



Equity Incentives in the Semiconductor Industry: A Case Study of Espressif Technology’s “High-Frequency Small-Batch” Model

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Abstract. At present, the competition in the semiconductor industry is intensifying, talent competition and technological innovation have become the key elements of enterprise development, and equity incentives, as an important tool to bind core talents and promote long-term development, are becoming more and more common in technology enterprises. This paper takes Espressif Technology as the research object, adopts case analysis and data comparison methods, and explores the motivations for implementing equity incentives and their impact on corporate performance. The study finds that the core motivations for Espressif Technology’s implementation of equity incentives include responding to industry talent competition, meeting technological innovation needs, and optimizing corporate governance. Its plan with the second type of restricted stocks as the core and the use of “high-frequency and small batch” granting has effectively lowered the threshold for employee participation and accurately covered the technical backbone group. From the performance perspective, equity incentives have driven the company’s revenue to grow continuously, with significant increases in R&D investment scale and the number of patents. This study provides a reference for enterprises in the semiconductor industry to design equity incentive schemes.

Keywords: Espressif Technology, Equity Incentives, Corporate Performance.

1 Introduction

Against the backdrop of China’s innovation-driven development strategy, the semiconductor industry, as a core foundational link of the information technology industry, occupies a pivotal position. Its industrial maturity significantly impacts national technological competitiveness and economic security. As a benchmark enterprise in the semiconductor industry, Espressif Technology has implemented 7 rounds of equity incentive plans since its listing on the Science and Technology Innovation Board in 2019, showing the characteristics of high-frequency promotion and batch execution [1].

From the human capital perspective, in the high-tech industry, the professional capabilities of key technical personnel are core production factors, and these capabilities directly drive corporate innovation and development. As a means of continuous incentives, equity incentives can effectively bind the value of talents, deeply tap the innovation potential of R&D entities, and realize the organic connection between personal income and the continuous growth of the enterprise [2].

There are many studies on equity incentives. First, the demand for talent competition. Second, innovation needs are met. Third, governance needs are adjusted. Existing studies indicate that human resource competition in the high-tech field is extremely fierce, and equity incentives enable employees to obtain long-term economic benefits, thereby enhancing long-term alignment between employees and the company [3]. Other leading semiconductor equipment companies have also implemented multiple equity incentives, and their motivations include various factors such as policy pulls, market demand, and stable talent structure, which can provide experience for analyzing the motivations of Espressif Technology's equity incentives [4]. Previous studies have concluded that the implementation effect of equity incentives is dynamically related to enterprise performance indicators and that standardized equity incentive arrangements have a positive effect on enterprise performance and encourage employees to work hard for enterprise goals. Empirical studies have shown that the higher the degree of equity incentives, the better the performance of enterprises. This effect will fluctuate due to variables such as company size and market competition. Some scholars have empirically studied the relationship between equity incentives, agency costs, and corporate performance of listed companies, and their research ideas have certain reference value for the exploration of Espressif's equity incentive performance [5].

At present, the research on equity incentives has made phased progress, but the relevant discussions in the semiconductor field are still relatively shallow, especially regarding the incentives and efficacy of enterprises to implement equity incentives multiple times are insufficient. This study takes Espressif Technology as a case, relying on the three theories of principal agent, human capital and signal transmission, and uses the case analysis method to disassemble its equity incentive plan, and combines financial data to compare the revenue, R&D investment and other indicators before and after the implementation of the plan, and finally finds that the core driving factors of Espressif Technology's implementation of equity incentives are to retain core talents, reduce agency costs and convey development confidence to the market, and this measure effectively promotes the company's performance growth, It has stabilized the team and improved innovation ability and market competitiveness, and the research conclusions can provide a reference for semiconductor and other technology companies to formulate equity incentive plans.

2 Motivation of Espressif's Equity Incentive Plan

2.1 Company Introduction

Espressif Technology is a global semiconductor company and has achieved success, adopting a fabless operation model, focusing on the research and development of wireless communication chips with both high performance and low power consumption, building an intelligent interconnection technology service system, its product line covers smart home, consumer electronics and industrial control and other fields, in the networked home equipment, now many smart home appliances are equipped with chip modules developed by Espressif Technology to realize intelligent connection and data interaction between home appliances, through mobile devices can achieve cross-space control, as far as consumer electronics is concerned, Some smart speakers and cameras use this chip solution, which improves the functionality and intelligence of the product.

In terms of industry competition. The competition in the chip industry is becoming more and more fierce, many international technology companies rely on professional technology precipitation, stable market foundation and significant brand influence, to create an industry monopoly situation, a large number of domestic enterprises are actively participating in this development trend, all of them are looking at this market with great potential, from the perspective of the global WiFi chip industry, Espressif Technology ranks in the top five, but under huge competitive pressure, in the Bluetooth chip market, Nordic, Dialog, TI and ST and other foreign-funded enterprises are the leading force, Other manufacturers continue to increase R&D investment and launch new products to share market share, and Espressif Technology must continue to make technological breakthroughs to gain an advantage in the competition.

2.2 Analysis of Equity Incentive Motivations

There are three main reasons for Espressif Technology's equity incentives. First, the retention and attraction of core talents. The microelectronics industry is short of human resources, the competition for professional talents is fierce, and technical backbones and high-level talents are the core support for Espressif's growth. As early as 2019, Espressif launched the first equity incentive plan with the grant price exceeding the "50%" limit, covering key technical teams and other personnel recognized by the board of directors.

Second, technology research and development and innovation-driven. In the chip industry, technological innovation is the core driving force for enterprise development, and Espressif Technology takes continuous innovation as a strategic means, and equity incentives have an outstanding effect in this process. Relevant studies have shown that equity incentives can positively affect the technological innovation ability of semiconductor companies, prompting employees to realize that innovation efforts can not only promote enterprise development but also bring

material returns to individuals, thereby effectively stimulating innovation enthusiasm [6].

Third, ease financing constraints and market value management. By implementing equity incentives, Espressif Technology conveys management's optimistic expectations for future performance to external stakeholders, boosts investors' investment enthusiasm, enhances capital market recognition of the company's value, lowers its financing threshold, and effectively alleviates financing pressure for chip R&D and production line construction.

3 Equity Incentive Plan and Implementation Status

3.1 Core Elements of the Incentive Plan

In the past five years, Espressif Technology has implemented 7 equity incentives as planned around the goals of talent retention, technological improvement and performance growth, showing the implementation characteristics of "high frequency, phased and dynamic change", as shown in Table 1 for details. It can be seen that Espressif Technology's equity incentive plan has shown two obvious changes: first, the number of incentive coverage personnel has gradually increased, and the scope has been expanded. In addition, the implementation time of its equity incentives is selected at key development nodes: at the beginning of its listing in 2019, to retain the core team. In 2024, a three-year assessment cycle will be set at the launch stage of the AIoT strategy to guide employees to focus on long-term value.

Table 1. Summary table of Espressif's 2019-2024 equity incentive plan.

| Implementation time | Incentive objects | Number of grants | Assessment indicators |
|---------------------|-------------------|------------------|---|
| 2019 | 21 | 29.28 | Assess the operating income of the year; Determine the attribution ratio based on the completion of individual KPIs of core employees |
| 2020 | 176 | 21.92 | With operating income as the core indicator, set a step-by-step performance target according to the vesting period; Simplify individual assessments and focus on teamwork contributions |
| 2021 | 173 | 106.03 | Assess operating income, refine the "trigger value" (minimum standard line) and "target value" (excess reward line); Set the ownership rules according to the value of the post |
| 2022 | 212 | 133.82 | The core assessment of operating income is divided into three vesting periods, and an incremental performance threshold is set; Bind the progress of R&D projects and the contribution of technological breakthroughs |
| 2023 | — | 55.11 | Continue the operating income assessment, and lower the performance benchmark by 5%-8% in combination with the competitive situation of the chip industry that year; Strengthen the two-dimensional evaluation of "revenue contribution and technological innovation" |
| 2024 | 165 | 85.86 | Assess the annual operating income compliance standards in fiscal years 2024-2026, and set a three-year continuous growth target; New "team talent training" indicator, accounting for 15% of the weight of personal assessment |

3.2 Design Features

Espressif Technology's equity incentive plans are highly flexible, with a high proportion of technical personnel covered. Each phase of incentives is centered on the second type of restricted stocks: employees do not need to fully pay for shares in the early stage, and are granted shares at a predetermined price after meeting the vesting conditions, making it easy to obtain the recognition of technical backbones, and improves employee engagement and incentive effect. The tool selection is universal in the industry, with more than 70% of semiconductor companies using the second type of restricted stocks, which can balance the risk appetite of technical employees with the long-term binding needs of enterprises due to the characteristics of "low participation threshold and high vesting constraints" [7].

The assessment indicators focus on growth and R&D, with operating income as the primary evaluation dimension, and the goal is to grow dynamically with the company's expansion. This is in line with the assessment characteristics of semiconductor companies on the Science and Technology Innovation Board as "core financial indicators and implicit R&D orientation", which not only helps achieve short-term business goals, but also promotes long-term technology accumulation through evaluation tilt, and avoids the short-term R&D problem caused by the simplification of financial indicators [8].

4 Equity Incentive Performance Analysis

4.1 Financial Performance

As shown in Table 2, after the implementation of equity incentives, Espressif Technology's revenue showed a significant growth trend.

Table 2. Espressif Technology's operating income from 2018 to 2024.

| Year | Annual operating income (100 million yuan) | Proportion of year-on-year increase (%) | Progress in the implementation of corresponding equity incentives |
|------|--|---|---|
| 2018 | 7.13 | — | --- |
| 2019 | 7.57 | 59.5 | The first round of equity incentives was officially implemented |
| 2020 | 8.31 | 9.71 | Implement the second phase of equity incentives |
| 2021 | 13.86 | 66.77 | Implement the third phase of equity incentives |
| 2022 | 12.71 | -8.31 | Implement the fourth and fifth equity incentive arrangements |
| 2023 | 14.33 | 3.7 | Implement the sixth phase of equity incentive measures |
| 2024 | 20.07 | 40 | Implement the seventh phase of equity incentives |

In terms of gross profit margin and technical premium ability of core products, in 2019, due to fierce competition in the industry, the gross profit margin of products

dropped from 50% in 2018 to 45%; With equity incentives driving technological progress, high-end chip sales will increase in 2024, and the gross profit margin of the chip business will rise to more than 49%, an increase of about 3 percentage points from the previous year; The gross profit margin of the module business has increased from 33% to more than 36% since 2022. In 2024, the company's overall gross profit margin will reach more than 41%, an increase of about 2 percentage points over 2022, higher than the industry average of 37%-39%, reflecting the value-added of product technology and customer recognition of high-quality technology.

4.2 Market Reaction

In terms of short-term market reaction. For instance, after announcing the seventh phase of equity incentives in March 2024, the company's stock price increased by 8% within 5 trading days, while the Science and Technology Innovation 50 Index (STAR 50 Index) rose by only 2% during the same period; In 2023, the sixth phase of equity incentives was announced, and the stock price rose by 5% after 3 days, which was much higher than the 1% increase in the market, which is because the equity incentive makes the market feel that "the company's management has positive expectations for the future" and drives investors to buy stocks.

In terms of long-term market reaction. Espressif's total market value was about 5 billion yuan when it was listed in 2019, and it rose to 15 billion yuan by the end of 2024, a two-fold increase from when it was listed. This is about the same as the rate of revenue growth, equity incentives have created a favorable cycle, and the capital market has increasingly recognized the company's long-term value.

4.3 Talent and Innovation Performance

Before 2019, the average tenure of R&D personnel was only 2 years, and 8% of the core technical team resigned annually. In 2024, R&D personnel will work for an average of more than 3 years, and only 5% of the core technical team will leave, which is lower than the industry average of 7%-10%, just like the first batch of 21 incentivized core technicians in 2019, and there will still be 18 in 2024, accounting for more than 85% of the personnel left.

Since 2019, the revenue of products led by it has accounted for more than 90%, such as chips that support Wi-Fi 7, and the sales of products with AI voice functions are considerable, of which the ESP32 series chips have sold more than 1 billion units worldwide, and from 2019 to 2024, the time it takes for technology to become a product has been reduced from 24 months to 18 months, and the R&D efficiency has increased by 25%, and the company has also made the company in Wi-Fi The MCU field ranks among the top five in the world.

5 Problems and Suggestions

5.1 Problems

First, the assessment indicators are overly simplistic, focusing solely on revenue. Although this can guide employees to focus on market expansion, it fails to incorporate key dimensions such as R&D quality improvement and customer retention, just like Northern Huachuang only cared about revenue in the early days, and some teams did not take chip quality seriously to achieve performance, and then had to invest money for rectification [9], for Espressif Technology as a company, Focusing only on revenue may make R&D personnel only do technology that can make money quickly, and don't want to spend time on long-term key technologies such as Wi-Fi 7 and AI, which will hinder the company's long-term progress.

Second, the allocation of equity incentive expenses adds pressure to profits. Espressif Technology has carried out 7 incentive activities in the past five years, and in 2024, this part of the expense alone will be 120 million yuan, accounting for about 15% of the net profit of that year. If Espressif Technology continues to implement high-frequency incentives in the future, related fees may further squeeze profits, causing investors to misjudge the company's actual profitability and affecting the company's market value.

Third, the exercise conditions are relaxed. Almost all relevant personnel can meet the standard, resulting in a discount in the incentive effect, more than 90% of Espressif Technology employees can successfully get equity, many technology companies on the Science and Technology Innovation Board are facing this problem, such as a chip company, the exercise conditions are set too loosely, all employees have achieved the standard for three consecutive years, and the core employees feel that "they are doing a good job", but they have no momentum to struggle[10].

5.2 Optimization Suggestions

In terms of these issues, with reference to the practical practices in the industry, the following suggestions are given: First, enrich the assessment index system, not only focus on short-term performance achievement, but also focus on long-term development needs, adopt Zhuosheng Micro's method, in addition to revenue considerations, and then add "R&D investment proportion", "core patents" and "high-end chips sold" These indicators. This prevents everyone from focusing only on revenue and guides companies to engage in more valuable technical practices [9].

Second, optimize the incentive rhythm and methods to alleviate cost pressure by adopting a "quarterly small-batch grant" model. On the one hand, adjust the previous annual 1-2 incentive phases to quarterly small-batch grants, enabling even amortization of expenses, and do not let the profits of a certain quarter fluctuate too much; on the other hand, allowing employees to use the company's dividends to offset part of the money to buy equity, which not only reduces the company's expenses during this period, but also reduces the cost of employee participation, which is of positive significance to both parties.

Third. Set differentiated exercise conditions according to job characteristics, increase rewards for contributing individuals, and refer to the relevant practices of “hierarchical compliance standards” of micro and medium companies [10], divide employees into core layers, corresponding to different standard requirements: the core layer must complete revenue and R&D targets at the same time, which is 15% higher than that of the backbone layer; The backbone only needs to complete the goal of revenue; The basic level of evaluation focuses on individual work performance, and at the same time controls the proportion of employees who meet the standards at 60%-70%, so that more equity is distributed to those who really contribute to prevent unnecessary consumption of resources.

6 Conclusion

This study analyzes 7 rounds of equity incentive plans implemented by Espressif Technology from 2019 to 2024 and finds that equity incentives have significantly promoted the company’s growth. At the market level, whenever the equity incentive announcement is released, the stock price outperforms the market, and the long-term market value has risen from 5 billion yuan at the beginning of the listing to 15 billion yuan; At the level of talent gathering and innovation breakthroughs, the retention rate of R&D personnel has increased, the core technical team has been stable, the cycle of technology to commercial application has become shorter, and several chip products recognized by the market have also been launched.

Espressif’s equity incentives also have problems, such as focusing on revenue, ignoring long-term R&D investment, and loose exercise conditions. In view of these problems, it is recommended to enrich the assessment indicators, reasonably adjust the incentive rhythm, and set different exercise conditions according to the position, which can improve the effectiveness of equity incentives. The main significance of this paper is that Espressif Technology, which focuses on the field of the semiconductor industry, systematically analyzes the effects and problems of its repeated implementation of equity incentives, fills the gap in the previous research on “multiple rounds of incentives for a single enterprise” in the semiconductor industry, and the research results can provide reference for other semiconductor or technology companies, assist them in designing more reasonable equity incentive plans, and more conveniently retain talents and drive innovation vitality. This study has limitations: it only focuses on Espressif Technology as a single case and lacks comparisons with more peer companies in the same industry; furthermore, it relies on superficial analysis of financial and market data, failing to deeply examine the impact of employees’ subjective perceptions on incentive effectiveness. Questionnaires, interviews, and other methods can also be used to grasp employees’ true views on equity incentives, so that the research conclusions are more comprehensive and more realistic.

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