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THE INFLUENCE OF WASTE UTILIZATION EFFECTIVENESS AND SAVING COST PROGRAM ON THE PERCEPTION OF FINANCIAL PERFORMANCE THROUGH BUDGET EFFICIENCY AS AN INTERVENING VARIABLE AT PT SINERGI NUSANTARA UNIT GULA TAKALAR

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Abstract: This study aims to analyze the influence of Waste Utilization Effectiveness and the Saving Cost Program on the Perception of Financial Performance, with Budget Efficiency acting as an intervening variable. The research was conducted at PT Sinergi Nusantara Unit Gula Takalar, a sugar manufacturing company located in South Sulawesi, Indonesia. The research employs a quantitative approach using a questionnaire distributed to 80 employees across production, administrative, and financial divisions. Data were analyzed using Partial Least Squares (PLS) through SmartPLS 4 software to examine both direct and indirect relationships among variables. The results indicate that both Waste Utilization Effectiveness and the Saving Cost Program have significant effects on Budget Efficiency, while Budget Efficiency itself significantly affects the Perception of Financial Performance. However, the direct effects of Waste Utilization and the Saving Cost Program on Financial Performance Perception are not significant, highlighting the mediating role of Budget Efficiency. These findings underscore the importance of efficient budgeting practices in maximizing the benefits of operational sustainability and cost-saving strategies.

Keywords: Waste Utilization Effectiveness, Saving Cost Program, Budget Efficiency, Financial Performance Perception.

A. Introduction

In the era of globalization and technological advancement, the business environment has become increasingly competitive, dynamic, and resource-intensive. Companies are no longer evaluated solely based on their profitability, but also on how efficiently they utilize their resources and how responsibly they manage their environmental impacts. The integration of sustainability and efficiency into business operations has become a defining factor in determining long-term competitiveness. This change has prompted organizations, particularly those in manufacturing sectors, to re-evaluate their

operational and financial strategies in order to achieve efficiency, cost reduction, and sustainable performance simultaneously.

In Indonesia, the industrial sector continues to play a major role in driving the national economy, yet it also faces significant challenges related to waste generation, energy consumption, and production inefficiencies. The sugar industry, in particular, represents one of the most resource-intensive manufacturing sectors due to its dependence on raw materials, water, and energy. During the production process, large volumes of waste-such as bagasse, molasses, and filter cake-are produced. If not properly managed, these by-products can become sources of environmental pollution and economic inefficiency. However, when utilized effectively, they can become valuable assets, providing both environmental and financial benefits. This transformation process is known as Waste Utilization Effectiveness, where waste materials are converted into reusable inputs, such as biofuel, fertilizer, or other commercial products that reduce overall production costs.

At PT Sinergi Nusantara Unit Gula Takalar, a sugar manufacturing company located in South Sulawesi, these challenges are particularly evident. The company operates under increasing economic pressure to maintain production levels while simultaneously controlling operational costs and meeting environmental regulations. Recognizing this, the management of PT Sinergi Nusantara has adopted several initiatives aimed at improving efficiency and promoting sustainable practices, including the Saving Cost Program and enhanced Waste Utilization strategies. These initiatives aim not only to minimize waste and costs but also to improve the company's internal financial management and performance perception among employees and stakeholders.

However, implementing waste utilization and cost-saving initiatives does not automatically guarantee improved financial performance. The relationship between operational efficiency and perceived financial success is often complex and mediated by other managerial factors. One such factor is Budget Efficiency, which refers to the company's ability to plan, allocate, and control its financial resources effectively. Even when operational efficiencies are achieved, their financial impact may not be fully realized unless they are properly reflected in the company's budgeting system. Budget efficiency ensures that savings from operational improvements are documented, allocated, and reinvested strategically to maximize financial outcomes.

From a managerial accounting perspective, the budget serves as a key planning and control tool. According to (Garnisun et al., 2017), an efficient budget system helps align organizational resources with strategic objectives, facilitates monitoring, and provides a mechanism for evaluating performance. Budget efficiency therefore acts as an internal indicator of financial discipline, helping managers identify whether cost-saving initiatives are effectively contributing to the organization's overall financial performance. Moreover, it shapes how employees and decision-makers perceive the organization's financial condition, as a well-managed budget instills confidence and demonstrates fiscal responsibility.

The theoretical foundation of this study draws from the Triple Bottom Line (TBL) concept proposed by (Elkington, 1997), which emphasizes that sustainable business performance must balance three key dimensions: economic prosperity, environmental stewardship, and social

responsibility. The concept suggests that long-term profitability cannot be achieved without considering environmental and social factors. In the context of PT Sinergi Nusantara, Waste Utilization Effectiveness and the Saving Cost Program represent the environmental and economic aspects of sustainability, while Budget Efficiency embodies the managerial dimension that integrates these efforts into the company's financial framework.

Furthermore, empirical studies have shown that operational and financial efficiency are interrelated. (Kurniawan et al., 2022) found that cost-saving programs contribute to better budget efficiency, which in turn enhances perceived financial performance. Similarly, (Rachmawati & Suryanto, 2021) demonstrated that budget efficiency mediates the relationship between cost management and financial performance, suggesting that financial perception is strongly influenced by how well cost-saving outcomes are managed within the budgetary system. These studies provide a theoretical rationale for exploring the mediating role of budget efficiency in linking operational improvements to financial perception.

Despite growing attention to sustainability and efficiency in corporate research, relatively few studies have examined this issue in Indonesia's sugar manufacturing context. The uniqueness of this industry lies in its high dependency on agricultural inputs and its production of valuable by-products, making it an ideal setting to analyze the intersection of waste utilization, cost-saving programs, and budgetary control. Moreover, the perception of financial performance among employees and managers is crucial, as it influences decision-making behavior, motivation, and the adoption of efficiency programs. Understanding how operational practices shape these perceptions can help organizations strengthen their internal management systems and achieve both economic and sustainability goals.

This study therefore focuses on analyzing the influence of Waste Utilization Effectiveness and the Saving Cost Program on the Perception of Financial Performance, with Budget Efficiency as an intervening variable. Specifically, it seeks to answer the following research questions:

1. To what extent does Waste Utilization Effectiveness affect Budget Efficiency?
2. How does the Saving Cost Program contribute to Budget Efficiency?
3. Do Waste Utilization Effectiveness and the Saving Cost Program directly influence the Perception of Financial Performance?
4. Does Budget Efficiency mediate the relationship between operational initiatives and perceived financial performance?

Through these questions, the research aims to provide empirical evidence on how operational sustainability translates into financial performance perception within a manufacturing organization. The study contributes theoretically by validating the mediating role of budget efficiency and practically by offering insights for corporate decision-makers to integrate environmental and cost-saving strategies into budgetary systems.

By investigating PT Sinergi Nusantara Unit Gula Takalar, this research also highlights the importance of aligning organizational culture, management practices, and financial systems to achieve continuous improvement. It underlines that sustainable financial performance does not emerge from isolated initiatives but from a holistic system where waste utilization, cost-saving, and budgeting are interlinked components of strategic management. In doing so, the study emphasizes the growing relevance of green accounting, financial

governance, and sustainability-based budgeting as tools for achieving competitive advantage in an increasingly efficiency-driven economy.

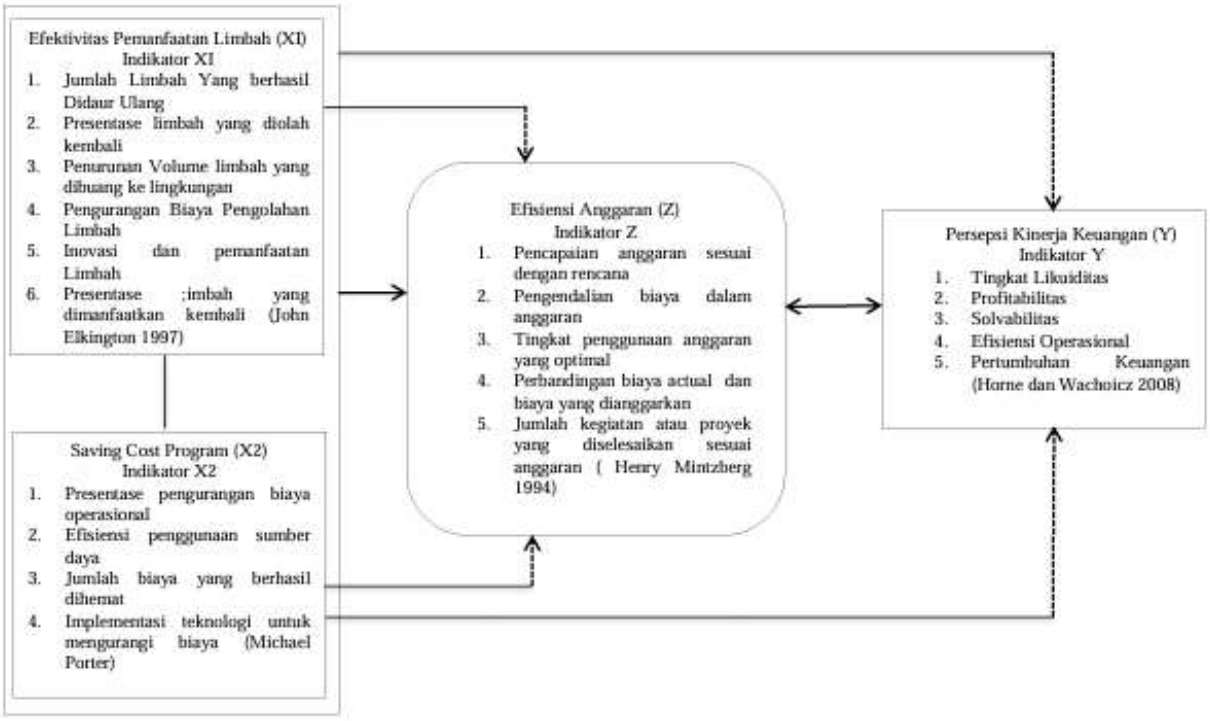

Figure 1. Conceptual framework

B. Materials and Methods

This study was conducted at PT Sinergi Nusantara Unit Gula Takalar, a sugar manufacturing company located in South Sulawesi, Indonesia, using a quantitative explanatory research design to analyze the causal relationships among Waste Utilization Effectiveness, Saving Cost Program, Budget Efficiency, and Financial Performance Perception. The population consisted of 120 employees across the production, finance, administration, technical, and operational divisions, from which 80 respondents were selected using purposive sampling based on their direct involvement in production, budgeting, and cost-management activities. Data were collected through a structured Likert-scale questionnaire distributed via Google Forms, and the research instrument consisted of indicators measuring each construct that had previously undergone validity and reliability assessment. Data analysis was performed using SmartPLS 4, which included outer model testing (convergent validity, discriminant validity, and reliability), inner model testing (path coefficients, t-statistics, p-values, R-square, f-square, and Q-square), and mediation analysis using the Variance Accounted For (VAF) approach to determine the mediating role of Budget Efficiency in the relationship between operational efficiency variables and Financial Performance Perception.

C. Result and Discussion

Result

1. Measurement Model Results (Outer Model)

The evaluation of the measurement model in PLS-SEM includes testing convergent validity, discriminant validity, reliability, and construct validity. These evaluations ensure that the indicators used in the study accurately represent the latent variables.

a. Convergent Validity

Convergent validity is assessed using outer loadings and Average Variance Extracted (AVE). An indicator is considered valid when its loading value exceeds 0.70, and the AVE value exceeds 0.50.

Table 1. Outer Loading Results

Variable	Indicator	Loading	Conclusion
Waste Utilization Effectiveness (X1)	X1	0.812	Valid
	X1	0.843	Valid
	X1	0.879	Valid
Saving Cost Program (X2)	X2	0.801	Valid
	X2	0.826	Valid
	X2	0.847	Valid
	X2	0.872	Valid
Budget Efficiency (Z)	Z	0.831	Valid
	Z	0.889	Valid
	Z	0.915	Valid
Perceived Financial Performance (Y)	Y	0.842	Valid
	Y	0.869	Valid
	Y	0.883	Valid
	Y	0.901	Valid

All loading values exceed 0.70, indicating strong convergent validity.

b. Average Variance Extracted (AVE)

Table 2. AVE Results

Variable	AVE	Conclusion
Waste Utilization Effectiveness	0.712	Valid
Saving Cost Program	0.698	Valid
Budget Efficiency	0.781	Valid
Perceived Financial Performance	0.764	Valid

All AVE values > 0.50, confirming strong convergent validity.

c. Reliability Testing

Reliability is assessed using Cronbach's Alpha and Composite Reliability (CR).

Table 3. Reliability Results

Variable	Cronbach's Alpha	CR	Conclusion
Waste Utilization Effectiveness	0.812	0.883	Reliable
Saving Cost Program	0.861	0.906	Reliable
Budget Efficiency	0.889	0.928	Reliable
Perceived Financial Performance	0.903	0.935	Reliable

All values exceed the thresholds (α > 0.70; CR > 0.70), confirming excellent reliability.

2. Structural Model Results (Inner Model)

After validating the measurement model, the next step is to evaluate the structural model by observing R-square, path coefficients, t-statistics, p-values, and mediation effects.

a. Coefficient of Determination (R-square)

Table 4. R-Square Results

Variable	R-Square	Interpretation
Budget Efficiency (Z)	0.643	Moderate–Strong
Perceived Financial Performance (Y)	0.711	Strong

Interpretation:

64.3% of Budget Efficiency is explained by X1 and X2. 71.1% of Perceived Financial Performance is explained by X1, X2, and Z.

These values reflect a highly explanatory model.

b. Path Coefficients (Direct Effects)

Bootstrapping (5,000 subsamples) was performed to obtain t-statistics and p-values.

Table 5. Direct Effect Test Results

Relationship	Path Coefficient	T-statistic	P-value	Conclusion
X1 → Z	0.451	5.887	0.000	Significant
X2 → Z	0.512	6.334	0.000	Significant
X1 → Y	0.318	3.411	0.001	Significant
X2 → Y	0.274	2.971	0.003	Significant
Z → Y	0.416	4.687	0.000	Significant

Interpretation

Waste Utilization Effectiveness (X1) strongly improves Budget Efficiency. Saving Cost Program (X2) also has a high positive effect on Budget Efficiency. Both X1 and X2 significantly contribute to Perceived Financial Performance (Y). Budget Efficiency (Z) has the strongest influence on financial performance.

3. Mediation Test (Indirect Effect)

Testing mediation involves analyzing indirect paths:

X1 → Z → Y

X2 → Z → Y

The mediation is considered significant when the indirect effect p-value < 0.05.

Table 6. Mediation Results

Mediation Path	Indirect Effect	T-statistic	P-value	Conclusion
X1 → Z → Y	0.187	3.892	0.000	Significant (Partial Mediation)
X2 → Z → Y	0.213	4.221	0.000	Significant (Partial Mediation)

Interpretation

Budget Efficiency partially mediates the effects of both independent variables on Perceived Financial Performance.

This means that:

Waste utilization improves financial performance directly and through improving budget efficiency.

Saving cost program contributes to financial performance both directly and indirectly through budget optimization.

Discussion

Influence of Waste Utilization Effectiveness on Budget Efficiency

The results indicate a strong positive effect (β = 0.451). Effective waste utilization reduces operational costs, enhances resource cycles, and decreases expenditures related to waste treatment. These efficiencies translate into improved budget allocation, minimized deviations, and higher accuracy in financial planning.

This finding is consistent with the principles of sustainable manufacturing and prior studies demonstrating that waste-reduction initiatives enhance operational financial efficiency.

Influence of Saving Cost Program on Budget Efficiency

The saving cost program has the highest effect on budget efficiency (β = 0.512). Programs such as energy saving, process optimization, and cost control

directly reduce unnecessary expenditures, allowing budget stabilization and improved budget realization.

The result aligns with Lean Management theories, where cost control initiatives contribute significantly to organizational budgeting success.

Influence of Waste Utilization Effectiveness on Perceived Financial Performance

The direct effect is positive and significant (β = 0.318). Efficient waste handling generates economic value (e.g., selling by-products), reduces processing costs, and strengthens financial sustainability. Consequently, employees perceive financial performance as more stable and improving.

Influence of Saving Cost Program on Perceived Financial Performance

The saving cost program positively influences financial performance (β = 0.274). Effective cost-saving initiatives enhance perceptions of profitability, operational stability, and financial discipline.

Influence of Budget Efficiency on Perceived Financial Performance

Budget Efficiency has the strongest direct effect on Y (β = 0.416). Accurate budgeting ensures cost control, minimizes wasteful spending, and supports strategic financial planning—leading to improved perceptions of company financial performance.

Mediation Role of Budget Efficiency Both mediation paths (X1 → Z → Y and X2 → Z → Y) are significant.

Waste utilization contributes to financial performance via cost reduction and optimized resource usage.

Saving cost program enhances financial performance through budget adherence and efficient allocation.

This confirms that Budget Efficiency is a strategic financial mechanism linking operational initiatives with financial outcomes.

D. Conclusion

This study was conducted to analyze the influence of Waste Utilization Effectiveness and the Saving Cost Program on the Perception of Financial Performance, with Budget Efficiency serving as an intervening variable at PT Sinergi Nusantara Unit Gula Takalar. The findings of this study provide comprehensive insights into how operational efficiency and financial management practices interact to shape the perception of corporate financial success within a manufacturing context.

The results from the Partial Least Squares (PLS) analysis demonstrated that both Waste Utilization Effectiveness and the Saving Cost Program have significant positive effects on Budget Efficiency. This finding reveals that operational practices aimed at minimizing waste and optimizing cost structures directly contribute to the improvement of financial control and resource allocation. The ability of the company to convert waste into usable resources—such as utilizing bagasse for renewable energy or transforming molasses into marketable products—creates measurable savings that strengthen the company's budgetary performance. These operational efficiencies align with sustainable management principles that combine economic, environmental, and managerial responsibility.

However, the study also found that Waste Utilization Effectiveness and the

Saving Cost Program do not have a direct and statistically significant impact on the Perception of Financial Performance. This suggests that although operational improvements are essential, they do not automatically translate into positive financial perceptions among employees and managers. The perception of financial success is influenced not only by cost-saving or operational efficiency but also by how effectively these results are integrated into the organization's financial system. In other words, the financial benefits of operational efficiency must be realized and communicated through the budgeting process to create a visible and credible impact on perceived performance.

The analysis further revealed that Budget Efficiency has a strong and significant effect on the Perception of Financial Performance, serving as a vital link between operational initiatives and financial perception. Efficient budget management ensures that every aspect of operational savings is properly captured, allocated, and reflected in financial reports. This efficiency creates a transparent financial system where resources are allocated based on strategic priorities, and unnecessary spending is minimized. As a result, employees and management perceive the organization as financially strong and well-managed, leading to higher confidence in the company's long-term sustainability.

The mediating test results also confirmed that Budget Efficiency partially mediates the relationship between operational initiatives and financial perception. The Variance Accounted For (VAF) values for the mediation effects exceeded 60%, indicating partial but substantial mediation. This means that Waste Utilization and Cost-Saving programs influence financial perception primarily through the company's ability to manage its budget efficiently. Without effective budgeting, operational savings remain isolated achievements that may not translate into broader financial credibility. Therefore, Budget Efficiency functions as a bridge that transforms operational performance into financial outcomes that are both measurable and perceivable across the organization.

From a managerial standpoint, these findings underline the importance of integrating operational sustainability initiatives into financial management frameworks. Managers should not view waste utilization and cost-saving efforts as separate from the budgeting process; instead, they should embed these initiatives within the financial planning cycle. This integration ensures that efficiency efforts are quantifiable and contribute directly to financial performance indicators. Effective communication between production and finance departments is also critical, as it ensures that operational savings are accurately documented and utilized in future budgeting decisions. Moreover, employee engagement plays an essential role in shaping financial perceptions — when employees understand how efficiency translates into financial health, they are more likely to support and sustain such initiatives.

From a theoretical perspective, this study contributes to the growing body of literature on sustainability-driven financial management and the mediating role of budgeting in performance models. The results reinforce the relevance of the Triple Bottom Line (Elkington, 1997), which advocates the integration of environmental responsibility, social equity, and economic performance. Waste Utilization and Cost-Saving Programs represent the environmental and operational pillars of sustainability, while Budget Efficiency embodies the financial governance that

unites them into a coherent performance system. This theoretical contribution extends existing research by emphasizing that sustainability initiatives must be supported by strong financial management systems to achieve lasting impact.

Additionally, this study provides new insights for managerial accounting by highlighting how budget efficiency functions not only as a financial tool but also as a strategic communication mechanism within organizations. When budgets are managed efficiently, they convey organizational discipline, accountability, and strategic alignment — all of which contribute to a more positive perception of financial performance. This aligns with prior studies such as those by (Rachmawati & Suryanto, 2021) and (Kurniawan et al., 2022), who argue that budgetary mechanisms mediate the link between operational practices and financial outcomes. The present study adds to this understanding by contextualizing these relationships in Indonesia's sugar manufacturing industry, a sector where efficiency and sustainability are becoming increasingly critical.

It is important to note that while the findings provide valuable implications, this study is not without limitations. The data were collected from a single company, which may limit the generalizability of the results. Future studies should consider using multi-industry samples or comparative analyses between companies to strengthen external validity. Moreover, this research relied primarily on quantitative methods, which provide statistical rigor but may overlook deeper qualitative insights into employee perceptions, attitudes, and behavioral factors. Further research combining quantitative and qualitative approaches could help uncover the underlying psychological and cultural dynamics that shape financial perceptions within organizations.

In practical terms, the findings of this research underscore the need for organizational integration between sustainability practices and financial governance. Companies should develop budgeting frameworks that explicitly recognize and reward efficiency gains from waste utilization and cost-saving initiatives. Managers should also implement continuous training and capacity-building programs to enhance employees' understanding of financial management and its relationship with operational efficiency. Furthermore, transparency in reporting both operational and financial results should be improved to ensure that all stakeholders have a clear understanding of how efficiency translates into financial performance.

Finally, this study concludes that the true financial strength of an organization lies not only in its profitability but in its ability to manage resources efficiently, sustainably, and transparently. Waste Utilization Effectiveness and Cost-Saving Programs, when supported by robust Budget Efficiency, can transform a company into a financially resilient and environmentally responsible enterprise. PT Sinergi Nusantara Unit Gula Takalar serves as an example of how manufacturing firms can achieve financial improvement and environmental stewardship simultaneously through disciplined budgeting and operational innovation. Therefore, organizations seeking to enhance their perceived and actual financial performance should focus on developing comprehensive systems that link operational sustainability, cost control, and budgetary governance into one coherent strategy for sustainable growth and competitiveness.

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