
Good Governance-Based Budget Management for Financial and Accounting Efficiency in OEM Health Supplement and Beauty Product Industries: An Integrated Carbon Credit–ESG Framework for Sustainable Corporate Governance in Samut Sakhon, Thailand

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Abstract

This study aimed to: (1) examine the level of good governance-based budget management in original equipment manufacturer (OEM) health and beauty dietary supplement industries operating within local administrative areas of Samut Sakhon Province; (2) examine the effects of good governance principles, Carbon Credit integration, and Environmental, Social, and Governance (ESG) practices on financial and accounting operational efficiency; and (3) develop guidelines for governance-based budget management to enhance financial and accounting performance and sustainable corporate governance. A mixed-methods research design was employed. The quantitative component involved 385 executives, financial and accounting managers, and relevant personnel from OEM health and beauty dietary supplement enterprises, selected through purposive sampling. Data were collected using a structured questionnaire, while qualitative data were obtained through semi-structured interviews and an appropriateness assessment of the proposed guidelines. Quantitative data were analyzed using descriptive and inferential statistics, whereas qualitative data were analyzed through content analysis. The findings indicated that the overall level of good governance-based budget management was high. Transparency, accountability, participation, and value for money were identified as key dimensions associated with financial and accounting operational efficiency. Good governance principles, Carbon Credit integration, and ESG practices had statistically significant positive effects on financial and accounting performance at the .05 significance level. The qualitative findings further supported the development of an integrated budget management framework incorporating good governance, risk management, Carbon Credit management, and ESG practices. The proposed framework provides practical guidance for improving budget administration, financial and accounting efficiency, transparency, and sustainable corporate governance in OEM health and beauty dietary supplement industries. The study contributes an integrated governance-based budget management framework that connects financial management with environmental and sustainability principles.

Keywords: Good Governance, Budget Management, Carbon Credit, Environmental Social and Governance (ESG), Financial and Accounting Efficiency, Original Equipment Manufacturer (OEM)

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Introduction

The Original Equipment Manufacturer (OEM) health and beauty dietary supplement industry has emerged as an important sector supporting Thailand's manufacturing base, domestic consumption, and export-oriented production. As a major production base serving both domestic and international brand owners, the industry operates within an increasingly competitive environment shaped by global supply chain transformations, stringent product safety regulations, rising production costs, and growing consumer expectations regarding responsible and sustainable business practices (Hilb, et. al., 2023). Consequently, manufacturers are required to comply with internationally recognized production and quality standards, including Good Manufacturing Practice (GMP), Hazard Analysis and Critical Control Point (HACCP), ISO 22000, and ISO 22716, while also complying with the regulatory requirements of the Thai Food and Drug Administration (Thai FDA) and the ASEAN Cosmetic Directive. (Jing, et. al., 2024). Beyond product quality and regulatory compliance, the contemporary business environment increasingly requires organizations to strengthen Good Governance, Environmental, Social, and Governance (ESG) practices, and Carbon Credit management as mechanisms for improving organizational accountability, environmental responsibility, and long-term sustainability

Although these developments have increased the importance of governance and sustainability-oriented management, the existing literature remains fragmented across these domains. Previous studies have generally examined Good Governance in relation to budget management, organizational effectiveness, accountability, and performance, particularly in public-sector and educational contexts. (Jinlei, et. al., 2024). Other studies have examined ESG primarily in relation to corporate sustainability, environmental performance, stakeholder management, and organizational value, while Carbon Credit research has largely focused on greenhouse gas emission reduction, carbon accounting, carbon markets, and environmental management. Consequently, these streams of research have developed largely as separate areas of inquiry. Limited empirical research has examined how Good Governance principles can be systematically integrated with budget management, financial and accounting efficiency, ESG implementation, and Carbon Credit management within OEM health and beauty dietary supplement manufacturing. (Kochaphan, Chotithammo, 2022). This fragmentation represents an important knowledge gap because financial decision-making, environmental costs, sustainability commitments, and governance mechanisms increasingly need to be managed as interconnected organizational processes

Samut Sakhon Province provides a particularly relevant context for investigating this issue because of its concentration of manufacturing enterprises and its role in Thailand's food, health-related, and OEM production sectors (Shen, et. al., 2024). Enterprises operating in this industrial environment must manage multiple financial and operational pressures, including production costs, budget allocation, energy expenditure, environmental costs, financial risks, regulatory compliance, and emerging ESG-related requirements. (Worapongpat, 2025a). These pressures create a need for budget management systems that extend beyond conventional

financial control and incorporate transparency, accountability, participation, value for money, environmental considerations, and sustainability-related expenditures

More specifically, the literature reviewed for this study suggests that existing research involving enterprises in the study context has tended to address financial management, operational management, or sustainability issues separately rather than examining their interaction within an integrated governance-based budget management framework (Worapongpat, 2025b). In particular, there is limited empirical evidence demonstrating how governance principles can be incorporated into budgeting and financial and accounting processes while simultaneously addressing ESG implementation and Carbon Credit management. (Worapongpat, 2026a). The absence of such integrated evidence makes it difficult for OEM enterprises to translate broad sustainability and governance principles into concrete budget allocation, financial control, risk management, and accounting practices. Therefore, the research gap is not simply the absence of studies on individual variables, but the limited integration of these variables into a single operational framework applicable to the OEM health and beauty dietary supplement industry.

Accordingly, this study was undertaken with three primary objectives: (1) to examine the level of governance-based budget management and the operational efficiency of financial and accounting functions among OEM health and beauty dietary supplement manufacturers located within the jurisdiction of local administrative organizations in Samut Sakhon Province; (2) to investigate the influence of Good Governance principles, Carbon Credit integration, and ESG practices on financial and accounting performance; and (3) to develop appropriate budget management guidelines that integrate governance, risk management, Carbon Credit, and ESG principles to enhance organizational efficiency and sustainable corporate governance. (Worapongpat, 2026b). The study employed a mixed-methods research design, combining quantitative analysis with qualitative inquiry to examine the relationships among the study variables and to develop and refine practical governance-based budget management guidelines. (Yongming, et. al., 2024)

The study contributes to the existing body of knowledge by proposing an integrated governance-based budget management framework that connects Good Governance principles with budget management, financial and accounting efficiency, ESG implementation, and Carbon Credit management in the OEM health and beauty dietary supplement industry. Conceptually, the framework extends conventional budget management research by positioning governance and sustainability as interconnected dimensions of financial decision-making and organizational performance. Practically, the findings provide guidance for OEM entrepreneurs, financial and accounting managers, government agencies, and local administrative organizations in strengthening budget administration, financial transparency, environmental responsibility, and sustainable corporate governance. The study therefore contributes to the broader development of governance-oriented management practices within Thailand's transition toward a green and sustainable economy.

Objectives

1. To examine the levels of governance-based budget management, Environmental, Social, and Governance (ESG) implementation, Carbon Credit management, and financial and accounting operational efficiency among Original Equipment Manufacturer (OEM) health and beauty dietary supplement enterprises in Samut Sakhon Province.

2. To examine the relationships between governance-based budget management, ESG implementation, Carbon Credit management, and financial and accounting operational efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

3. To examine the effects of governance-based budget management, ESG implementation, and Carbon Credit management on financial and accounting operational efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

Literature Review

This study synthesizes theoretical concepts and empirical evidence concerning governance-based budget management, financial and accounting operational efficiency, Environmental, Social, and Governance (ESG) implementation, and Carbon Credit management within the context of the Original Equipment Manufacturer (OEM) health and beauty dietary supplement industry. The review emphasizes both international and Thai scholarship and is organized around four interconnected themes: (1) governance-based budget management and organizational performance, (2) ESG and sustainable financial management, (3) Carbon Credit management and sustainability accounting, and (4) synthesis of the research gap.

1. Governance-Based Budget Management and Organizational Performance

Governance-based budget management integrates budgeting processes with principles of transparency, accountability, participation, integrity, rule of law, and value for money. From a corporate governance perspective, effective governance mechanisms strengthen oversight, improve managerial accountability, and enhance the quality of organizational decision-making. These principles are particularly relevant to budget management because budgeting involves the allocation of organizational resources, prioritization of expenditures, monitoring of financial performance, and control of financial risks. (Keerati et. al., 2025).

The relationship between governance and organizational performance can also be explained through agency and stakeholder perspectives. (Thanaphon Phusricharoen, et. al., 2025). Effective governance mechanisms reduce information asymmetry between managers and stakeholders, strengthen monitoring, and encourage managers to allocate organizational resources in ways that are consistent with organizational objectives and stakeholder expectations. In this context, transparency and accountability in budgeting can improve financial control, while participation can enhance the quality and acceptance of budgetary decisions.

Empirical studies have generally reported positive relationships between sound governance practices, effective budgeting, financial control, and organizational performance. (Preeda et. al., 2025). However, much of the existing research has concentrated on public-sector organizations, educational institutions, or large corporations. Comparatively less empirical attention has been devoted to governance-based budget management within OEM manufacturing enterprises, particularly SMEs and contract manufacturers operating in highly regulated health and beauty product markets. (Srivastava, et. al., 2025). This limitation suggests the need to

examine governance-based budgeting within an industrial context in which cost control, regulatory compliance, supply-chain requirements, and sustainability pressures interact.

2. ESG, Sustainable Finance, and Financial Management

Environmental, Social, and Governance (ESG) has increasingly become an important framework for integrating sustainability considerations into organizational decision-making and corporate performance evaluation. (Ding, 2025). ESG extends conventional financial management by requiring organizations to consider environmental impacts, social responsibilities, stakeholder relationships, governance quality, and long-term organizational resilience alongside short-term financial outcomes.

From a stakeholder perspective, ESG implementation can strengthen organizational relationships with customers, employees, investors, regulators, suppliers, and local communities. (Bania, Biswas, 2024). Effective ESG practices may also reduce environmental and social risks, improve corporate reputation, strengthen regulatory compliance, and support long-term competitiveness. These mechanisms may indirectly influence financial and accounting efficiency by improving risk management, resource allocation, operational control, and the quality of sustainability-related information.

The increasing integration of ESG into financial management has also strengthened the role of accounting systems in identifying, measuring, and reporting sustainability-related costs and performance. Sustainable and green finance approaches emphasize that investment and budgetary decisions should consider environmental and social consequences in addition to conventional financial returns. Consequently, financial and accounting functions increasingly serve not only as mechanisms for recording transactions and controlling expenditures but also as information systems supporting sustainability-oriented decision-making.

Nevertheless, much of the international ESG literature has focused on ESG disclosure, firm value, financial performance, investor behavior, and corporate reputation. (Hu, Li, 2026). Comparatively fewer studies have examined ESG implementation as an operational predictor of financial and accounting efficiency within OEM health and beauty dietary supplement manufacturing. This distinction is important because the implementation of ESG principles at the operational level may require changes in budgeting, cost allocation, internal control, procurement, environmental expenditure, and performance measurement.

3. Carbon Credit Management and Sustainability Accounting

The global movement toward carbon neutrality and greenhouse gas emission reduction has increased the importance of carbon management, carbon accounting, and Carbon Credit mechanisms within corporate sustainability strategies. Carbon management involves the systematic measurement, monitoring, reduction, and reporting of greenhouse gas emissions, whereas Carbon Credits provide an economic mechanism through which organizations can account for and manage emission reductions. (Zhang, et. al., 2026).

Carbon management is closely connected to accounting because effective environmental decision-making requires reliable information concerning energy consumption, greenhouse gas emissions, environmental costs, and resource utilization. Carbon accounting can therefore contribute to more comprehensive cost information and support managerial decisions concerning energy efficiency, production processes, technology investment, and environmental expenditures.

Research on green manufacturing, circular economy practices, sustainable supply chains, and environmental management has demonstrated that resource efficiency and emission reduction can contribute to cost savings, operational improvements, risk reduction, and competitive advantage. For manufacturing enterprises, carbon-related information may therefore become relevant to both environmental performance and financial planning. In particular, the integration of carbon-related expenditures and benefits into budgeting and accounting systems can help managers evaluate the financial implications of emission reduction initiatives and sustainability investments.

However, existing research on Carbon Credits and carbon accounting has often focused on carbon markets, emissions trading, climate policy, carbon disclosure, and environmental performance. Less attention has been devoted to examining Carbon Credit management as an organizational management practice directly associated with budgeting and financial and accounting operational efficiency. This gap is particularly relevant for manufacturing enterprises facing increasing pressure to reduce emissions while maintaining cost competitiveness.

4. Integration of Governance, ESG, Carbon Management, and Financial Efficiency

The preceding literature suggests that Good Governance, ESG, and Carbon Credit management are conceptually interconnected but have frequently been examined as separate research domains. Governance provides mechanisms for transparency, accountability, oversight, and responsible resource allocation. ESG provides a framework for integrating environmental, social, and governance considerations into organizational decision-making. Carbon management provides mechanisms for measuring and reducing greenhouse gas emissions and incorporating climate-related considerations into organizational processes.

These perspectives can be integrated through a resource-allocation and management-control perspective. Governance-based budget management establishes the mechanisms through which organizational resources are planned, allocated, monitored, and evaluated. ESG implementation broadens the criteria used in these decisions by incorporating environmental and social considerations. Carbon Credit management further introduces measurable climate-related information into budgeting, accounting, risk management, and operational decisions. Together, these mechanisms may contribute to improved financial and accounting operational efficiency through better resource allocation, cost control, risk management, transparency, and sustainability-oriented decision-making.

Despite the growing international literature on corporate governance, ESG, sustainable finance, and carbon management, limited empirical research has examined these constructs simultaneously within a single operational framework. The gap is particularly evident in the OEM health and beauty dietary supplement industry, where manufacturers must simultaneously address financial efficiency, regulatory compliance, supply-chain requirements, environmental responsibilities, and changing market expectations. Existing Thai studies provide useful contextual evidence concerning governance, financial management, and sustainability; however, they have generally examined individual dimensions rather than testing an integrated model that

simultaneously considers governance-based budget management, ESG implementation, Carbon Credit management, and financial and accounting operational efficiency.

Accordingly, the present study addresses this gap by conceptualizing governance-based budget management, ESG implementation, and Carbon Credit management as complementary predictors of financial and accounting operational efficiency. The framework moves beyond examining these concepts independently and instead investigates their combined contribution to organizational financial and accounting processes within OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

Summary of the Literature Review

The literature indicates that effective governance provides an important foundation for transparent, accountable, and efficient resource allocation and budget management. ESG implementation extends organizational decision-making by incorporating environmental, social, and governance considerations, while Carbon Credit and carbon management practices provide mechanisms for incorporating climate-related information into operational, financial, and accounting decisions. These three dimensions are therefore theoretically complementary rather than isolated management practices.

Based on the theoretical and empirical literature, this study proposes an integrated framework in which governance-based budget management, ESG implementation, and Carbon Credit management function as complementary predictors of financial and accounting operational efficiency. The framework provides the theoretical basis for examining the relationships among the study variables and for developing governance-based budget management guidelines that integrate financial management with sustainability and environmental responsibility in the OEM health and beauty dietary supplement industry.

Research framework

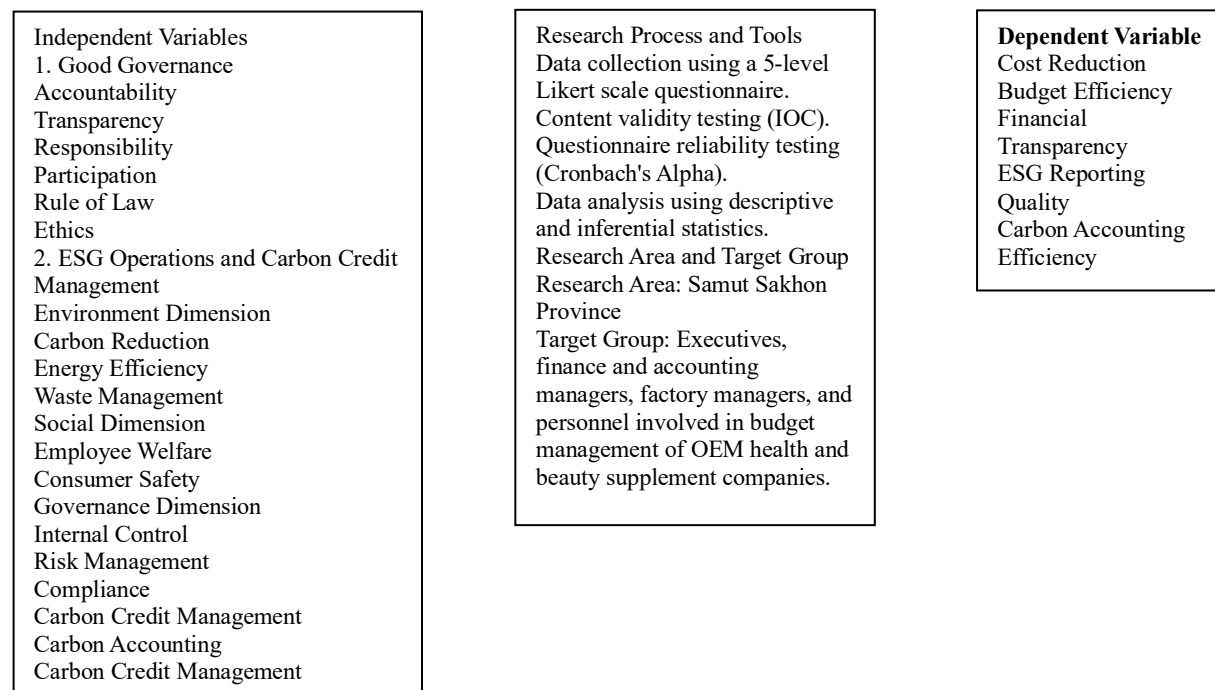


Figure 1. Conceptual framework of the research.

Research methodology

Research Design

This study employed a sequential mixed-methods research design consisting of quantitative and qualitative phases. The quantitative phase was conducted first to examine the levels of governance-based budget management, Environmental, Social, and Governance (ESG) implementation, Carbon Credit management, and financial and accounting operational efficiency, as well as to examine the relationships and predictive effects among these variables. The qualitative phase was subsequently conducted to obtain in-depth perspectives from relevant experts and practitioners regarding the quantitative findings and to identify practical considerations for developing governance-based budget management guidelines. The findings from both phases were integrated to develop and assess the appropriateness of the proposed guidelines for OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

The research framework specified governance-based budget management, ESG implementation, and Carbon Credit management as the independent variables, while financial and accounting operational efficiency was specified as the dependent variable. The quantitative findings provided the empirical basis for examining the proposed relationships, whereas the qualitative findings were used to provide contextual explanations and practical recommendations for the development of the governance-based budget management framework.

Population and Sample

The target population comprised executives, financial and accounting managers, and personnel responsible for budget management, finance, accounting, internal control, risk management, and corporate governance in OEM health and beauty dietary supplement enterprises operating in Samut Sakhon Province. These respondents were selected because their positions provided direct knowledge and experience relevant to the financial, accounting, governance, budgeting, ESG, and Carbon Credit practices examined in the study.

Because a complete and up-to-date sampling frame identifying all personnel with these responsibilities was not available, the exact population size could not be determined. Therefore, the quantitative participants were recruited using non-probability purposive sampling. The inclusion criteria required respondents to be employed by an OEM health and beauty dietary supplement enterprise in Samut Sakhon Province and to have direct responsibilities or relevant experience in budget management, finance, accounting, internal control, risk management, corporate governance, ESG-related activities, or Carbon Credit-related activities.

The minimum sample size for the quantitative phase was determined using an a priori power analysis with G*Power for multiple linear regression. The parameters were specified as an effect size of ($f^2 = 0.15$), a significance level of ($\alpha = 0.05$), statistical power of ($1 - \beta = 0.80$), and the number of predictors corresponding to the three independent variables in the conceptual framework: governance-based budget management, ESG implementation, and Carbon Credit management. The resulting minimum sample size was used as the basis for determining the required number of quantitative respondents. The final sample consisted of valid respondents.

Because purposive sampling is a non-probability sampling method, the findings are interpreted within the context of the participating OEM enterprises and should not be considered

statistically representative of all OEM health and beauty dietary supplement enterprises in Thailand. The sampling approach was selected to ensure that respondents possessed relevant knowledge and experience concerning the variables under investigation.

Qualitative Participants

The qualitative phase involved purposively selected experts and relevant practitioners with substantial knowledge or professional experience in financial and accounting management, budget management, corporate governance, ESG, Carbon Credit management, or OEM health and beauty dietary supplement operations. Participants were selected according to predetermined inclusion criteria and their ability to provide substantive information relevant to the development of the proposed guidelines.

A total of [insert actual number] experts and practitioners participated in the semi-structured interviews. The number of participants was determined based on the adequacy and richness of the information obtained and the point at which additional interviews no longer generated substantially new themes or insights.

Research Instruments

Three instruments were employed in the study: (1) a structured questionnaire for the quantitative phase, (2) a semi-structured interview protocol for the qualitative phase, and (3) an appropriateness assessment form for evaluating the proposed governance-based budget management guidelines.

1. Structured Questionnaire

The questionnaire was developed based on the theoretical framework, relevant empirical studies, and the operational definitions of the study constructs. The questionnaire consisted of sections covering respondent characteristics and the principal study variables.

The governance-based budget management construct consisted of the dimensions specified by the adopted Good Governance framework, including ESG implementation covered the environmental, social, and governance dimensions, while Carbon Credit management covered the organizational practices associated with carbon measurement, management, reduction, and utilization of Carbon Credit mechanisms. Financial and accounting operational efficiency covered the efficiency of financial planning, budget control, accounting processes, financial information management, cost control, and related operational functions.

All closed-ended items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

2. Semi-Structured Interview Protocol

The semi-structured interview protocol was developed from the conceptual framework and the findings emerging from the quantitative phase. The interview questions focused on the practical implementation of governance-based budget management, ESG practices, Carbon Credit management, financial and accounting processes, organizational constraints, and mechanisms for improving operational efficiency.

The interviews were designed to complement the quantitative findings by providing explanations of organizational practices, implementation challenges, and practical requirements for developing an appropriate governance-based budget management framework.

3. Guideline Appropriateness Assessment Form

Following the integration of quantitative and qualitative findings, a draft governance-based budget management framework was developed. The proposed framework was subsequently

submitted to [insert actual number] qualified experts for assessment of its appropriateness, feasibility, clarity, usefulness, and applicability. The assessment results were used to refine the final guidelines.

Instrument Validity and Reliability

Content validity of the questionnaire was assessed by a panel of at least three experts with relevant expertise in management, accounting, governance, ESG, Carbon Credit management, or research methodology. The Index of Item–Objective Congruence (IOC) was calculated for each item. Items meeting the predetermined IOC criterion were retained, while items requiring improvement were revised according to expert recommendations.

Following the content validity assessment, the questionnaire was pilot-tested with respondents who possessed characteristics similar to those of the target population but were not included in the final sample. Item quality was examined using the Corrected Item–Total Correlation, and internal consistency was assessed using Cronbach’s alpha coefficient. A coefficient of 0.70 or higher was considered acceptable for internal consistency reliability.

Because the questionnaire contained multidimensional constructs, exploratory factor analysis (EFA) was conducted where appropriate to examine the underlying factor structure of the measurement items. The adequacy of the data for factor analysis was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett’s Test of Sphericity. Factor loadings and the percentage of variance explained were examined to evaluate the empirical structure of the constructs.

The final manuscript reports the number of items, factor loadings, and reliability coefficients for each construct to provide transparent evidence of measurement quality.

Data Collection

Data collection was conducted after obtaining the required ethical approval and permission from the participating organizations, where applicable. During the quantitative phase, questionnaires were distributed to purposively selected respondents who met the inclusion criteria. Questionnaires were administered both in person and through an online survey platform, depending on the accessibility and preference of participating organizations and respondents.

After completion, all questionnaires were screened for completeness and response quality. Invalid or substantially incomplete questionnaires were excluded from the analysis. Valid responses were coded, verified, and entered into the statistical analysis dataset.

During the qualitative phase, semi-structured interviews were conducted with the selected experts and practitioners. With participants’ permission, interviews were recorded and subsequently transcribed for analysis. Where recording was not permitted, detailed interview notes were prepared. The qualitative data were organized and analyzed systematically according to the predetermined analytical procedures.

Quantitative Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. First, frequency and percentage were used to summarize respondents’ demographic characteristics. Means and standard deviations were used to describe the levels of governance-based budget management, ESG implementation, Carbon Credit management, and financial and accounting operational efficiency.

Second, Pearson's correlation coefficient was employed to examine the bivariate relationships among the study variables and to assess the direction and strength of their associations.

Third, multiple linear regression analysis was conducted to examine the effects of governance-based budget management, ESG implementation, and Carbon Credit management on financial and accounting operational efficiency. The regression model was specified as follows: $[Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \text{varepsilon}]$ where: (Y) = Financial and Accounting Operational Efficiency

(X₁) = Governance-Based Budget Management

(X₂) = ESG Implementation

(X₃) = Carbon Credit Management

(β₀) = Constant

(β₁-β₃) = Regression coefficients

(varepsilon) = Error term

Prior to interpreting the regression results, relevant assumptions were assessed, including linearity, independence of errors, normality of residuals, homoscedasticity, and multicollinearity. Variance Inflation Factor (VIF) and tolerance values were examined to assess potential multicollinearity among the predictors.

Independent Samples t-test and One-way Analysis of Variance (ANOVA) were additionally employed where appropriate to examine differences in respondents' perceptions across relevant demographic or organizational characteristics. Statistical significance was determined at the 0.05 level.

Qualitative Data Analysis

Qualitative interview data were analyzed using thematic content analysis. The analysis involved several stages: transcription and familiarization with the interview data, initial coding, categorization of related codes, identification of recurring patterns, development of themes, and interpretation of the themes in relation to the quantitative findings and research objectives.

The analysis focused particularly on explanations concerning the implementation of governance-based budget management, ESG and Carbon Credit practices, financial and accounting challenges, organizational constraints, risk management, and practical mechanisms for improving operational efficiency.

To enhance the credibility of the qualitative findings, the researcher compared information obtained from different participants and examined the consistency of emerging themes with the quantitative results and relevant documentary or organizational information where available.

Integration of Quantitative and Qualitative Findings

The quantitative and qualitative findings were integrated at the interpretation and guideline-development stages. Quantitative results identified the levels, relationships, and predictive effects among the study variables, while qualitative findings provided contextual explanations of these relationships and identified practical implementation conditions and constraints.

The integrated findings were used to develop a governance-based budget management framework incorporating Good Governance principles, budget management, risk management, ESG implementation, and Carbon Credit management. The draft framework was then assessed for appropriateness and refined based on expert feedback.

This integration ensured that the proposed guidelines were supported by both empirical quantitative evidence and contextual qualitative insights rather than being derived solely from theoretical assumptions.

Ethical Considerations

Participation in the study was voluntary. Respondents were informed about the purpose of the research, the nature of their participation, confidentiality procedures, and their right to decline participation or withdraw where applicable. No personally identifiable information was disclosed in reporting the findings. Research ethics approval was obtained from before data collection.

Research Findings

Objective 1. To investigate the level of budget management based on the principles of good governance and the operational efficiency of financial and accounting practices in the Original Equipment Manufacturer (OEM) health supplement and beauty product industry in Samut Sakhon Province.

The findings indicated that the respondents comprised executives and personnel directly responsible for budget management, finance, accounting, internal control, risk management, and corporate governance within OEM health supplement and beauty manufacturing enterprises in Samut Sakhon Province. The respondents represented a range of organizational positions and professional experience relevant to the financial, accounting, budgeting, and governance practices examined in this study.

Table 1. Descriptive Statistics of the Study Variables

Variable	Mean	SD	Level
Good Governance	4.18	0.47	High
ESG Implementation	4.02	0.51	High
Carbon Credit Management	3.98	0.49	High
Financial and Accounting Operational Efficiency	3.97	0.53	High

The analysis revealed that budget management based on the principles of Good Governance was implemented at a high level overall. The six dimensions examined—accountability, transparency, responsibility, participation, rule of law, and ethics—were all rated at a high level. These findings indicate that the participating enterprises had established governance-oriented budget management practices emphasizing accountability, transparency, responsible decision-making, stakeholder participation, compliance with applicable rules and regulations, and ethical conduct in the administration of organizational resources.

The findings also showed that the operational efficiency of financial and accounting practices was at a high level overall. As presented in Table 1, the overall mean score was 3.97 (S.D. = 0.53), indicating a high level of operational efficiency. Among the five dimensions, Budget Efficiency obtained the highest mean score ($\bar{x} = 4.11$, S.D. = 0.58), followed by ESG Reporting Quality ($\bar{x} = 4.09$, S.D. = 0.59), Financial Transparency ($\bar{x} = 4.06$, S.D. = 0.60), Cost

Reduction ($\bar{x} = 4.01$, S.D. = 0.62), and Carbon Accounting Efficiency ($\bar{x} = 3.59$, S.D. = 0.73), respectively. All five dimensions were rated at a high level.

These findings suggest that the participating OEM enterprises placed considerable emphasis on effective budget utilization, financial transparency, sustainability-related reporting, and cost control. However, the comparatively lower mean score for Carbon Accounting Efficiency indicates that carbon-related financial and accounting practices may require further development. Strengthening carbon accounting capabilities could support more systematic measurement and reporting of greenhouse gas emissions and improve the integration of environmental considerations into financial and budgetary decision-making.

Overall, the findings demonstrate that the participating OEM health supplement and beauty product enterprises had a relatively strong foundation in governance-based budget management and financial and accounting operational efficiency. Nevertheless, differences across the individual dimensions indicate opportunities for further improvement, particularly in carbon accounting efficiency, to support the integration of financial management with sustainability-oriented corporate governance.

Table 2. Operational Efficiency of Financial and Accounting Practices in the OEM Health Supplement and Beauty Manufacturing Industry in Samut Sakhon Province (n = 385)

Operational Efficiency Dimension	Mean ($\bar{x}$)	S.D.	Level
1. Cost Reduction	4.01	0.62	High
2. Budget Efficiency	4.11	0.58	High
3. Financial Transparency	4.06	0.60	High
4. ESG Reporting Quality	4.09	0.59	High
5. Carbon Accounting Efficiency	3.59	0.73	High
Overall	3.97	0.53	High

The results demonstrate that Budget Efficiency was the strongest dimension of financial and accounting operational efficiency, suggesting that the enterprises had relatively effective mechanisms for planning, allocating, monitoring, and controlling financial resources. The high level of ESG Reporting Quality and Financial Transparency further indicates that sustainability-related information and financial accountability were increasingly incorporated into organizational management.

In contrast, Carbon Accounting Efficiency received the lowest mean score ($\bar{x} = 3.59$, S.D. = 0.73). Although still classified as high, this comparatively lower score suggests that carbon-related accounting practices have not developed to the same level as conventional budgeting and financial management practices. This finding provides an important basis for the subsequent analysis of Carbon Credit Management and its relationship with financial and accounting operational efficiency.

Table 3. Relationship between Governance-Based Budget Management and Financial and Accounting Operational Efficiency in the OEM Health and Beauty Dietary Supplement Industry in Samut Sakhon Province (n = 385)

Governance-Based Budget Management	<i>r</i>	<i>p</i>	Strength of Relationship	Rank
1. Accountability	0.781	< .001	High	3

Governance-Based Budget Management	<i>r</i>	<i>p</i>	Strength of Relationship	Rank
2. Transparency	0.823	< .001	Very High	2
3. Responsibility	0.768	< .001	High	4
4. Participation	0.742	< .001	High	6
5. Rule of Law	0.756	< .001	High	5
6. Ethics	0.835	< .001	Very High	1
Overall Good Governance	0.901	< .001	Very High	—

Note. *r* = Pearson's product-moment correlation coefficient. Statistical significance was determined at the 0.05 level.

The Pearson product-moment correlation analysis demonstrated that governance-based budget management was positively and significantly associated with financial and accounting operational efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province. The overall correlation was very strong ($r = 0.901$, $p < .001$), indicating a strong positive association between the extent to which Good Governance principles were incorporated into budget management and the level of financial and accounting operational efficiency.

Table 4. Relationship between Environmental, Social, and Governance (ESG) Implementation and Financial and Accounting Operational Efficiency in the OEM Health and Beauty Dietary Supplement Industry in Samut Sakhon Province ($n = 385$)

ESG Dimension	<i>r</i>	<i>p</i>	Strength of Relationship	Rank
Environmental Dimension				
1. Carbon Reduction	0.741	< .001	High	6
2. Energy Efficiency	0.779	< .001	High	5
3. Waste Management	0.792	< .001	High	4
Social Dimension				
4. Employee Welfare	0.808	< .001	High	3
5. Consumer Safety	0.821	< .001	Very High	2
Governance Dimension				
6. Internal Control	0.832	< .001	Very High	1
7. Risk Management	0.817	< .001	Very High	2
8. Compliance	0.805	< .001	High	3

Note. *r* = Pearson's product-moment correlation coefficient. $p < .001$ indicates statistical significance at the 0.05 level.

The Pearson product-moment correlation analysis demonstrated that Environmental, Social, and Governance (ESG) implementation was positively and significantly associated with financial and accounting operational efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

At the dimensional level, Internal Control demonstrated the strongest positive association with financial and accounting operational efficiency ($r = 0.832$, $p < .001$), followed by Consumer

Safety ($r = 0.821, p < .001$), Risk Management ($r = 0.817, p < .001$), Compliance ($r = 0.805, p < .001$), Waste Management ($r = 0.792, p < .001$), Energy Efficiency ($r = 0.779, p < .001$), and Carbon Reduction ($r = 0.741, p < .001$), respectively.

These findings indicate that all examined ESG dimensions were strongly and positively associated with financial and accounting operational efficiency. In particular, the relatively strong associations of internal control, consumer safety, and risk management suggest that governance and operational-risk mechanisms are closely related to the effectiveness of financial and accounting processes within the participating enterprises.

Table 5. Relationship between Carbon Credit Management and Financial and Accounting Operational Efficiency in the OEM Health and Beauty Dietary Supplement Industry in Samut Sakhon Province ($n = 385$)

Carbon Credit Management Dimension	r	p	Strength of Relationship	Rank
1. Carbon Accounting	0.784	< .001	High	2
2. Carbon Credit Management	0.826	< .001	Very High	1
Overall Carbon Credit Management	0.854	< .001	Very High	—

Note. r = Pearson's product-moment correlation coefficient. Statistical significance was determined at the 0.05 level.

The Pearson product-moment correlation analysis demonstrated that Carbon Credit Management was positively and significantly associated with financial and accounting operational efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province. The overall relationship was very strong ($r = 0.854, p < .001$), indicating a strong positive association between the implementation of carbon-related management practices and financial and accounting operational efficiency.

At the dimensional level, Carbon Credit Management demonstrated the strongest positive association with financial and accounting operational efficiency ($r = 0.826, p < .001$), followed by Carbon Accounting ($r = 0.784, p < .001$). Both dimensions showed statistically significant positive relationships with financial and accounting operational efficiency.

Table 6. Multiple Regression Analysis of Factors Influencing Financial and Accounting Operational Efficiency in the OEM Health and Beauty Dietary Supplement Industry in Samut Sakhon Province ($n = 385$)

Independent Variable	B	S.E.	β	t	p	Tolerance	VIF	Result
Good Governance	0.318	0.051	0.341	6.235	< .001	0.721	1.387	Significant
ESG Implementation	0.426	0.058	0.458	7.391	< .001	0.683	1.464	Significant
Carbon Credit Management	0.194	0.047	0.211	4.128	< .001	0.806	1.241	Significant
R	R^2	Adjusted R^2	Standard Error of the Estimate			F	p	
0.882	0.778	0.774	0.324			247.563	< .001	

Note. The dependent variable was Financial and Accounting Operational Efficiency. Statistical significance was determined at the 0.05 level. Tolerance values above 0.20 and VIF values below 5.00 indicate that no serious multicollinearity was detected among the independent variables.

The multiple regression analysis was conducted to examine the effects of Good Governance, ESG Implementation, and Carbon Credit Management on Financial and Accounting Operational Efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province.

The results demonstrated that all three independent variables had positive and statistically significant effects on financial and accounting operational efficiency. ESG Implementation was the strongest predictor ($\beta = 0.458, p < .001$), followed by Good Governance ($\beta = 0.341, p < .001$) and Carbon Credit Management ($\beta = 0.211, p < .001$).

Among the predictors, ESG Implementation therefore demonstrated the greatest relative contribution to financial and accounting operational efficiency. This finding suggests that the integration of environmental, social, and governance practices into organizational operations is particularly important for strengthening financial transparency, resource management, risk management, sustainability reporting, and overall operational effectiveness.

Good Governance also demonstrated a substantial positive effect ($\beta = 0.341, p < .001$). This result indicates that transparent, accountable, ethical, and well-regulated budget management is associated with greater efficiency in financial and accounting operations.

Carbon Credit Management showed a positive and statistically significant effect ($\beta = 0.211, p < .001$), although its standardized effect was lower than those of ESG Implementation and Good Governance. This finding suggests that carbon accounting and carbon credit management can contribute to financial and accounting operational efficiency by supporting environmental cost monitoring, carbon-related financial information, sustainability-oriented planning, and organizational preparedness for a low-carbon economy.

The regression model demonstrated substantial explanatory power, with $R^2 = 0.778$ and Adjusted $R^2 = 0.774$. Thus, the three predictors jointly explained approximately 77.8% of the variance in financial and accounting operational efficiency. The overall regression model was statistically significant, $F(3, 381) = 247.563, p < .001$, indicating that the model provided a statistically significant explanation of variation in the dependent variable.

Multicollinearity

The multicollinearity diagnostics indicated that the independent variables did not exhibit serious multicollinearity. Tolerance values ranged from 0.683 to 0.806, while VIF values ranged from 1.241 to 1.464, all within commonly accepted thresholds. Therefore, the regression coefficients can be interpreted without evidence of problematic overlap among the three predictors.

The multiple regression analysis demonstrated that Good Governance, ESG Implementation, and Carbon Credit Management each had a positive and statistically significant effect on Financial and Accounting Operational Efficiency among OEM health and beauty dietary supplement enterprises in Samut Sakhon Province. All three predictors were statistically significant at the 0.05 level.

Based on the standardized regression coefficients, ESG Implementation was the strongest predictor of Financial and Accounting Operational Efficiency ($\beta = 0.458, p < .001$), followed by

Good Governance ($\beta = 0.341, p < .001$) and Carbon Credit Management ($\beta = 0.211, p < .001$), respectively. These findings indicate that ESG implementation made the largest relative contribution to explaining variation in financial and accounting operational efficiency among the three predictors examined.

The regression model demonstrated substantial explanatory power, with $R^2 = 0.778$ and Adjusted $R^2 = 0.774$, indicating that Good Governance, ESG Implementation, and Carbon Credit Management jointly explained approximately 77.8% of the variance in Financial and Accounting Operational Efficiency. The overall regression model was statistically significant, $F(3, 381) = 247.563, p < .001$, indicating that the set of predictors significantly explained variation in the dependent variable.

The multicollinearity diagnostics indicated no serious multicollinearity among the independent variables. Tolerance values ranged from 0.683 to 0.806, while VIF values ranged from 1.241 to 1.464, which were within the accepted criteria. Therefore, the regression coefficients could be interpreted without evidence of problematic multicollinearity.

Overall, the findings provide empirical support for the proposition that Good Governance, ESG Implementation, and Carbon Credit Management are important predictors of Financial and Accounting Operational Efficiency in the OEM health and beauty dietary supplement industry. Nevertheless, because the study employed a cross-sectional research design, the regression findings should be interpreted as statistical predictive relationships rather than definitive causal effects.

Table 7. Summary of Hypothesis Testing Results

Research Hypothesis	Statistical Result	Decision
H1: Good Governance has a positive and statistically significant effect on Financial and Accounting Operational Efficiency.	$B = 0.341, p < .001$	Supported
H2: ESG Implementation has a positive and statistically significant effect on Financial and Accounting Operational Efficiency.	$B = 0.458, p < .001$	Supported
H3: Carbon Credit Management has a positive and statistically significant effect on Financial and Accounting Operational Efficiency.	$B = 0.211, p < .001$	Supported
H4: Good Governance, ESG Implementation, and Carbon Credit Management jointly significantly predict Financial and Accounting Operational Efficiency.	$R^2 = 0.778$; Adjusted $R^2 = 0.774$; $F(3, 381) = 247.563, p < .001$	Supported

Note. Statistical significance was determined at the 0.05 level. B = standardized regression coefficient; R^2 = coefficient of determination.

The hypothesis testing results provided empirical support for all four hypotheses. First, Good Governance had a positive and statistically significant effect on Financial and Accounting Operational Efficiency ($\beta = 0.341, p < .001$). Therefore, H1 was supported.

Second, ESG Implementation had the strongest positive effect among the three predictors ($\beta = 0.458, p < .001$). Accordingly, H2 was supported. This finding indicates that ESG-related

practices made the greatest relative contribution to financial and accounting operational efficiency in the regression model.

Third, Carbon Credit Management also had a positive and statistically significant effect on Financial and Accounting Operational Efficiency ($\beta = 0.211$, $p < .001$). Therefore, H3 was supported.

Finally, Good Governance, ESG Implementation, and Carbon Credit Management jointly provided a statistically significant prediction of Financial and Accounting Operational Efficiency, explaining 77.8% of its variance ($R^2 = 0.778$; Adjusted $R^2 = 0.774$). The overall regression model was statistically significant, $F(3, 381) = 247.563$, $p < .001$. Thus, H4 was supported.

Collectively, the findings indicate that Good Governance, ESG Implementation, and Carbon Credit Management operate as complementary organizational mechanisms associated with financial and accounting operational efficiency. Among these factors, ESG Implementation demonstrated the strongest relative predictive contribution, followed by Good Governance and Carbon Credit Management.

Table 8. Ranking of Factors Influencing Financial and Accounting Management Efficiency in the OEM Health Supplement and Beauty Manufacturing Industry in Samut Sakhon Province

Factor	β	Magnitude
ESG	.458	Highest
Good Governance	.341	High
Carbon Credit	.211	Moderate

The multiple regression analysis revealed that Good Governance, Environmental, Social, and Governance (ESG) practices, and Carbon Credit Management each exerted a positive and statistically significant influence on financial and accounting management efficiency in the OEM health supplement and beauty manufacturing industry in Samut Sakhon Province ($p < .05$).

The regression model demonstrated substantial explanatory power, accounting for 77.8% of the variance in financial and accounting management efficiency ($R^2 = 0.778$), while the overall model was statistically significant, as indicated by the F-test ($F = 247.563$, $p < .001$). These results confirm the robustness and predictive validity of the proposed regression model.

Based on the standardized regression coefficients (β), ESG practices emerged as the most influential predictor of financial and accounting management efficiency ($\beta = 0.458$), followed by Good Governance ($\beta = 0.341$) and Carbon Credit Management ($\beta = 0.211$), respectively. This ranking indicates that ESG implementation contributes the greatest explanatory effect among the three determinants examined.

Rank	Predictor	β	Sig.
1	ESG	.458	< .001
2	Good Governance	.341	< .001
3	Carbon Credit Management	.211	< .001

Overall, the findings highlight that the integration of good governance principles, ESG practices, and carbon credit management plays a pivotal role in enhancing financial and accounting management efficiency. The results further suggest that organizations adopting these complementary strategic practices are better positioned to strengthen financial governance, improve operational effectiveness, reinforce organizational accountability and transparency, and promote sustainable business development within the OEM health supplement and beauty manufacturing industry.

Discussion

Discussion of Objective 1. The findings addressing the first research objective revealed that budget management based on good governance principles, Environmental, Social, and Governance (ESG) practices, carbon credit management, and the operational efficiency of financial and accounting practices among OEM health supplement and beauty manufacturing enterprises in Samut Sakhon Province were all implemented at a high level. Among these constructs, good governance–based budget management achieved the highest mean score, followed by ESG practices, financial and accounting operational efficiency, and carbon credit management, respectively. These findings may be attributed to the increasingly competitive global business environment in which OEM manufacturers operate. As noted by firms are required to strengthen corporate governance, ensure transparency in management, comply with regulatory requirements, and adhere to internationally recognized standards such as Good Manufacturing Practice (GMP), Hazard Analysis and Critical Control Points (HACCP), ISO 22716, and the regulations of the Thai Food and Drug Administration (Thai FDA). In addition, growing expectations from international business partners and consumers regarding sustainable business practices, ESG disclosure, and greenhouse gas emission reduction have encouraged firms to enhance the effectiveness of their budgeting, financial management, and accounting systems. These findings are consistent with the perspective of (Akkaranan Ariyasripong, et. al., 2025). who argued that organizations should balance economic, social, and environmental performance to achieve long-term sustainability. They also align with Stakeholder Theory, proposed by Freeman, which posits that organizations must address the expectations of all stakeholder groups in order to achieve sustainable organizational success. Furthermore, the findings are supported by contemporary ESG and corporate governance research demonstrating that organizations with robust governance structures and well-developed sustainability practices generally exhibit superior managerial effectiveness and stronger financial performance than their counterparts.

Discussion of Objective 2. The findings related to the second research objective demonstrated that good governance-based budget management, ESG practices, and carbon credit management were all positively and significantly associated with the operational efficiency of financial and accounting practices among OEM health supplement and beauty manufacturing enterprises in Samut Sakhon Province. Among the governance dimensions, Ethics demonstrated the strongest relationship with financial and accounting operational efficiency ($r = .835$), whereas Participation showed the weakest, although still strong, relationship ($r = .742$). This difference provides an important insight into how governance principles may operate differently within the organizational context of OEM manufacturing enterprises. The particularly strong relationship

between Ethics and financial and accounting operational efficiency may be explained by the highly regulated nature of the health supplement and beauty product industry. Ethical conduct is closely associated with accurate financial reporting, responsible budget utilization, compliance with accounting standards, avoidance of conflicts of interest, and integrity in internal control processes. In OEM enterprises, where product quality, consumer safety, regulatory compliance, and contractual relationships with brand owners are critical, ethical management can directly influence the reliability of financial information and the effectiveness of resource allocation. Consequently, ethical practices may become embedded in routine financial and accounting operations more directly than other governance dimensions.

By contrast, Participation recorded the lowest correlation among the six governance dimensions ($r = .742$). Importantly, this does not indicate that participation is unimportant; rather, it suggests that employee and stakeholder participation may have a less immediate relationship with financial and accounting operational efficiency than ethics, transparency, or accountability. OEM manufacturing enterprises often operate through relatively specialized managerial structures in which budgeting, financial control, accounting, compliance, and risk management are primarily assigned to designated executives and professional personnel. As a result, opportunities for broad-based participation in financial decision-making may be more limited, particularly where decisions require technical accounting knowledge, regulatory expertise, confidentiality, or rapid managerial responses. This finding may also reflect a distinction between participatory governance as a process and financial and accounting efficiency as an operational outcome. Participation may contribute indirectly by improving information sharing, employee engagement, problem identification, and organizational acceptance of decisions, whereas ethical conduct and transparency can influence financial control and reporting more immediately. Thus, the comparatively lower correlation of participation should not be interpreted as evidence of weak governance. Instead, it indicates that different governance mechanisms may contribute to organizational efficiency through different pathways and with different degrees of directness. From the perspective of Stakeholder Theory, this finding is particularly meaningful because effective stakeholder governance requires not only opportunities for stakeholders to participate but also mechanisms that ensure responsible, transparent, and ethical decision-making. In the present context, the relatively high correlation of Ethics and Transparency suggests that OEM enterprises may currently derive greater operational benefits from governance mechanisms that ensure integrity, accountability, and reliable information than from broad participatory mechanisms. Nevertheless, strengthening meaningful participation among employees, managers, business partners, and other relevant stakeholders could provide an additional mechanism for improving organizational learning, risk identification, and sustainability-oriented decision-making. The findings are consistent with the work of (Boonsukkerd, Saksiri, 2022). who argued that organizations creating economic value alongside social and environmental value are more likely to strengthen their competitive advantage. They also corroborate previous studies in Sustainable Finance and Green Accounting, which have reported positive relationships between ESG implementation and financial performance, reporting transparency, stakeholder confidence, and organizational effectiveness. The present findings extend this literature by showing that governance dimensions do not necessarily contribute equally to financial and accounting efficiency. In particular, ethical integrity appears to have a more immediate association with

operational efficiency than participatory mechanisms in the OEM health and beauty manufacturing context.

Discussion of Objective 3. The findings addressing the third research objective indicated that good governance, ESG practices, and carbon credit management each exerted a positive and statistically significant influence on the operational efficiency of financial and accounting practices among OEM health supplement and beauty manufacturing enterprises in Samut Sakhon Province. Among the three predictors, ESG practices emerged as the strongest determinant, followed by good governance and carbon credit management, respectively. This finding can be explained by the comprehensive nature of ESG implementation, which integrates environmental stewardship, social responsibility, and governance quality into organizational management. Such integration enhances budgeting processes, accounting systems, internal control mechanisms, and enterprise risk management, thereby improving overall financial and accounting efficiency. Likewise, carbon credit management facilitates the development of carbon accounting systems, sustainability disclosure, and environmental cost management. These capabilities enable organizations to reduce operational costs, improve resource efficiency, and strengthen their long-term competitive advantage. The present findings are consistent with those reported by (Dongjie, Worapongpat, 2024), who concluded that organizations responding effectively to stakeholder expectations tend to achieve superior organizational performance. They also support the arguments of who emphasized that organizational resources and managerial capabilities constitute strategic assets for achieving sustainable competitive advantage. More broadly, the findings reinforce the principles of sustainable development, highlighting that the integration of good governance, sound budget management, ESG implementation, and carbon credit management provides a comprehensive strategic framework for improving financial and accounting management efficiency while enhancing the long-term competitiveness and sustainability of OEM health supplement and beauty manufacturing enterprises.

Novel Contribution of the Research

This study contributes new knowledge by proposing an integrated framework for enhancing financial and accounting management efficiency within the Original Equipment Manufacturer (OEM) health supplement and beauty manufacturing industry. The findings demonstrate that good governance-based budget management alone is insufficient to sustain organizational competitiveness in the emerging green economy. Instead, organizations must strategically integrate Environmental, Social, and Governance (ESG) practices with carbon credit management to strengthen organizational capabilities and facilitate the transition toward sustainable business operations.

Building upon the empirical findings, this study synthesizes a novel conceptual framework entitled the G-BECS Model (Governance–Budget–ESG–Carbon–Sustainability Model). The model provides a comprehensive management framework that integrates governance, financial management, sustainability practices, and carbon management into a unified strategic approach for organizational development. It comprises the following five interrelated components:

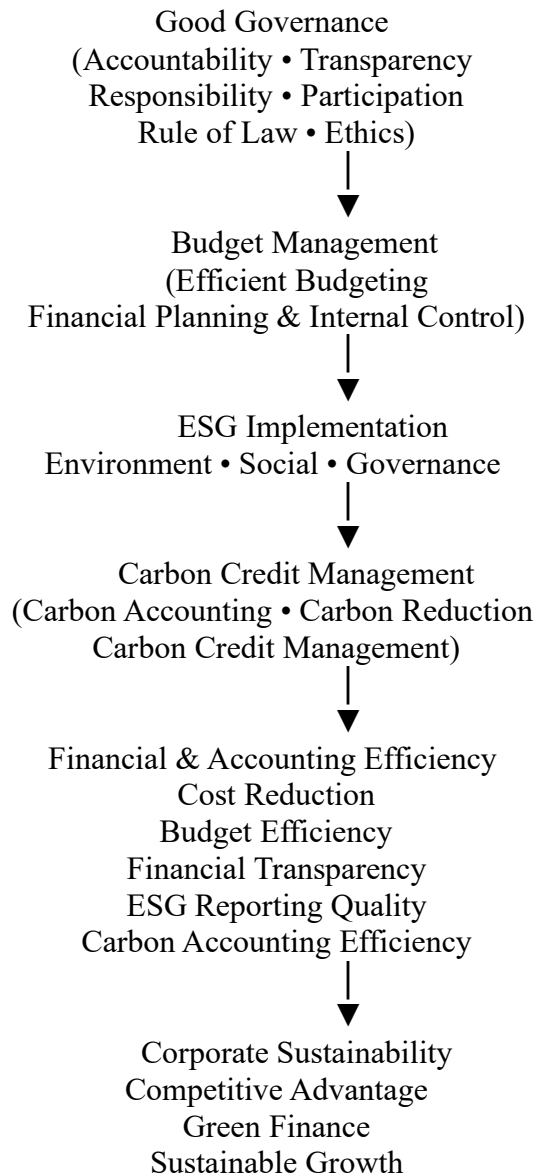


Figure 2. The G-BECS Model: An Integrated Framework for Good Governance–Based Budget Management to Enhance Financial and Accounting Operational Efficiency in the OEM Health Supplement and Beauty Manufacturing Industry within the Local Administrative Areas of Samut Sakhon Province through the Integration of Carbon Credit Management and Environmental, Social, and Governance (ESG) Practices for Sustainable Corporate Governance.

Conclusion

Good Governance-based budget management constitutes a fundamental pillar of effective organizational management, fostering transparency, accountability, sound internal control, and efficient budget administration. When strategically integrated with Environmental, Social, and Governance (ESG) practices and carbon credit management, it substantially enhances the efficiency of financial and accounting management. Such integration contributes to cost reduction, more efficient resource utilization, transparent disclosure of financial and sustainability-related information, and the implementation of carbon accounting systems aligned with international standards. Collectively, these capabilities strengthen organizational competitiveness, improve access to green finance, and support the achievement of long-term corporate sustainability.

Recommendations

1. Policy and Practical Recommendations

OEM health supplement and beauty manufacturing enterprises should strengthen their Good Governance-based budget management systems by promoting transparency, accountability, stakeholder participation, regulatory compliance, and ethical business conduct. These governance practices will enhance the effectiveness of financial and accounting management while reinforcing organizational credibility and stakeholder confidence.

Organizational leaders should integrate Environmental, Social, and Governance (ESG) principles into budgeting systems, internal control mechanisms, and enterprise risk management processes. Such integration will improve resource efficiency, reduce operating costs, enhance the quality of sustainability disclosures, and reinforce long-term organizational resilience.

Organizations should establish comprehensive carbon accounting and carbon credit management systems as integral components of their financial and accounting functions. These systems will facilitate compliance with emerging environmental regulations, support participation in carbon markets, and improve sustainability reporting in accordance with both national and international reporting standards.

Government agencies and relevant regulatory bodies should provide greater institutional support through professional training, capacity-building initiatives, and the development of standardized guidelines for ESG implementation, carbon accounting, and carbon credit management, particularly for small and medium-sized enterprises (SMEs) operating within the OEM manufacturing sector. Such support would enhance international competitiveness and facilitate the transition toward a low-carbon economy.

2. Recommendations for Future Research

Future studies should investigate additional determinants of financial and accounting management efficiency, including Digital Transformation, Artificial Intelligence (AI), Big Data Analytics, Enterprise Resource Planning (ERP) systems, and Sustainable Supply Chain Management (SSCM). Examining these emerging organizational capabilities may provide a more comprehensive understanding of the factors driving sustainable organizational performance.

Future research should also expand the geographical scope to include other major manufacturing provinces in Thailand or conduct comparative analyses across different manufacturing industries. Such studies would enhance the external validity and generalizability of the findings across diverse industrial contexts.

Researchers are encouraged to employ Mixed Methods Research by combining quantitative analysis with in-depth interviews involving executives, industry experts, and policymakers. This methodological approach would generate richer insights into the critical success factors, implementation challenges, and strategic pathways for advancing sustainable organizational management.

Finally, future studies should extend the proposed research framework by incorporating mediating and moderating variables, such as organizational innovation, organizational culture, dynamic capabilities, and digital readiness. Moreover, the application of Structural Equation Modeling (SEM) is recommended to examine the complex causal relationships among governance, sustainability practices, carbon management, and organizational performance with greater precision and theoretical rigor.

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