical framework to more accurately assess the company's long-term investment value and potential risks.

Second, focus on the quality and efficiency of capital allocation strategies and R&D investment. Investors should pay close attention to the future return prospects of the company's huge capital expenditures and the conversion efficiency of high R&D investment. During shareholder meetings and communication with management, actively inquire about the expected EVA payback period of new investment projects and the industrialization progress of R&D projects, urging management to maintain capital discipline and ensure that investments ultimately translate into shareholder value.

Third, understand the challenges of the transition period and maintain long-term confidence. Gree Electric Appliances is in the deep-water zone of transitioning from a specialized air conditioner enterprise to a technology-based global industrial group. Investors need to understand that transformation inevitably accompanies short-term increases in capital investment and profit pressure. They should focus more on the rationality of its long-term strategic layout and execution effectiveness, rather than quarterly performance fluctuations. As long as the EVA creation capability of the core business remains solid and the new business layout has long-term potential, strategic patience and confidence in its transformation should be maintained.

In summary, for Gree Electric Appliances, the key to continuously improving EVA lies in smarter capital allocation, more efficient profit conversion from new businesses, and more extreme operational efficiency. For stakeholders, it lies in adopting EVA, a more scientific yardstick, for value judgment and supervision. Joint efforts from both sides will propel Gree Electric Appliances forward steadily and sustainably on the path of high-quality development.

5.3. Research Limitations and Future Outlook

(1) Research Limitations

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

First, the subjectivity of adjustments in EVA calculation. The core of EVA calculation lies in the "economic" adjustment of accounting data to approximate true economic profit. However, the treatment of some adjustment items relies on the researcher's professional judgment. In this study, when calculating NOPAT, adjustments were made for interest expense, R&D expenses, etc. Although these adjustments follow the EVA theoretical framework, the selection of specific items and adjustment methods may involve a certain degree of subjectivity, and different researchers might obtain slightly different results.

Second, the assumption-based nature of capital cost estimation. Estimating the Weighted Average Cost of Capital (WACC) is a technical difficulty in the EVA model. This study used the Capital Asset Pricing Model (CAPM) to calculate the cost of equity, where the risk-free rate used the yield of China's 10-year government bond at the end of 2023 (approx. 2.5%), the market risk premium was set at 5.5%, and the beta coefficient was set at 0.8. These parameters are based on public market data and conventional assumptions, but they are inherently volatile and predictive. Minor changes in these parameters could affect the WACC result, causing corresponding fluctuations in the EVA value.

Third, the timeliness and cyclicality of research data. This study selected the four years from 2020 to 2023 as the observation period. While this can reflect the company's recent performance trends, a four-year period is still relatively short for assessing the long-term strategic transformation of an enterprise. The payback cycle for major investments in areas like new energy and intelligent equipment may be long, and their full impact on the company's EVA might not have been fully apparent by the end of this study period. Therefore, the conclusions of this study focus more on medium-to-short-term value creation performance.

(2) Future Outlook

First, extend the research time span. Follow-up research could cover a longer economic cycle to more comprehensively evaluate the long-term value creation effects of Gree's strategic transformation, especially the complete EVA evolution trajectory of its diversified businesses from the investment phase to the harvest phase.

Second, conduct in-depth cross-industry and cross-enterprise comparative studies. Future research could benchmark Gree's EVA and its driving factors against leading domestic and international peers in the same industry. Such horizontal comparisons can more clearly reveal Gree's relative competitive advantages and disadvantages, providing more targeted insights for management decisions.

Third, explore the integration of EVA with non-financial indicators. Corporate value creation is reflected not only in financial results but also stems from non-financial drivers such as technological innovation, brand value, and talent development. Future research could attempt to build a comprehensive evaluation framework that combines EVA with non-financial indicators like patent numbers, market share, customer satisfaction, and employee efficiency to more holistically assess the overall value creation capability of an enterprise.

Despite the above limitations, this study, through the systematic calculation and analysis of Gree's EVA, still yields valuable and reliable conclusions, providing a rigorous and in-depth evaluation perspective on its value creation capability. It is hoped that the framework, methods, and findings of this study can provide a useful reference and foundation for subsequent related research.

Acknowledgments

The successful completion of this thesis would not have been possible without the support, assistance, and encouragement of many people. I would like to express my sincerest gratitude here.

ISSN: 2692-7608 DOI: 10.6981/FEM.202512_6(12).0004

First and foremost, I extend my heartfelt thanks to my supervisor, Professor Hou Yi. From the selection of the research topic, the formation of the research framework, and the refinement of the methodology, to the final writing and revisions, Professor Hou provided meticulous guidance and invaluable advice. Her rigorous academic attitude, profound expertise, and selfless dedication have greatly benefited me and will continue to inspire me in my future pursuits.I am also grateful to all the faculty members of the School of Management at Sichuan University of Science & Engineering. The professional knowledge and research methods you imparted have laid a solid foundation for this study.My thanks go to my senior and junior fellows, as well as my classmates. Throughout the research process, we engaged in fruitful discussions and mutual inspiration. Your valuable suggestions and enthusiastic support provided significant momentum for this research. A special thanks to my roommates and close friends-your companionship, support, and encouragement were crucial forces in helping me successfully complete my studies.Last but not least, I deeply appreciate my family. Thank you to my parents for your unconditional love and steadfast support-you are my strongest foundation and driving force. I also extend my gratitude to other relatives and friends for their quiet care and understanding.

I would like to extend my sincere appreciation to all the experts and professors who participated in the review, evaluation, and defense of this thesis.

Due to my limited knowledge, there may inevitably be oversights and shortcomings in this work. I sincerely welcome any comments and criticisms from experts and readers.

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