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Article

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M&A valuation for going concern: A case study using Samsung electronics' adjusted EBITDA Multiple

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Abstract: This study analyzes the limitations of EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) Multiple from the perspective of the going concern principle. A new Adjusted EBITDA Multiple that complements the limitations of the EBITDA Multiple is generated and applied to real-world cases for comparison. EBITDA Multiple is used to assess if the target company is undervalued or overvalued; adjusted EBITDA Multiple is used to determine the time taken to recover the total acquisition cost of a company in an M&A transaction. Samsung Electronics, South Korea's leading tech firm, is used as a case study to analyze financial information between 2017 and 2021. The result varied with the M&A decisions. Investment decisions in M&A are made considering the assets (debt + capital) to be assumed with the acquisition and additional investment costs for the target's sustainable management. We propose a new valuation method for recovering M&A investment costs, considering the long-term sustainable growth of the acquired company.

Subjects: Korean Business; Corporate Finance; Financial Statement Analysis

Keywords: M&Amp;A; valuation; EBITDA multiple; going concern; M&A consideration

JEL classification: G30; G34

1. Introduction

Corporate valuation plays a critical role in essential business activities, such as mergers and acquisitions (M&A), initial public offerings (IPOs), and fundraising efforts (Damodaran, 2006). Accurate valuations are crucial for investors and managers to make informed decisions about investments, acquisitions, and divestitures (Fernández, 2007). However, traditional valuation methods such as the EBITDA Multiple have been criticized for not fully accounting for the complexity of modern business transactions (T. Copeland et al., 2000). For instance, according to a study by Duff & Phelps, over 50% of M&A deals fail due to inaccurate valuations (Duff & Phelps,2019). Inaccurate valuations can result in overpaying for a company or undervaluing its assets, leading to significant financial losses for investors. Moreover, traditional valuation methods often fail to capture the true value of companies with complex capital structures, which can have a significant impact on their overall valuation (Damodaran, 2012).

The purpose of this paper is to propose a new valuation method called the "Adjusted EBITDA Multiple," which aims to address the limitations of the traditional EBITDA Multiple by considering additional factors that were not accounted for in the traditional method. The Adjusted EBITDA Multiple improves upon the existing EBITDA Multiple by considering debt-like items and disposable items, providing a more accurate assessment of a company's real value from a going concern cash flow perspective.

There are several reasons why the traditional EBITDA Multiple may not accurately reflect a company's true value. First, it does not consider the company's capital structure and debt levels, which can significantly affect its valuation. Second, it does not consider non-cash items such as stock-based compensation and non-recurring items like gains or losses from asset sales. Third, the EBITDA Multiple may not be appropriate for companies with high growth rates, as it tends to undervalue such companies (Damodaran, 2012).

The Adjusted EBITDA Multiple addresses these shortcomings by adjusting the EBITDA for various factors, including debt-like items and disposable items. This new method allows for a more accurate assessment of a company's real value from a going concern cash flow perspective, making it a valuable tool for investors and managers in their decision-making processes.

To demonstrate the practicality and accuracy of the Adjusted EBITDA Multiple, this paper includes a case study using the financial indicators of Samsung Electronics, a leading company in South Korea, for the past five years. By comparing Samsung Electronics' EBITDA Multiple and Adjusted EBITDA Multiple over time, the paper aims to verify the effectiveness of the Adjusted EBITDA Multiple in addressing the underestimation or overestimation issues associated with the traditional EBITDA Multiple. This case study serves to demonstrate the real-world applicability and effectiveness of the proposed method. Moreover, this paper will review the existing literature on corporate valuation and EBITDA Multiple, including the works of T. Copeland et al. (2000), Fernández (2007), and Koller et al. (2010), to provide a comprehensive understanding of the current state of research in this area. The paper will also explore the potential applications of the Adjusted EBITDA Multiple in various industries and contexts, as well as its limitations and areas for improvement.

The structure of this paper is as follows. First, the limitations and disadvantages of the existing EBITDA Multiple will be examined in-depth, drawing upon existing literature and empirical evidence. Second, the concept and calculation method of the Adjusted EBITDA Multiple will be introduced, and the differences from the existing EBITDA Multiple will be explained. Third, the practicality and accuracy of the Adjusted EBITDA Multiple will be verified through the case study focusing on Samsung Electronics. Fourth, the advantages of the Adjusted EBITDA Multiple compared to the traditional EBITDA Multiple will be discussed, and its potential as a method for better decision-making in the M&A industry will be presented. Finally, the conclusion will summarize the main points of the paper and suggest directions for future research, including potential refinements to the Adjusted EBITDA Multiple and its application to other industries and contexts. The Adjusted EBITDA Multiple offers several advantages over the traditional EBITDA Multiple. By accounting for debt-like items and disposable items, the Adjusted EBITDA Multiple provides a more comprehensive view of a company's true value, allowing for better-informed investment decisions. According to a report by PwC, over 60% of dealmakers believe that EBITDA adjustments are critical in valuing businesses accurately (PwC, 2020). Moreover, its adaptability to different types of companies and industries makes it a versatile valuation tool that can meet the demands of the rapidly changing business environment.

The practical application of the Adjusted EBITDA Multiple in the M&A industry is particularly noteworthy. The M&A industry is one of the most critical sectors of the economy, with global M&A deals reaching $3.6 trillion in the first quarter of 2021 alone (Statista, 2021). Accurate valuations

are crucial in this industry, and the Adjusted EBITDA Multiple can facilitate better decision-making, leading to more successful transactions and ultimately benefiting all parties involved.

This paper complements the limitations of the existing EBITDA multiple, and it is expected to make a significant contribution to decision-making in academia and management. Firstly, although the EBITDA multiple is widely used for company valuation, it has limitations in accurately assessing a company's value. EBITDA multiple is a valuation method based on a company's EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization), which has the advantage of providing an easy understanding of the company's financial status. However, it calculates the value based only on EBITDA, without considering a company's assets, liabilities, cash flow, and other factors that could impact its actual value. Secondly, since EBITDA multiple is based on specific indicators, it may overlook important factors. It is only applicable for valuation based on past financial information, as it does not consider a company's sustainability, financial soundness, market environment, industry structure, competition, technological advancements, and other crucial factors. Thirdly, for large companies like Samsung Electronics, using EBITDA multiple poses difficulties in determining the appropriate valuation due to the complexity of the company. EBITDA multiple application for large companies has limitations due to their complexity and various influencing factors. Particularly, large corporations with multiple sectors and locations are experiencing the limitations of EBITDA multiple. Fourthly, in contrast, the "Adjusted EBITDA multiple" can provide a more accurate valuation by using adjusted EBITDA based on a company's past financial statements and cash flow. The "Adjusted EBITDA multiple" is a method of calculating a company's value by adjusting EBITDA and considering a company's financial status and management environment. By adjusting EBITDA based on a company's cash flow, capital structure, market environment, and other factors, more accurate valuation is possible from an M&A perspective. Fifthly, the "Adjusted EBITDA multiple" can comprehensively consider a company's financial status and management environment, providing more accurate valuation in the M&A industry. Compared to EBITDA multiple, the "Adjusted EBITDA multiple" can consider a company's financial status and management environment more comprehensively. Therefore, the M&A industry is gradually adopting the "Adjusted EBITDA multiple" based on these advantages. These significant reasons highlight the need for a new valuation method, the "Adjusted EBITDA multiple," to overcome the limitations of EBITDA multiple. This can clearly convey the importance of the paper and the need for a new valuation method to the readers.

In conclusion, the Adjusted EBITDA Multiple offers several advantages over the traditional EBITDA Multiple and is a valuable tool for accurate and comprehensive corporate valuation. By accounting for debt-like items and disposable items, the Adjusted EBITDA Multiple provides a more precise measure of a company's value from a going concern cash flow perspective, enabling better-informed investment decisions. Moreover, its adaptability to different types of companies and industries makes it a versatile valuation tool that can meet the demands of the rapidly changing business environment. The practical application of the Adjusted EBITDA Multiple in the M&A industry is particularly noteworthy, as accurate valuations are crucial in this sector. The case study on Samsung Electronics demonstrates the practicality and effectiveness of the proposed method, while the exploration of potential applications, limitations, and areas for improvement highlights the importance of developing more accurate valuation methods. Future research should continue to refine and expand upon the Adjusted EBITDA Multiple, exploring its potential applications in other industries and contexts and addressing any limitations or areas for improvement that may emerge over time.

2. Background

Investment decisions in M&A transactions and stock investment serve different purposes. Stock investors seek to gain capital through a rise in the investee's stock price, and they are only responsible for the amount they invest. However, M&A transactions can also have a positive impact on stock prices. For instance, a study by Q. Huang and Walkling (2018) found that M&A

announcements are associated with significant stock price reactions for both acquiring and target firms, with the effects being stronger for larger deals and for deals involving private targets.

The objectives of M&A investments vary depending on whether the acquirer is a strategic investor (SI) or a financial investor (FI). Like stock investors, financial investors seek capital gains, but their investment period is shorter than strategic investors who focus on the long-term growth of the investee and make additional investments when the investee's financial structure deteriorates.

In today's capital markets, M&A is a strategy for evaluating the challenges of corporate growth. Many studies related to M&A are being conducted, and investors are also monitoring M&A research results. For example, Y. Kim and Ritter (2017) found that M&A deals that involve private equity (PE) firms tend to have higher takeover premiums and more favorable acquisition characteristics. Moreover, Xiong and Wong (2021) found that M&A deals in emerging markets tend to be more value-destroying compared to deals in developed markets due to weaker legal and regulatory environments.

When acquiring a company, valuation is a crucial element, and there are two primary M&A valuation methods: discounted cash flow (DCF) and the relative valuation method using multiples. The latter includes several relative valuation methods such as the P/E (price-to-earnings) ratio focusing on net profit, P/B ratio (price-to-book-value) focusing on capital, and price-to-sales ratio (P/S) focusing on sales. Unlike stock investment, the target company is acquired in M&A transactions, and the EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) Multiple, which focuses on the cash flow of the primary business, is widely used in M&A transactions.

The EBITDA Multiple is computed by dividing the Enterprise Value (EV) by EBITDA, indicating how many times the target company is worth its EBITDA. The denominator, EBITDA, is calculated by adding depreciation and amortization, which are representative expenses among non-cash expenses, to a company's pre-tax operating profit. The numerator, Enterprise Value, is calculated by adding the stock value (100%) of the target company that is to be acquired and the company's net debt (interest-bearing borrowings minus cash and cash equivalents).

The result of EBITDA Multiple determines if the target company is "undervalued or overvalued" in making investment decisions. If the target company's result value is lower than the EBITDA Multiple of the industry average to which it belongs or that of competitors, potential investors will consider the target company as undervalued. Conversely, if the target company's result value is higher than the EBITDA Multiple of the industry average to which it belongs or that of competitors, potential investors will regard the target company as overvalued. This judgement—overvalued or undervalued—will be used as a trigger in investing in a target company. EBITDA Multiple is a preferred valuation method by many investors due to its intuitive result. Unlike the DCF method that requires expertise to interpret the result, including number of assumptions, estimations, and calculation of discount rates, EBITDA Multiple only needs the target company to compare its valuation with similar entities to make an investment decision.

However, it is important to note that EBITDA has several limitations. Although it is widely used in the M&A industry, its calculation formula involves merely adding net borrowings to the stock value, and the denominator, EBITDA, does not consider non-cash expenses such as interest and tax expenses. Additionally, the Enterprise Value (numerator) is too simple, which can result in errors in investment decisions based solely on the EBITDA multiple. For example, the EBITDA multiple may not accurately reflect the underlying value of a company with high capital expenditures, resulting in an overvalued target company.

To overcome the limitations of the EBITDA multiple, several alternative valuation methods have been proposed in the literature. One such method is the adjusted EBITDA multiple, which

adds back non-cash expenses such as depreciation and amortization and adjusts for one-time expenses to provide a more accurate measure of a company's cash flow. Another alternative method is the use of free cash flow (FCF), which measures a company's ability to generate cash after accounting for capital expenditures and is often used in combination with the DCF method.

In addition to valuation methods, there has been extensive research on the determinants of M&A success, including factors such as cultural compatibility, management expertise, and strategic fit. A study by Baker and Ruback (1999a) found that deals in which the acquirer has a high degree of expertise in the target company's industry are more likely to create value, while deals that result in significant cultural differences between the two companies are more likely to fail. Other studies have focused on the impact of M&A on employee morale and productivity, with some finding that M&A can led to a decrease in employee morale and others finding no significant impact. Overall, the M&A industry is complex and multifaceted, with a wide range of factors influencing investment decisions and outcomes. As such, there is a need for continued research and analysis to develop new methods and strategies for successful M&A transactions.

The discounted cash flow (DCF) method, frequently used in the M&A industry, was developed by Modigliani and Miller (1958) and has the advantage of reflecting the time value of money and mid- to long-term business plans of the target company. The Residual Income Model shares the same concept as the DCF method. Ohlson (1995) argued that efficient use of equity capital is more important than a firm's future profit, and that a firm generating profits exceeding the opportunity cost of using its capital is more valuable. However, this method has a limitation in that the evaluator's subjective judgment may affect estimating future profits and calculating the discount rate. Another disadvantage is that it cannot sufficiently reflect market conditions by focusing only on the target company. Brotherson et al. (2015) argued that the DCF method's estimation is highly unreliable, and that it is reasonable to use it only as a reference for investment decisions. Zavitsanos (2017) also used the DCF method to measure synergy between two merging companies but indicated that actual long-term synergy may differ from previous estimates. Fernandes (2019) argued that the valuation result generated by investment banks is not objective, and that the calculation process is not transparent due to the possibility of the investment bank's position and subjectivity being involved. DeAngelo (1990) argued that using "multiples," based on accounting numbers, to compensate for these shortcomings can be more convincing to consumers. Valuations using multiples evaluate corporate value, and "multiple" implies that several items are multiplied to calculate corporate value, including GMV (gross merchandise volume) sales, gross profit, EBIT, EBITDA, and net income. Srinivasa Reddy and Nisar (2015) suggested a new research design method, "Test-Tube," which refers to the point that existing theoretical studies, including M&A, may apply well in Western society but not as well in emerging markets. Chen and Gong (2021) examined the impact of investor sentiment on M&A deal announcements and found that high levels of investor sentiment led to higher announcement returns for both acquiring and target firms. J. Huang and Walkling (2007) analyzed the impact of M&A announcements on the volatility of the stock market and found that M&A announcements have a significant impact on market volatility. Agrawal and Jaffe (2000) investigated the role of CEO overconfidence in M&A activity and found that overconfident CEOs are more likely to engage in M&A activity and that their deals tend to underperform compared to those of non-overconfident CEOs. Singh and Nagar (2019) studied the impact of financial leverage on M&A activity and found that higher levels of financial leverage increase the likelihood of M&A activity and also have a positive impact on post-merger performance. Gugler and Yurtoglu (2003) examined the effect of ownership structure on the performance of acquired firms and found that acquisitions by widely held firms tend to result in higher post-merger performance compared to those by closely held firms. Investors evaluate whether a potential investment is overvalued or undervalued based on the level of multiples for the investment target, which can be summarized as shown in Table 1.

Table 1. Investors' decisions according to multiples

Situation	Investor's decision
When target's multiple is low	Target is undervalued
When target's multiple is high	Target is overvalued

Table 2. Items to be subtracted while calculating Enterprise Value (Disposable items)

No.	Category	Note
(1)	Short-term and long-term financial products	Assets that are not directly related with the company's business activities, and the new acquirer may them dispose of without any significant influence on the existing business.
(2)	Other current and non-current assets	
(3)	Overpaid Net Defined Benefit Assets	
(4)	Investment properties, investment assets	
(5)	Other non-business-related assets	

Table 3. Items to be added while calculating Enterprise Value (debt-like items)

No.	Category	Note
(1)	Payable	Debts that are not directly related with the company's business activities, but the new acquirer is obliged to repay debts after completing the acquisition.
(2)	Other current and non-current liabilities	
(3)	Excess of net defined benefit liabilities compared to net defined benefit assets	

Table 4. Items to be adjusted in the EV/EBITDA Multiple denominator (going concern cashflow)

No.	Category	Reason
(1)	Operating cash flow	An indicator that reflects the total amount of cash inflows or outflows from business activities and changes in working capital
(2)	Capital expenditure (CAPEX)	Future investment for the going concern

Table 5. Average market capitalization of Samsung Electronics, by year (100 mil. won, 2017 ~ 2021)

100 mil. won	2017	2018	2019	2020	2021
Market Cap	3,097,109	2,999,509	2,780,924	3,411,923	4,725,420

3. Theoretical literature review

Valuation in M&A transactions typically depends on the conditions of both the target company and the potential acquirer and seller. Schill et al. (2008) compared various valuation methods that can be used in M&A transactions and stressed the importance of selecting an appropriate method

Table 6. Samsung Electronics' net debt (100 mil. won, 2017 ~ 2021)

No.	Item	2017	2018	2019	2020	2021
1	Short-term Borrowings	157,676	135,867	143,935	165,534	136,878
2	Liquid Long-term Liabilities	2,786	334	8,461	7,161	13,300
3	Debentures	9,534	9,620	9,753	9,481	5,082
4	Long-term Borrowings	18,144	851	21,972	19,997	28,662
5	Cash and cash Equivalents	305,451	303,405	268,860	293,826	390,314
Net debt (1 + 2 + 3 + 4–5)		(117,311)	(156,734)	(84,740)	(91,652)	(206,393)
Debt ratio %		40.7%	37.0%	34.1%	37.1%	39.9%

Table 7. Samsung Electronics' disposable items (100 mil. won, 2017 ~ 2021)

No.	Item	2017	2018	2019	2020	2021
1	Short-term financial products	526,391	705,994	818,937	952,703	851,188
2	Long-term financial products	78,589	83,151	175,613	218,550	244,234
3	Overpaid net defined benefit assets	4,360	583	1,191	8,910	23,437
4	Other current and non-current assets	92,157	150,192	121,165	88,677	118,806
5	Assets classified as held for sale	-	-	-	9,294	-
Disposable items (1 + 2 + 3 + 4 + 5)		701,497	939,920	1,116,905	1,278,134	1,237,665

Table 8. Samsung Electronics' debt-like items (100 mil. won, 2017 ~ 2021)

No.	Items	2017	2018	2019	2020	2021
1	Payable	138,996	107,115	120,025	118,990	155,849
2	Long-term payables	18,144	851	21,842	16,829	29,914
3	Other current and non-current liabilities	31,121	30,060	34,459	28,536	27,594
Debt like items (1 + 2 + 3)		188,262	138,026	176,327	164,355	213,357

Table 9. Numerators of Samsung electronics' EV/EBITDA and Adjusted EV/EBITDA formula (100 mil. Won, 2017 ~ 2021)

Value of Numerator	2017	2018	2019	2020	2021
EBITDA Multiple	2,979,799	2,842,775	2,696,184	3,320,271	4,519,027
Adjusted EBITDA Multiple	2,466,564	2,040,881	1,755,606	2,206,492	3,494,719

Table 10. Samsung Electronics' EBITDA and EBITDA margin (100 mil. Won, %, 2017 ~ 2021)

Item	2017	2018	2019	2020	2021
Sales	2,395,754	2,437,714	2,304,009	2,368,070	2,796,048
Operating Profits	536,450	588,867	277,685	359,939	516,339
EBITDA	757,624	853,687	573,661	663,295	858,812
EBITDA %	31.6%	35.0%	24.9%	28.0%	30.7%

Table 11. Samsung Electronics' going concern cashflow trend (100 mil. won 2017 ~ 2021)

Item	2017	2018	2019	2020	2021
Operating cash flow	621,620	670,319	453,829	652,870	651,054
Capital expenditure	(434,669)	(300,080)	(280,972)	(398,880)	(494,690)
Difference (Going Concern Cashflow)	186,952	370,238	172,858	253,990	156,365

Table 12. Samsung Electronics' EBITDA and going concern cash flow trend (100 mil. won 2017 ~ 2021)

Items	2017	2018	2019	2020	2021
① **EBITDA**	757,624	853,687	573,661	663,295	858,812
② Cash flow from operating activities	621,620	670,319	453,829	652,870	651,054
③ Capital expenditure	(434,669)	(300,080)	(280,972)	(398,880)	(494,690)
④**Going Concern Cashflow (②-③)**	186,952	370,238	172,858	253,990	156,365

based on the situation. In this study, we conducted a literature review on valuation methodologies, including the main factors of valuation and the EBITDA multiple, to identify research trends. Our review confirmed that previous studies have focused on analyzing factors that affect corporate values and the limitations of the EBITDA multiple.

Equation 1: EBITDA Multiple Formula

Table 13. Samsung Electronics' EV/EBITDA multiple trend (100 mil. won, multiple, 2017 ~ 2021)

Item	2017	2018	2019	2020	2021
Market cap	3,097,109	2,999,509	2,780,924	3,411,923	4,725,420
Net debt	(117,311)	(156,734)	(84,740)	(91,652)	(206,393)
Enterprise Value	2,979,799	2,842,775	2,696,184	3,320,271	4,519,027
EBITDA	757,624	853,687	573,661	663,295	858,812
EBITDA Multiple	**3.9**	**3.3**	**4.7**	**5.0**	**5.3**

Table 14. Samsung Electronics' Adjusted EBITDA multiple trend (100 mil. won, multiple, 2017 ~ 2021)

Item	2017	2018	2019	2020	2021
Market cap	3,097,109	2,999,509	2,780,924	3,411,923	4,725,420
Net debt	(117,311)	(156,734)	(84,740)	(91,652)	(206,393)
Disposable items	701,497	939,920	1,116,905	1,278,134	1,237,665
Debt like items	188,262	138,026	176,327	164,355	213,357
EV (total cost perspective)	2,466,564	2,040,881	1,755,606	2,206,492	3,494,719
Going Concern Cashflow	186,952	370,238	172,858	253,990	156,365
Adjusted EBITDA Multiple	**13.2**	**5.5**	**10.2**	**8.7**	**22.3**

Table 15. Samsung Electronics' EBITDA Multiple vs Adjusted EBITDA Multiple (2017 ~ 2021)

Item	2017	2018	2019	2020	2021
EBITDA Multiple	3.9	3.3	4.7	5.0	5.3
Adjusted EBITDA Multiple	13.2	5.5	10.2	8.7	22.3

Table 16. EBITDA Multiple-based decision making and differences (Samsung Electronics) (Years)

Item	Optimal invest decision Time	Sub-Optimal invest decision Time	Worst invest decision Time
By EBITDA Multiple	2018	2017	2021
Expected payback period	3.3 years	3.9 years	5.3 years
Expected actual payback period (From Adjusted EBITDA Multiple)	5.5 years	13.2 years	22.3 years
Difference (years)	**2.2**	**9.3**	**17**

$$\text{EBITDA Multiple} = \frac{\text{Equity Value} + \text{Interest Bearing Debt} - \text{Cash \& Cash Equivalent}}{\text{Earnings Before Interest and Tax} + \text{Depreciation \& Amortization}}$$

Table 17. Decision-making differences by the period of Adjusted EV/EBITDA Multiple analysis

Case 1. Calculating Samsung Electronics' 2017 Adjusted EV/EBITDA Multiple in 2017

Item	**2017**	**Investment Decision**
Adjusted EBITDA Multiple	13.2	**Uncertainty whether or not it is undervalued**

Case 2. Calculating Samsung Electronics' prior Adjusted EV/EBITDA Multiple Trend in 2021

Item	**2017**	**2018**	**2019**	**2020**	**2021**	**Investment Decision**
Adjusted EV/EBITDA Multiple	13.2	5.5	10.2	8.7	22.3	**Overvalued** (withdrawal of investment)

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Table 18. M&A implications in the comparison of two multiples

Situation	Implication
When EBITDA Multiple is **higher** than Adjusted EBITDA Multiple	From an M&A perspective, the target company is undervalued, and potential investors can recover the total investment within a shorter period than the figure shown by the EBITDA Multiple.
When EBITDA Multiple is **lower** than Adjusted EBITDA Multiple	From an M&A perspective, the target company is overvalued, and potential investors can recover the total investment over a longer period than the figure shown by the EBITDA Multiple.

Table 19. When EBITDA Multiple is higher than Adjusted EBITDA Multiple

Situation	M&A Implication
EBITDA Multiple > Adjusted EBITDA Multiple	Target's EBITDA has high growth potential Relatively high share of non-operating assets Cashflow for a high level of going concern assumption

Table 20. When EBITDA Multiple is lower than Adjusted EBITDA Multiple

Situation	M&A Implication
EBITDA Multiple < Adjusted EBITDA Multiple	Target's potential for low EBITDA growth Relatively lower share of non-operating assets Cashflow for a low level of going concern assumption

3.1. In relation to multiples

Baker and Ruback (1999b) employed statistical techniques to calculate the average value of industry multiples for various valuation multiples across 22 industries in the S&P 500. Comparing values by multiples, he argued that EBITDA is the most appropriate metric for comparing the value of companies, with an emphasis on the appropriateness of the EBITDA Multiple. Nissim and Stephen (1999) emphasized that in-depth analysis of financial statements should be made in valuation and analyzed US stock market data from 1963 to 1996. He stated that a company's profitability and growth potential are the most important factors for increasing corporate value, and free cash flow and ratio analysis of financial indicators are useful measures. Baker and Ruback (1999a) analyzed industry multiples such as revenue, EBIT, and EBITDA for the S&P 500 and argued that the EBITDA Multiple is the most suitable for corporate valuation, as it better represents corporate value than revenue and EBIT. Liu et al. (2000) argued that a firm's future earnings have the most significant impact on corporate value, whereas sales and EBITDA are only supplementary indicators. The author compared various valuation methods and insisted that future profit is the most important factor for a company. Chan and Lui (2011) proposed eliminating the impact of depreciation in valuation and suggested using EV/EBIT, as EBIT is highly comparable and an efficient approach to company analysis. D. H. Kim and Ryou (2017) compared the accuracy of enterprise value multiples and price multiples in predicting stock returns in the Korean market and found that enterprise value multiples are more accurate than price multiples. Yang et al. (2017) investigated the relationship between corporate social responsibility and firm value, and found that firms with high levels of corporate social responsibility have higher valuations, as measured by EV/EBITDA. Lastly, Gao and Zhu (2021) compared different valuation multiples and found that P/E (price-to-earnings) and P/B (price-to-book) ratios are most commonly used, but P/S (price-to-sales) and P/CF (price-to-cash flow) ratios have more significant explanatory power in the Chinese market.

3.2. In relation to use of EBITDA

Stumpp et al. (2000) argued that using EBITDA alone as a valuation measure is not reasonable without considering other items. The author explained that EBITDA cannot reflect changes in a company's operating capital and future investments, and presented points to acknowledge when using EBITDA through a case study. Fernandez (2001) compared various relative valuation methods used by analysts and examined the differences and cautions of each multiple. Working capital and capital expenditure are considered limitations of EBITDA Multiple. John Cassis (2002) compared EBITDA and operating cash flow (OCF) in the statement of cash flows. He argued that reasonable decision making is possible when additional variables are considered while analyzing companies. Christian and Jones (2004) emphasized that EBITDA is a more appropriate firm valuation method for M&A than net income or operating cash flow, especially in situations with relatively high uncertainty in estimation. Chan and Lui (2010) claimed that the EV/EBITDA multiple better explains a company's current value level than the P/E Ratio (PER), using the market capitalization of U.S. telecommunications companies as an example. Helleren and Stige (2017) found no significant statistical correlation between management emphasis on EBITDA and company size or cash flow status based on the financial statements of companies listed in Norway from 2011 to 2015. Bouwens et al. (2018) cautioned against investing in companies that emphasize EBITDA and confirmed that companies with low intrinsic value and low profitability tend to emphasize EBITDA based on the analysis of financial statements of US S&P 1500 companies from 2005 to 2016. Mauboussin (2018) analyzed the meaning of EBITDA Multiple and suggested that the simple use of EBITDA multiple could jeopardize decision-making due to differences in industry proportions of operating profit and depreciation cost, and the exclusion of capital expenditure, working capital, and taxes. Nissim (2019) argued that EBITDA is not a good indicator for stock price growth after 2010 because companies' profit structure turned complex. Rosebrock (2021) mentioned that EBITDA valuation does not reflect the future cash flows of the company and suggested analyzing the existing discounted future cash method (DCF) from the perspective of Equity IRR to reflect the time value of money.

3.3. Summary of literature review

The majority of previous studies have recognized the importance of EBITDA in corporate valuation, while also acknowledging its limitations and shortcomings. However, the proposed solutions to address these issues have varied from this study. Rather than solely analyzing the limitations and proposing supplementary multiples, we have attempted to modify the EBITDA multiple formula and apply the adjusted EBITDA multiple to practical cases. This approach is significant, as it allows for the use of the adjusted EBITDA multiple in actual investment decision-making by comparing it to the results of the traditional EBITDA multiple.

4. Empirical literature review

The empirical literature on M&A valuation presents mixed results regarding the usefulness of EBITDA multiples in predicting acquisition premiums. Some studies have found that EBITDA multiples are positively associated with acquisition premiums (e.g., Lamont & Polk, 2002; Martynova & Renneboog, 2008), while others have found no significant relationship (e.g., Flanagan & O'Shaughnessy, 2013; Siu & Wong, 2007). Critics of the EBITDA multiple argue that it fails to capture important firm-specific factors that affect M&A valuations, such as the quality of a company's management, its reputation, and its intellectual property (Cooke & Heilmann, 2008). In response to these criticisms, some researchers have proposed alternative measures of cash flow, such as Free Cash Flow (FCF) and Cash Flow Return on Investment (CFROI), that incorporate a broader range of financial and operational factors (Ashbaugh-Skaife et al., 2007; J. B. Kim & Ritter, 1999; T. E. Copeland et al., 1990). Despite these criticisms, the EBITDA multiple remains widely used in M&A valuations because it provides a simple and easily understandable measure of a company's financial performance that can be applied across different industries and sectors (Weston & Weaver, 2001). Additionally, the EBITDA multiple can serve as a proxy for a company's ability to generate cash flow, which is an important consideration for many M&A deals (Damodaran, 2002). This study aims to contribute to the ongoing debate on the usefulness of

EBITDA multiples in M&A valuations by developing a set of hypotheses that test the relationship between EBITDA multiples and acquisition premiums, while controlling for firm-specific factors that are known to influence M&A valuations, such as firm size, industry, and financial performance. The study will also compare the predictive power of EBITDA multiples to alternative measures of cash flow, such as Free Cash Flow (FCF) and Cash Flow Return on Investment (CFROI). Previous studies have suggested various variables for corporate valuation, including cash flow, growth rate, and industry growth rate (Hwang et al., 2014). Based on these previous studies, this paper proposes an Adjusted EBITDA Multiple for better corporate valuation that incorporates these variables. In addition to the EBITDA multiple, other valuation methods have been proposed for M&A, including the Cash Flow to Interest Expense Ratio (CFIER) by Harris and Raviv (1991), and the DCF (Discounted Cash Flow) model, PE (Price-to-Earnings) ratio, and P/B (Price-to-Book) ratio by Bruner (2002). However, these methods also have limitations and may not be suitable for certain situations. Previous studies have suggested considering a company's cash flow to complement the limitations of EBITDA multiples in accurately reflecting corporate valuation, such as J. B. Kim et al. (2016) who proposed a more comprehensive valuation method by comparing it with EBITDA multiples, and Berger and Ofek (1995) who suggested considering a company's cash flow. Overall, this study offers important insights into the role of EBITDA multiples in M&A valuations and provides guidance for practitioners seeking to improve their M&A decision-making process.

5. Research design & hypotheses development

5.1. Research design resources

Our analysis used financial statements from the electronic disclosure system of the Financial Supervisory Service (FSS), the Republic of Korea's financial regulator, and market capitalization data from the Korea Stock Exchange. The analysis period covered five years, from 2017 to 2021, in order to avoid decision-making errors that could arise from analyzing only a specific year.

5.2. Research design

In this study, we discuss how to reflect the items that EBITDA multiple cannot consider in the existing formula after decomposing the EBITDA multiple formula. The EBITDA multiple formula itself is simple and does not consider other important items of a company (e.g. disposable items, debt-like items). Therefore, in this study, we reconfigured the formula and compared the results of the existing formula and the new formula in actual cases to derive new meaning.

5.2.1. Numerator of EBITDA multiple (enterprise value) analysis

In the EBITDA Multiple formula, the numerator denotes enterprise value, which can be interpreted as the total cost of acquiring a certain company. The formula adds interest-bearing borrowings to the stock value and subtracts cash and cash equivalents. The acquirer is obligated to repay the existing debt while gaining autonomy in using the existing cash and cash equivalents. Thus, the numerator of the EBITDA Multiple should reflect the assets and liabilities items that have no relation with its business activities, such as net liabilities and stock value. In this study, we refer to these items as "disposable items," which have little or no influence on the target company's main business when disposed of by the new acquirer. Disposable items serve as negative costs that reduce the company's acquisition costs, such as cash and cash equivalents in the EBITDA Multiple. The typical financial statement items that fall under the category of disposable items are presented in Table 2.

The items described below are additional costs included in the total investment cost, such as interest-bearing borrowings. These costs, referred to as "debt-like items" in this study, are unrelated to the target company's main business activities and must be repaid by the new acquirer after acquisition. The typical financial statement items that fall under the category of debt-like items are presented in Table 3.

5.2.2. Denominator of EBITDA multiple (EBITDA) analysis

The implication of the EBITDA Multiple, namely that the investment costs of acquiring a company can be recovered is less likely to be realized because capital expenditure (CAPEX) is required periodically for the going concern, and the EBITDA omits the Tax Effect. For these reasons, the misunderstanding that the EBITDA of the acquired company can be transferred to the acquirer often leads to an error by M&A decision makers. To calculate the financial resources, which the acquirer can autonomously utilize from the acquired company in the future, it is reasonable to start from the after-tax operating profit, that is, the amount that remains after all the operating and non-operating expenses and other liabilities and taxes are paid. Since 1985, disclosure of companies' cash flow statements has been mandatory in the U.S. Since then, cash flows from operating activities reflected in the statement of cash flows can be used to make investment decisions. Operating cash flow is an index indicating the total amount of cash inflows and outflows from business activities, reflecting the impact of changes in working capital, payment of corporate tax, and payment and receipt of interest and dividend, which are not included in EBITDA. In the cash flows statement, cash flow from operating activities is from the company's original business. By contrast, cash flow from investment activities shows the CAPEX (capital expenditure) assumption for the going concern. Companies need CAPEX to operate the business uninterruptedly. Unless it is a monopoly, continuous investment is essential for a company to stay afloat and keep curb competition. Without investment, the company may slacken and lag in the industry it belongs to. Global companies are making huge investments for future business, and most of them prioritize corporate investment (CAPEX) over dividends, which are represented by the recovery of investment from a shareholder's perspective. Table 4 can be taken into consideration to adjust the numerator in the EV/EBITDA multiple formula.

By reflecting the above items, cash flow that can be used autonomously is the portion remaining after deducting CAPEX from the cash flow from operating activities, which can replace the denominator (EBITDA) in the EBITDA Multiple. In this study, this adjusted denominator is referred to as "Going Concern Cashflow."

5.2.3. Adjusted EV/EBITDA formula generation

The items analyzed from the perspective of recovering investment are summarized as follows, adjusting the numerator and denominator using the EBITDA Multiple formula. The values calculated with the adjusted formula can provide an answer to the following question. Under the premise that the performance of the acquired company is maintained status quo, how many years will it take to recover the total cost of acquiring the target company while satisfying the going concern assumption?

Equation 2: Adjusted EV/EBITDA Formula

$$\text{Adjusted EBITDA Multiple} = \frac{[\text{Equity Value} + \text{Interest Bearing Debt} + \text{Debt like Items} - \text{Cash\&Cash Equivalent} - \text{Disposable Items}]}{[\text{Cashflow from Operating Activity} - \text{Capital Expenditure}]}$$

6. Empirical results: Samsung electronics co., Ltd

6.1. Company overview

Samsung Electronics is South Korea's leading tech firm, with 234 subsidiaries, including 9 overseas regional managers in Korea and business divisions such as consumer electronics (CE), information technology and mobile communications (IM), and 5 overseas regional managers in device solutions (DS) and Harman (Harman International Industries, Inc. and its subsidiaries). The CE division manufactures TVs and refrigerators, and the IM division manufactures smartphones, network systems, and computers. The parts business (DS division) consists of a semiconductor business that produces devices such as DRAM, NAND flash, and mobile AP. A DP business produces TFT-LCD and OLED display panels.

6.2. Market cap trend (2017 ~ 2021)

The average annual market cap of Samsung Electronics from 2017 to 2021 is as follows. It has grown from a market cap of about 300 trillion won in 2017 to about 470 trillion won in 2021. The average market capitalization of Samsung Electronics from 2017 to 2021 is presented in Table 5.

6.3. Net debt trend (2017 ~ 2021)

The net debt trend of Samsung Electronics for the period from 2017 to 2021 is as follows. Samsung Electronics has maintained a good net cash financial structure with negative net borrowings for five consecutive years. The net debt of Samsung Electronics from 2017 to 2021 is presented in Table 6.

6.4. Disposable items trend (2017 ~ 2021)

The trend observed in Samsung Electronics' disposable items from 2017 to 2021 is as follows. Disposable items increased from 70 trillion won in 2017 to about 124 trillion won in 2021, which is mainly attributable to an increase in the long-term and short-term financial instruments and overpaid net defined benefit assets. The disposable items of Samsung Electronics from 2017 to 2021 are presented in Table 7.

6.5. Trend in debt-like items (2017 ~ 2021)

The trend observed in Samsung Electronics' debt-like items from 2017 to 2021 is as follows. Debt-like items have grown from about 19 trillion won in 2017 to about 21 trillion won in 2022. The debt-like items of Samsung Electronics from 2017 to 2021 are presented in Table 8.

6.6. Numerator summary

In this study, we identified the items necessary to calculate the numerator of the EBITDA Multiple and Adjusted EBITDA Multiple that must be applied to calculate the numerators of the EBITDA Multiple (EV) and the Adjusted EBITDA Multiple (EV, total cost of acquiring a target company). The numerators of Samsung Electronics' EV/EBITDA and adjusted EV/EBITDA formulas from 2017 to 2021 can be summarized as presented in Table 9.

6.7. EBITDA trend (2017 ~ 2021)

Samsung Electronics' EBITDA from 2017 to 2021 is as follows. In 2018, the company achieved an EBITDA margin of about 35%, and the profit margin plummeted in 2019 and 2020, but improved in 2021. The EBITDA and EBITDA margin of Samsung Electronics from 2017 to 2021 are presented in Table 10.

6.8. Going concern cashflow trend (2017 ~ 2021)

Samsung Electronics' operating cash flow and capital expenditure from 2017 to 2021 is as follows. The annual capital expenditure of nearly 43 trillion won in 2017 decreased marginally from 2018 to 2020 and increased again in 2021. Additionally, it is confirmed that as capital expenditure increases, the amounts of surplus resources available to the firm decreases. The going concern cash flow trend of Samsung Electronics from 2017 to 2021 can be summarized as presented in Table 11.

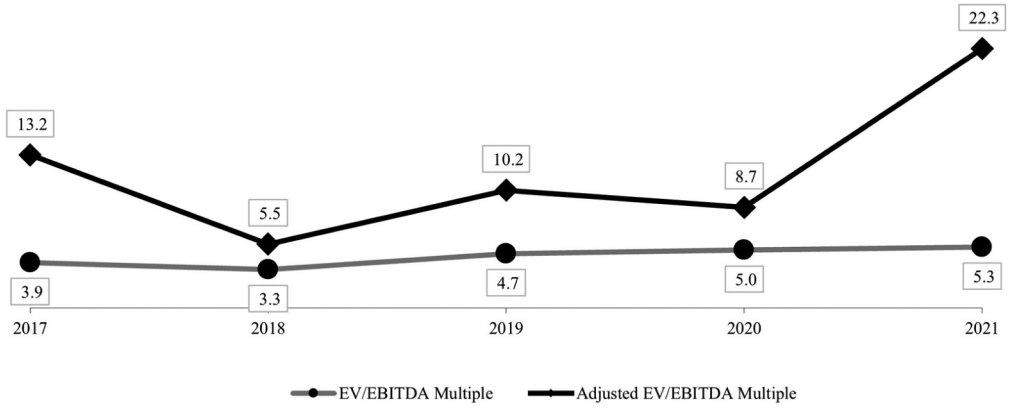
6.9. Denominator summary

In the case study of Samsung Electronics, the items required for the denominator of EBITDA Multiple and Adjusted EBITDA Multiple are summarized as follows. To compare the results of the EBITDA multiple and the adjusted multiple, the values corresponding to the numerators in the formulas, Samsung Electronics' EBITDA and going concern cash flow trend from 2017 to 2021, are presented in Table 12.

6.10. EBITDA multiple results

Based on the above data, the five-year trend of Samsung Electronics' EV/EBITDA Multiple is calculated as follows. The company's EV/EBITDA Multiple rose from about 4 times in 2017 to about 5.3 times in 2021. This can be interpreted as Samsung Electronics' corporate value is evaluated to be about 5.3 times its EBITDA, that is, the information potential investors can use to make decisions. The higher the EV/EBITDA multiple of an investment target, the higher the

Figure 1. Samsung Electronics' EBITDA Multiple vs Adjusted EBITDA Multiple (2017 ~ 2021).



investor interprets the investment target as being overvalued, and the reverse is also true. The EV/EBITDA multiple trend of Samsung Electronics from 2017 to 2021 is presented in Table 13.

6.11. Adjusted EBITDA multiple results

Based on the above data, the five-year trend of Samsung Electronics' Adjusted EBITDA Multiple is calculated as follows. Samsung Electronics' Adjusted EBITDA Multiple grew from about 13.2 times in 2017 to about 22.3 times in 2021. Adjusted EBITDA Multiple is a valuation indicator, and the higher the value the longer twill be the period of recovering investments. A longer payback period implies that the investment has lower profitability, whereas a shorter payback period denotes that the investment has higher profitability. If the calculated value is not available (N/A), this indicates that the company's current earnings level does not meet the going concern's cash flow. The adjusted EBITDA multiple trend of Samsung Electronics from 2017 to 2021 is presented in Table 14.

6.12. Comparison of results and implications

A comparison of Samsung Electronics' EBITDA Multiple and Adjusted EBITDA Multiple for the past five years were compared and the result is shown in the following table. Comparing the results of Samsung Electronics' EBITDA multiple and adjusted EBITDA multiple from 2017 to 2021, the values are presented in Table 15. Furthermore, the trend changes can be easily compared by graphically representing the results in Figure 1.

According to the investment indicators used, the results show that the expected level at the time of the decision and the actual result are different. When making an investment decision in Samsung Electronics, based on the EBITDA Multiple, the investment will be executed in 2018 (3.3 times) when Samsung Electronics is most undervalued, and the payback period is estimated to be about three to four years; however, the payback period may be longer, at five to six years. A decision of M&A in 2021 caused an even more serious result. At 5.3 of EBITDA Multiple, the company seems to have been relatively undervalued, and it takes about 22 years to recover investments, according to Adjusted EBITDA Multiple. The optimal time of investment differs between the notion of stock investment (undervalued section) and M&A (recovery of investment). This provides implications for Samsung Electronics' current profit level and the scale of investment, from the perspective of M&A investment and its recovery. If the EBITDA multiple and adjusted EBITDA multiple are used for investment decision-making, the difference in the results can be summarized as presented in Table 16.

7. Discussion and conclusions

7.1. Discussion

The decision-making process in M&A and stock investment differ significantly. While stock investment aims to gain capital from stock prices, M&A decisions focus on achieving long-term mutual growth after acquiring the target company. This study has several implications:

Firstly, from an M&A perspective, cash flow is a crucial factor in recovering the investment cost after acquiring a company. If the target company has residual cash flow after the acquisition and plans to make investments for the future, the cash flow can be used to recover the investment in the form of a dividend to the acquiring company. By repeating this process, the acquirer can recover the target company's acquisition costs. However, if the residual profit remains negative for an extended period after executing the investment, it indicates that the current profit level is lower than the investment level. To meet the investment level, the target company needs to utilize internal financial resources or raise funds from external sources, which increases its debt ratio. Therefore, the acquirer must conduct a detailed analysis of the going concern cash flow for the acquired company before making the acquisition decision.

Secondly, enterprise value is affected by items other than net borrowing, such as non-operating assets and debt. Non-operating assets are disposable items that are included in the total cost of enterprise value (EV) and deducted from the actual acquisition cost, while non-operating debt is debt-like items that are included in the enterprise value (EV) and added to the actual acquisition cost. The new acquirer is given new rights (disposable items) and obligations (debt-like items), so these items must be considered when making an investment decision, in addition to the stock value (market cap) and net borrowings.

Thirdly, it is crucial to view the trend over a period rather than the value at a specific point in time when making strategic investment decisions. Enterprise value changes constantly, and the adjusted EV/EBITDA multiple should be applied to a specific period rather than a spot to avoid limiting reasonable decision making. For instance, the adjusted EBITDA multiple of 13.2 for Samsung Electronics in 2017 implies that it would take about 13.2 years to recover the investment if the current level is maintained. Analyzing data over a period is necessary to determine if a company is undervalued or overvalued. Therefore, the acquirer must continuously monitor and assess the target company's financial performance to make informed investment decisions. If the adjusted EBITDA multiple is used for decision-making, different results may be obtained at each point in time, and these results can be summarized as presented in Table 17.

7.2. Limitations and practical implications

By comparing the EBITDA Multiple and Adjusted EBITDA Multiple of the target company (by period) for acquiring the target company, a potential investor can derive insights and implications for investment based on the difference between the two multiple values. The difference can be interpreted as follows. The implications of the EBITDA multiple and adjusted EBITDA multiple from an M&A perspective are presented as shown in Table 18.

Whether the target company is overvalued or undervalued depends on the market cap (stock value) and the acquired target's EBITDA and also on the valuation from an investment recovery perspective. For cases that may occur during a comparison of both EBITDA Multiple and Adjusted EBTDA Multiple, the implications of M&A for each case are analyzed as follows.

7.2.1. Case 1. EBITDA Multiple > Adjusted EBITDA Multiple

It is an ideal company from an M&A perspective. A potential acquirer can determine when to invest through time series analysis by analyzing the target company's past and present data. A high EBITDA Multiple indicates that the company is trading at higher prices than EBITDA, and a high stock value reflects the market's expectation that the target company's EBITDA will grow rapidly in the future, as stock values reflect the company's future viability. Conversely, there can be two cases where the Adjusted EBITDA Multiple is lower than the EBITDA Multiple. First, if the target company has huge assets that are far from the original business, thereby reducing potential investors' total acquisition costs. In this case, the potential investor can reduce and recover acquisition costs by disposing of the relevant account after the acquisition. Second, when the target company's business structure generates high "going concern cashflow," the business structure is stable and continuous operating cash flow is generated, without requiring excessive CAPEX. Going concern cashflow will enable the acquirer to recover the cost of

acquisition. If the EBITDA multiple results are higher than the adjusted EBITDA multiple results from an M&A perspective, considerations similar to those presented in Table 19 should be taken into account.

7.2.2. Case 2. EBITDA Multiple < Adjusted EBITDA Multiple

From an M&A perspective, this type of company is not suitable for acquisition. A potential acquirer can observe changes in the target company through time series analysis by analyzing the target company's data from the past to the present. A low EBITDA Multiple indicates that the current corporate value is trading at a low multiple of EBITDA, and it can be inferred that the low stock value reflects the market's expectation that the target company's EBITDA will have low growth in the future. Conversely, there can be two cases where the Adjusted EBITDA Multiple is higher than the EBITDA Multiple. First, this is a case where the target company has a larger amount of debt that is outside the original business, thereby increasing the total acquisition cost for potential investors. In this case, the potential investor is obliged to repay the relevant account after acquiring the company, thereby increasing the acquisition cost. Second, this is a case wherein the target company's business structure is generating low "going concern cash-flow." If the current business structure requires consistently high capital expenditure (CAPEX), the company generates relatively low cash flows for the going concern by re-investing the cash flows generated through operating cash flows into capital expenditure (CAPEX). This implies that acquisition costs will be recouped at a slower rate. If the EBITDA multiple results are lower than the adjusted EBITDA multiple results from an M&A perspective, considerations similar to those presented in Table 20 should be taken into account.

In this case study, we have developed a new formula that complements the limitations of EBITDA Multiple, a commonly used metric in M&A transactions. Although this study focuses on modifying the formula, we plan to expand the research by utilizing hypotheses regarding the decision-making of future stakeholders in the capital market. Our proposed formula considers the period required to recover the total acquisition cost from an M&A perspective, and it is expected to help strategic investors in making better investment decisions. Unlike financial investors (FIs), who prioritize short investment periods and resale, strategic investors (SIs) focus on growing the acquired company from a going concern by making additional investments. Even if the acquired company generates profits, if the actual required investment cost is higher than the expected future investment cost prior to the acquisition, the new acquirer will not benefit from the return on investment and may face negative cash flow. In M&A activities, high-value companies are those that generate steady profits and require lower investment costs. Our case study aims to provide practical assistance to individuals considering M&A from a long-term perspective, rather than focusing solely on stock price direction. We believe our findings have important economic, academic, and policy implications and open avenues for future research

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