

Research on the evaluation of growth capability of hard-tech enterprises—based on the financial data of Montage Technology from 2021 to 2025

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Abstract. After selecting data of Montage Technology from 2021 to 2025, one can observe a growth process that is not neatly linear. The overall scale expanded over the five years, yet the differences between years were large. Based mainly on the company's annual reports, this paper continuously observes the changes in operating revenue, profit, R&D expenses, assets, and equity, and uses relevant data from the Science and Technology Innovation Board as a reference. There is a time lag between input and output in the chip design business: R&D occurs first, and sales may only form after sample production, validation, and customer introduction are completed; meanwhile, fluctuations in the server and storage markets also affect orders. In 2023, the company's revenue and profit clearly fell, and then recovered in 2024–2025 with the DDR5 upgrade, shipment of new products, and increased demand from AI servers. In 2025, operating revenue grew 49.94% year-on-year and R&D investment intensity was 16.77%. Therefore, this paper's judgment of the company is not simply "fast growth", but rather a strong growth foundation coupled with pronounced volatility; customer structure, revenue sources, and the external manufacturing dependence under the Fabless model still require continued attention.

Keywords: integrated circuits, development capability, financial analysis, R&D investment, Science and Technology Innovation Board, Fabless model

1. Introduction

1.1. Research background

The requirements of AI servers for computing, storage, and high-speed data transmission continue to rise, creating new demand for high-speed interconnect chips. However, growing demand does not mean that the performance of chip design enterprises will rise unidirectionally. R&D activities must proceed continuously, while the server and storage industries frequently go through cycles of stockpiling, inventory digestion, and restocking, so corporate revenue and profit easily fluctuate with the business climate. This paper is concerned not with whether growth was fast in any single year, but with whether Montage Technology, over five

consecutive years, could sustain R&D investment, improve operating results, and withstand fluctuations in the industrial chain.

Montage Technology Co., Ltd. (hereinafter referred to as "Montage Technology") was established in 2004 and was listed on the Science and Technology Innovation Board (STAR Market) of the Shanghai Stock Exchange in 2019. The company's business mainly focuses on the R&D and sales of memory interconnect, PCIe/CXL high-speed interconnect, and Jintide products. It has accumulated extensive experience in the field of memory interface chips, while directly serving demand from servers, storage devices, and cloud computing infrastructure; thus it exhibits two types of characteristics: on the one hand, it builds technological barriers through continuous R&D, while on the other hand its operating performance is easily affected by semiconductor cyclical fluctuations. This paper takes 2021–2025 as the research period, and all operating events and data used in the analysis are based on information publicly disclosed during this period; capital market events after 2026 are excluded from this evaluation.

1.2. Research significance

1.2.1. Theoretical significance

Existing research on enterprise development capability has formed a relatively mature financial analysis framework, but most frameworks were not originally built for integrated circuit design enterprises. Compared with traditional manufacturing enterprises, chip design companies have relatively light fixed-asset investment and a higher proportion of R&D expenditure, and their products often take a long time from R&D completion to customer validation and then to volume sales. Therefore, directly applying general financial indicators to such enterprises easily overlooks the processes of technology accumulation and product commercialization. Building on traditional development-capability indicators, this paper incorporates factors such as R&D investment, product iteration, and the Fabless business model, hoping to discuss more concretely the links among growth speed, growth quality, and risk-bearing capacity.

1.2.2. Practical significance

2023 was a relatively critical turning point within these five years. That year, downstream inventory destocking put pressure on both the company's revenue and profit; in 2024–2025, demand recovered and DDR5 and other interconnect products began to ship. Therefore, the rebound in the latter two years was driven by both industry factors and the gradual realization of earlier R&D achievements. Observing five consecutive years reflects the company's true growth status better than looking at a single year's high growth rate.

1.3. Literature review

1.3.1. Foreign literature review

This paper adopts the theories of Penrose and Higgins, but the two undertake different analytical tasks. Penrose [1] pays more attention to how a firm's internal resources are accumulated and reused, which is suitable for explaining why R&D teams, technical experience, and standards participation affect Montage Technology's subsequent product development. Higgins [2] discusses how fast a firm can grow given its current profitability, retained earnings, and capital structure. In addition, Coad and Rao [3] discuss the relationship between innovation and firm growth from the perspective of high-tech industries, providing supplementary reference for this paper's analysis of the link between R&D and growth performance. The first two theories are used respectively to explain the source of technological capability and to test whether a certain stage of high-speed growth exceeds the range that the firm's internal financial conditions can sustain in the long run.

1.3.2. Domestic literature review

Among domestic literature, the studies most relevant to this paper are not concentrated along a single line. Some scholars evaluate enterprise development from financial indicators, some discuss R&D and growth of high-tech enterprises, and another portion of the literature specifically analyzes the cycle, technology, and supply risks of the semiconductor industry. This paper reviews existing achievements along these three lines of thought.

Existing financial analysis research usually observes enterprise development capability from changes in revenue, profit, assets, and equity. Zhang Xianzhi and Chen Youbang [4] and Wang Huacheng et al. [5] both address these indicators and emphasize that they should not be used in isolation from consecutive annual and peer data. Li Xinhe [6] and Xie Deren and Liu Jinsong [7] further discuss growth quality, arguing that after a firm expands in scale, its profitability, distribution, and capital structure must also keep pace. This paper follows these basic ideas but does not treat any single growth rate as an isolated conclusion; instead, it makes judgments in light of Montage Technology's changes over five years.

Research on high-tech enterprises places greater emphasis on the long-term role of R&D. Wang Xiuli and Zhao Xibu [8] argue that R&D investment affects enterprise growth through technological innovation and product upgrading, but the effect often lags in time. Chen Yan and Niu Jianbo [9], from a life-cycle perspective, find that technology enterprises in the growth stage often simultaneously exhibit high investment, high growth, and large fluctuations. For hard-tech enterprises, therefore, one cannot merely compare the level of R&D intensity; one must also track whether R&D results turn into products and whether those products pass customer validation and generate sales. Treating R&D expenses merely as a deduction from current-period profit would omit this intertemporal effect.

Research on the growth of semiconductor enterprises does not share a consistent focus. Liu Jianhua [10] focuses on financial fluctuations under high R&D investment, while Zhao Min [11] discusses technology barriers, industry cycles, and supply chain stability; industry reports released by the China Semiconductor Industry Association pay more attention to technology evolution and domestic substitution. In the context of Montage Technology, one must also consider the relatively long customer certification cycle and the outsourcing of the manufacturing process under the Fabless model.¹

1.3.3. Literature commentary

From the existing literature, theories and indicators of enterprise development capability are not lacking, yet there remain gaps when used to explain memory interface chip enterprises. First, existing semiconductor research mostly uses industry samples or comprehensive chip enterprises, and studies that focus on a single segment leader while tracking multiple consecutive years are relatively few, making it harder to see how product generational changes actually transmit to revenue and profit. Second, some studies emphasize growth rates and asset scale, but touch little on semiconductor cycles, customer certification barriers, and the external dependence on manufacturing and testing under the Fabless model, which may make a single year's high growth appear overly optimistic. Third, some studies lack tight connections among "identifying problems—explaining causes—proposing solutions". Based on these shortcomings, while retaining traditional development-capability indicators, this paper introduces R&D intensity, product revenue structure, industry growth rate, and supply chain risk, and conducts the analysis as closely as possible along the mutually corresponding lines of problems, causes, and countermeasures.

¹ China Semiconductor Industry Association, China Integrated Circuit Industry Development Report (2024), Beijing: China Semiconductor Industry Association, 2024, pp. 15–42.

1.4. Research methods

This paper mainly uses four methods. First, through literature research, it organizes enterprise growth theory and the sustainable growth model, and on this basis determines the indicators to be observed. Second, taking Montage Technology as a specific case, it links the business model, product structure, and industry position with changes in financial data. Third, based on the company's annual reports from 2021 to 2025, it calculates the operating revenue growth rate, net profit growth rate, total asset growth rate, capital accumulation rate, R&D investment intensity, and a simplified sustainable growth rate. Finally, it conducts a comparative analysis: on the one hand comparing the company's own changes over five years, and on the other hand using the overall growth rate of STAR Market integrated circuit industry-chain companies in 2025 and the STAR Market R&D intensity as references. Because these cross-sectional data cover different segments such as design, manufacturing, equipment, materials, and testing, this paper uses them only to judge the approximate relative position, and does not derive a strict peer ranking from them.

2. Related concepts and theoretical foundation

2.1. Definition of growth capability

Growth capability is also often called development capability; it emphasizes an enterprise's ability to continue expanding and improving operating results over a period of time, rather than how many assets it holds or how much profit it realizes at a single point in time. For integrated circuit design enterprises, this capability must be observed simultaneously along at least several chains: whether market demand can be converted into revenue, whether increased revenue can form relatively stable profit, whether sustained R&D investment ultimately yields technological and product advantages, and whether capital and supply chain conditions can support subsequent expansion. Based on this understanding, this paper does not view financial indicators separately from R&D, product, and risk factors, but places them within the same analytical framework.

2.2. Theoretical foundation

The core of Penrose's theory of firm growth [1] lies in the accumulation and use of heterogeneous resources. This paper cites this theory not to repeat the general definition of enterprise growth, but to observe whether the resources formed by Montage Technology's long-term R&D can be repeatedly utilized by subsequent products. The company has accumulated experience over a long period in memory interface standards, high-speed SerDes, customer validation, and R&D teams; these capabilities are not limited to a particular generation of RCD products, and also provide a foundation for new directions such as PCIe, CXL, and clock chips. Therefore, Section 4.3 will analyze R&D investment, technology accumulation, and product iteration together, focusing on whether these resources have been transformed into new sources of growth.

Higgins's theory [2] is mainly used in this paper to judge whether an enterprise's growth rate is commensurate with its own financial conditions. In the calculation, a simplified approach—return on equity multiplied by the earnings retention ratio—is used to obtain a growth level supportable under internal funding conditions, which is then compared with the actual operating revenue growth rate. If the actual growth rate is far above this level over the long term, it indicates that growth may also rely on external financing, improvements in asset turnover, or demand expansion at a certain stage; when the gap between the two is small, the internal financial foundation is usually better matched. Section 4.4 will use this method to examine whether Montage Technology's high growth in 2025 can be regarded as a long-term state.

The enterprise life cycle theory [9] can help explain why the same company shows different growth performances at different stages. Montage Technology has existed for a long time and is no longer a start-up, yet its high-speed interconnect related products are still in the process of iteration and market expansion, so the company still contains obvious growth-type businesses internally. Such a company, on the one hand, already has a stable profit base, yet on the other hand is affected by new product introduction and industry cycles, so its performance is not always smooth. Therefore, in evaluation one should neither ignore growth potential just because it is relatively mature, nor directly judge its technological capability to have weakened simply because of the decline in 2023. Later sections will analyze the 2023 decline and the 2024–2025 recovery in connection with each other.

2.3. Main evaluation indicators of growth capability

When evaluating growth capability, this paper mainly looks at six categories of indicators. The revenue growth rate reflects sales scale; the net profit attributable to parent growth rate and the net sales margin are used to observe profit changes; the total asset growth rate and the capital accumulation rate correspond to assets and equity; R&D investment intensity reflects technological input; and the sustainable growth rate is used to estimate the expansion speed supportable by internal financial conditions. These data, once calculated, cannot directly yield conclusions. For example, a revenue decline may be related to industry inventory destocking, and a rise in R&D intensity may simply reflect a smaller revenue base. Therefore, later sections will explain financial indicators together with product structure, industry cycles, and supply conditions under the Fabless model.

3. Current state of Montage Technology's growth capability

3.1. Basic company information

Montage Technology is mainly responsible for chip design, R&D, and sales, while wafer manufacturing, packaging, and testing are completed by external vendors. In 2025, the company's revenue remained dominated by interconnect chips, including memory interface chips, memory module supporting chips, PCIe Retimers, CXL memory expander controllers, and clock chips, mainly serving servers, storage, and high-performance computing. The Fabless model reduces the capital pressure of building its own production lines, but manufacturing schedules and deliveries also rely more heavily on suppliers.²

In 2025, different products were at inconsistent stages. The fourth-generation DDR5 RCD has entered mass production; the fifth-generation RCD, the second-generation MRCD/MDB, and the new-generation CKD have completed mass-production-version R&D; PCIe 6.x/CXL 3.x Retimers and CXL 3.x MXC are still in progress, and the company continues to participate in JEDEC-related standards work. From the progress of these projects, it can be seen that the performance recovery in the past two years was not due solely to market recovery; earlier R&D has also begun to be transformed into products. However, after a chip completes R&D it still needs validation, introduction, and volume ramp-up, so a cross-year mismatch between R&D expenses and sales revenue is a normal phenomenon.

² Montage Technology Co., Ltd., 2021 Annual Report, 2022 Annual Report, 2023 Annual Report, 2024 Annual Report, 2025 Annual Report, Shanghai, 2022–2026.

3.2. Overall performance of growth capability

As can be seen from Table 1, Montage Technology's performance changes over the five years were not continuously upward. In 2021–2022, market demand was strong and the company's revenue kept growing; in 2023, the server and computer markets entered an inventory destocking phase, and both revenue and profit declined while R&D expenses continued to be incurred; by 2024–2025, with higher DDR5 penetration, successive volume ramp-ups of new-generation products, and increased demand from AI servers, the company's revenue and profit grew significantly again. Such changes indicate that the company recovers quickly when the market rebounds, but is also easily affected by downstream cycles. The following analysis will examine revenue, profit, R&D, and capital separately, rather than judging solely on the final five-year increase.

4. Analysis of Montage Technology's growth capability

4.1. Analysis of operating revenue growth capability

Looking at Table 1 year by year, the change in operating revenue is fairly large. It was 2.562 billion yuan in 2021 and reached 5.456 billion yuan in 2025, with a compound growth rate of about 20.8% calculated over the four annual intervals. But within this, growth was 40.49% in 2021, 43.33% in 2022, yet declined 37.76% in 2023, and then grew 59.20% and 49.94% in 2024 and 2025 respectively. Therefore, looking only at the 20.8% compound growth rate easily averages out the sharp fluctuations in between and obscures how heavy the pressure was in a particular year.

Placing the 2025 revenue growth rate within the STAR Market sample, Montage Technology is at a relatively high level. That year its operating revenue grew 49.94% year-on-year, while the 129 STAR Market integrated circuit industry-chain companies disclosed by the Shanghai Stock Exchange grew by a combined 25.4%, a difference of about 24.5 percentage points. From 2021 to 2025, Montage Technology's revenue compound growth rate was about 20.8%, compared with about 11.7% for the relevant industry-chain companies overall. However, this set of figures can only be used to judge the approximate position, and one cannot thereby conclude that the company has completely shaken off cyclical influence.³

Over the five years, the main products driving the company's revenue growth have changed. In 2021–2022, it relied more on DDR4 and Jintide products, while in 2024–2025 the contributions of products such as DDR5, MRCD/MDB, CKD, and PCIe Retimer increased. However, most of these products still serve the server and storage markets. The fact that multiple product lines were under pressure simultaneously in 2023 also indicates that the diversification of end-demand remains limited.

³ Shanghai Stock Exchange, New Growth Drivers in the Main Battlefield, Hard Sciences for the Future—Decoding the 2025 Annual Report Performance of STAR Market Companies, April 30, 2026.

Table 1. Main financial data of Montage Technology, 2021–2025

Financial Indicator	2021	2022	2023	2024	2025
Operating Revenue (100 million CNY)	25.62	36.72	22.86	36.39	54.56
Operating Revenue Growth Rate (%)	40.49	43.33	-37.76	59.20	49.94
Net Profit Attributable to Parent (100 million CNY)	8.29	12.99	4.51	14.12	22.36
Net Profit Growth Rate (%)	-24.88	56.71	-65.30	213.10	58.35
R&D Expenses (100 million CNY)	3.70	5.63	6.82	7.63	9.15
R&D Investment Intensity (%)	14.44	15.33	29.83	20.98	16.77
Total Assets (100 million CNY)	89.59	106.94	106.98	122.19	137.48
Net Assets Attributable to Parent (100 million CNY)	83.91	99.12	101.00	114.03	129.24

Note: Source: Compiled from Montage Technology's annual reports, 2021–2025.

4.2. Analysis of profit growth capability

The profit curve is steeper than the revenue curve. Net profit attributable to the parent grew from 829 million yuan in 2021 to 2.236 billion yuan in 2025, with a compound growth rate of about 28.1% calculated over the four annual intervals; but year-to-year changes varied greatly, declining 65.30% in 2023, growing 213.10% in 2024, and growing 58.35% in 2025. For a chip design enterprise, expenditures such as R&D personnel, tape-out, and validation cannot be increased or decreased immediately with order changes. When revenue falls, these fixed-nature inputs do not decrease proportionally, so profit drops faster; when revenue recovers, the same cost structure causes profit to rebound quickly.

In 2025, the net sales margin was 40.97%, significantly higher than 19.73% in 2023; the overall gross margin also increased by 4.10 percentage points compared with 2024. Interconnect chips generated revenue of 5.139 billion yuan that year with a gross margin of 65.6%, which was an important source of profit recovery. In 2025, the after-tax share-based payment adjustment amounted to about 412 million yuan; excluding it, the net profit attributable to the parent was 2.647 billion yuan, but share-based payment remains an actual talent-incentive cost.

In 2025, the net profit attributable to the parent of STAR Market integrated circuit industry-chain companies grew by a combined 86.3%, while Montage Technology's was 58.35%. If one only compares these two percentages, the company seems to be in a lower position, but the industry aggregate includes enterprises that turned losses into profits and those with low bases, so the growth rate is easily amplified. Montage Technology's net profit attributable to the parent that year was 2.236 billion yuan with a net sales margin of about 41%, so its profit base is not low. Therefore, what deserves more attention is the profit curve itself over the five years: profit elasticity is strong when the climate is up, and profit contraction is also rapid when the climate falls.

4.3. Analysis of R&D investment and innovation development capability

Changes in R&D expenses reveal whether the company sustained investment amid industry fluctuations. Montage Technology's R&D expenses were 370 million yuan in 2021 and increased to 915 million yuan in 2025, with a compound growth rate of about 25.4% calculated over the four annual intervals. Among these, in 2023, when revenue and profit clearly declined, R&D expenses did not decrease accordingly. The R&D investment intensity was about 14%–15% in 2021–2022, rose to 29.83% in 2023 due to a lower revenue base, and then fell back to about 20% and 16.77% in 2024–2025.

In 2023, the company's revenue and profit declined markedly, yet R&D expenses continued to increase, indicating that the R&D plan did not contract in sync with short-term performance. By 2025, the R&D investment intensity was 16.77%, still about 3.8 percentage points higher than the STAR Market's overall level of close to 13%. According to Penrose's theory [1], technological and engineering experience requires long-term accumulation; maintaining R&D during a downturn increases current-period expenses but facilitates the continued iteration of subsequent products.

Whether R&D investment can form new growth also depends on whether projects finally enter the sales stage. In 2025, the fourth-generation DDR5 RCD had entered mass production, the fifth-generation RCD, the second-generation MRCD/MDB, and the new-generation CKD had completed mass-production-version R&D; PCIe 6.x/CXL 3.x Retimers, CXL 3.x MXC, PCIe 7.0 Retimer, and PCIe Switch remain in progress. In the same year, the company's R&D expenses were 915 million yuan, an increase of about 147% over 2021, while its number of R&D personnel and product pipeline also expanded in parallel.

4.4. Analysis of capital expansion and sustainable growth capability

From 2021 to 2025, the company's total assets grew from 8.959 billion yuan to 13.748 billion yuan, a compound growth rate of about 11.3%; net assets attributable to the parent grew from 8.391 billion yuan to 12.924 billion yuan, a compound growth rate of about 11.4%. Both growth rates are lower than revenue and profit over the same period. At the end of 2025, the company's liabilities were about 824 million yuan, with an asset-liability ratio of about 6.0%. This indicates that the company's expansion did not significantly rely on new leverage and retained a large financial buffer.

Estimated with the simplified approach of the Higgins model [2], in 2025 the company's weighted average return on equity was 18.25%, cash dividends and repurchases together accounted for 50.07% of net profit attributable to the parent, and the earnings retention ratio was about 49.93%, yielding a sustainable growth rate of about 9.1%. This level differs greatly from the 49.94% operating revenue growth rate that year, indicating that high growth cannot be explained solely by retained earnings. Factors such as demand recovery, volume ramp-up of new products, existing cash reserves, and improved asset turnover all played a role to varying degrees.

5. Problems in Montage Technology's growth capability

Viewing the data of Chapter 4 together, Montage Technology does not have an obvious "growth fatigue" problem; rather, the main contradiction lies in whether growth can be more stable. Over the five years, revenue and profit fluctuated considerably, the customer structure was concentrated, interconnect chips still accounted for the vast majority of revenue, and at the same time the company adopted the Fabless model, lacking direct control over external manufacturing and testing. The following discusses these four problems separately, because they directly affect the sustainability of growth.

5.1. Pronounced cyclical fluctuation in performance and insufficient growth stability

Looking at the five-year growth rates, the stability problem is very intuitive. The operating revenue growth rate first fell from 43.33% to -37.76%, then rose to 59.20%, a difference of about 97 percentage points between the two extremes; the amplitude of change in net profit was even greater. After revenue declined in 2023, expenditures such as R&D personnel and tape-out still had to continue, so profit fell faster. When demand recovered, the same cost structure caused profit to rebound quickly. For operation and management, this fluctuation directly increases the uncertainty of tape-out, inventory, and cash planning.

5.2. High customer concentration and dependency risk

Customer concentration is first related to the product certification method. Before memory interface chips enter formal procurement, they need to complete relatively long compatibility validation with DRAM particles, server CPUs, memory modules, and whole-machine platforms, and there are inherently few manufacturers capable of long-term large-scale procurement. After entering the supply system of top-tier customers, orders are usually more stable, but the procurement rhythm, product specifications, and price negotiations are also more easily affected by major customers. If R&D resources are long prioritized to meet the near-term needs of a few customers, investment in more general technology routes may be weakened.

5.3. Relatively single product line and an incubating second growth curve

In 2025, interconnect chip revenue was 5.139 billion yuan, accounting for about 94.2% of operating revenue, so the revenue structure remained concentrated. Although new products such as MRCD/MDB, CKD, PCIe Retimer, and CXL MXC have entered the stages of R&D, certification, or volume ramp-up, their sales scale cannot yet be compared with mature memory interface chips. Therefore, the company's second growth source is still in the cultivation process, and its performance remains highly correlated with the server memory market.

5.4. Prominent supply chain risk under the Fabless model

The Fabless model enables the company to concentrate resources on design and R&D, but wafer manufacturing, packaging and testing, and delivery all require the cooperation of external vendors. The number of suppliers for key links is limited, and changes in capacity, price, and lead time can all affect operations. At the end of 2025, the company's inventory carrying value was 896 million yuan; stocking can enhance supply assurance, but when demand weakens or product updates accelerate, it also increases the risk of price declines.

6. Analysis of the causes of Montage Technology's growth capability problems

This chapter analyzes the causes separately according to the four problems raised in Chapter 5. Section 6.1 discusses performance fluctuations, 6.2 explains customer concentration, 6.3 analyzes product structure, and 6.4 corresponds to supply chain risk. The purpose of this treatment is to distinguish the external constraints caused by the industry environment from the internal factors that the company can improve through operation and management, establishing a more direct correspondence for the measures proposed in Chapter 7.

6.1. Strong industry cyclicity and downstream demand fluctuations

The inventory cycle of the server and storage industries is an important source of the company's performance fluctuations. When demand improves, downstream manufacturers usually first replenish inventory and then increase procurement; after inventory reaches a high level, they may again reduce orders in concentration, and this change continues to transmit to upstream chip enterprises. Most of Montage Technology's products target the same type of scenario, so the demand directions of several product lines are relatively consistent, and when the market as a whole weakens there is insufficient reverse hedging. At the same time, the R&D team and project expenditures cannot contract in the short term following orders, and this cost rigidity further amplifies profit fluctuations.

6.2. Oligopolistic memory market structure and customer bargaining power

Montage Technology's customer concentration is directly related to the structure of the global DRAM and server memory markets themselves. The main procurement volumes and platform validation resources are in the hands of a few large manufacturers, and memory interface chips must also undergo compatibility validation with particles, modules, and server platforms before sale. Once a customer completes certification, the cooperative relationship often lasts a long time; conversely, the introduction of new customers is also relatively slow. Because top-tier manufacturers have large procurement scales and control platform resources, they have more say in price and technology route choices, which leaves small and medium suppliers with relatively limited bargaining room.

6.3. Niche track focus strategy and new product incubation cycle

Long-term focus on memory interface chips once helped Montage Technology build strong technological accumulation. When the company was smaller, concentrating limited R&D resources on one niche field was conducive to participating in industry standards and establishing product advantages. As the business scale expanded, this focus also brought the problem of a concentrated revenue source. On the other hand, high-speed interconnect chips, from design completion to actual sales, inherently go through tape-out, testing, customer validation, and waiting for CPU platform and server ecosystem updates. Even with a correct technology route, the period from input to output is long, which makes revenue growth still mainly rely on mature products for a period of time.

6.4. Global industrial chain division and geopolitical risk

External manufacturing dependence first comes from the specialization of the Fabless industry. Advanced wafer manufacturing and packaging and testing require large amounts of capital and long-term process accumulation, and design enterprises usually find it difficult to build complete alternative capacity on their own. As Montage Technology's products increase, the process, packaging, and testing schemes also become more complex. The parts the company can actively improve mainly involve pre-validating alternative supply schemes and strengthening safety inventory and key supplier management.

7. Countermeasures and suggestions for enhancing Montage Technology's growth capability

The four problems identified earlier are not suitable to be solved with the same type of measures, so this chapter divides the suggestions into near-term operational adjustments and long-term capacity building. The near-term part mainly targets order judgment, inventory arrangement, customer certification, new product ramp-up, and supply backup, aiming first to reduce the impact of industry fluctuations on current operations; the long-term part focuses on product structure, customer structure, R&D conversion, and capital use efficiency, hoping to gradually change the state of a concentrated revenue source and strong dependence on a single supply link. This division helps connect short-term responses with long-term layout.

7.1. Short-term response measures

7.1.1. *Optimize inventory and order management to smooth cyclical fluctuations*

Inventory and order management must first avoid decisions based solely on market heat. The company can update demand forecasts separately by product generation, customer validation progress, and end applications,

and then arrange inventory levels of raw materials, work-in-progress, and finished goods. For wafers with long lead times and inventories with high unit value, order coverage should be checked carefully and impairment tests performed promptly. When demand suddenly increases, it is not advisable to rapidly expand tape-out relying only on short-term orders; if downstream shows signs of weakening, procurement should be contracted in time. Placing operating cash flow and inventory turnover in a more important position helps retain a buffer when the climate falls.

7.1.2. Deepen customer cooperation and expand customer boundaries

Reducing customer dependence in the short term does not mean replacing existing major customers, but adding accessible customers while maintaining the main cooperative relationships. For core customers, the company can participate earlier in discussions of next-generation platforms and product specifications and provide complete software and hardware support to improve cooperation stability. On the other hand, it should continue to promote sample testing and certification by domestic memory manufacturers, server manufacturers, cloud service providers, and module manufacturers, so that the customer source gradually expands. Sales assessment can also incorporate indicators of new customer certification progress, guiding resources to tilt toward diversifying the customer structure.

7.1.3. Accelerate the ramp-up pace of new products and optimize revenue structure

To improve the revenue structure in the short term, the focus should be on projects already close to commercialization. MRCD/MDB, CKD, and PCIe Retimer have relatively clear product paths, and their three stages—customer validation, small-batch shipment, and stable orders—can be tracked separately to judge exactly where they are stuck. CXL MXC is still in the ecosystem cultivation stage, so it is more appropriate to first accumulate real application experience through joint validation with key customers. An increase in R&D projects does not mean revenue increases immediately; too many projects may instead disperse resources.

7.1.4. Promote supply chain diversification to ensure delivery safety

Supply chain backup should not adopt the same approach for all products. For products that have already formed a large sales scale, what is most needed is a second source of supply, alternative packaging and testing schemes, and advance validation of key materials; for new products not yet ramped up, process migration space can be considered at the design stage. In addition, the capacity, yield, and delivery status of main suppliers should be continuously tracked, and safety inventory should also be adjusted with order changes. The significance of multi-source supply is not to evenly distribute procurement among more vendors, but to have substitutable backup capability at key links.

7.2. Long-term strategic layout

7.2.1. Build a multi-category product matrix and forge a second growth curve

A second growth curve cannot be formed merely by "making a few more product types"; the key is whether new products can truly generate sustained revenue. Montage Technology already has technological accumulation in memory interconnect, high-speed PCIe/CXL, and clock chips, and there is a certain reuse foundation among these directions, allowing continued extension around data center interconnect. Before entering new businesses, one should still compare market space, certification cycle, degree of technology reuse, and profit expectations, avoiding entering fields only loosely related to one's own technology in order to diversify revenue. For projects already cultivated internally for a long time, clearer resource and assessment support should be given so that they can cross the commercialization threshold as soon as possible.

7.2.2. Deepen the domestic market and build a dual-circulation market pattern

Adjusting the customer market should not be simply understood as "domestic replacing international" or "international first". The values the two types of markets can provide are not the same: international customers usually bring newer platform demands and larger-scale validation opportunities, while domestic customers help expand local server, cloud computing, and computing-infrastructure applications. The company can simultaneously advance product introduction among memory original manufacturers, server OEMs, cloud service providers, and module manufacturers, gradually diversifying customer types. If the domestic market is to form long-term revenue, the key lies in matching the iteration pace of the local ecosystem, rather than relying only on price competition.

7.2.3. Improve the efficiency of R&D achievement conversion and strengthen innovation drive

After R&D investment remains at a high level, the evaluation focus should shift more toward project results. Forward-looking research can be judged by technology reserves, engineering development by mass-production progress, and customer-customized projects by validation and order conversion. After a project enters a critical stage, market demand, technical feasibility, and customer intention should be re-examined, and resources should be adjusted in time for projects whose commercial expectations have clearly declined, so as to improve the actual conversion efficiency of R&D investment.

7.2.4. Optimize capital operation and financial management to improve capital efficiency

The goal of financial and capital management should serve cross-cycle operation and supply chain safety, rather than simply increasing the leverage ratio. Relying on the STAR Market financing platform and relatively sufficient net assets, the company can establish a medium- and long-term capital budget covering R&D, inventory, and key capacity lock-in, retaining necessary cash when the industry is down and increasing tape-out and working-capital investment after demand certainty improves. For share-based payments, their impact on talent retention, expense amortization, and shareholder dilution should also be observed simultaneously, so that incentive arrangements better match long-term development.

8. Conclusion and prospect

8.1. Research conclusions

From 2021 to 2025, the compound growth rates of Montage Technology's operating revenue and net profit attributable to the parent were about 20.8% and 28.1% respectively, but there was a clear decline in 2023, after which recovery came with DDR5 upgrades, new product shipments, and increased AI server demand. In 2025, operating revenue grew 49.94% and R&D investment intensity was 16.77%, both at relatively high levels. Combined with the low debt ratio, the company's growth foundation is sound, yet its annual performance still exhibits clear cyclical characteristics.

However, the five-year data also show that high growth rate and stable growth are not the same thing. The company's revenue and profit are still affected by server and storage cycles; its customers and revenue sources are relatively concentrated; new products take a long time from R&D to commercialization; and the Fabless model makes manufacturing, packaging, testing, and delivery depend on external suppliers. Further analysis reveals that these problems are respectively related to industry inventory and capital expenditure cycles, the oligopolistic and certification structure of the memory market, the company's long-term focus strategy, and the global industrial chain division.

8.2. Research limitations

This paper still has limitations in data scope. The research interval covers only 2021–2025, which is not yet sufficient to cover multiple complete semiconductor cycles; the cross-sectional comparison sample also includes design, manufacturing, equipment, materials, and testing enterprises, which are not entirely of the same type as Montage Technology. The annual reports also disclose limited information on major customers, suppliers, and the profitability of individual products. In addition, the sustainable growth rate adopts a simplified approach, so the conclusions of this paper are more suitable for trend judgment than for precise prediction.

8.3. Future prospects

Follow-up research can continue to improve in three aspects. First, extend the data interval to test the stability of revenue, profit, and R&D investment across more industry up and down phases. Second, select IC design enterprises with closer business models, product stages, and customer structures to form a comparable sample, reducing the caliber differences brought by using comprehensive industry-chain data. Third, add non-financial information beyond financial indicators—such as patent quality, R&D personnel structure, customer certification progress, product revenue share, and supplier concentration—so that the evaluation is closer to the enterprise's true state.

From the perspective of the company's next-stage development, the focus should not be placed only on whether it can maintain a very high growth percentage in a given year, but more on whether revenue is predictable, whether R&D results can form sales more quickly, and whether it has substitution capability when the supply chain changes. If new products gradually form independent revenue, customers and supply sources are also somewhat diversified, and existing technology investment is maintained, the company may gradually shift from "high-elasticity growth when the cycle is up" to "more stable growth across cycles."

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