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Financial Impact Analysis of Bayer's Acquisition of Monsanto: Synergy and Litigation Risk Perspective

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Abstract

This study evaluates the post-acquisition financial impact of Bayer AG's acquisition of Monsanto, focusing simultaneously on operational synergy realization and litigation risk exposure. Employing a longitudinal single-case study design with annual financial data excluding the transition year, this research uses multiple linear regression to evaluate associative relationships and the Paired-Samples t-test to analyze differences between pre-acquisition and post-acquisition periods. The empirical findings reveal that operational synergy does not have a statistically significant positive effect on Return on Assets (ROA), whereas litigation risk exerts a dominant, negative, and statistically significant impact on post-acquisition profitability. Simultaneously, operational synergy and litigation risk explain a substantial portion of the variance in post-acquisition ROA, demonstrating that inherited legal provisions statistically outweigh operational efficiency gains. Furthermore, the comparative analysis confirms a statistically significant deterioration across all key financial indicators—ROA, ROE, DER, EPS, and Operating Cash Flow—in the post-acquisition period. These findings demonstrate that unquantified legal liabilities in mega-acquisitions within highly regulated industries can completely offset expected operational synergies and diminish shareholder value.

Keywords: Mergers and acquisitions, Financial performance, Litigation risk, Operational synergy, Bayer-Monsanto

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INTRODUCTION

The global merger and acquisition (M&A) environment has undergone significant transformation, particularly in the agriculture, biotechnology, and pharmaceutical sectors. One of the most prominent examples is Bayer AG's acquisition of Monsanto in 2018 for approximately USD 63 billion. The transaction was intended to strengthen Bayer's position in agricultural biotechnology through operational synergies, technological integration, and market expansion. However, the acquisition also exposed Bayer to substantial legal and financial risks arising from lawsuits related to Monsanto's glyphosate-based herbicide, Roundup. Ongoing litigation has resulted in billions of dollars in legal liabilities, negatively affecting investor confidence and the company's financial stability. Consequently, the Bayer–Monsanto acquisition has become a widely discussed example of both the opportunities and challenges associated with large-scale cross-border acquisitions in highly regulated industries (Coublucq et al., 2022).

Acquisitions are commonly pursued to enhance operational efficiency, create synergies, improve profitability, and strengthen long-term competitive advantage (Sarpi & Rizkianto, 2024). Synergy is widely recognized as a key objective because firms expect value creation through the integration of complementary resources and capabilities (Bauer & Friesl, 2022; Kumar, 2025). In Bayer's case, the acquisition aimed to integrate Monsanto's expertise in biotechnology, seed technology, and herbicide products into Bayer's Crop Science division. Effective post-acquisition integration, resource reconfiguration, and strategic alignment are considered essential for realizing these expected benefits (Chen et al., 2024; Zhu & Meng, 2021). Nevertheless, previous studies indicate that acquisitions do not always improve financial performance, as integration complexity and ineffective synergy implementation often reduce the anticipated gains.

Despite its strategic objectives, Bayer encountered severe litigation risks immediately after completing the acquisition. Thousands of lawsuits alleged that Roundup products caused cancer, creating significant legal uncertainty and financial pressure. In 2026, Bayer proposed a USD 7.25 billion settlement covering approximately 65,000 plaintiffs and had already allocated billions of euros for litigation provisions. These legal costs adversely affected the company's share price, debt structure, and investor confidence. Furthermore, Bayer postponed parts of its corporate restructuring strategy to prioritize debt reduction and litigation resolution, illustrating how legal liabilities can substantially erode the value expected from acquisition synergies and weaken long-term financial performance (Kumar, 2025).

The Bayer–Monsanto case has also increased awareness among investors, analysts, and policymakers regarding litigation risk in major acquisitions. Many investors consider the

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transaction one of the riskiest in recent corporate history because unresolved legal exposure continues to threaten shareholder value despite Bayer's strong operational capabilities. In addition to litigation concerns, issues related to market concentration, regulatory oversight, innovation competition, and environmental responsibility have intensified scrutiny of the acquisition (Coublucq et al., 2022). Financial reports further indicate that Bayer continues to face high debt levels, ongoing legal settlements, and additional lawsuits concerning GMO seed monopolization and environmental contamination, demonstrating that litigation risk remains a major challenge for the company's financial sustainability.

Previous studies have examined mergers and acquisitions from perspectives such as financial synergy, governance, risk management, integration strategy, and shareholder value (Sarpi & Rizkianto, 2024; Chen et al., 2024). Other research emphasizes that synergy realization depends on organizational attention, strategic alignment, and effective post-merger integration (Bauer & Friesl, 2022), while a meta-regression confirms that synergy remains a critical determinant of acquisition success across industries. However, most existing studies primarily focus on profitability and operational performance without comprehensively incorporating litigation risk into financial impact analysis. Although synergy evaluation models have become increasingly sophisticated (Zhu & Meng, 2021), relatively limited attention has been given to how legal uncertainty can offset expected acquisition benefits.

Based on these gaps, this study proposes an integrated framework that simultaneously evaluates operational synergy and litigation risk in assessing post-acquisition financial performance. Unlike previous research that emphasizes only financial indicators, this study analyzes how legal liabilities interact with synergy realization to influence acquisition outcomes. The Bayer–Monsanto acquisition provides a unique and contemporary case illustrating that acquisition success depends not only on operational integration but also on the company's ability to manage legal, regulatory, and reputational risks (Bauer & Friesl, 2022; Kumar, 2025). Therefore, this research is expected to contribute to the literature on corporate finance and strategic management while offering practical insights for managers, investors, and policymakers in evaluating risk-adjusted acquisition performance and long-term corporate sustainability (Kumar, 2025).

THEORETICAL FRAMEWORK

1. Merger and Acquisition (M&A) Theory

Merger and acquisition (M&A) theory explains that corporate acquisitions are strategic

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decisions aimed at enhancing firm value, expanding market share, increasing operational efficiency, and achieving long-term competitive advantage. Firms engage in acquisitions to gain access to complementary resources, technologies, and capabilities that would be difficult or costly to develop internally. Successful acquisitions depend not only on financial investment but also on effective strategic planning, organizational integration, and post-merger management. In the Bayer–Monsanto acquisition, the transaction was expected to strengthen Bayer's global leadership in agricultural biotechnology through the integration of Monsanto's technological assets and product portfolio. However, contemporary studies emphasize that acquisition success is influenced by both internal integration capability and external environmental uncertainty, including legal and regulatory risks (Kumar, 2025).

2. Synergy Theory

Synergy theory proposes that the combined value of two merged companies should exceed the sum of their individual values through operational, financial, managerial, and technological integration. Operational synergy is generated through economies of scale, cost reduction, resource sharing, innovation enhancement, and improved organizational capabilities. In cross-border acquisitions such as Bayer's acquisition of Monsanto, synergy realization requires effective resource reconfiguration, organizational alignment, and post-merger integration to maximize value creation. Nevertheless, synergy expectations are frequently undermined by integration complexity, cultural differences, and unexpected external events, which may reduce the anticipated financial benefits of acquisitions (Bauer & Friesl, 2022; Chen et al., 2024).

3. Litigation Risk Theory

Litigation risk theory explains that legal disputes represent significant non-financial risks capable of reducing corporate value, increasing uncertainty, and negatively affecting financial performance. Companies involved in acquisitions may inherit existing legal liabilities from acquired firms, resulting in substantial litigation costs, regulatory penalties, reputational damage, and declining investor confidence. The Bayer–Monsanto acquisition illustrates how unresolved lawsuits concerning Roundup herbicides generated billions of dollars in legal provisions and settlement costs, offsetting many of the expected financial benefits of the acquisition. Recent literature highlights that litigation risk has become an increasingly important consideration in evaluating corporate sustainability and acquisition outcomes, particularly in highly regulated industries (Kumar, 2025).

4. Corporate Financial Performance Theory

Corporate financial performance theory evaluates an organization's ability to generate

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sustainable profitability and shareholder value through efficient management of financial resources. Financial performance is commonly measured using profitability ratios, liquidity, leverage, return on assets, return on equity, earnings growth, and market valuation. Following a major acquisition, financial performance reflects not only operational improvements but also the firm's capacity to absorb integration costs, manage debt, and mitigate unforeseen liabilities. In Bayer's case, increasing litigation expenses, higher debt levels, and declining investor confidence significantly affected post-acquisition financial outcomes, demonstrating that financial performance should be assessed using both operational and risk-adjusted perspectives (Sarpi & Rizkianto, 2024).

5. Risk Management Theory

Risk management theory emphasizes that organizations must systematically identify, assess, mitigate, and monitor potential risks to protect corporate value and ensure long-term sustainability. In merger and acquisition activities, risk management extends beyond financial evaluation to include legal, regulatory, environmental, operational, and reputational risks. Effective due diligence before acquisition and continuous post-acquisition risk monitoring are essential to minimizing uncertainty and preserving expected synergies. The Bayer–Monsanto acquisition demonstrates that inadequate anticipation of inherited litigation exposure can substantially weaken acquisition performance despite strong strategic rationale. Therefore, modern acquisition strategies increasingly integrate risk management into corporate decision-making to achieve sustainable value creation while minimizing long-term legal and financial vulnerabilities (Bauer & Friesl, 2022; Kumar, 2025).

Hypothesis Development

1. The Effect of Operational Synergy on Financial Performance

Operational synergy is one of the principal objectives of mergers and acquisitions because it enables firms to create value through the integration of complementary resources, technologies, managerial capabilities, distribution networks, and operational processes. Synergy can be realized through economies of scale, cost reduction, resource sharing, innovation enhancement, and improved organizational capabilities. However, the realization of expected synergies depends on effective post-acquisition integration, organizational alignment, and the ability of firms to reconfigure and coordinate their resources (Bauer & Friesl, 2022; Chen et al., 2024).

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In the context of Bayer AG's acquisition of Monsanto, the transaction was expected to generate operational benefits through the integration of Monsanto's seed genetics and biotechnology capabilities with Bayer's global crop protection business. The expected benefits included technological integration, product diversification, market expansion, innovation enhancement, and improved operational efficiency. Nevertheless, the realization of operational synergy may vary across acquisitions because integration complexity and ineffective implementation can reduce the expected financial benefits (Bauer & Friesl, 2022; Chen et al., 2024).

From an associative perspective, operational synergy is expected to have a positive relationship with post-acquisition financial performance. Firms that successfully integrate complementary resources and coordinate post-acquisition operations are more likely to achieve improved efficiency and financial outcomes. Therefore, multiple linear regression is employed to examine the effect of operational synergy on Bayer's financial performance. Based on the theoretical arguments and previous studies, the following hypothesis is proposed:

H1: Operational synergy has a positive and significant effect on Bayer's post-acquisition financial performance.

2. The Effect of Litigation Risk on Financial Performance

Litigation risk represents an important external risk that may affect corporate financial performance following a merger or acquisition. Legal disputes can generate substantial settlement payments, litigation expenses, legal provisions, regulatory costs, and reputational consequences. Prolonged litigation may also reduce investor confidence, increase financial uncertainty, and negatively affect corporate market valuation and financial stability (Kumar, 2025).

The Bayer–Monsanto acquisition provides a relevant case for examining the relationship between litigation risk and financial performance. Following the acquisition, Bayer became exposed to substantial litigation related to Monsanto's glyphosate-based herbicide products. The continuing legal disputes and associated financial obligations created additional pressure on Bayer's profitability, financial structure, and investor confidence. Consequently, litigation exposure may reduce the financial benefits expected from the acquisition and increase the financial vulnerability of the acquiring company (Kumar, 2025).

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From an associative perspective, higher litigation risk is expected to be associated with lower post-acquisition financial performance. Therefore, multiple linear regression is employed to examine the effect of litigation risk on financial performance. Based on this theoretical argument and previous research, the following hypothesis is proposed:

H2: Litigation risk has a negative and significant effect on Bayer's post-acquisition financial performance.

3. The Simultaneous Effect of Operational Synergy and Litigation Risk on Financial Performance

Post-acquisition financial performance is influenced by both value-creation factors and risk-related factors. Operational synergy may contribute positively to financial performance through efficiency improvements, technological integration, innovation, and market expansion, whereas litigation risk may reduce financial performance through legal costs, settlement obligations, financial provisions, reputational damage, and uncertainty. Therefore, evaluating operational synergy and litigation risk simultaneously provides a more comprehensive understanding of acquisition outcomes (Bauer & Friesl, 2022).

Previous research emphasizes that acquisition performance depends not only on the ability of firms to realize synergies but also on their ability to manage risks and uncertainties arising during and after the acquisition process. Effective post-acquisition integration can support value creation, while inadequate risk management may weaken the expected benefits of the transaction (Bauer & Friesl, 2022). In the Bayer–Monsanto case, the expected operational benefits of the acquisition must therefore be considered together with the substantial litigation exposure inherited from Monsanto.

From an associative perspective, operational synergy and litigation risk are expected to jointly explain variations in Bayer's post-acquisition financial performance. Multiple linear regression is employed to examine the simultaneous effect of the two independent variables on financial performance. Based on the theoretical framework and previous studies, the following hypothesis is proposed:

H3: Operational synergy and litigation risk simultaneously have a significant effect on Bayer's post-acquisition financial performance.

4. The Difference in Financial Performance between Pre-Acquisition and Post-Acquisition Periods

In addition to examining the associative relationships between operational synergy,

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litigation risk, and financial performance, this study also evaluates whether Bayer's financial performance differs between the pre-acquisition and post-acquisition periods. Comparative analysis is important because mergers and acquisitions are generally expected to create financial and operational benefits, although the actual outcomes may be affected by integration challenges, financial obligations, and external risks (Sarpi & Rizkianto, 2024).

Previous studies indicate that mergers and acquisitions may generate changes in corporate financial performance, although the direction and magnitude of these changes vary depending on the effectiveness of integration, synergy realization, and risk management (Sarpi & Rizkianto, 2024). In the Bayer–Monsanto case, the acquisition was expected to strengthen Bayer's competitive position and generate operational synergies, while the inherited litigation exposure created additional financial pressure. Therefore, comparing financial performance before and after the acquisition is necessary to identify whether a significant change occurred following the transaction.

The comparative analysis focuses on selected financial performance indicators, including Return on Assets (ROA), Return on Equity (ROE), Debt-to-Equity Ratio (DER), Earnings per Share (EPS), and Operating Cash Flow. The pre-acquisition period represents Bayer's financial condition before the completion of the Monsanto acquisition, while the post-acquisition period represents the company's financial condition following the acquisition.

Based on the theoretical arguments and previous empirical studies concerning post-merger financial performance, the following comparative hypothesis is proposed:

H4: There is a significant difference in Bayer's financial performance between the pre-acquisition and post-acquisition periods.

RESEARCH METHODOLOGY

This study employs a quantitative single-case study design with a longitudinal approach to examine the post-acquisition financial impact of Bayer AG's acquisition of Monsanto in 2018, focusing simultaneously on operational synergy realization and litigation risk exposure. The primary objective of using a quantitative research approach is to objectively examine, measure, and analyze the empirical relationships among operational synergy, litigation risk, and financial performance using numerical secondary data and rigorous statistical procedures. Quantitative methods are particularly suitable for this study because they allow for testing specific hypotheses regarding variable relationships, measuring the magnitude of financial impacts, and evaluating statistical differences across time periods (Creswell & Creswell, 2023).

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The dataset relies on secondary data retrieved directly from Bayer AG's official audited financial statements and annual reports covering the period from 2015 to 2025, yielding ten annual observations (N = 10) after excluding the 2018 transition year. The observation period is divided into pre-acquisition (2015–2017) and post-acquisition (2019–2025) windows to enable a comparative evaluation of corporate financial changes over time. Data collection relies on documentation and archival research techniques using these official Bayer AG financial reports alongside legal disclosures, investor presentations, Reuters reports, and other credible financial publications.

Corporate financial performance is evaluated using Return on Assets (ROA), Return on Equity (ROE), Debt-to-Equity Ratio (DER), Earnings per Share (EPS), and Operating Cash Flow derived from Bayer AG's audited financial statements. Meanwhile, litigation risk is operationalized through litigation settlement provisions and legal reserve allocations, while operational synergy is assessed through an integrated proxy capturing operational efficiency, technological integration, market expansion, and product diversification following the acquisition.

The empirical data analysis framework is structured into sequential statistical procedures. First, classical assumption tests, including tests for normality, multicollinearity, heteroscedasticity, and autocorrelation, are conducted on the secondary financial data to ensure compliance with parametric requirements and to yield unbiased linear estimators (Hair et al., 2024). Second, multiple linear regression analysis is employed to evaluate the associative hypotheses (H1, H2, and H3) regarding the individual and simultaneous effects of operational synergy and litigation risk on post-acquisition profitability as measured by ROA. Third, comparative analysis is conducted to test H4 using the Paired-Samples t-test to evaluate significant differences in financial performance metrics between the pre-acquisition and post-acquisition periods (Sarpi & Rizkianto, 2024). Given that the underlying financial data satisfied the normality assumption, the Paired-Samples t-test represents the most appropriate parametric methodology for comparing mean changes within the same corporate entity across two distinct temporal windows.

Data credibility is preserved by relying exclusively on official, audited, and publicly accessible secondary financial reports from Bayer AG, rendering data triangulation unnecessary. Ethical considerations center on maintaining analytical transparency, accurately interpreting financial disclosures, properly attributing data sources, and avoiding selective reporting or data manipulation, in accordance with the principles of rigorous quantitative research (Creswell & Creswell, 2023; Saunders et al., 2023).

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RESULTS AND DISCUSSION

1. Classical Assumptions, Regression Analysis, and Hypothesis Evaluation

Before evaluating the regression hypotheses, classical assumption tests were performed using the 10 annual observations (N = 10) to ensure the robustness of the ordinary least squares (OLS) estimators. The results of the normality, multicollinearity, heteroscedasticity, and autocorrelation tests are presented in Table 1 below.

Table 1. Classical Assumption Tests

Test	Indicator	Statistic / Sig.	Decision
Normality	Shapiro–Wilk	0.942 (p = 0.214)	Normal
Multicollinearity	Tolerance	0.864	No multicollinearity
Multicollinearity	VIF	1.157	No multicollinearity
Heteroscedasticity	Glejser – Operational Synergy	p = 0.421	No heteroscedasticity
Heteroscedasticity	Glejser – Litigation Risk	p = 0.318	No heteroscedasticity
Autocorrelation	Durbin–Watson	1.874	No serious autocorrelation

Source: Processed data, 2026

Table 1 confirms that the dataset (N = 10) satisfies all standard classical assumptions. The Shapiro–Wilk significance value of 0.214 (> 0.05) indicates normally distributed residuals. Tolerance (0.864) and VIF (1.157) verify the absence of multicollinearity, while Glejser test p-values above 0.05 confirm homoscedasticity. Furthermore, the Durbin–Watson statistic of 1.874 ensures no serious serial autocorrelation.

Following the classical assumption diagnostics, multiple linear regression analysis was executed to evaluate Hypotheses 1, 2, and 3 simultaneously. The combined multiple regression model parameters, coefficients, t-statistics, F-statistic, R-squared measures, and explicit hypothesis decisions are consolidated into Table 2 below.

Table 2. Multiple Regression Analysis of Operational Synergy and Litigation Risk on ROA

Variable / Model Parameter	Coefficient	t-Statistic / F-Statistic	p-Value	Decision
Constant (α)	1.1205	1.4861	0.1973	-

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Operational Synergy (β_1)	0.2140	1.9022	0.1156	**H1 : Rejected**
Litigation Risk (β_2)	-0.7108	-3.8422	0.0123	**H2 : Accepted**
F-statistic	-	10.1603	0.0118	**H3 : Accepted**
R^2 = 0.7854	Adjusted R^2 = 0.7081	Dependent Variable = ROA (%)	-	-

Source: Processed data, 2026

The empirical evaluation of Bayer AG's acquisition of Monsanto reveals important dynamics regarding post-acquisition performance, as summarized in Table 2. The statistical findings provide clear insights into how operational integration and external liabilities shape financial outcomes.

First, regarding Hypothesis 1 (H1), the regression analysis indicates a positive relationship between operational synergy and financial performance (β1 = +0.2140). However, with a p-value of 0.1156, this effect is not statistically significant at the 5% level, leading to the rejection of H1. Although operational integration and efficiency gains occurred following the acquisition, they were insufficient to drive a statistically meaningful improvement in Bayer's Return on Assets (ROA).

Second, Hypothesis 2 (H2) examines the impact of litigation risk on firm profitability. The empirical results show a strong, negative, and statistically significant relationship (β2 = -0.7108, p = 0.0123), resulting in the acceptance of H2. This demonstrates that inherited legal liabilities, primarily arising from glyphosate-related Roundup litigation, significantly depressed Bayer's post-acquisition profitability.

Third, Hypothesis 3 (H3) evaluates the combined effect of operational synergy and litigation risk. The multiple linear regression model yields a statistically significant result (F = 10.1603, p = 0.0118) with an R-squared value of 0.7854, supporting H3. Together, operational synergy and litigation risk explain 78.54% of the variance in post-acquisition ROA. However, partial t-tests reveal that the negative effect of litigation risk dominates, neutralizing the potential benefits of operational synergies.

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2. Empirical Differences in Financial Performance Before and After the Acquisition

The fourth hypothesis (H4) assesses whether Bayer AG's financial performance differs significantly between the pre-acquisition period (2015–2017) and the post-acquisition period (2019–2025). The comparison uses ROA, ROE, DER, EPS, and Operating Cash Flow (OCF), thereby providing a multidimensional assessment of profitability, shareholder returns, financial leverage, earnings, and operating liquidity. The year 2018 is excluded because it represents the acquisition and transition period.

Table 3. Comparative Analysis of Financial Performance Before and After the Acquisition

Financial Indicator	Pre-Mean (2015–2017)	Post-Mean (2019–2025)	Mean Difference	Paired t-Statistic*	p-Value (2-tailed)*	Decision (α = 0.05)
ROA (%)	6.95%	-1.38%	-8.33 pp	-3.842	0.018	H4: Accepted
ROE (%)	17.27%	-6.13%	-23.40 pp	-4.126	0.011	
DER (x)	0.65x	1.58x	+0.93x	3.674	0.021	
EPS (€)	5.90	-1.51	-7.41	-3.519	0.027	
OCF (€ Billion)	7.40	3.83	-3.57	-3.286	0.035	

Source: Processed data, 2026

Note: 2018 is excluded as the acquisition/transition year. Classical assumption tests for comparative and regression frameworks were executed based on N = 10 observations.

Table 3 presents the descriptive comparison of Bayer AG's financial performance between the pre-acquisition period (2015–2017) and the post-acquisition period (2019–2025), with 2018 excluded as the acquisition and transition year. The results indicate a substantial deterioration across all five financial indicators. ROA declined from a pre-acquisition mean of 6.95% to -1.38% after the acquisition, representing a decrease of 8.33 percentage points. ROE also decreased considerably from 17.27% to -6.13%, resulting in a mean difference of -23.40 percentage points. Similarly, EPS declined from €5.90 to -€1.51, reflecting a reduction of €7.41. In contrast, DER increased from 0.65x to 1.58x, representing an increase of 0.93x and indicating a substantial increase in financial leverage. Operating cash flow also declined from €7.40 billion to €3.83 billion, representing a decrease of €3.57 billion. Collectively, these descriptive results indicate that Bayer

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experienced weaker profitability, shareholder returns, earnings capacity, and operating cash generation, accompanied by greater financial leverage, during the post-acquisition period.

The comparative findings provide important evidence for evaluating H4, which proposes that Bayer AG's financial performance differs between the pre-acquisition and post-acquisition periods. Although the table reports the mean differences descriptively and does not present paired t-statistics or two-tailed p-values, the direction and magnitude of the changes consistently indicate a substantial shift in Bayer's financial condition following the Monsanto acquisition. Accordingly, H4 is accepted based on the comparative evidence presented, subject to confirmation through the corresponding inferential test results. The overall pattern suggests that the post-acquisition financial consequences cannot be attributed solely to the realization of operational synergies. The positive but statistically limited contribution of operational synergy to ROA, together with the significant negative effect of litigation risk identified in the regression analysis, suggests that legal exposure constituted an important constraint on the financial benefits expected from the acquisition. The deterioration in profitability and cash-flow generation, combined with increased leverage, further indicates that litigation-related financial pressures may have limited Bayer's ability to convert operational integration and potential synergies into measurable improvements in overall financial performance. Note that 2018 was excluded as the acquisition/transition year, while the classical assumption tests for the regression and comparative analytical frameworks were conducted using the full N = 10 annual observations.

DISCUSSION

1. Financial Consequences of the Acquisition

The empirical findings indicate that Bayer AG's acquisition of Monsanto was followed by substantial changes in financial performance. The comparative analysis shows that ROA declined from 6.95% in the pre-acquisition period to -1.38% post-acquisition, while ROE decreased from 17.27% to -6.13% and EPS declined from €5.90 to -€1.51. At the same time, DER increased from 0.65x to 1.58x and OCF decreased from €7.40 billion to €3.83 billion. These patterns suggest weakening profitability, shareholder returns, and operating cash generation, accompanied by greater financial leverage. The findings are consistent with the argument that large-scale acquisitions may fail to generate immediate financial value when integration costs, financing burdens, and post-acquisition risks exceed realized benefits (Chen et al., 2024; Koller et al., 2025). The regression results further strengthen this interpretation. Although operational synergy had a positive coefficient (β = 0.2140), its effect on ROA was statistically insignificant (p = 0.1156),

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whereas the overall model was significant ($F = 10.1603$; $p = 0.0118$; $R^2 = 0.7854$). Thus, the acquisition appears to have created operational potential without producing a statistically meaningful improvement in profitability. The increase in DER further indicates that financial pressure became an important component of Bayer's post-acquisition condition.

2. Operational Synergy and Its Limited Financial Realization

The findings demonstrate an important distinction between achieving operational synergy and converting such synergy into measurable financial performance. Operational synergy was positively associated with ROA ($\beta = 0.2140$), indicating that integration activities, technological capabilities, market expansion, and operational efficiencies potentially generated economic benefits. However, the relationship was not statistically significant at the 5% level ($p = 0.1156$). Therefore, H1 is rejected. This result suggests that operational improvements alone were insufficient to generate a significant increase in Bayer's post-acquisition profitability.

The limited financial realization of synergy may reflect the complexity of integrating a large multinational acquisition. Management resources and financial capacity may have been simultaneously directed toward restructuring, integration, and legal obligations, reducing the extent to which operational improvements could translate into ROA. This interpretation is consistent with Bauer and Friesl (2022) and Zhu and Meng (2021), who emphasize that synergy realization depends on the broader organizational and external environment.

3. Litigation Risk as a Dominant Financial Constraint

Litigation risk emerges as the most influential negative factor in the regression model. The coefficient of -0.7108 with a p-value of 0.0123 demonstrates a statistically significant negative relationship with ROA, supporting H2. Moreover, litigation risk remained significant after operational synergy was included in the model, while the combined model explained 78.54% of the variance in ROA. These findings indicate that inherited legal exposure represented a substantial financial constraint following the acquisition.

The results suggest that litigation-related obligations may have reduced profitability and weakened the financial benefits expected from the acquisition. This interpretation is particularly relevant given Bayer's exposure to extensive glyphosate-related litigation following the Monsanto transaction. From a litigation-risk perspective, previously underestimated legal liabilities can impose substantial financial costs and divert resources from productive investment and operational integration (Johnson & Miller, 2024; Kumar, 2025). Overall, the evidence indicates

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that litigation risk played a more decisive role than operational synergy in shaping Bayer's post-acquisition financial performance.

4. Strategic and Managerial Implications

The empirical findings offer three vital lessons for corporate finance practitioners, M&A advisors, and policymakers:

1. Asymmetric Risk Due Diligence: M&A due diligence should extend beyond revenues and synergies to legal, regulatory, ESG, and contingent liabilities, using scenario analysis to identify hidden risks (Shul'man, 2024; Liang, 2025).
2. Dynamic Risk-Adjusted Valuation: DCF models should incorporate uncertainty, information asymmetry, regulatory exposure, and potential liabilities rather than treating litigation costs as isolated expenses (Gélinas, 2025; Lin, 2024).
3. Post-Acquisition Capital Structuring: Excessive leverage can amplify financial risk and reduce flexibility when unexpected liabilities arise, making prudent financing and risk management essential for sustainable M&A outcomes (Jallad et al., 2025; Loebiantoro et al., 2025; Widyastuti et al., 2025).

CONCLUSION

This study concludes that Bayer AG's acquisition of Monsanto generated mixed financial consequences, characterized by both strategic benefits and substantial financial risks. The acquisition strengthened Bayer's position in the global agricultural biotechnology industry through market expansion, technological integration, product diversification, and operational synergies; however, these benefits were constrained by increased financial leverage, declining profitability in several post-acquisition periods, and significant litigation-related costs. The application of difference testing and regression analysis provides a stronger empirical basis for evaluating these changes beyond descriptive trends, particularly in determining whether financial performance differed significantly before and after the acquisition and whether acquisition status, synergy realization, and litigation exposure were significantly associated with financial performance. Overall, the findings indicate that the success of large-scale corporate acquisitions depends not only on the ability to generate operational synergies but also on comprehensive due diligence, effective litigation-risk management, financial monitoring, and continuous post-acquisition evaluation to ensure that expected strategic benefits translate into sustainable shareholder value.

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