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Performance Evaluation of a Company's Merger on the STAR Market from the Perspective of Performance Commitments

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Abstract

The Science and Technology Innovation Board (STAR Market), as a nascent capital market segment dedicated to supporting technological innovation enterprises, has not only significantly streamlined the financing processes for technology-driven companies but also substantially enhanced their market competitiveness. With the backing of capital, these enterprises have demonstrated stronger merger and acquisition capabilities, enabling more efficient integration of market resources, acquisition of cutting-edge technologies, and assimilation of managerial expertise. This has paved new avenues for technological innovation and industrial upgrading. This article delves into the latest trends in merger and acquisition activities among STAR Market-listed companies within the Chinese capital market, with a particular focus on the case of Company A's acquisition of Company B. The evaluation of the short-term merger and acquisition performance employs the event study method, while the long-term performance is assessed through financial indicators and other metrics tailored to the characteristics of STAR Market enterprises. The aim is to provide an in-depth analysis of the actual impact of this merger event through the evaluation of performance outcomes.

Keywords

Company's Merger, STAR Market, Performance Evaluation

1. Introduction

In the academic discourse on the impact of mergers and acquisitions (M&A) on corporate performance, diverse perspectives are prevalent. Khanala AR (2014) and colleagues employed the event study methodology to examine M&A activities within the ethanol biofuel industry between 2010 and 2012. Their findings indicated a significant increase in cumulative abnormal returns, suggesting a positive market reaction to these M&A events. In contrast, Schwert (2013) and his team conducted an empirical

analysis of over 800 M&A cases spanning from 2001 to 2010, revealing that mergers and acquisitions did not significantly alter company performance. Wang Jing's (2015) research highlighted that the type of acquisition influences corporate performance differently, with horizontal mergers demonstrating less improvement in performance compared to vertical and conglomerate mergers. Shi Wen, Gao Ke, and others (2019) investigated M&A activities among emerging industry firms, finding that while cross-industry mergers enhance enterprise value, they also lead to a decline in profitability and performance. Zhang Yongji, He Yu, and their collaborators (2020) demonstrated that technology-focused mergers elicit a significant market response in the short term and have a positive impact on long-term financial performance. Yu Hongtao (2020) explored the internal motivations behind vertical mergers and their influence on long-term M&A performance, concluding that vertical mergers outperform horizontal mergers in the long run, with this effect becoming more pronounced over extended observation periods.

In the realm of performance evaluation, Sun and Chang (2024) conducted an in-depth analysis of A Company's financial data from 2017 to 2022, emphasizing the pivotal roles of post-merger integration, innovation and R&D activities, and the design of performance compensation mechanisms in enhancing merger performance. Tong (2023), from the perspective of the Balanced Scorecard, provided a detailed analysis of the impact of the first merger and acquisition on the performance of companies listed on the Science and Technology Innovation Board (STAR Market). She systematically assessed the comprehensive impact of these transactions on the overall performance of the companies, examining key dimensions such as financial performance, customer satisfaction, internal process efficiency, and learning and growth capabilities.

2. Securities Market Performance Analysis

2.1 Determine the Event Window and Estimate Period

In the application of the event study methodology, the determination of the event window is a critical step, centered around the occurrence date of the key event, known as the event day. Typically, the event day is selected based on the announcement date. In this study, the first announcement regarding the merger was made on December 6, 2019, thus designating this date as the event day t_0. A window of 10 trading days before and after the event day was chosen as the study window, resulting in the time interval [-10, 10], to assess the impact of the event on stock prices. Accounting for non-trading days, the actual study window spans from November 22, 2019, to December 20, 2019. Additionally, to estimate the normal market performance, a period of 70 trading days prior to the event window was designated as the estimation period, corresponding to the time interval [-80, -11]. Due to the presence of non-trading days, the actual estimation period extends from August 8, 2019, to November 21, 2019.

2.2 Mergers and Acquisitions Events Triggered a Positive Response from Market Investors

In the analysis of the acquisition event involving Company A, this study specifically focuses on the stock price performance during the event window period. Prior to the event window, Company A's

daily excess returns typically remained below 5%, with relatively low volatility. On December 6th, the day before the acquisition information was disclosed, Company A's stock excess returns did not exhibit any significant anomalies. However, on the second and third days following the announcement of the acquisition, Company A's excess returns surged dramatically, jumping from 2.13% to 21.17%. This substantial increase indicates a rapid and positive market reaction to the acquisition news.

Further examination of the cumulative excess returns reveals a continuous upward trend following the acquisition event, peaking at 64.97%. Although the cumulative excess returns experienced a decline over the subsequent four trading days, they rebounded significantly on the fifth trading day, reaching a high of 70.82%. Subsequently, the cumulative excess returns remained above 60%, reflecting the market's generally positive view of Company A's acquisition of Company B and investors' optimistic expectations regarding the potential value brought about by the merger.

3. Financial Performance Analysis

3.1 Mergers and Acquisitions Provide New Profit Growth Points

Profitability, as a core indicator for assessing a company's success in market competition, reveals the company's ability and extent to generate profits over a specific period. In the context of mergers and acquisitions, profitability analysis plays a crucial role in strategic and operational decision-making, as it directly impacts a company's ability to meet performance commitments, thereby significantly affecting its reputation and market position. For investors, creditors, and other stakeholders, such analysis provides critical insights into a company's future profitability potential, financial stability, and capacity to fulfill performance commitments.

The selected profitability assessment metrics in this article include Return on Total Assets (ROA), Return on Equity (ROE), Net Operating Margin, and Gross Profit Margin. ROA measures the efficiency of total assets in generating profits, calculated as net profit divided by total assets; ROE evaluates the return on shareholders' investment, calculated as net profit divided by shareholders' equity; Net Operating Margin reflects the profitability of the main business, calculated as net operating profit divided by operating revenue; Gross Profit Margin assesses the profitability of sales revenue, calculated as gross profit divided by sales revenue.

In 2019, the net profit margin on total assets and the return on equity of Company Z experienced a significant decline, dropping from 22.19% in 2018 to 10.44%. This downward trend can be partly attributed to the company's situation following its listing on the Science and Technology Innovation Board (STAR Market) in the third quarter of 2019. The listing led to an increase in equity financing, which in turn significantly boosted the company's total assets and shareholders' equity. Prior to the acquisition of Company Y, Company Z's profitability in the third quarter of 2019 was unsatisfactory, primarily due to a decrease in revenue and an increase in operating costs. Additionally, as the company's core products are automated equipment with highly transparent prices for key components, this put pressure on the gross margin. The introduction of new products also increased the difficulty in

controlling the overall process, thereby raising costs. Moreover, the company's sales, administrative, and research and development expenses grew by 66.23%, 47.43%, and 45.56%, respectively. Notably, in 2019, Company Z increased its investment in semiconductor testing projects and expanded its personnel and expenditure, collectively contributing to a decline in net profit and suboptimal profitability.

However, the acquisition of Company Y in December 2019 provided Company Z with new growth opportunities for profitability. Post-acquisition, Company Z's business lines expanded, leading to increased revenue and sales scale, with both the net operating margin and sales gross margin showing signs of recovery. According to relevant financial statements, Company Z's revenue in 2020 grew by 33.37% compared to 2019, and the net profit attributable to listed companies increased by 50.25%. As illustrated in Figure 5.4, comparing Company Z's net profit from 2018 to 2022 with the industry average, it is evident that Company Z's net profit generally exceeded the industry average, and after acquiring Company Y, the growth rate of the company's net profit surpassed that of the industry. These data indicate that the acquisition had a positive impact on the company's profitability over a certain period.

Further examination of Company Z's profitability data after the performance commitment period reveals that by the third quarter of 2023, the net profit margin on total assets had fallen to 3.47%, and the return on equity had decreased to 4.97%. The continuous decline from 2019 to the third quarter of 2023 suggests that while the acquisition of Company Y provided new growth points and initial increases in net profit, the long-term challenge of maintaining and enhancing this profitability remains. The over-fulfillment of performance commitments by Company Y may have temporarily boosted Company Z's profitability, but over time, Company Y also faces the pressure of maintaining this high profitability level.

3.2 Rapid Expansion Brings Solvency Challenges

Debt-servicing capacity serves as a pivotal indicator of a company's financial health and stability, reflecting its ability to meet debt obligations upon maturity and its risk tolerance. Enterprises with robust debt-servicing capabilities typically exhibit a healthy capital structure and effective cash flow management. Moreover, the strength of a company's debt-servicing capacity directly influences its financing costs and borrowing terms. A company demonstrating strong debt-servicing abilities is often able to secure financing on more favorable terms, thereby reducing financial expenses and enhancing its financial stability and growth potential. Consequently, continuous monitoring and analysis of debt-servicing capacity are of paramount importance to corporate managers, investors, and creditors.

The selected metrics for assessing debt-servicing capacity in this article include the current ratio, quick ratio, and debt-to-asset ratio. The current ratio evaluates the ability of current assets to cover current liabilities, calculated as current assets divided by current liabilities. The quick ratio measures the portion of current assets that can be quickly liquidated to meet current liabilities, computed as (current assets - inventory - prepayments) divided by current liabilities. The debt-to-asset ratio reflects the

proportion of assets financed through debt, calculated as total liabilities divided by total assets.

From the perspective of short-term solvency, the trends in the current ratio and quick ratio are critical indicators. Data shows that in 2019, Company A's current ratio and quick ratio significantly increased to 7.44 and 6.56 respectively, indicating the company had abundant current assets and strong debt repayment and payment capabilities. Notably, the trading financial assets in the company's current assets grew nearly 300 times compared to 2018, primarily due to the company's use of IPO proceeds to purchase bank financial products to enhance capital efficiency. However, by 2020, these ratios had significantly declined, mainly due to a substantial increase in current liabilities, which grew by 89.61%, specifically in items such as notes payable, accounts payable, employee compensation payable, and other receivables. The company explained that these increases were due to significant business expansion, substantial performance improvements, increased bonus accruals, and increased project guarantees. While these factors reflect the rapid growth and good operational performance of the company's business after acquiring Company B, they also reveal the risks of weakened short-term solvency that may arise from rapid expansion.

From the perspective of performance commitments, Company B's strong performance has a dual impact on Company A's short-term solvency. On one hand, the over-fulfilled performance commitments brought additional income to Company A, enhancing its solvency. On the other hand, the rapid business expansion increased current liabilities, putting pressure on short-term solvency.

In terms of long-term solvency, the change in the debt-to-asset ratio is the main indicator to examine. Data shows that since 2018, Company A's debt-to-asset ratio has consistently been below the industry average. Especially after the company's IPO in 2019, the debt-to-asset ratio dropped to its lowest point of 11.19% due to the substantial increase in net assets from the initial public offering. However, after the acquisition in 2020, the company's debt-to-asset ratio slightly increased, indicating that the growth rate of total liabilities began to exceed that of total assets. By 2021, the company's debt-to-asset ratio surged to 31.43%, an increase of 18.33%. This growth was mainly due to the expansion of the company's business scope in the intelligent equipment field, leading to continuous growth in procurement scale and orders, as well as increased advance payments, resulting in a significant increase in total liabilities. Notably, part of the assets brought by the merger and acquisition included goodwill with nearly six times the premium generated in the enterprise valuation. If Company B's future performance fluctuates or declines, it may lead to goodwill impairment, affecting Company A's non-current assets and ultimately leading to a decline in the company's long-term solvency.

3.3 Asset Management and Collection Efficiency Slowed

Operational efficiency, a pivotal metric for assessing the effectiveness of a company's day-to-day operations, profoundly reflects how well a company utilizes its assets, particularly operational assets, to maximize profits and optimize efficiency. This concept encompasses not only the management of inventory, accounts receivable, and accounts payable but also the efficiency of generating returns from fixed assets and other operational assets. These factors not only influence the smoothness of daily

operations but also directly correlate with a company's ability to achieve its performance objectives, demonstrating robust profitability and market competitiveness.

The indicators chosen for evaluating operational efficiency in this article include total asset turnover, inventory turnover, accounts receivable turnover, and current asset turnover. Total asset turnover measures the efficiency with which a company uses its total assets to generate revenue, calculated as revenue divided by total assets. Inventory turnover assesses the speed at which a company sells and replenishes its inventory, calculated as cost of goods sold divided by inventory. Accounts receivable turnover reflects the speed of collecting receivables, calculated as revenue divided by accounts receivable. Current asset turnover gauges the efficiency of using current assets to generate revenue, calculated as revenue divided by current assets.

The total asset turnover ratio of Company A has been consistently declining both before and after its acquisition. As of 2020, the company's total assets reached 364,540.44 million yuan, representing a 70.60% increase from the previous year. Simultaneously, its operating revenue stood at 167,749.64 million yuan, reflecting a 33.37% year-on-year growth. A deeper analysis reveals that Company A has shown significant speed in expanding its asset base. With the completion of acquisition and restructuring projects and the advancement of fundraising investment projects, both the company's asset and business scales have expanded. However, the growth in the company's operating revenue has not kept pace with the expansion of its total assets, resulting in a total asset liability ratio below the industry average since 2021.

Compared to Jingce Electronics, Huafeng Testing Control, and Changchuan Technology, which are also engaged in testing machine business with similar product types, Company A has a higher inventory turnover ratio, indicating faster turnover of inventory and the funds tied up in it, as well as stronger inventory asset liquidity. Nevertheless, Company A's inventory turnover ratio has generally been on a downward trend, contrasting with the relatively stable trends of other companies. In 2020, Company A's inventory turnover ratio saw a slight increase, possibly due to the expansion of business scope and the resulting increase in operating revenue and costs after acquiring Company B. However, by 2021, the company's inventory turnover ratio had significantly declined, opposite to the rising trend in the industry. This change suggests that Company A faces challenges in inventory management post-acquisition, particularly in terms of inventory liquidity and capital turnover speed. This might be due to Company A increasing its inventory levels to meet the surge in order demand resulting from the over-fulfillment of performance commitments after acquiring Company B. While this strategy might have enhanced supply chain control in the short term, it also intensified capital occupation and reduced liquidity. In the long run, Company A needs to strike a balance between ensuring sufficient inventory to support sales and optimizing capital efficiency to promote sustainable and healthy business development.

Additionally, Company A's accounts receivable turnover ratio has also been continuously declining. Despite the increase in operating revenue brought by the acquisition of Company B, accounts

receivable has maintained a high growth trend. This could be due to the better-than-expected performance commitments of Company B, leading to transactions with larger clients who typically have longer payment cycles. Annual reports indicate that the increase in accounts receivable is mainly due to the expansion of business scale post-acquisition and the increase in the number of bank acceptance drafts. The trend in the current asset turnover ratio mirrors that of accounts receivable turnover, both showing a declining state, indicating that the growth rate of current assets has consistently outpaced that of operating revenue.

4. Non-financial Performance Analysis

4.1 The Market Share in the Initial Stage of Merger and Acquisition Increased Significantly

Based on the extensive collection of laws and regulations, internal control systems, risk cases and other information, 284 specific financial risk matters in five major aspects of the city were sorted out. At the same time, according to the probability of occurrence of the risk and the possible impact, carry out two-dimensional evaluation, and assign values ranging from 1 to 10 points respectively. In this way, it fundamentally solves the difference in risk assessment caused by personal subjective judgment, reduces misjudgments and omissions caused by staff's lack of professionalism and incomplete access to information, and basically realizes the standardization of risk assessment.

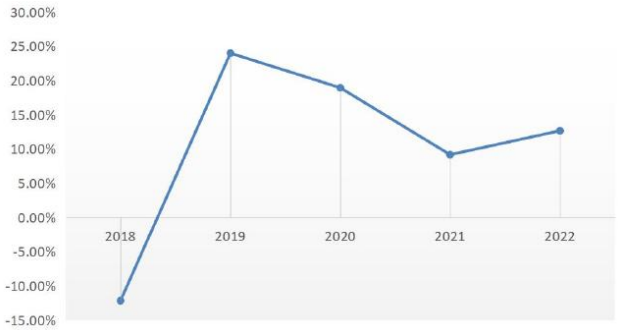

Figure 1. A company's Market Share Growth Trend

In the realm of business, market share serves as a pivotal metric for assessing a company's proportion within its industry. This ratio is typically derived by comparing a firm's sales performance against the total industry sales. Market share not only elucidates a company's or brand's market position but also gauges its competitive strength. As illustrated in Figure 1, Company A experienced a notable increase in market share during the initial stages of its merger, achieving a transition from negative to positive growth. Nonetheless, over the subsequent years, while market share continued to rise, the rate of growth decelerated. This pattern indicates that Company A achieved rapid market expansion post-merger but has since exhibited a more steady and gradual growth trajectory in the long-term competitive landscape.

During the initial merger phase, Company A swiftly expanded its share in the smart wearable device market by leveraging the resources of the acquired entity. However, given that both Company B (the acquired) and Company A operate within the same industry and share Apple Inc. as their primary client, this merger, while enhancing the combined service capabilities to Apple, also introduces a significant risk: fluctuations in Apple's product performance could adversely impact the order demand for both A and B, potentially jeopardizing the companies' stability, sustainability, and ongoing operational capabilities. Consequently, Company A must remain vigilant to the inherent risks associated with high customer concentration.

In summary, the trend in market share reveals that while the initial merger resulted in a substantial boost in market share, the company must navigate a more intricate and competitive market environment in the long run.

4.2 R&d Investment and Innovation Achieve Mutual Benefit and Win-win Results

Research and development (R&D) investment, which refers to the resources a company allocates for the research and development of new products or services, is a crucial indicator of a company's innovation capability. Innovation capability, in turn, refers to a company's ability to develop new products, services, or improve existing ones. The industry in which Company A operates is a multidisciplinary and comprehensive field, requiring continuous accumulation of technical R&D experience to ensure that technological reserves match downstream development needs and maintain high levels of R&D investment.

To maintain its leading position in the industry, Company A has consistently increased its investment in the development of new products and technologies. According to the data in Figure 2, Company A's R&D investment has significantly increased annually from 2018 to 2022, with the total R&D expenditure showing a steady growth trend, and the proportion of R&D expenditure to operating income generally rising. Notably, in the years when the company implemented merger and acquisition strategies, R&D investment saw a significant increase compared to the previous year. This growth is primarily attributed to the company's continuous enhancement of standardized semiconductor testing equipment and sorter R&D efforts, as well as the expansion of its R&D team in the United States and increased R&D intensity. Additionally, Company A has established R&D centers in Taiwan, China, and South Korea, further expanding its global R&D network. The company's investment in R&D for flat panel testing has also been steadily increasing.

In 2020, Company A's R&D investment saw a significant rise compared to 2019, with an increase of 31.09%. This growth was not only due to the company's continuous investment in the semiconductor field but also because Company A completed the acquisition of Company B and incorporated it into its consolidated reporting scope. Company B, a company specializing in wearable, brought new impetus to Company A's R&D capabilities. In the 2020 annual report, Company A added four core technologies: smartwatch button function testing technology, smartwatch heating lamination technology, smartwatch motherboard program download and testing equipment, and acoustic testing technology. These

technologies are all related to the smart wearable device industry in which Company B operates. The integration of the company's own R&D investment with Company B's technologies jointly drove a significant increase in Company A's R&D investment during the reporting period.

The number of intellectual property rights is an important indicator of a company's innovation capability. Figure 2 shows that Company A's intellectual property rights have not only maintained steady growth but also exhibited a significant high-speed growth trend. Particularly after the acquisition of Company B, Company A strengthened post-merger integration and synergy efforts, effectively tapping into market demand in the smart wearable device field and leveraging its own R&D advantages to fill market gaps in Company B's testing equipment products. Overall, this merger not only significantly enhanced the R&D capabilities of both parties but also achieved a mutually beneficial outcome.

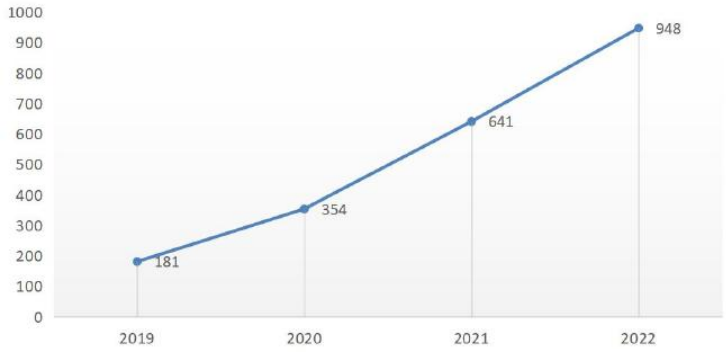

Figure 2. The Amount of the Company's Intellectual Property

4.3 Talent Complementarity Lays the Foundation for Long-term Development

Employees are pivotal to the growth of an enterprise and serve as the cornerstone for achieving long-term sustainable development. For companies listed on the Science and Technology Innovation Board (STAR Market), high-quality talent is predominantly concentrated among the research and development (R&D) technical staff. According to the data in Table 1, Company A has consistently increased its number of R&D personnel, with these employees accounting for approximately 40% of the company's total workforce. This demonstrates the company's strong emphasis on attracting and retaining R&D talent, viewing R&D as the primary driver of corporate growth. Following the acquisition of Company B, the integration of R&D teams from both companies has facilitated a complementary blend of expertise and diverse technical experiences across different fields.

With the successful implementation of the merger and acquisition projects and the gradual advancement of the funds raised from public offerings, the number of technical, managerial, sales, and production personnel within the company has increased. In addition to the rapid growth in R&D personnel, there has been a significant increase in the number of sales and production staff compared to before the company's listing and the merger and acquisition activities. Furthermore, after completing

the acquisition, Company Z not only enhanced its own technical and production capabilities but also actively expanded into new markets, broadening its business scope. As the company's orders have increased, the demand for personnel in various roles, particularly in sales and production, has also grown. These developments indicate that the company's strategic initiatives in resource integration and market share expansion are gradually yielding positive results.

Table 1. R&d personnel and Proportion of the Company from 2018 to 2022

index	2018	2019	2020	2021	2022
Number of R&D personnel	400	463	598	827	993
Total number of the company	955	1116	1600	120	2402
The proportion of R&D personnel in the total number (%)	41.88	41.49	37.38	39.01	41.34

5. Conclusion

In terms of market performance, A Company's acquisition activities have received positive feedback from the market. Through event study analysis, both the daily abnormal return and the cumulative abnormal return of the company showed significant increases following the acquisition event, indicating a positive market sentiment towards this strategic move.

In terms of financial performance, A Company's acquisition activities have had a profound and multidimensional impact on its overall financial and operational status. Initially, the acquisition had a positive effect on the company's profitability. After acquiring Company B, A Company expanded its business scope, leading to increased revenue and sales, which in turn improved the operating net profit margin and sales gross profit margin. However, this growth was not sustained, as the rate of increase in profitability slowed over time. This suggests that the company needs to continuously innovate and adapt to market dynamics to maintain its profitability levels.

In terms of non-financial performance, A Company's acquisition activities have positively influenced its market share, R&D investment and innovation capabilities, as well as the quality and structure of its workforce. Following the acquisition of Company B, A Company's position in the relevant market significantly improved, with an increase in market share. Simultaneously, the increase in R&D investment and the number and proportion of R&D personnel have driven technological innovation and product updates. Additionally, the significant growth in the number of sales and production personnel has provided solid support for the expansion of the company's business and market development, laying a foundation for long-term growth.

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