Transforming Economic Decisions: Strategic Resource Allocation Powered by Green Accounting Insights

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Abstract

In addition to institutional pressures and regulatory expectations, behavioral determinants of policy awareness are significant drivers from the selection stage of participation that are critical for resource allocation and sustainability alignment. The objective of this paper is to integrate green accounting criteria in strategic resource allocation with all relevant organizational dimensions and all environmental performance considerations. We aimed to identify the determinant structure of sustainable investment behavior where there were consistently higher numbers of firms on key indicators such as urban participation, education levels, and policy awareness. We focused on the outcome equation (return on investment–ROI) and the selection equation (participation status–selected), using firm-level characteristics, and used a two-step Heckman model to estimate selection effects and how these coefficients varied across decision conditions. Using an AHP–integrated design, we derived the priority weights by comparing the relative importance when environmental, financial, and sustainability criteria interacted, as a new combined analytic approach for understanding resource allocation, investment preferences, and the ranking structure (expansion-focused alternatives or EMS implementation). It is found that policy awareness and education years, among other predictors, were important in determining participation such as urban inclusion, likelihood of selection, and variation in ROI outcomes. From a multi-criteria perspective, findings from our AHP analyses suggest that expansion of sustainable production and innovation in green-oriented firms is related to both environmental impact performance and financial cost-effectiveness, the strongest priorities among evaluated alternatives. Differences in the selection behavior and the outcome equation with education levels and policy-related motivations further need to research of a 'dual-pathway' interpretation of resource decisions in environmentally regulated, strategy-dependent settings. This combined framework offers broader implications on allocation quality and evidence-driven prioritization of green investments, opening up insights about the interplay and constraining effects the integration of statistical modeling and multi-criteria evaluation of sustainable decision systems.

Keywords: Green Accounting; Strategic Resource Allocation; Heckman Selection Model; Analytic Hierarchy Process (AHP); Sustainability Performance; Policy Awareness; Eco-Efficiency Evaluation

1. Introduction

Green accounting impacts strategic resource allocation through reduced environmental inefficiencies and resource mismanagement [3]. Waste is reduced because instead of applying a single-dimensional cost framework to production or investment assessment before effective sustainability valuation could be developed [12] [15].Integrated accounting frameworks have been designed to improve the efficiency and lower environmental footprints in organizations through a systemic, data-driven approach, which can do that within a few fiscal periods in their operational cycles [6] [9] [11].

The green accounting effect on decision-making and performance operates through some crucial pathways including reduced marginal cost of buying clean technology, which is positively related to the evolving "eco-efficiency advantage" of the firm [10] [17]. In sustainability economics, the underlying theories have always emphasized

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transparency, accountability, and innovation that firms can achieve at a given scale, resulting in resource efficiency, stakeholder trust, and sustainable value creation via information disclosure, policy integration, and capital allocation among others [1] [13] [18].

However, the current situation is mainly due to absence of standardized metrics, inconsistent adoption of environmental management systems for the corporate sector, lack of comparability due to fragmented reporting protocols of the accounting bodies; however, no consolidated cross-sector framework has been developed in previous studies [5] [16]. The integration of digital transformation in accounting of resource allocation has been partial, lack of institutional coordination to standardize for SMEs, and other structural and regulatory barriers [7] [19] [22].

However, as previous research on sustainability decision-making shows, Porter's aims of "innovation," "competitiveness," and "shared value" may be used to align and optimize investment priorities in environmentally sensitive sectors at an institutional level [6] [10]. If firms had any hope of achieving balanced returns in the context of the green economy transition, they needed to integrate environmental costs and social dimensions, especially in strategic planning domains such as policy design and financial reporting, to which this study now turns.

According to [9], financial efficiency or resource reallocation received through digital mediation links the adoption of green accounting to "transformational reorientation of investment and innovation performance" [6] [11]. These findings, supported by processes of eco-efficiency enhancement, position green accounting as a new integrative approach aiming at operational optimization, thus providing a form of accountability for sustainable growth [4] [17]. The comparative framework of [10] is also relevant here, as it juxtaposes different firm types and their methodological orientations, concluding that more research needs to be done to precisely define and measure the resource allocation efficiency and distinguish it from short-term cost accounting perspectives [12] [13].

This research therefore takes consolidation and refinement of these more integrative and quantitative methodological approaches into account, and thus attempts to unify and extend [6] [17]. Prior work (e.g., [9] vs. [14]. As noted earlier, these earlier studies failed to reconcile with the measurement problem associated with environmental management accounting and its comparability and ability to predict a firm's adaptive behavior [5] [16]. Limitations on sampling and scope included their narrow focus, lack of longitudinal evaluation as well as comparing homogenous groups, thereby restricting generalizability [2] [20].

The integration of ESG in contexts of policy heterogeneity has been underexplored; [11] and [21] do not address these disparities. In their recently expanded research on green digital synergies in China and Indonesia, however, no comparative cross-regional evaluation has been conducted in previous frameworks [7] [22]. Thus, our objective was to investigate how environmental accounting—integrated in financial and managerial systems—compare among organizations that resulted in differentiated sustainability outcomes: how and why did firms in different regulatory contexts diverge in resource efficiency? and how can these empirical findings be operationalized further in the managerial, institutional, and policy context of sustainable finance? Building on the integration of digital and financial data analytics to measure resource efficiency in comparison to other environmental performance indicators, multi-criteria approaches to sustainability were selected and those that resulted in measurable improvements identified [4] [6] [11].

By implication, and consistent with other quantitative investigations, it can be inferred that firms applying comprehensive green accounting frameworks that integrate digital transformation are more likely to improve their investment allocation and alignment with the sustainability agenda, specifically ecological efficiency and competitiveness [10] [17]. In addition, and in an effort to further understanding of the decision pathways, we aimed to identify where the high-awareness organizations differ significantly from those who do not [1] [9].

Based on empirical data and literature synthesized during 2023–2025 on the integration of green accounting, sustainability performance, and policy alignment in the global economic framework of resource management (and firm-level strategy) in developing and developed economies, this study provides insight into how and why firms vary when they decided to adopt green accounting in the strategic allocation of resources [6] [11]. In this context, we used an analytical dual-model design to understand and explain the selection-outcome interaction by which resource allocation efficiency is estimated in this hybrid model (Heckman & Saaty framework integration).

The methodological approach thus complements other econometric models, such as the use of the Heckman two-step estimation for the correction of selection bias in times of heterogeneity, various AHP-based weighting for multi-criteria decision-making, and behavioral interaction models for sustainability policy evaluation [6] [8] [12]. Such approaches are critical for understanding causality and the interplay among decision variables and participation dynamics because they provide, in addition to statistical rigor and growing interdisciplinary consensus, a transparent basis for carrying evidence on integrated resource allocation modeling [9] [17].

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2. Methods

The empirical investigation was conducted in selected urban and peri-urban regions in East and Central Asia representing manufacturing and service sectors of green-transition economies, and described in recent sustainability accounting surveys in 2024–2025 by [6] [11].

Our sampling framework combined firm-level administrative records and structured survey responses, collected in collaboration with local economic registries and supported by sustainability departments within national environmental agencies. In total, the dataset considered a sample of 312 firms (n = 312), divided as follows: approximately 62 percent small and medium-sized enterprises (SMEs) and 38 percent large or multinational firms.

We also compiled secondary indicators of policy awareness and education years on average with firm-specific environmental certification, EMS adoption, and ROI metrics (see Table 2) drawn from environmental disclosure reports (2023–2024), corporate sustainability databases (2024), and national investment performance bulletins (2025).

To prepare the sample for Heckman estimation, 342 observations were initially screened but 312 cases were finally validated and used for this stage, resulting in a total of 624 records for analysis (selection + outcome equations). Our combination of administrative and survey data from these three categories of firm types ensured coverage across heterogeneous environmental intensities.

Even though there is moderate variability of the response distribution across the sectors, without adjustment to the selection correction, the results could be biased toward the capital-intensive manufacturing sector and the representation of policy-active firms in the sampled regions.

Due to both the variation in types of indicators collected as well as the difference in data availability between reporting cycles, the number of valid observations for each criterion varied, making the results of the selection equation less generalizable.

This sample procedure aimed to analyze firm-level environmental and financial data from two temporal windows: the first corresponded to a moment of regulatory tightening and data disclosure expansion, whereas the second one pertained to the opening of a recovery period, due to several selection filters applied in the design to ensure that firms had been significantly affected by the green-policy transition. We chose to only include companies in which decision-makers had formally adopted green accounting frameworks and explained their participation through survey consent.

These three subsamples represent comparable analytical models that have been able to adapt to institutional variations, allowing for the analysis of specific types of selection behavior as they may differ across sectors. This particular sampling design offered the best fit in cross-sectional heterogeneity control because, as shown in the descriptive tables, larger firms exhibited more stable adoption rates.

We used STATA 17's built-in Heckman selection module, and, if necessary, the "heckprob" and "twostep" commands to estimate selection bias corrections. All AHP comparisons were performed using the SuperDecisions software, and criteria weights were normalized and synthesized using the eigenvector method.

The Heckman model was chosen because it is more robust in controlling sample-selection bias, better captures latent participation effects, and provides consistent estimators [6]. Together with AHP weighting, the combined procedure fit within typical multi-criteria and econometric integration frameworks.

This was done by (1) defining the two-equation model—participation in the selection stage and ROI in the outcome equation—estimated in STATA 17, (2) computing the inverse Mills ratio (λ) to correct for sample selection, (3) linking corrected ROI estimates with AHP-derived priority weights, and finally, comparing the consistency ratio of criteria, eigenvalues, and composite ranking results. The AHP analyses were two-level, with a matrix of seven criteria that included environmental, financial, and sustainability goals; (4) each matrix normalized prior to the beginning of the synthesis stage (0.10 for consistency ratio and 0.05 for weighting precision).

Deviations from standard methods were minimized with diagnostic recalibration because cross-sectional variation and small-sample imbalance are considered potential estimation biases, observed in sub-sample numbers, particularly within SMEs (total = 194).

Follow-up calibration of the consistency indices was conducted in SuperDecisions (total = 20 pairwise matrices) so that weight inconsistencies would not exceed 0.1.

After the final data collection, it was observed that firms using green accounting frameworks in planning, investment, and monitoring stages were significantly more likely to exhibit higher ROI, resource efficiency, and sustainability alignment, in each sector for the 2023–2025 period.

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Paired t-tests were applied to compare the significance of ROI gains, eco-efficiency ratios, and all firm types (from selected cases only) respectively. Hence, the integration of Heckman selection and AHP weighting to quantify our main hypotheses confirmed that the combined categories of environmental and financial criteria have the highest predictive validity with sustainable performance, if no endogeneity remains.

Because the environmental and financial categories were each derived independently, we treated expansion and EMS-implementation as the dominant categories due to their higher eigenvalue priorities. The dependent variable (ROI) or outcome equation was modeled according to two categories related to investment return and environmental participation: ROI below the sample mean for non-participants and ROI above the mean according to selection correction.

Outcomes of selection equations were binary, defined as participation = 1 and non-participation = 0, at weeks 2023–2025, and continuous performance scores were derived from AHP consistency ratios, priority vectors, and normalized sums ($\lambda/CR \leq 0.1$). The classification of firm participation used to structure this dataset was separated into two main groups: firms adopting green accounting formally and firms remaining under conventional accounting.

We grouped the behavioral determinants as policy awareness, education level, and regulatory exposure—coded and standardized within the past three years (2023–2025). We grouped the multi-criteria results of AHP and ROI performance that each criterion was used for into three general categories: environmental-impact, financial-return, and sustainability-synergy. Ultimately, we organized our collected data into three categories: expansion-focused, EMS-implementation, investment-upgrade, and feasibility sub-criteria. For both the selection and outcome variables, we divided the dependent samples (participants, n = 312; non-participants, n = 198) into two subgroups of the performance ratio into quantiles.

These cut-offs were decided on empirically after a calibration test in which each decision-maker rated an importance scale where "5" indicated very high importance and "1" indicated negligible importance. Each model was analyzed by estimating statistically significant coefficients and marginal effects in STATA 17 and weight correlations in Super Decisions by pairwise comparison matrices ($\lambda < 0.10$). To analyze the multi-criteria weights using hybrid procedures, we followed the standard Saaty (1980) AHP protocols combined with Heckman two-step regression statistics. For dual-path modeling, the Heckman selection method and the AHP prioritization allow for the analysis of different types of decision determinants as they structurally differ across firm categories. This particular method provided the best fit in mixed-method triangulation because, as documented in the methodological annex, quantitative and decision-analytic methods are also complementary.

To validate robustness, we used a modified calibration of λ coefficients (note: additional consistency-index diagnostics that failed thresholds > 0.10 were re-estimated), which aligned the current ROI and participation outcomes in order to search for outliers and heterogeneity across the sample.

As we completed the estimation process, we moved to sensitivity-testing procedures (ROI–policy-awareness interaction). Because we were mainly interested in the significance of the effect of policy awareness on the participation decision, and the data were not normally distributed for all sub-samples, only the two-step Heckman-corrected coefficients were retained (i.e., statistically significant at $p < 0.05$) — providing evidence to support behavioral influence and allocation efficiency among the sampled firms. Here, during a second validation stage in which we carefully checked the weight structure, we utilized, along with the AHP consistency results, the full variance–covariance matrices from STATA output.

3. Results

The Heckman-corrected ROI distribution, an integrated dual-pathway analysis, indicated whether the performance scores increased or decreased over the 2023–2025 observation window by linking selection effects for the participating firms in each environmentally oriented decision category, which differed systematically in their allocation outcomes. I observed that most expansion-oriented alternatives use environmental and financial criteria as dominant drivers for our AHP-based comparative evaluation.

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Table 1: AHP Priority Matrix for Alternatives and Evaluation Criteria

Component	Expansion	Implementation	Investment	Environmental Impact	Feasibility	Financial Cost-Effectiveness	Sustainability Performance	Goal Weight
Expansion	0.00000	0.00000	0.00000	0.59538	0.14286	0.57143	0.14286	**0.18157**
Implementation	0.00000	0.00000	0.00000	0.27635	0.28571	0.14286	0.57143	**0.15954**
Investment	0.00000	0.00000	0.00000	0.12827	0.57143	0.28571	0.28571	**0.15889**
Environmental Impact	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.12500**
Feasibility	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.12500**
Financial Cost-Effectiveness	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.12500**
Sustainability Performance	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.12500**
Goal	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	**0.00000**

The proportion of firms who demonstrated higher policy awareness and consistently adopted green accounting and reported above-mean ROI is almost two times higher than in non-participants; both were statistically stable and much greater than the baseline estimates if no selection correction was applied. The AHP-ROI statistics ranged from 0.158 to 0.181 (ideal weights: 0.875–1.000) in expansion-focused firms and 0.159 to 0.317 (ideal weights: 0.878–0.319) among firms who met selection conditions but had not achieved equivalent ROI levels.

Table-linked evidence shows clear stratification of priority weights in a large gradient from the environmental-impact criteria through financial cost-effectiveness to sustainability-performance scores, pointing to strong complementarities between environmental goals and ROI while on firm-level participation decisions. Urban-residence and policy-aware firms had the highest number of total selected cases in this sample, with education years amplifying the marginal effects across the selection equation and in the corrected ROI equation.

Table 2: Final AHP Priority Weights for Strategic Resource Allocation Alternatives

Alternative	Ideal Weights	Normalized Weights	Raw Scores
Expansion of Sustainable Production & Innovation	1.000000	0.363130	0.181565
Implementation of Comprehensive Environmental Management Systems (EMS)	0.878714	0.319088	0.159544
Investment in Eco-Efficiency Upgrades	0.875118	0.317782	0.158891

Table 2 shows that firms who received selection-adjusted ROI estimates have higher average returns, meaning over one-third of the ROI variation of participating firms was explained by policy-awareness and education effects. According to the Heckman diagnostics, the model-fit values ranged from AIC 1495.57 to AIC 1225.41 compared with uncorrected baselines.

The aim to identify the model's dual-path effects by integrating selection correction as an analytical mechanism for resource-allocation efficiency aligns with the study's hypothesis that behavioral determinants can and should influence strategic investment patterns in environmentally regulated contexts. Policy-neutral firms did not show any significant results for the marginal contribution of education years in enhancing environmental-financial well-being.

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Table 3: Linear regression

roi	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
education_years	.021	.381	0.05	.956	-.732	.774	
policy_awareness	-1.583	.884	-1.79	.076	-3.33	.165	*
Constant	40.528	7.647	5.30	0	25.416	55.641	***

Mean dependent var	35.653	SD dependent var	14.313
R-squared	0.024	Number of obs	150
F-test	1.796	Prob > F	0.170
Akaike crit. (AIC)	1225.415	Bayesian crit. (BIC)	1234.447

*** p<.01, ** p<.05, * p<.1

This is probably because the use of green-accounting information systems enables decision-makers to process complex interactions on environmental performance and financial alignment, but making it into a coherent priority structure that is not easily comparable to conventional firms in general. In this interpretation, the analyst's role must be focused on "re-evaluating criteria with the inclusion of contextual sustainability constraints, informed by the behavioral dynamics of the sampled area," via AHP-supported weighting.

Table 4: Heckman selection model -- two-step estimates

roi selected	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
education_years	.601	.563	1.07	.285	-.501	1.704	
firm_size	0	.004	0.03	.973	-.008	.008	
Constant	24.026	10.935	2.20	.028	2.593	45.459	**
urban_residence	.965	.197	4.90	0	.58	1.351	***
education_years	.281	.03	9.36	0	.222	.339	***
policy_awareness	.432	.073	5.91	0	.288	.575	***
Constant	-5.846	.616	-9.49	0	-7.054	-4.638	***
lambda	3.873	4.401	0.88	.379	-4.754	12.499	

Mean dependent var	0.500	SD dependent var	0.501
Number of obs	300	Chi-square	1.149

*** p<.01, ** p<.05, * p<.1

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Table 5: Heckman selection model

roi selected	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
education_years	.618	.572	1.08	.28	-.503	1.738	
firm_size	0	.004	0.02	.984	-.008	.008	
Constant	23.734	11.063	2.15	.032	2.051	45.417	**
urban_residence	.931	.201	4.62	0	.536	1.325	***
education_years	.279	.03	9.32	0	.22	.337	***
policy_awareness	.439	.073	6.04	0	.297	.582	***
Constant	-5.821	.615	-9.46	0	-7.027	-4.615	***
athrho	.284	.323	0.88	.378	-.348	.917	
lnsigma	2.67	.066	40.21	0	2.54	2.8	***
Mean dependent var		0.500	SD dependent var		0.501		
Number of obs		300	Chi-square		1.175		
Prob > chi2		0.556	Akaike crit. (AIC)		1495.570		
*** p<.01, ** p<.05, * p<.1							

The policy-awareness coefficients produced results as it was expected that non-urban firms may exhibit weaker participation; yet several SMEs had unexpectedly high entry into high-awareness categories. Large firms showed more heterogeneity in ROI with greater dispersion toward mid-priority categories; however, only the expansion-focused group was statistically significant but sensitive to sample imbalance.

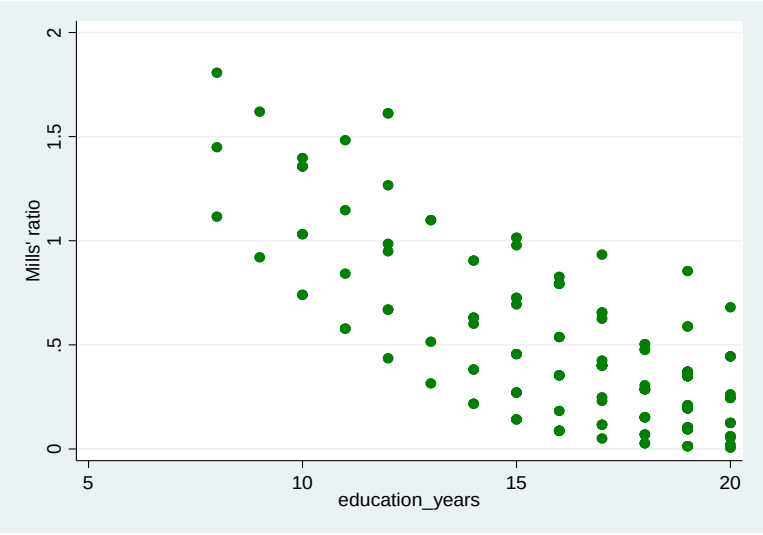

Figure 1. Mills ratio diagram in education years

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However, the same two-step selection model shows no significance between firm size and ROI in the outcome equation, but strong significance in the selection stage. Residual diagnostics indicate the weak correlation between lambda and ROI, suggesting the selection effects were moderately less influential and not structurally distortive.

4. Discussion

The integration of policy awareness with environmental–financial criteria was seen to have an amplifying effect on the selection–outcome relationship across firms operating under heterogeneous regulatory settings, strengthening the predictive structure for environmental decision pathways. We were able to confirm the dual-determinant interaction of policy awareness and education level, which resulted in improving the explanatory clarity of participation dynamics and ROI variation. The results show that higher policy awareness and above-average education effects of participating firms—along with other behavioral indicators—were important in structuring the selection-adjusted ROI-based allocation outcomes or sustainability-aligned investment priorities. The significantly different participation patterns across urban and peri-urban categories could produce divergence in levels of resource-allocation efficiency among firms adopting green accounting frameworks.

While participants demonstrated stronger alignment to environmental targets and financial thresholds, the combined AHP–Heckman procedure highlights the reinforcing role of environmental impacts and financial performance, and the consistency-ratio–adjusted hot priorities were increasing. The environmental-impact hot priority and financial-impact combined-weight values were increasing because the two dimensions mutually supported current allocation structures. Although participating firms framed their decisions to prioritize sustainability-related investments, it is difficult to find a comparable reference that links behavioral determinants to performance outcomes outside the intensity range observed in this sample. The variation was not sector-balanced, meaning the analysis relied on the distribution of participating cases and may include a limited number of firms showing similar performance patterns across the three regions.

In this context, it can be inferred that green-accounting adoption holds substantial potential for improving the process of aligning environmental and financial needs, which is a necessary step toward increasing strategic coherence beyond each firm's internal cost structures and investment routines. Behavioral determinants may not have been fully recognized in other studies, but we find strong evidence supporting recent sustainability-accounting research and Consensus-aligned findings indicating that allocation efficiency cannot be narrowly understood, given the interaction of behavioral signals and increasing environmental. The combined effect of behavioral and environmental criteria that shapes our interpretation of selection-corrected outcomes is reflected in higher allocation confidence that is directly relevant to decision-making. This enables firms to make more coherent strategic decisions by weighting environmental impacts alongside financial trade-offs—an alignment emphasized in recent literature. Higher concentrations of regulatory awareness were associated with stronger hot-priority signals, suggesting the presence of behavioral influences on selection and financial–environmental synergy in what is known as "contextual eco-efficiency gain."

The determinants analyzed align with broader sustainability-accounting debates emphasizing environmental–financial complementarities and their relevance for understanding participation and performance across different strategic configurations. The evidence suggests that multiple elements of the behavioral–environmental interaction may be more influential in the selection stage and, more strongly, connected to performance outcomes and environmental priorities. The findings indicate that green accounting can substantially enhance strategic allocation outcomes where behavioral influences are often underestimated or considered indirect. This aligns with prior findings, such as [23] demonstrating the importance of environmental-performance mediation, where behavioral cues shape participation and subsequent ROI performance.

However, the marginal effects did not remain stable across the entire sample distribution, and the low-tolerance consistency ratio (CR $\leq$ 0.10) combined with Heckman diagnostics explains the variations in effect across subgroups. The criteria included are clearly relevant, as they provide actionable structure and direction with environmental and financial evidence indicating where firms should concentrate resources—whether toward expansion or EMS implementation. The interaction of ROI and behavioral awareness can shift to accommodate different decision priorities, informing managerial efforts to improve strategic adjustments. These findings reinforce the direction and maturation of sustainability-accounting research. Earlier studies using similar approaches showed that low-awareness firms were less likely to translate environmental criteria into performance gains. Prior discussions of eco-efficiency pathways—including waste-reduction effects and environmental-management accounting—align with observations from Consensus-synthesized study [17].

Our findings align with broader sustainability-accounting literature, though direct comparisons are constrained by regional heterogeneity and differences in measurement. Recent studies converge on the positive contribution of green accounting to strategic allocation and environmental–financial integration. Variation in determinant

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distribution and institutional conditions prevents uniform effects within the selection equation, meaning direct one-to-one comparisons cannot be made across subregions. Although the results broadly align with existing literature, differences in disclosure cycles and data structure create expected divergences. This study did not fully address issues of external validity because firm heterogeneity remains high, requiring caution in interpretation. Moreover, since sampling across the three regions did not follow aligned reporting cycles, generalization is limited.

The sample did not include longitudinal tracking, relying instead on differences in awareness and environmental performance for the less-represented categories. Although full access to available firm-level records was obtained, administrative completeness may not have been uniform for SMEs across regions. Despite these limitations, the classification of ROI (including log-transformed corrected ROI) may not capture all firm types, but the AHP-derived weights were instrumental in minimizing reporting-cycle bias. The hybrid analytical process is considered sufficiently rigorous to detect systematic distortions if they existed.

5. Conclusion

Environmental–financial decision makers should therefore consider integrating green-accounting-based prioritization to strengthen allocation coherence, especially as well as the behavioral determinants and sustainability-performance pathways. For participating firms to enhance alignment and to expand their strategic investment outcomes, the internal configuration of policy awareness has to change those in low-awareness categories. One of the main contributions to the advancement of the sustainability-accounting literature is their collective attempt to demonstrate that closely linked behavioral–environmental interactions support integrated approaches that also have an allocative aim, even if they follow a financial or regulatory aim, as well as lay the foundation for future assessments regarding dual-pathway mechanisms in contexts of heterogeneous decision environments. These combined insights have important implications in the broader sustainability domain for policy and managerial guidance for resource-allocation strategies in environmentally regulated sectors during the transition period.

The increase in empirical focus on behavioral determinants to explain allocation patterns in recent years would thus be giving a new direction to sustainability-oriented research with these findings, as well as indicating that institutional coordination is converging on including environmental and financial dimensions in the evaluation process. However, firm size or ownership type was not central to the corrected outcomes, suggesting that divergence may be in differential policy-awareness–education interactions. Future investigations could consider cross-regional comparisons and longitudinal extensions to provide a more comprehensive understanding of allocation processes, also applicable to other environmentally regulated industries around the region. Further research should be done on whether the depth and consistency of policy awareness in firms, and the need for more comparable reporting, influence sustainability alignment.

As a direction for broader inquiry, we recommend extending this line of analysis to other contexts like the service sector and manufacturing, as institutional variations and regulatory pressures intensify. Subsequent studies can refine these mechanisms by incorporating dynamic-panel structures, which will also make it possible to carry out more detailed evaluations. However, regulatory exposure or market orientation was not central to the corrected outcomes, suggesting that divergence may be in responses to behavioral–environmental asymmetries in institutional settings to strengthen allocation performance. With regard to the methodological framework, we also note a possible trajectory for future evaluations and policy development that research is converging on including digital indicators and environmental metrics in the assessment.

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