STRATEGIC COST MANAGEMENT AND SUSTAINABLE VALUE CREATION: A STRUCTURAL EQUATION MODELING APPROACH

Abstract

Strategic Cost Management (SCM) has evolved as a critical mechanism for aligning cost systems with long-term organizational strategy and sustainability objectives. This study empirically examines the relationship between strategic cost management practices and sustainable value creation using Structural Equation Modeling (SEM). A structured questionnaire was administered to 128 finance and cost professionals across manufacturing and service sectors. The study conceptualizes SCM as a multidimensional construct comprising target costing, activity-based costing, life-cycle costing, sustainability cost tracking, and digital cost analytics. Sustainable value creation is measured through financial resilience, environmental performance, and stakeholder value. The SEM results indicate a strong positive and statistically significant relationship between SCM and sustainable value creation ($\beta = 0.71$, $p < 0.001$). Model fit indices confirm the robustness of the proposed framework. The findings reinforce the strategic role of management accountants in integrating sustainability metrics within cost architecture to enhance long-term competitive advantage.

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Introduction

The contemporary business environment is characterized by volatility, regulatory pressures, and increasing stakeholder scrutiny regarding sustainability practices. Organizations are no longer evaluated solely on financial profitability but on their ability to create sustainable value encompassing economic, environmental, and social dimensions.

Strategic Cost Management (SCM) extends beyond traditional cost accounting by aligning cost structures with competitive strategy and long-term value creation. With the emergence of ESG frameworks and integrated reporting, cost systems must incorporate sustainability-related expenditures and performance metrics.

Despite growing recognition of SCM's importance, empirical validation of its influence on sustainable value creation remains limited. This study addresses this gap using Structural Equation Modeling (SEM) to test a comprehensive conceptual model.

Review of Literature

Strategic Cost Management (SCM) was

introduced as a framework linking cost information with competitive strategy ***Shank & Govindarajan, (1993). Porter (1985)*** emphasized cost leadership as a core strategic positioning approach, arguing that firms achieving lower relative costs gain sustainable competitive advantage. SCM extends this view by embedding cost analysis within the broader value chain, ensuring alignment between cost drivers and strategic objectives.

Kaplan and Cooper (1998) advanced the evolution of cost systems through Activity-Based Costing (ABC), emphasizing more accurate allocation of overheads and identification of non-value-adding activities. ABC improved decision relevance by tracing costs to activities rather than departments, thereby enhancing managerial visibility. Life-cycle costing further broadened cost analysis by incorporating costs incurred during product design, production, distribution, usage, and disposal. This life-cycle perspective aligned cost management with long-term profitability rather than short-term accounting efficiency.

The emergence of sustainability concerns significantly reshaped management accounting literature. ***Burritt and Schaltegger (2010)*** highlighted the role of sustainability accounting in integrating environmental and social costs into organizational decision-making processes. Environmental management accounting developed as a response to increasing regulatory pressures and stakeholder expectations. By identifying environmental expenditures such as waste treatment, carbon emissions, and compliance costs, firms could make more informed sustainability-oriented decisions.

The ***Resource-Based View (RBV)*** provides an additional theoretical lens to understand SCM's strategic importance. According to RBV, sustainable competitive advantage derives from valuable and inimitable organizational capabilities. Integrated cost analytics systems, digital dashboards, and sustainability monitoring frameworks constitute strategic capabilities that enhance adaptability and decision-making effectiveness. When cost systems are digitally integrated and strategically aligned, they become sources of competitive differentiation.

Institutional theory further explains the growing adoption of sustainability-oriented cost systems. Organizations operate within regulatory, normative, and cultural environments that exert pressure for responsible practices. As global reporting standards evolve, firms adopt sustainability cost frameworks not only for efficiency but also for legitimacy and stakeholder confidence.

Digital transformation has accelerated the evolution of cost management. Real-time data integration through ERP systems, cloud platforms, and advanced analytics tools has enhanced cost transparency. Digital cost analytics enables predictive modeling, scenario simulation, and sensitivity analysis, transforming cost management into a forward-looking strategic function.

Despite these developments, empirical research examining the direct relationship between SCM and sustainable value creation remains limited. Many studies rely on descriptive approaches or simple regression models that do not account for measurement error or multidimensional constructs. Sustainable value creation itself is a composite outcome encompassing financial resilience, environmental stewardship, and stakeholder satisfaction. Similarly, SCM consists of multiple interrelated practices, including target costing, ABC, life-cycle costing, sustainability cost tracking, and digital analytics.

Structural Equation Modeling (SEM) provides a more rigorous analytical approach by simultaneously evaluating measurement reliability and structural relationships among latent constructs. SEM enables researchers to test complex models that reflect the multidimensional nature of strategic cost systems and sustainability outcomes. Furthermore, ***contemporary literature*** emphasizes the evolving role of management accountants. Rather than functioning solely as cost controllers, modern CMAs act as strategic advisors contributing to sustainability strategy, risk assessment, and long-term value creation.

In summary, the literature indicates a conceptual linkage between strategic cost management and sustainable performance. However, there remains a need for empirical validation using

advanced modeling techniques that capture the multidimensional nature of both constructs. The present study addresses this gap by employing SEM to examine the structural relationship between SCM practices and sustainable value creation.

Conceptual Framework and Hypotheses

Strategic Cost Management (SCM) is measured by:

- Target Costing (TC)
- Activity-Based Costing (ABC)
- Life-Cycle Costing (LCC)
- Sustainability Cost Tracking (SCT)
- Digital Cost Analytics (DCA)

Sustainable Value Creation (SVC) is measured by:

- Financial Sustainability (FS)
- Environmental Performance (EP)
- Stakeholder Value (SV)

Hypothesis

H1: Strategic Cost Management positively influences Sustainable Value Creation.

Research Methodology

This study adopts a quantitative research design to empirically examine the relationship between Strategic Cost Management (SCM) and Sustainable Value Creation (SVC). The empirical investigation is based on 128 valid responses collected from finance managers, Certified Management Accountants (CMAs), and senior accounting professionals working across manufacturing and service industries. Respondents were selected based on their direct involvement in cost management, budgeting, sustainability reporting, or strategic decision-making functions, ensuring informed responses and content validity.

Although the final sample comprised 128 valid responses, the sample size was considered adequate for the purposes of this study. The proposed SEM model is relatively ungenerous, consisting of two latent constructs, eight observed indicators, and a single structural relationship. According to Hair et al. (2019) sample adequacy in SEM depends not only on the number of observations but also on model complexity, indicator reliability, and factor loadings. The sample exceeds the commonly recommended minimum threshold of 100 observations for models of moderate complexity and satisfies the respondent-to-parameter ratio suggested in SEM literature. Furthermore, the satisfactory model fit indices, reliability coefficients, and validity measures provide additional evidence that the sample size was sufficient to generate stable and meaningful parameter estimates.

Data were collected using a structured questionnaire developed from established literature on strategic cost management and sustainability performance. The instrument consisted of two primary latent constructs: Strategic Cost Management (SCM) and Sustainable Value Creation (SVC). SCM was operationalized through multiple dimensions, and SVC was measured through financial sustainability, environmental performance, and stakeholder value indicators.

A five-point Likert scale (1 = strongly disagree; 5 = strongly agree) was employed to measure respondents' attitudes, perceptions, and levels of agreement with various statements. The Likert scale enables the quantification of subjective perceptions into measurable data suitable for multivariate statistical analysis.

To test the hypothesized relationships, Structural Equation Modeling (SEM) using an AMOS-based analytical framework was applied. SEM is particularly appropriate for this study as it allows simultaneous estimation of measurement and structural models while accounting for measurement error in latent constructs. The measurement model was first assessed to evaluate construct reliability and validity using indicators such as Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE). Convergent and discriminant validity were examined to ensure construct distinctiveness.

Subsequently, the structural model was estimated to test the hypothesized causal relationship between SCM and SVC. Model fit was evaluated using multiple goodness-of-fit indices, including Chi-square/df ratio, Comparative Fit Index (CFI),

Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). These indices provide comprehensive evidence regarding the adequacy and robustness of the structural model.

Measurement Model Assessment

(i) Reliability Analysis

Construct	*Cronbach's Alpha*	*Composite Reliability*
SCM	0.91	0.93
SVC	0.88	0.90

Values exceed the acceptable threshold of 0.70, confirming internal consistency.

(ii) Convergent Validity

Construct	*AVE*
SCM	0.64
SVC	0.61

AVE > 0.50 which indicates adequate convergent validity.

(iii) Discriminant Validity

The square root of AVE for each construct exceeded inter-construct correlations, confirming discriminant validity.

Structural Model Results

(i) Model Fit Indices

Index	*Value*	*Recommended Threshold*
χ^2/df	2.11	< 3.00
CFI	0.94	> 0.90
TLI	0.92	> 0.90
RMSEA	0.067	< 0.08
GFI	0.91	> 0.90

The model demonstrates good fit.

(ii) Path Coefficient

SCM → SVC

β = 0.71

t-value = 8.94

p < 0.001

The hypothesis is strongly supported.

R^2 for Sustainable Value Creation = 0.50. Therefore, SCM explains 50% of variance in SVC.

Findings of the Study

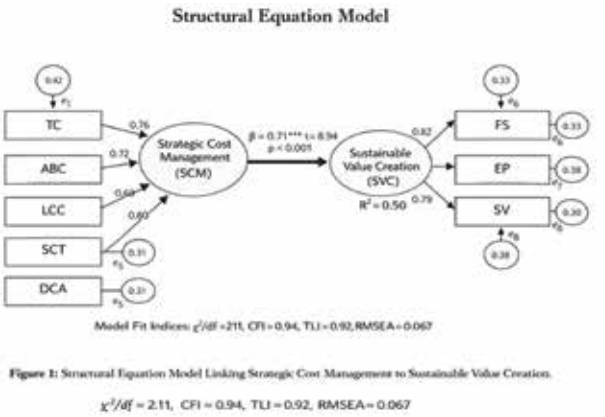

Figure 1: Structural Equation Model Linking Strategic Cost Management to Sustainable Value Creation.

$\chi^2/df = 2.11$, CFI = 0.94, TLI = 0.92, RMSEA = 0.067

The Structural Equation Modeling (SEM) results provide strong empirical support for the hypothesized relationship between Strategic Cost Management (SCM) and Sustainable Value Creation (SVC). The structural path coefficient from SCM to SVC is positive and statistically significant ($\beta = 0.71$, $p < 0.001$), indicating a substantial and meaningful effect. This coefficient suggests that improvements in strategic cost management practices are associated with significant enhancements in sustainable value outcomes. The magnitude of the standardized coefficient (0.71) reflects a strong effect size, demonstrating that SCM is a major explanatory driver of sustainable value creation within the proposed model.

The coefficient of determination ($R^2 = 0.50$) for Sustainable Value Creation indicates that approximately 50% of the variance in SVC is explained by Strategic Cost Management. This level of explanatory power is considered substantial in behavioural and management research, reinforcing the strategic importance of cost architecture in shaping long-term organizational outcomes.

Within the measurement model, SCM was conceptualized as a multidimensional latent construct reflected by five key indicators: target costing (TC), activity-based costing (ABC), life-cycle costing (LCC), sustainability cost tracking (SCT), and digital cost analytics (DCA). The findings indicate that traditional cost techniques alone may not be sufficient; rather, integration with sustainability monitoring and digital intelligence

strengthens strategic impact.

Sustainable Value Creation (SVC) was modeled as an endogenous latent construct measured through financial sustainability (FS), environmental performance (EP), and stakeholder value (SV). The strong loadings of these indicators confirm that sustainable value creation is inherently multidimensional, extending beyond profitability to include environmental stewardship and stakeholder trust.

The results are consistent with stakeholder theory, which suggests that organizations create long-term value by addressing the interests of multiple stakeholders rather than focusing solely on shareholders. By integrating sustainability metrics within cost systems, organizations enhance transparency, accountability, and strategic alignment. The empirical validation supports the theoretical proposition that cost systems function not merely as administrative accounting tools but as strategic enablers that influence sustainable competitive positioning.

Overall, the structural model confirms that organizations adopting integrated, sustainability-oriented, and digitally enabled cost management practices are better positioned to achieve long-term financial resilience, environmental responsibility, and stakeholder value.

Managerial Implications

- CMAs should integrate ESG metrics into cost architecture.
- Firms should adopt digital cost dashboards for predictive analysis.
- Strategic budgeting must incorporate life-cycle environmental costs.
- Sustainability reporting should align with cost accounting systems.
- Management accountants should function as sustainability strategists.

Limitations and Future Research

Some of the limitations of the study are:

- Cross-sectional design, which restricts the ability to establish causality overtime.
- Although the sample size of 128 respondents was adequate, a larger sample would enhance the generalizability of the findings.
- The study relied on self-reported perceptions, which may be subject to respondent bias.

Future studies may adopt longitudinal SEM or multi-group analysis across industries.

Conclusion

This study empirically establishes that Strategic Cost Management significantly drives sustainable value creation. The SEM analysis confirms a strong and positive relationship between SCM practices and sustainability outcomes. Organizations that strategically integrate cost systems with sustainability objectives enhance financial stability, environmental accountability, and stakeholder trust.

The evolving role of the CMA is pivotal in this transformation. Strategic cost management emerges not merely as a financial discipline but as a cornerstone of sustainable competitive advantage. MA

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