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Strategic integration of management accounting practices into ESG risk and reporting: Evidence from Malaysia

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Abstract

This research examines the use of management accounting practices (MAPs) by Malaysian corporations to incorporate Environmental, Social, and Governance (ESG) considerations in strategic planning and reporting. It evaluates the extent to which MAPs enhance ESG disclosures, internal risk management, and organizational legitimacy. The research design employs a mixed-methods approach, grounded in stakeholder theory and the institutional theory of legitimacy. ESG-active firms were interviewed through semi-structured interviews, and a nationwide survey was conducted among finance professionals in publicly listed companies. The results indicate that MAPs such as sustainability cost accounting, carbon budgeting, risk-based performance systems, and internal ESG dashboards improve the quality of external ESG reporting and internal controls over non-financial risks. These practices assist corporations in anticipating material ESG risks, aligning decision-making with stakeholder expectations, and facilitating integrated risk governance. However, challenges such as limited ESG information, knowledge gaps, and weak connectivity with traditional accounting systems hinder implementation, especially among medium-sized enterprises. This study can be valuable to corporate managers, regulators, and policymakers by highlighting opportunities to utilize MAPs for enhancing ESG governance and reporting. It also emphasizes the need for capacity-building programs and system integration to overcome current barriers and promote more sustainable corporate practices. The study concludes that management accounting practices are vital mechanisms for integrating ESG into corporate strategy and governance. Proper utilization of these practices can significantly improve ESG-related performance in Malaysian corporations, although organizational barriers remain a concern.

Keywords: Carbon Budgeting, Environmental, ESG Reporting, ESG Risk, Governance (ESG), Management accounting practices (MAPs), Social.

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1. Introduction

In an increasingly interconnected and transparent global economy, the imperative for businesses to integrate Environmental, Social, and Governance (ESG) considerations into their core operations has never been more pressing [1]. This imperative is driven by a confluence of factors, including stringent regulatory frameworks, growing demand from institutional and retail investors for sustainable portfolios, heightened consumer awareness, and the undeniable impact of corporate reputation on long-term viability [2]. ESG factors represent a spectrum of non-financial risks and opportunities that can profoundly influence a company's financial performance and societal license to operate. Environmental risks may include climate change [3]. Resource depletion and pollution social risks encompass labour practices, human rights, diversity, and community engagement, while governance risks involve board structure, executive compensation, business ethics, and transparency [4]. Effective navigation of these complexities requires sophisticated mechanisms for risk identification, assessment, and robust reporting [5].

This study is framed within the context of Malaysian corporations, and the journey toward comprehensive ESG integration is particularly critical. National ambitions for sustainable development, coupled with initiatives from key regulators such as Bursa Malaysia's enhanced sustainability reporting requirements and Bank Negara Malaysia's frameworks for managing climate-related financial risk [6]. Signify a clear strategic direction. These developments compel Malaysian businesses to transcend traditional financial reporting and embrace a holistic view of performance that incorporates its impact on people and the planet [7]. This shift is not merely about compliance but also about fostering long-term resilience, attracting sustainable investment, and building stakeholder trust in a rapidly evolving global marketplace [8].

However, management accounting emerges as a crucial yet often underestimated discipline. Traditionally focused on providing internal financial and non-financial information to managers for decision-making, planning, and control, management accounting possesses inherent tools and analytical capabilities to bridge the gap between abstract ESG goals and concrete operational realities [9].

It can play a fundamental role in that it allows systematic identification of ESG risks based on internal data collection and analysis, the quantitative and qualitative assessment of these risks based on their materiality and the possible consequences of these risks, and the creation of effective internal reporting systems feeding both external disclosures and business planning [10]. The first and probably the most important measure in dealing with ESG risks is proper identification and evaluation. Management accounting practices can offer the supporting infrastructure and analytical skills needed to make this process, and they can go beyond anecdotal observations to data-driven insights [11]. To identify ESG risks, management accountants, who have profound knowledge of operational processes and cost structures, can be particularly well-suited to identifying ESG risks throughout the value chain [12]. The concepts of Activity-Based Costing (ABC) and Environmental Management Accounting (EMA) are used to track and examine the costs of pollution, waste, energy use, and social projects, and to expose the hidden effects and material risks [13]. Carbon risk exposure is directly informed by carbon accounting and footprint, which is an organized measure of greenhouse gas emissions. Moreover, the implementation of ESG criteria in supplier risk assessments expands supply chain identification [14]. Participation in materiality assessments allows the prioritization of important ESG issues by analyzing their financial impact. Upon identification, ESG risks should be evaluated in terms of their possible damage and probability. Both quantitative and qualitative evaluations can be conducted using management accounting [15].

An example of quantitative risk modeling is the ability to estimate the financial costs of climate-related disruptions or ethical violations, which is commonly done through a cost-benefit analysis of sustainable investments [16]. ESG-specific Key Performance Indicators (KPIs) can be developed and monitored over time and included in Balanced Scorecards to allow constant monitoring and evaluation of risk exposure, offering an integrated perspective, including both financial and non-financial performance [17]. In addition, a management accountant can help develop and oversee internal control systems to reduce ESG risks and guarantee data integrity and compliance [18].

Therefore, the last phase of the ESG risk-management cycle is efficient reporting, both internally and externally, to support strategic decisions and inform stakeholders. Management accounting practices are essential in ensuring that such reports are accurate and complete and that they are useful [19]. Internally, management accountants create customized performance reports, which provide managers with relevant information on ESG performance and risk exposure to help them make proactive decisions and be accountable [20]. They are important in the process of incorporating ESG risks into the Enterprise Risk Management (ERM) framework through the translation of ESG risks into financial and probability terms and a consistent and comprehensive assessment of the company’s risk profile [21]. In the case of external sustainability reporting, management accountants will provide detailed data, sound measurement techniques, and an assurance mechanism that legitimizes and organizes non-financial data that need to be disclosed publicly, which adds credence to the information [22]. There are also great opportunities and challenges in the Malaysian corporate setting to integrate management accounting into managing and reporting ESG risks [23].

This regulatory pressure through organizations such as Bursa Malaysia is directly stimulating companies to develop internal ESG processes, and management accountants are important allies in achieving compliance [24]. Whereas larger companies might have specialized departments, numerous Small and Medium Enterprises (SMEs) can overly depend on their current finance and accounting operations to provide ESG data and risk management, which explains the necessity of capacity development and specific talent building in such fields as carbon accounting and integrated reporting [25]. Utilizing innovative digital technologies, including analytics, artificial intelligence, and blockchain, has the potential to enhance data gathering, risk modeling, and reporting integrity in ESG, enabling Malaysian companies to streamline operations and improve the accuracy of the process [26]. Management accounting has not only been relegated to the use of

conventional financial measures but has also become a powerful ally in managing the intricacies of ESG risks, making Malaysian corporations more resilient, able to satisfy the needs of stakeholders, and ensuring a sustainable future in a world that has become increasingly focused on purpose [27].

2. Literature Review

In the modern business environment, where the situation changes quickly, firms must consider their financial performance, their roles, and duties to stakeholders, the environment, and society in general [28]. Such an increased focus on nonfinancial performance is widely known as Environmental, Social, and Governance (ESG), a concept that measures the long-term sustainability and financial stability of a given company [29]. The environmental aspect concerns saving resources, minimizing emissions, saving energy, and reducing waste [30]. The social aspect evaluates the ties of companies to their stakeholders, namely, the workers, suppliers, and the community, respecting human rights and equity. The governance aspect is related to fairness, involvement of shareholders, financial procedures, and practices aimed at preventing fraud or misconduct [31]. This increased focus is representative of stakeholders' perception that ESG performance is an indicator of a company's ability to generate long-term shareholder value by managing financial and operational risks [32]. Regulators and standard-setting organizations, particularly in Malaysia, request that businesses report not only their ESG performance but also their financial metrics [33]. This policy shift is evidence of the growing realization that the financial future of businesses is tightly linked to their ability to manage their non-financial commitments effectively [34]. Management accounting practices enable organizations to identify, quantify, examine, and regulate financial and non-financial data related to their operations [4]. This makes them useful in the procedure of integrating ESG standards into business judgment, as well as in the assessment of risks and opportunities related to them [35]. Management accounting practices in Malaysian firms are essential for maintaining quality ESG reporting, developing stakeholder relationships, and maximizing financial performance [36].

2.1. The Role of Management Accounting Practices in ESG

Management accounting practices enable companies to comprehend, track, and control the financial impacts that may arise from ESG-related risks [37]. Activity-based costing, enterprise risk management, and key performance indicators are methods that could assist companies in integrating ESG requirements into their practices and controls [38]. This strategy will help companies address the risks that can be encountered, avoid fines, maximize financial and nonfinancial returns that can be received with good ESG performance, and achieve sustainable financial growth [39]. Moreover, management accounting can be used to translate ESG data into financial terms and relate them to financial performance metrics [40]. It encompasses the introduction of non-financial measures and the combination of the latter with the existing financial ones, forming composite indicators, including the Sustainability Scorecard, and scenario analysis to assess financial implications under different scenarios [41]. Markedly, such a comprehensive approach allows companies to make more informed financial decisions that reflect both financial and ESG-related standards. Many companies, especially those listed in Bursa Malaysia [42]. Integrating such practices due to the rising demand from investors and the Main Market Listing Requirements (Paragraph 29, Part A) of Bursa Malaysia [43]. The Exchange explicitly urges firms to disclose their financial and non-financial performance, as well as to disclose their Sustainability Statements in annual reports. The policy establishes an effective framework in which Malaysian firms can carry out their ESG risk identification and assessment processes [44].

Enhanced disclosure and accountability enable stakeholders to make more accurate decisions about the financial wellness of a company and its sustainability in the long term [45]. Transparent ESG reports will assist regulators, investors, and stakeholders in determining whether companies are taking the right steps toward their ESG responsibilities, and quality disclosure helps build trust and loyalty among stakeholders [46]. Management accounting provides trust and completeness of ESG disclosure by validating information, certifying controls, and strengthening internal processes [47]. This can assist businesses in presenting credible reports and, therefore, reduce information asymmetry as well as raise the financial credibility of the businesses [48]. Discipline controls help identify material issues and provide appropriate data-capturing mechanisms [49]. Some examples of best-practice ESG disclosure include the Malaysian companies listed in the FTSE4Good Index by Bursa Malaysia and the Malaysian Investor Relations Association [50]. These firms ensure that their reports are aligned with the Global Reporting Initiative requirements, that forward-looking measures are high, and that they employ proper controls and independent audits to assure stakeholders of the credibility of their reports [51]. This makes them financially stronger and more viable in a growing, sustainable investment climate.

2.2. ESG Risk Identification

Management accounting practices enable businesses to comprehend, track, and control the financial impact of ESG-related risks [52]. Activity-based costing, enterprise risk management, and key performance indicators are methods that can assist companies in integrating ESG requirements into their practices and controls [53]. This strategy can help companies manage the risks that might emerge, avoid fines, maximize both financial and non-financial returns that can be obtained with good ESG performance, and guarantee sustainable financial performance.

Moreover, management accounting transforms ESG data into financial terms and links them with financial performance indicators [54]. This involves the introduction of non-financial metrics and their combination with traditional financial metrics, the development of composite indicators, including a Sustainability Scorecard, and scenario analysis to assess the financial impact in different scenarios [55]. Interestingly, such a holistic approach enables companies to make more informed financial decisions that consider both financial and ESG-related criteria. Many companies integrate these

practices, especially the public-listed companies (PLCs) listed on Bursa Malaysia [56]. As more investors are demanding it and because of the Main Market Listing Requirements [57]. The Exchange makes it clear that it wants companies to disclose their non-financial and financial performance and Sustainability Statements in annual reports. This policy provides an effective framework for Malaysian firms to conduct their ESG risk identification and assessment [58].

ESG risk assessment frameworks assist companies in structuring their evaluation processes. Such mechanisms help companies examine their vulnerability to non-financial and financial risks resulting from their operations. Reporting standards, such as Integrated Reporting, are integral to these frameworks [59]. The Sustainable Reporting Guidelines by Bursa Malaysia may help companies to structure their ESG risk evaluation and management accounting to convert qualitative and quantitative information into financial data, utilizing an evaluation such as Net Present Value [24]. Return-on-Investment [28]. The exercise assists businesses in determining the financial significance of their ESG risks and in making better decisions. In addition, companies will have a chance to conduct stress tests and understand how they will be able to sustain themselves financially in different scenarios [60]. Other Malaysian corporations, including Petronas, Maybank, and Sime Darby, have been able to integrate ESG risk assessments into their financial activities [61]. Petronas has enterprise-risk management that considers climate-related financial impacts; Maybank analyzes its portfolio in terms of climate-risk exposure, and Sime Darby also includes supplier-risk data to determine human rights and labor practice exposure [62]. Case studies show that management accounting is progressively becoming an important tool in the improvement of financial stability and credibility in Malaysian firms [63].

Malaysian businesses face several challenges in implementing ESG standards in their management accounting [64]. Among them, there is a lack of standard measures, inadequate data, resistance to change, and a lack of experience or training in nonfinancial accounting. Financial constraints, competing demands, and a lack of knowledge regarding the informational requirements of stakeholders also contribute to the implementation challenges [64]. In addition, the rapidly evolving regulations and codes regarding ESG increase their complexity, and compliance-intensive Malaysian firms may not be capable of keeping up with the rate of policies and harmonizing their reports [65]. In addition, internal stakeholders may resist ESG practices because they believe that such practices will incur additional costs without any visible financial returns in the short run [66].

Management accounting can also be integrated with enterprise risk management, financial control, and strategic decision-making [67]. An increasing amount of big data, artificial intelligence (AI), and enterprise-wide information systems will enable firms to monitor, measure, and manage their ESG performance in real-time [68]. Furthermore, proactive actions, scenario analysis, and stress tests are becoming increasingly important, enabling firms to learn how well prepared they are for future shocks associated with ESG [69]. Such a gradual transition means that in the future, financial and non-financial information will be fully integrated, and businesses will be able to optimize their financial performance without jeopardizing their responsibilities to stakeholders, the environment, and society in general [70]. This model will assist companies in growing sustainably, responsibly, and resiliently, and in strengthening their financial credibility, competitiveness, and long-term sustainability [71].

2.3. ESG Reporting

Petronas, the state-owned oil and gas company in Malaysia, has incorporated carbon budgeting into its enterprise risk management (ERM). As an example, Petronas uses carbon budgeting to distribute emission targets to its upstream, midstream, and downstream activities. A carbon budget is set per business unit, per year, in metric tons of CO2 equivalent, and is tied to operational costs. Through management accounting techniques such as activity-based costing (ABC), Petronas monitors emissions produced by specific activities (e.g., drilling or refining) and attaches costs to them based on carbon pricing schemes (e.g., internal carbon pricing at 30 dollars per ton of CO2). This enables Petronas to track high-emission activities, make more investments in cleaner technologies (e.g., carbon capture and storage), and report on progress in its Sustainability Report, which aligns with the reporting requirements of Bursa Malaysia and the standards of the Global Reporting Initiative (GRI).

This practice has helped Petronas achieve a 10 percent reduction in Scope 1 and Scope 2 emissions over a five-year period (as indicated in its 2023 Sustainability Report), in addition to enhancing cost efficiency as capital is shifted towards low-carbon ventures. It boosts stakeholder trust by demonstrating that it is making objective progress toward Malaysia's net-zero emissions target of 2050.

Maybank is one of the largest banks in Malaysia that applies sustainability cost accounting to measure the environmental and social risks in its loan books. An example is Maybank, which uses environmental management accounting (EMA) to determine the cost of funding projects in risky industries such as palm oil or coal. It computes environmental compliance lifecycle costs (e.g., wastewater treatment of palm oil mills) and social costs (e.g., community resettlement programs). Maybank is able to price risk premiums on projects with high ESG risks into its loan approval process, so that lending decision-making aligns with its ESG Policy Framework. Additionally, Maybank has implemented ABC to assign the costs of its sustainability activities, including green financing programs, which facilitated RM 10 billion of sustainable loans in 2024, according to its annual report.

This practice has strengthened Maybank in terms of risk management by enabling early detection of high-risk borrowers and reducing non-performing loans associated with ESG concerns by 15 percent within three years. It also enhances external ESG reporting by providing clear data on the financial impact of sustainable lending, thereby satisfying investor interest in accountability.

3. Methodology

The study objectives were preliminarily collected through surveys of various enterprises in Malaysia, not considering multinational corporations and well-known Malaysian organizations in the year 2024 of the fiscal year. SPSS statistical software was used to analyze the data collected. The quantitative data were collected using a self-administered questionnaire, where the employees had to evaluate their degree of agreement on a 5-point Likert scale ([5] strongly agree, [4] agree, [3] neutral, [2] disagree, [1] strongly disagree).

A Cronbach's Alpha of 0.6 is considered acceptable in early exploratory studies, and the higher it is, the more reliable the scale. A scale must have a Total Correlation value of 0.3 or more for it to be deemed successful, and the quality of the observed variables is enhanced through the Corrected Item-Total Correlation coefficient. Standard deviation is used to assess the variability of the dataset relative to the mean. In hypothesis testing, a t-test compares the means of one or two populations, and factor analysis includes the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, Bartlett's test of sphericity, and eigenvalue analysis to verify the relationships among the sub-elements in the research model and the model's validity.

3.1. Population, Sampling, Data Collection Procedures and Rationale

The business entities selected were categorized under the FDI type in 2025 Malaysian firms. In this study, Malaysian and foreign-invested companies were examined in key areas, such as Northern, Central, and Southern Malaysia, and the adjoining states. A non-probability sampling technique was used, whereby a class sample was adopted to reflect the different types of investors in Malaysia. The respondents' demographic parameters, including gender, education, and occupation, were considered to evaluate the quality of the sample. This was achieved by calibrating the total sample size with a 5 percent margin of error and a 95 percent confidence level. Statistical Package for Social Sciences (SPSS) was used to analyze the data. Reliability tests were conducted in this study.

3.2. Research Design

The research design comprises a single primary dependent variable and one independent variable that constitute the research design. It supports the analysis of the relationship between ESG reporting and its driving factors, such as environmental, social, and corporate governance components in practice.

4. Analysis of Data and Results

4.1. Cronbach Alpha Testing

The research continues to test its data through the reliability of the eight research variables that demonstrate the correlation between ESG reporting, management accounting, and its consequences for business performance at a higher level. In the references for Tables 4.02 and 5.02, the data values are 0.735 and 0.867, respectively. The variables of the study in this module were reliable in further stages of research.

4.1.1. Cronbach Alpha Testing for Independent Variables

Table 1 presents the case processing summary for the dataset used in this study. Of the 116 cases (100 percent), most 103 cases (88.8 percent) were considered valid and thus included in the analysis, whereas 13 cases (11.2 percent) were not. The cases may be excluded because of missing values, incomplete answers, or data entry mistakes, a frequent event in empirical research that uses surveys or field data. The percentage of valid cases (almost nine in every ten observations) demonstrates that the dataset is strong enough to be analyzed, as the percentage of missing or eliminated data lies at an acceptable level. In methodological terms, a rate of exclusion less than 15 percent is usually deemed manageable and such exclusions are unlikely to affect the reliability or generalizability of findings.

However, the fact that there are excluded cases is indicative of the significance of quality checks of data and pre-analysis screening. It also implies that future studies should consider more strategies, such as data imputation or sensitivity analysis, to reduce information loss and ensure that the results are not skewed by the exclusion of cases.

Table 1.
Case Processing Summary.

		N	%
Cases	Valid	103	88.8
	Excluded	13	11.2
	Total	116	100.0

Source: Analysis Result,2025.

The Table 2 shows the reliability test results with Cronbach's alpha in the scale items used in the study. The analysis presents a Cronbach's Alpha of 0.742 in 8 items. Nunnally and Bernstein [72] posit that a reliability coefficient of 0.70 and higher is usually deemed acceptable in research, especially in the social sciences. The value derived shows that the instrument has good internal consistency, i.e., the items have enough correlation and measure the same underlying construct. Although the coefficient is not very high (e.g., >0.80), it also indicates a stable scale that could be used with certainty in further analysis.

Table 2.
Reliability Statistics.

Cronbach's Alpha	N of Items
0.742	8

Source: Analysis Result,2025.

Table 3 gives the item-total statistics of the scale, which show the contribution of the items to overall reliability. The adjusted item-total correlations have values between 0.38481 (H0132) and 0.505 (H0131). There is no item that is weakly correlated with the construct being measured, as all values are greater than the generally accepted threshold of 0.30, and the correlation between each item and the overall scale is therefore satisfactory.

The column Cronbach's Alpha, when an item is deleted, indicates that removing any item will not significantly affect the total alpha (0.742). For example, removing H0122 would slightly increase the reliability to 0.69791, and removing H0132 would decrease it to 0.72518. These differences are insignificant, which means that each item makes a significant contribution to the internal consistency of the scale.

The mean and variance of the scale when an item is deleted are also constant across all items, indicating that the deletion of any item would not have a significant effect on the construct being measured.

Table 3.
Item-Total Statistics.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H0111	24.724396	9.16777	0.42319	0.71912
H0113	24.765604	9.64651	0.45147	0.71104
H0115	24.827416	9.494	0.44541	0.71205
H0122	24.827416	9.1405	0.50298	0.69791
H0123	24.940839	8.87992	0.47167	0.707
H0131	24.631678	9.69701	0.505	0.70094
H0132	24.734698	10.12626	0.38481	0.72518

Source: Analysis Result,2025.

4.1.2. Cronbach Alpha Testing for Dependent Variables

The dataset has its case processing summary as shown in Table 4. The total number of cases was 116, with 103 cases (88.8 percent) included in the analysis and 13 cases (11.2 percent) excluded due to missing or incomplete responses. The high percentage of valid cases indicates that the dataset is sufficiently reliable for statistical analysis, as the exclusion rate is not excessively high and aligns with acceptable research standards. The reliability statistics of the measurement instrument are shown in Table 5. The findings show a Cronbach's Alpha of 0.875 in 8 items, which is well above the generally accepted value of 0.70. It is a strong indicator of internal consistency, indicating that items are highly related to each other and measure the same construct. Collectively, the outcomes demonstrate high data quality with few exclusions and the reliability of the research instrument, which ensures the trustworthiness of results obtained after further analyses are conducted.

Table 4.
Case Processing Summary

		N	%
Cases	Valid	103	88.8
	Excluded	13	11.2
	Total	116	100.0

Table 5 shows the reliability analysis of the measurement scale. The resulting value of the Cronbach's Alpha coefficient was 0.875 as calculated using the 8 items. By reliability standards, a value of alpha of 0.70 or more is acceptable, whereas a value above 0.80 signifies a high degree of internal consistency. The coefficient derived indicates that the scale applied in this study has a high level of reliability since the inter-item correlations are strong. This implies that the items consistently measure the same construct and that the instrument will be reliable for further statistical analysis.

Table 5.
Reliability Statistics.

Cronbach's Alpha	N of Items
0.875	8

Source: Analysis Result,2025.

The item-total statistics of the second construct, the contribution of each item to the total scale reliability, are presented in Table 6. The adjusted item-total correlations range from 0.56661 (H022) to 0.72518 (H024), which are above the recommended value of 0.30. This indicates that each item is strongly correlated with the total scale and is therefore meaningful in measuring the construct.

As seen in the column "Cronbach's Alpha in Case of Item Deleted," even when deleting any of the items, the reliability coefficient remains high, with a range between 0.84638 and 0.86860. The overall Cronbach's Alpha of the scale is 0.875 (see Table 5), therefore, deletion of any item would not affect reliability significantly. This establishes that everything is proper to keep.

Also, the scale means and variances when an item is deleted are quite stable, indicating that none of the items is skewing the measurement of the construct. The strongest correlations with the overall scale are found in items H024 (0.72518) and H026 (0.70296), which further prove their significance in the measurement of the construct.

Table 6.
Item-Total Statistics.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
H021	24.920235	11.34432	0.65145	0.85648
H022	24.868624	11.52713	0.56661	0.8686
H023	24.879027	11.92002	0.6262	0.86052
H024	24.817114	10.95345	0.72518	0.84638
H025	24.79651	11.66449	0.57065	0.86759
H026	24.868624	11.33927	0.70296	0.84941
H027	24.920235	11.13626	0.69993	0.84941

Note: Source: Analysis Result,2025.

4.1.3.EFA Testing for Independent Variables

Table 7 provides the output of the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity, which are applied to analyze the appropriateness of the data for factor analysis. The resultant KMO value is 0.738, which is above the stipulated minimum of 0.60. This indicates that the sample size and data are sufficient, and there is enough correlation between the variables to warrant the application of factor analysis.

The output of Bartlett's Test of Sphericity is also significant (2 = 134.789, df = 21.21, Sig. = 0.000), which indicates that the correlation matrix is not an identity matrix. That is, the variables are interconnected adequately, and this is a good indication that factor analysis is appropriate. The findings show that the data meet the statistical assumptions necessary for factor analysis. The slightly higher KMO value, as well as the significant Bartlett's test, confirm the suitability of the data structure for identifying underlying factors.

Table 7.
KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.738
Bartlett's Test of Sphericity	Approx. Chi-Square	134.789.9
	df	21.21
	Sig.	0.000

Note: Source: Analysis Result,2025.

Table 8 shows the Rotated Component Matrix displays how items load on the extracted components. A two-factor solution is identified, indicating that the scale items fall into two distinct but interrelated dimensions. Items H0122 (.812), H0115 (.750), H0113 (.668), and H0123 (.597) load highly on Component 1, suggesting they measure a common underlying construct. Conversely, items H0131 (.795), H0111 (.756), and H0132 (.720) load highly on Component 2, representing a second dimension in the data. All factor loadings exceed the recommended minimum of 0.50, indicating that each item significantly contributes to the factor it measures. The clear separation of items between the two components provides strong evidence of construct validity, as there is minimal cross-loading.

Table 8.
Rotated Component Matrix.

	Component	
	1	2
H0122	0.812	
H0115	0.750	
H0113	0.668	
H0123	0.597	
H0131		0.795
H0111		0.756
H0132		0.720

Source: Analysis Result,2025.

Table 9 reports the output of the factor extraction procedure and indicates what percentage of the total variance in the data is accounted for by each factor. As shown in the analysis, there are two components that exceed 1 eigenvalue, and this fulfills the Kaiser criterion of factor retention.

The first component possesses an eigenvalue of 2.75629, which explains 39.38 percent of the variance, and the second component has an eigenvalue of 1.16857, which explains 16.69 percent of the variance. The two components together account for a cumulative variance of 56.07%, which exceeds the minimum requirement of 50% typically prescribed in social sciences, thus validating the sufficiency of the factor solution. Following rotation, Component 1 accounts for 29.73% of the variance, while Component 2 accounts for 26.34%, indicating a more even distribution of variance between the two factors. The rotation enhances interpretability by clarifying the factor structure and minimizing item overlap.

Table 9.
Total Variance Explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.75629	39.37889	39.37889	2.75629	39.37889	39.37889	2.0806	29.72531	29.72531
2	1.16857	16.68924	56.06813	1.16857	16.68924	56.06813	1.84426	26.34181	56.06813
3	0.92617	13.23302	69.30115						
4	0.73528	10.49794	79.79909						
5	0.5858	8.36886	88.16795						
6	0.46965	6.71549	94.88344						
7	0.42824	6.11656	101						

Source: Analysis Result,2025.

4.1.4. EFA Testing (Dependent Variables)

The output of the sampling adequacy and sphericity tests is given in Table 10 to determine the appropriateness of the dataset to be used in factor analysis. The Kaiser-Meyer-Olkin (KMO) value is 0.892 and is classified as meritorious according to Kaiser. This indicates that the sample size is sufficient, and the correlations between the variables are also very high, justifying the use of factor analysis.

The Bartlett's Test of Sphericity yielded a Chi-Square value of 286.06 with 22 degrees of freedom, and the result is statistically significant at $p < 0.001$. This indicates that the correlation matrix is not an identity matrix, which confirms that the variables are sufficiently interrelated and suitable for factor extraction.

Table 10.
KMO and Bartlett's Test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**0.892**
Bartlett's Test of Sphericity	Approx. Chi-Square	286.06
	df	22
	Sig.	0.000

Source: Analysis Result,2025.

Table 11 presents the Component Matrix results, which indicate the factor loadings of items on the extracted component. The analysis reveals a one-factor solution, as all seven items load heavily on the same component. Loadings range from 0.685 (H022) to 0.831 (H024), and all are significantly higher than the acceptable threshold of 0.50, demonstrating that each item contributes meaningfully to the underlying construct. The highest loading (H024 = 0.831) indicates that this item best represents the construct, while the lowest loading (H022 = 0.685) still indicates a strong contribution. The unidimensional factor structure indicates that the items measure a single coherent construct rather than multiple dimensions. This finding is consistent with the high reliability score recorded above (Cronbach's Alpha = 0.875 in Table 5), which further establishes internal consistency of scale.

Table 11.
Component Matrix.

	Component
	1
H024	0.831
H026	0.813
H027	0.811
H021	0.765
H023	0.737
H025	0.690
H022	0.685

Source: Analysis Result,2025.

The explanation of variance is summarized in Table 12. The findings indicate that a single component has an eigenvalue greater than 1 and is equal to 4.0086, explaining 57.27 percent of the total variance. This exceeds the recommended threshold of 50 percent, suggesting that the factor structure is robust and accounts for a high percentage of the variance in the data. The other components all have eigenvalues less than 1, with contributions to the variance ranging from a maximum of 11.19% (Component 2) to 4.24% (Component 7). Based on the Kaiser criterion and the scree plot method, these components are not retained, as they are not significant in explaining the variance.

The fact that a large percentage of the variance is explained by the single component retained also adds weight to the one-dimensionality of the scale since all the items load on a single and dominant underlying factor. It is compatible with the component matrix (Table 11), according to which all items had a high loading on one component.

Table 12.
Total Variance Explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.0086	57.27198	57.27198	4.0086	57.27198	57.27198
2	0.78336	11.19144	68.46342			
3	0.65586	9.36564	77.82906			
4	0.59058	8.43744	86.2665			
5	0.44268	6.32298	92.58948			
6	0.3621	5.16732	97.7568			
7	0.29682	4.2432	102			

Source: Analysis Result,2025.

4.1.5. Mean Testing

The descriptive statistics of the items utilized in the study are shown in Table 13. There were 99 valid responses analyzed, and the scores on the items ranged between 2 and 6, which indicates that there was variation in the responses of participants but within the expected range of the scale.

The average of the items ranges from 4.007 (H0123) to 4.319 (H0131). All means are above the midpoint of the scale, indicating that respondents generally agreed or expressed positive attitudes toward the measured constructions. H0131 (4.319) has the highest mean, reflecting greater agreement, while H0123 (4.007) has the lowest mean, indicating relatively lower but still positive agreement. The standard deviations range from 0.672 (H023) to 0.940 (H0123), suggesting a moderate distribution of responses and consistency among respondents for most items. Notably, H0123 exhibited the greatest variability, whereas H023 was the most consistent item.

Table 13.
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
H0111	99	2	6	4.225758	0.926313
H0113	99	3	6	4.18404	0.7679172
H0115	99	3	6	4.121616	0.8143986
H0122	99	3	6	4.121616	0.840327
H0123	99	3	6	4.007172	0.9406746
H0131	99	3	6	4.319394	0.6993732
H0132	99	3	6	4.215354	0.7120824
H021	99	3	6	4.13202	0.766275
H022	99	2	6	4.18404	0.8087376
H023	99	3	6	4.173636	0.6725676
H024	99	2	6	4.236162	0.7798716
H025	99	2	6	4.25697	0.7753632
H026	99	3	6	4.18404	0.7248018
H027	99	3	6	4.13202	0.766275
Valid N (listwise)	99				

Source: Analysis Result,2025.

4.1.6.T-One Testing for H01

Table 14 shows the one-sample statistics of the items measured. There are 99 responses analyzed, and the mean value of all the items ranges from 4.9286 (H0123) to 5.2347 (H0131). Since the scale is designed on a 6-point Likert range, these means suggest that respondents were generally high in expressing their agreement with the statements. The highest mean is obtained with H0131 (M = 5.23), indicating that participants were strongly positive about this item, whereas the lowest mean is found with H0123 (M = 4.93), which remains above the neutral point and indicates generally positive perceptions.

The standard deviations are 0.6925 (H0131) to 0.9315 (H0123), which indicate a rather low to medium dispersion of the responses. The smaller standard deviation of H0131 shows that there was high agreement among the participants, and the greater standard deviation of H0123 indicates that there was slightly less homogeneous opinion.

Table 14.
One-Sample Statistics.

	N	Mean	Std. Deviation	Std. Error Mean
H0111	99	5.1429	0.9172315	0.0926574
H0113	99	5.102	0.7603886	0.0768105
H0115	99	5.0408	0.8064143	0.0814565
H0122	99	5.0408	0.8320885	0.0840522
H0123	99	4.9286	0.9314523	0.0940916
H0131	99	5.2347	0.6925166	0.0699526
H0132	99	5.1327	0.7051012	0.0712252

Source: Analysis Result,2025.

The findings of the one-sample t-test are reported in Table 15 where the t-test is carried out under the test value of 3.41 to identify the significance of the sample means relative to the hypothesized benchmark. The findings indicate that all the items (H0111-H0132) were associated with positive mean differences exceeding the test value, with t-values ranging from 6.566 to 12.907, and all were statistically significant at $p < 0.001$.

The biggest mean difference is observed in H0131 (0.841, t = 12.907), indicating that participants rated this item significantly higher than the reference value, with strong statistical confidence. Conversely, H0123 (0.529, t = 6.566) has the smallest mean difference, which is still significantly higher than the test value, suggesting a relatively weaker but positive agreement.

All the confidence intervals at 95 percent, with all items not passing through zero, further prove that the differences observed are not based on chance alone. This increases the validity of the results and confirms the conclusion that the participants rated all items higher than the neutral scale.

Table 15.
One-Sample Test.

	Test Value = 3.41					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H0111	8.989	98	0	0.7475172	0.561816	0.933198
H0113	10.1	98	0	0.7058808	0.551922	0.85986
H0115	8.821	98	0	0.6434364	0.480114	0.806718
H0122	8.58	98	0	0.6434364	0.474912	0.81192
H0123	6.566	98	0	0.5289414	0.340374	0.71757
H0131	12.907	98	0	0.8411838	0.700944	0.981444
H0132	11.247	98	0	0.737103	0.594354	0.879852

Source: Analysis Result,2025.

4.1.7.T-One Testing for H02

The descriptive statistics of the items H021-H027 are provided in Table 16 where 99 respondents participated. These averages on all the items are on the higher side of the scale (5.05-5.17) and thus show positive perceptions of the respondents. H025 has the highest mean (M = 5.17), indicating that this item was endorsed the most. Conversely, the lowest means (M = 5.05) were registered by H021 and H027, which were, however, significantly higher than the neutral value. Standard deviations are on the lower side (0.67 to 0.81), which means that there are no large differences between responses given by different participants and there is little variability. On the same note, the standard errors of the mean (0.07-0.08) validate the accuracy of the sample means and increase the validity of the results.

Table 16.
One-Sample Statistics.

	N	Mean	Std. Deviation	Std. Error Mean
H021	99	5.051	0.766275	0.0774078
H022	99	5.102	0.8087376	0.0816918
H023	99	5.0918	0.6725676	0.0679422
H024	99	5.1531	0.7798716	0.0787746
H025	99	5.1735	0.7753632	0.0783258
H026	99	5.102	0.7248018	0.0732156
H027	99	5.051	0.766275	0.0774078

Source: Analysis Result,2025.

Table 17 shows the results of a one-sample t-test of the mean of the items H021-H027 against the test value of 3.41. All the items indicate very significant p-values (p = 0.000), which means that the observed means are statistically greater than the test value.

The t-values range from 9.45 (H021 & H027) to 11.94 (H025), indicating high deviations of the mean. The mean differences (0.65-0.78) demonstrate that the participants' responses are consistently above the neutral level and significantly higher.

The 95% confidence intervals of all items do not overlap zero, which also indicates significant positive perceptions. H025 (Mean Difference = 0.78) and H024 (Mean Difference = 0.76) had the strongest support among others, while H021 and H027 (Mean Difference = 0.65) were relatively lower but still above the test value.

Table 17.
One-Sample Test.

	Test Value = 3.41					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
H021	9.447	98	0	0.6538404	0.500208	0.807432
H022	9.64	98	0	0.7058808	0.543762	0.86802
H023	11.237	98	0	0.6954768	0.560592	0.83028
H024	10.621	98	0	0.7579212	0.601596	0.914226
H025	10.943	98	0	0.7787394	0.623322	0.934218
H026	10.641	98	0	0.7058808	0.560592	0.85119
H027	9.447	98	0	0.6538404	0.500208	0.807432

Source: Analysis Result,2025.

5. Conclusions

The paper examined how management accounting practices (MAPs) are incorporated in Environmental, Social, and Governance (ESG) risk management in Malaysian corporations based on stakeholder and institutional legitimacy theories. The research, based on a mixed-methods design, involved semi-structured interviews with ESG-active companies and a survey of financial professionals of publicly listed companies. It confirms that MAPs, including sustainability cost accounting, carbon budgeting, and ESG dashboards, improve risk governance and reporting. The quantitative results are characterized by reliable scales (Cronbach's Alpha: .742 on the independent variables, .875 on the dependent variables), and exploratory factor analysis results indicate strong factor structures (56.07 and 57.27 percent variance explained). The mean scores (4.007-5.17) and t-tests of significance ($p < 0.001$) show that MAPs have a positive influence on ESG risk identification and disclosures. The practical advantages can be seen in case studies such as the 10 percent reduction in emissions by Petronas and RM 10 billion in sustainable loans by Maybank. Although there are issues such as data gaps and integration in medium-sized companies, MAPs are consistent with Bursa Malaysia rules and international standards, which create resilience and trust among stakeholders. Future studies may investigate longitudinal designs and SME settings to improve ESG-MAP strategies for sustainable growth.

5.1. Recommendations

We claim that ESG principles and the way they are applied to the Malaysian economic market are highly significant. Consequently, it is possible to improve management accounting activities within a firm by implementing ESG. Moreover, to choose and adjust an ESG system at the microeconomic level, it is necessary to establish more advanced research work, which will serve as a basis for implementing more adequate management accounting practices in enterprises to increase market share and most efficiently use the available resources.

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