

A multi-criteria decision-making framework for evaluating corporate governance: An operations research approach

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Abstract

Purpose: This study aims to develop a systematic, evidence-based framework to evaluate corporate governance across global sectors, overcoming the limitations of traditional, one-dimensional assessment methods.

Design/methodology/approach: A hybrid Multi-Criteria Decision-Making (MCDM) framework integrating the Analytic Hierarchy Process (AHP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and Data Envelopment Analysis (DEA) was developed. Data from ten anonymised publicly listed firms operating globally were used to assess corporate governance across five core dimensions: Board Effectiveness, Transparency and Disclosure, Stakeholder Engagement, Ethical Conduct, and Risk Management via AHP with a Consistency Ratio of 0.06.

Findings: The results indicate that firms prioritising transparency, ethical conduct, and stakeholder engagement achieve higher governance performance and resource efficiency. TOPSIS scores ranged from 0.88 to 0.39, while DEA efficiency scores ranged from 0.72 to 1.00, highlighting variation in governance effectiveness among firms.

Limitations and Research implications: The study is based on a relatively small sample of ten firms, and the anonymisation of data may limit sector-specific insights. Further research could extend the framework to larger datasets and additional industries for broader generalisation.

Practical Implications: The hybrid MCDM framework provides boards, regulators, and researchers with a quantitative, replicable, and globally adaptable tool for benchmarking corporate governance, enabling evidence-based decision-making and improved accountability.

Originality/value: This research offers a novel integration of AHP, TOPSIS, and DEA for corporate governance assessment, delivering a structured, multidimensional, and internationally applicable approach to evaluating governance performance and resource efficiency.

Keywords: Corporate governance, board effectiveness, governance efficiency, transparency

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Introduction

Corporate governance has turned out to be one of the more scrutinised topics in both the academic literature and the business world, especially in the emerging markets like Nigeria, where the quality of governance has had startling implications on investor confidence,



financial stability, and long-term economic growth. Corporate governance is particularly relevant in the Nigerian environment due to frequent corporate failures, banking industry restructuring, flawed enforcement procedures, and a long-standing issue of transparency, accountability, and regulatory compliance. Corporations govern the complex arrangement of institutional frameworks, decision-making procedures, ethical standards, and control systems aimed at aligning managerial behavior with the interests of both shareholders and other stakeholders, while ensuring adherence to the legal and regulatory structure (Donaldson and Davis, 1991; Freeman, 1984). Practically, agency conflicts can be reduced through governance in the Nigerian firms in regards to board composition, audit committees, disclosure practices, internal controls, risk management systems, and increasingly, through the ESG-related governance mechanisms, all of which are supposed to reduce agency conflicts in the same Jensen and Meckling (1976) theorisation, as well as incorporate the stewardship responsibilities of a stakeholder-oriented environment (Donaldson & Davis, 1991).

Although there is a written code of governance, such as the Nigerian Code of Corporate Governance (NCCG, 2018), governance effectiveness in Nigeria remains debatable, primarily due to poor enforcement, nominal compliance, and the sector's heterogeneity. Several high-profile corporate scandals, financial misreporting issues, and governance failures, particularly in the financial services and listed company sectors, have raised doubts about whether governance structures translate into actual performance outcomes. The problem is further aggravated by a changing regulatory environment, ownership concentration, family-owned companies, and political-economic pressures in Nigeria, which complicate the use of traditional governance assessment instruments. The conventional methods, such as compliance checklists, governance indices, and third-party ratings, are more inclined to have a traditional and reductionist perception of governance, where the emphasis is on the existence of structures instead of their efficiency in creating accountability, transparency, and sustainable value (Bhagat & Bolton, 2008; OECD, 2015). Consequently, such approaches frequently do not accurately reflect the way governance processes work in real-life Nigerian firms or how they can impact the performance of the firms and the trust they inspire among stakeholders.

The growing pressure on both global and domestic levels to introduce sustainability and ESG principles into governance systems has also impacted the Nigerian corporate sphere. Nigerian firms are now expected by regulators, institutional investors, and development finance institutions not just to demonstrate their financial performance, but also to uphold their social accountability and environmental responsibility (Basdekidou, 2024; Buchetti, 2025). Nevertheless, the ESG ratings that have been imposed on the Nigerian companies often refer to externally created rating systems that might be insensitive to the context, methodologically opaque, and inconsistent (Reig-Mullor et al., 2022). This casts doubt on the applicability of governance ratings in the emerging markets where institutional bottlenecks, limited resources, and industry relationships shape governance practices. Therefore, to effectively assess governance in Nigeria, there is a need for an analytical tool that is flexible, multidimensional, and capable of accommodating both qualitative judgments and quantitative performance measures. Recent developments in operations research and decision sciences present an opportunity to overcome these limitations through Multi-Criteria Decision-Making (MCDM). Analytic Hierarchy Process (AHP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and Data Envelopment Analysis (DEA) are the methods that enable researchers to place any dimension of governance into the background and rank firms in comparison to an ideal governance profile, as well as evaluate the efficiency of the transformations of governance inputs into performance outputs (Saaty, 1980; Zhu, 2003). Empirical research is also beginning to demonstrate that MCDM-focused strategies are highly suitable in the field of governance evaluation, as they can accommodate competing criteria, incorporate expert judgment, and quantify the efficiency of operations and structural compliance (Lin et al., 2023; López-García et al., 2025). Nevertheless, even though they are

relevant, these approaches are still not optimised in the studies of corporate governance in Nigeria, where assessment practices still strongly depend on descriptive indices and compliance-based models.

The research problem of this study is to develop a holistic, efficiency-focused model for assessing corporate governance performance in Nigeria that transcends the concept of token compliance and the efficiency with which governance processes are carried out. In particular, it is difficult to find integrated models that can prioritise governance criteria at the same time rank firms according to their governance performance and to quantify the efficiency with which governance resources are turned into tangible outputs, i.e., transparency, stakeholder trust, and sustainable value creation. To fill this gap, the paper hypothesises and implements a hybrid AHP-TOPSIS-DEA model using a sample of companies from selected industries in Nigeria. In this manner, the research will offer a contextually relevant, reproducible, and decision-support-based model of governance evaluation, which can inform boards, regulators, and investors who wish to enhance governance accountability and performance in emerging market environments (Hong et al., 2024; Zournatzidou et al., 2025; Zhang, 2024).

Research Objectives

This study addresses the limitations of existing governance assessments by proposing a hybrid MCDM framework. The key objectives of this study are: i) To determine the main dimensions and indicators of corporate governance performance. ii) To use AHP to generate the relative weights of governance criteria depending on expert input. iii) To apply TOPSIS for ranking firm governance performance across these criteria. iv) To integrate the DEA for measuring governance efficiency by evaluating input-output relationships. v) To develop a comprehensive, replicable, and data-driven model for governance evaluation.

Significance of the Study

The importance of this study lies in its contribution to the field of research and practice by filling the gaps between research on corporate governance and the implementation of an elaborate decision-making framework. Theoretically speaking, the study contributes to the body of governance research by developing a hybrid model of evaluation that incorporates AHP, TOPSIS, and DEA, allowing for the addressing of the long-standing issue that current governance frameworks are either too normative or too reductionist, which is necessary to reflect the multidimensionality of governance performance. In contrast to other existing models, where a checklist or a set of fixed indices are used to determine the number of governance dimensions identified and the amount of governance dimensional priorities, this model is an integrated model that considers how much the governance mechanisms utilise resources into quantifiable results, including accountability, transparency, shareholder value, and sustainability integration.

This contribution can expand the body of decision science literature by contextualizing MCDM methods within the framework of governance research, providing scholars with an operational framework through which to view governance dynamics in a multidimensional sense. In practice, the research is relevant to corporate boards, regulators, policymakers, and institutional investors who require valid instruments for measuring governance performance, rather than merely paying lip service to compliance. The research will equip the decision-makers with a structured yet flexible assessment framework, enabling them to find strengths, weaknesses, and gaps in the efficiency of governance practices and promote evidence-based interventions that may enhance the organisation's legitimacy and long-term resilience. This flexibility in the sector and regulatory environment makes the model valuable, applicable not



only to firms in the capital markets environment, but also to regulators seeking a more nuanced supervisory tool and investors looking to incorporate the quality of governance into their responsible investment choices.

Scope of the study

The scope of this study is carefully delineated to achieve rigour in the methodology and analysis manageability, with a focal point on publicly listed companies in one economic region where governance structures have been formalized, regulatory frameworks are clear, and data are accessible to facilitate more complex forms of analysis. Restricting the research to listed companies, the study will ensure comparability of governance disclosure practices and allow the use of standardized indicators to assess board structure, audit quality, risk management, and ESG integration. This research is based on the synthesis of secondary data based on corporate reports, governance indices, and regulatory filings, complemented by expert judgment, in weighting governance criteria through AHP, to guarantee objectivity and depth to the situation. Yet these limits are bound to bring with them constraints. Findings may not be generalizable outside the region under study because results can differ in industries with different systems of governance, geographies with diverse cultural and regulatory backgrounds, and firms at various stages of organizational maturity. Methodologically, although AHP can provide a systematic means of integrating expert judgment, it can be affected by subjectivity and bias in pairwise comparisons, which can impact the prioritization of governance criteria. Similarly, DEA presupposes input-output causality in determining efficient governance; however, the outcomes of governance are conditioned by the interaction of social, cultural, and other contextual factors, which cannot be fully reflected in quantitative modeling.

Literature Review

Corporate governance evaluation requires a theoretical and empirical basis, which highlights the complexity of governance systems. The chapter provides a review of leading theories of governance, global governance systems, and available methodologies for governance appraisal. It further explains how decision science, especially MCDM, can be used as a method of governance assessment.

Theoretical Review

Agency Theory

The agency theory, as theorized by Jensen and Meckling (1976), and based on the premise that managers (agents) are not necessarily acting in the best interest of shareholders (principals), has remained one of the most potent theoretical frameworks used to explain agency relationships in corporate governance, through opportunistic behaviours, which may be empire building, excessive risk-taking, or false reporting. These governance mechanisms, including independent boards, audit committees, and performance-related remuneration, are designed to mitigate this misalignment (Bhagat & Bolton, 2008). According to critics, however, conventional applications of agency theory have limited governance to a single-minded shareholder perspective, overlooking other societal and sustainability considerations (Buchetti, 2025). Practically, compliance checklists or index-based assessments often tend to place too much emphasis on structural proxies of independence (board composition) without evaluating their effectiveness in reducing agency costs or creating measurable stakeholder value (Cunningham et al., 2024).

In this case, the combination of the operations research techniques, especially DEA, is a more subtle one: rather than focusing on governance as a fixed structure, the DEA can estimate the effectiveness of governance inputs (i.e., the independence of the board, ethics programs) in terms of the outputs (i.e., investor confidence, profitability, or ESG performance) (Basdekidou, 2024; Zhang, 2024). MCDM models, such as AHP and TOPSIS, can also be used to weight the governance attributes beyond simple independence ratios, thereby reflecting the dynamic and multidimensional nature of agency resolution strategies (Reig-Mullor et al., 2022).

Stewardship Theory

Unlike the control-based assumptions of agency theory, stewardship theory does not consider managers to be opportunistic players; instead, it considers them to be stewards who are inherently motivated to safeguard and increase organisational value and who take pleasure in trust, reputation, and organisational success instead of self-interest (Donaldson & Davis, 1991). With the recent discussions of sustainability-oriented governance, where collaborative leadership, empowerment, and relational accountability have been put at the forefront, this theory has been rediscovered (Durdu, 2025). Although the stewardship theory offers a positive alternative to the agency theory, its naivety can be very pronounced, particularly in situations where weak regulatory systems or a culture of secrecy still exists (Hoang et al., 2024). However, it is also relevant in the construction of governance systems that identify trust, empowerment, and intrinsic motivation as efficiency drivers, rather than risk. There are difficulties associated with operationalising stewardship; however, because classic scorecard appraisals tend to overlook qualitative aspects of stewardship, such as ethical leadership, trust in stakeholders, or organisational culture.

MCDM frameworks would come in handy here too: methods such as AHP can still be used to incorporate expert verdicts regarding the relationship between governance in a systematic manner, whereas DEA models can be used to conduct efficiency analysis of softer inputs (such as leadership ethics, transparency culture) against quantifiable outputs (such as better ESG ratings or stakeholder satisfaction) (Hong et al., 2024). There is an emerging body of empirical research indicating that firms focusing on stewardship-based value systems, such as collaboration and accountability, perform better in terms of long-term stability and ESG performance (Zournatzidou et al., 2025). Therefore, integrating stewardship theory into an MCDM-based system of governance evaluation is a strategic step, as it not only balances the monitoring focus of agency theory but also ensures that the performance implications of management based on trust and value are reflected in the governance evaluation.

Stakeholder Theory

The stakeholder theory was first described by Freeman (1984), who believed in the expansion of governance beyond the traditional principal-agent dyad, which encompasses various stakeholders, including employees, customers, regulators, communities, and the environment. This extended outlook has gained increased prominence in the ESG period, wherein governance performance is linked to the effectiveness with which firms manage conflicting interests, in addition to their contribution to long-term sustainability (Buchetti, 2025). Corporate governance practices, as outlined by the OECD (2015), also emphasize the inclusiveness of stakeholders as a key characteristic of effective governance systems. Nonetheless, conventional assessment instruments are still inadequate in providing a systematic evaluation of the trade-offs between the heterogeneous interests of stakeholders. A majority of rating instruments consolidate ESG standards without paying sufficient attention to their interdependence or effectiveness in resource allocation (Su et al., 2023).



In that respect, the use of the operations research and MCDM methodologies can be critically innovative in this respect: AHP and TOPSIS models enable prioritization and ranking of stakeholder-related criteria according to expert and contextual input, and the DEA enables the assessment of the efficiency of how stakeholder-oriented input (e.g., CSR expenditure, stakeholder engagement mechanisms) is converted into tangible outputs (e.g. reputation capital, regulatory compliance, and market legitimacy) (Lin et al., 2023; Lopez-Garcia, In addition, hybrid methods that integrate DEA with AHP or TOPSIS have been demonstrated to address shortcomings of individual methods where stakeholder trade-offs are expressed in both relative efficiency and a ranking (Nguyen, et al 2023; Heydarpour, 2022). In this way, operationalized with the help of MCDM tools, stakeholder theory can facilitate the evaluation of governance, which is not only multidimensional but also more consistent with contemporary corporate reality, where companies must strike a balance between economic, social, and environmental responsibilities in increasingly complex stakeholder systems.

Empirical Review

Governance Frameworks and Standards

International standards of good governance, such as the OECD Principles of Corporate Governance and the UK Corporate Governance Code, have traditionally been used as benchmarks for good governance, whereby firms utilize these rules as normative frameworks for board accountability, transparency, and shareholder protection. The OECD Principles are prominent because they are internationally applicable, shareholder rights-oriented, and equitably treated, involve stakeholders, are disclosed, and outline the responsibilities of a board (OECD, 2015). Their breadth has been criticised, however, as being more aspirational than operational, providing few instruments by which to compare the performance of governance across firms and sectors (Cunningham et al., 2024). Bhagat and Bolton (2008) argue that though the Sarbanes-Oxley Act enhanced compliance and decreased fraud, it had caused inflexible reporting requirements and expense, but had not necessarily increased firm efficiency, with independent auditors and internal control requirements being some of the prescriptive measures that were introduced by the Sarbanes-Oxley Act in the U.S. to regain trust following corporate scandals. The UK Corporate Governance Code is a compromise in its own right, with its completion or explanation strategy that allows flexibility but also sparks debate about whether companies may be offering superficial explanations without actually changing their governance practices (Buchetti, 2025). Although the three frameworks establish some standards, none are necessarily developed to measure efficiency that translates into such outputs as shareholder value, stakeholder trust, or ESG performance. This is where decision science and operations research will be of use.

The efficiency of adherence to such frameworks can be assessed using tools like DEA, which can determine whether companies that adhere to the governance codes in question actually produce better results (Basdekidou, 2024; Zhang, 2024). In addition, hybrid models, which combine AHP and TOPSIS, may prioritise the relative significance of governance principles in these models to have a greater focus on contextual factors, including transparency or stakeholder involvement (Hoang et al., 2024).

Evaluation Approaches

Checklist and Scorecard Models

Checklist and scorecard frameworks are the most common and intuitively attractive market frameworks for corporate governance evaluation, as they are straightforward to execute, simple to communicate, and have comparatively low data intensity; typical items present binary or ordinal answers that enable fast cross-sectional comparisons (Cunningham et al.,

2024). However, the evaluative and methodological perspectives of such models are radically constrained: both the confusion of presence and performance, and the neglect of intensity, are overlooked (Bhagat & Bolton, 2008; Buchetti, 2025). Checklists also promote box-ticking compliance behavior, making most checklist-based rankings weak predictors of real governance effectiveness (OECD, 2015; Cunningham et al., 2024).

In view of the current study, the checklist paradigm is incomplete since it is unable to quantify efficiency (the conversion of inputs into outputs) or to be explicitly modelled. DEA and MCDM methods are the operational research techniques that directly address these weaknesses by supporting continuous measures, weighing schemes based on expert judgment, and multi-dimensional performance outputs; by combining both methodologies (e.g., AHP to compute weights, TOPSIS to rank, and DEA to benchmark performance efficiency), checklist items are translated into operational inputs and outputs, and whether the formal adoption of governance structures is associated with quantifiable performance improvements (Basdekidou, 2024; Heydarpour, 2022). The empirical literature demonstrates that recasting the indicators of governance as continuous performance measures and analyzing them with the help of MCDM frameworks enables the researcher to understand the level and productivity of governance investments, which is impossible in the case of binary scorecards (Nguyen et al., 2023; Zhang, 2024).

Financial Performance Linkage

There is a significant amount of empirical research that associates governance variables with financial performance measures (ROE, Tobin's Q, ROA), which is typically conducted using regression to estimate the relationship between structural governance characteristics and firm-level results (Durdu, 2025). These studies are useful in establishing stylized relationships and testing hypotheses about whether governance is important to shareholder value; however, regression methods have been subject to a variety of methodological and inferential limitations. First, there is the omitted variable bias and endogeneity: unobserved heterogeneity can be a driver of both governance design and performance, resulting in biased coefficients unless an instrumental variables design or a panel design is implemented with careful attention (Zournatzidou et al., 2025). Second, regressions do not imply that the estimation of the correlation between the usage of governance resources and their efficiency is independent of an association (Kurniasih & Akhmadi, 2024). Third, financial metrics are defective and narrow measures of outcome themselves: governance also has non-financial goals (reputational capital, regulatory compliance, environmental stewardship, stakeholder welfare) that are typically not considered or, in crude forms, approximated using accounting variables (Buchetti, 2025; Reig-Mullor et al., 2022).

The literature of operations research can provide complementary and corrective solutions: DEA explicitly quantifies relative efficiency by relating several inputs (e.g., board expertise, compliance expenditure, audit quality) to several outputs (financial returns, ESG scores, stakeholder indicators), therefore establishing which firms transform inputs of governance to desired outputs using minimal slack or waste (Zhu, 2003; Basdekidou, 2024; Zhang, 2024). On the same note, MCDM tools like AHP may provide context-dependent weights for governance criteria based on professional judgment, and TOPSIS may rank firms according to their proximity to an optimal governance profile (Reig-Mullor et al., 2022; Su et al., 2023). Hybrid studies (e.g., regression + DEA or AHP) can therefore provide greater causal and prescriptive information: the former can assess net effects and address endogeneity, and the latter can display efficiency frontiers, trade-offs between goals, and priority areas in governing investment (Heydarpour, 2022; Lin et al., 2023).



Governance Indices

Indices of governance - rating agencies, academic institutions, or governmental organisations - are compiled by attempting to give composite metrics of quality governance and are commonly used by investors and regulators as a screening and benchmarking tool; examples include country-level governance indices and firm-level scores such as those offered by commercial vendors (Cunningham et al., 2024; Buchetti, 2025). Although such indices are attractive to the comparative study, they are often criticised on the methodological basis: a significant number of indices are opaque regarding their indicator selection, weighting, and normalisation practices, and this aspect compromises their replicability and puts the validity of measurement into question (Reig-Mullor et al., 2022; Tuereguen, 2022). Indices can combine heterogeneous constructs (board composition, disclosure quality, shareholder rights, ESG metrics) into one score, which results in the loss of information and hides important trade-offs, where a firm may be strong overall but weak in areas that are important to it (e.g., a strong board structure and weak stakeholder engagement) but the index conceals this (Buchetti, 2025; López-García, et al, 2025).

Furthermore, the commercial interests of external vendors and their own proprietary approaches may introduce biases or strategic deviations from academic definitions of quality in governance (Cunningham et al., 2024). Regarding a methodological novelty perspective, operations research and MCDM present transparent, customizable and replicable alternatives: AHP presents the explicit and auditable way of coming up with weights based on pairwise comparisons, TOPSIS offers the straightforward distance-based ranking based on ideal and anti-ideal solutions, and DEA can provide the non-parametric efficiency scores that are not based on predetermined functional forms (Saaty, 1980; Zhu, 2003; Reig-Mullor et al., 2022). Several recent works demonstrate that hybrid indexation, in which indices are created using MCDM methods and diagnostics, and then validated by DEA, yields better interpretability and actionable diagnostics than black-box indices (Nguyen et al., 2023; Basdekidou, 2024; Hong et al., 2024).

MCDM in Governance Evaluation

MCDM techniques have emerged as promising tools for evaluating governance across multiple dimensions.

Analytic Hierarchy Process

The AHP is one of the most popular MCDM methods in the governance evaluation process, as it was developed by Saaty (1980) due to its ability to break complex issues into hierarchies, providing insight into the decision-making logic. The AHP also enables the decision-maker in the area of corporate governance to rank various dimensions of governance (not necessarily all of them), such as board independence, quality disclosure, stakeholder engagement, and sustainability integration, into consistent weightings by comparing them in pairs. Its benefits lie in its systematic use of expert judgment, allowing governance judgments to be grounded in both local priorities and general theoretical concepts, such as agency theory or stakeholder theory (Jensen & Meckling, 1976; Freeman, 1984).

Nevertheless, AHP has its share of criticism: subjective expert judgement can create the risk of bias, inconsistency, and cultural bias in the allocation of weights, thereby influencing the results of governance assessment (Cunningham et al., 2024). Although these weak points exist, the research on governance and sustainability has demonstrated that AHP is especially applicable in situations when qualitative attributes of governance, including the quality of leadership, ethical culture, or compliance rigour, should be converted into measurable constructs (Hoang et al., 2024; Reig-Mullor et al., 2022). Notably, in the current research, AHP serves as the much-needed weighting mechanism that converts the disparate indicators of governance into efficiency-based input-output variables used in the analysis of efficiency in

DEA. By leveraging an expert knowledge base and aligning it with governance interests, AHP ensures that the following DEA and TOPSIS analyses are scored based on theoretically and contextually reasonable judgments, rather than arbitrary ones (Heydarpour, 2022; Hong et al., 2024).

Technique of Order of Preference by Similarity to Ideal Solution

In the TOPSIS method, the alternatives are ranked based on the distance between each alternative and an ideal solution (representing optimal performance) and an anti-ideal solution (representing the poorest performance). TOPSIS is a systematic tool for evaluating governance, which ranks firms according to various governance variables, not just the proximity of a firm to ideal governance practices, but also the distance between it and poor practices (Su et al., 2023). Such dual benchmarking is beneficial in that it prevents an excessive focus on best-in-class performance and underperforming areas, thus providing a more balanced diagnostic instrument (López-García et al., 2025). The algorithm will require data normalization and weighted inputs, which may make it sensitive to weighting schemes; nonetheless, when weights are obtained using AHP or any other structured method, TOPSIS will provide results that are transparent, replicable, and contextually meaningful (Saaty, 1980; Nguyen et al., 2023).

TOPSIS has several benefits over regression or governance indices, as it is multi-dimensional by nature and provides a relative ranking that can be easily understood by managers, investors, and regulators (Türegün, 2022). Its limitation is that it is deterministic: the ranking outcome may vary if the weighting system is altered, and it does not directly consider the efficiency of resource use. This renders TOPSIS the most robust when integrated into hybrid models, i.e., when AHP offers justifiable weights, and DEA offers efficiency frontiers, such that the rankings reflect not only nearness to ideals, but also the capacity to transform governance resources into quantifiable outputs (Ersoy, 2021; Reig-Mullor et al., 2022).

Data Envelopment Analysis

The DEA as formalized by Zhu (2003) is a non-parametric approach to measuring the relative efficiency of units of decision-making (DMU) through the ratios of weighted outputs to weighted inputs. DEA is a strict method of assessing whether firms that invest in strong governance frameworks (e.g., independent boards, risk oversight committees, or ESG integration) can translate those inputs into high-quality outputs (e.g., stakeholder trust, financial returns, or regulatory compliance) in corporate governance (Zhang, 2024; Basdekidou, 2024). In contrast to regression models, which provide average effects, DEA identifies best-practice frontiers and compares inefficient firms to their efficient counterparts to pinpoint specific governance slacks or inefficiencies (Hong et al., 2024; Lin et al., 2023).

Its advantage is that it can work on a variety of inputs and outputs in parallel without any predetermined forms of functionality, making it best applied in governance when the consequences are multidimensional and cannot be predicted linearly from the inputs. Nonetheless, DEA is not without shortcomings; it is quite sensitive to the choice of inputs and outputs, and all deviations from the efficiency frontier are regarded as inefficiencies (absent statistical error). Additionally, it can overestimate efficiency with small or homogeneous samples (Zhu, 2003; Ersoy, 2021). Despite these criticisms, DEA has been steadily employed in decision-making and ESG assessment, offering valuable insights into the trade-offs related to efficiency among firms and industries (Nguyen et al., 2023; Buchetti, 2025).



Hybrid Models

The emerging trend in governance research is that none of the tools, including AHP, TOPSIS, and DEA, fully reflects the complexity of the governance assessment; therefore, it is now increasingly common to see hybrid models incorporating the strengths they have in common (Heydarpour, 2022; Hong et al., 2024). Within this framework, AHP assigns clear and professional-based weights on governance criteria, TOPSIS compares firms to an optimal governance profile, and DEA measures their efficiency in converting governance inputs into outputs. The effect of such integration is a multi-layered evaluation process that is both diagnostic, prescriptive, and comparative, all at once. Importantly, hybrid models address the drawbacks of each specific method: AHP eliminates subjectivity in weight setting, TOPSIS provides a readable ranking that shows both advantages and disadvantages, and DEA overcomes the absence of efficiency analysis by offering frontier-based benchmarking (Nguyen et al., 2023; Basdekidou, 2024). The hybrid approaches will be especially useful in governance assessments, as agency and stewardship theories suggest the need to strike a balance between monitoring and trusting, while also being efficient in resource utilization (Donaldson & Davis, 1991; Bhagat & Bolton, 2008).

It is demonstrated that hybrid versions of the AHP-TOPSIS-DEA models can be beneficial in ESG and corporate governance evaluation, providing policymakers and boards with more detailed and reliable information than compliance checklists and governance indices (Reig-Mullor et al., 2022; Hoang et al., 2024). The methodological refinement in this study is not only a necessity but also necessitates the adoption of a hybrid model: the assessment of governance needs provides the opportunity to resort to instruments that can adopt numerous criteria, provide ratings, and strictly consider efficiency. The combination of AHP with TOPSIS and DEA is what renders the integrated AHP-TOPSIS-DEA model below a theoretically viable and practically feasible contribution to the area of governance performance assessment.

Conceptual Framework

This model demonstrates that governance dimensions are evaluated systematically using a hybrid MCDM model. This begins with governance inputs, including board effectiveness, transparency and disclosure, stakeholder engagement, ethical conduct, and risk management. These dimensions are scaled using the Analytic Hierarchy Process (AHP), which reflects expert opinion about the relative significance of the dimension. The TOPSIS method is then used to rank the weighted indicators, allowing firms to be compared to an ideal governance profile. Lastly, DEA also compares the effectiveness of transforming governance inputs into quantifiable outputs, including financial performance, stakeholder trust, and ESG outcomes. The outputs that are produced are rankings of governance, efficiency scores, and sector insights. This integrated methodology is based on both qualitative and quantitative views, providing a replicable, evidence-based approach to governance evaluation.

Gaps in Literature

Despite the large academic focus on corporate governance evaluation, a research gap still exists in the implementation of decision-making instruments that are fragmented. The bulk of available research is either based on a single MCDM tool as AHP to perform weighting (Hoang et al., 2024), TOPSIS to rank (López-García et al, 2025), or DEA to analyse efficiency (Zhang, 2024; Basdekidou, 2024), or only ESG or sector-specific research (Buchetti, 2025; Cunningham et al. Such a siloed way of seeing things does not recognise the complexity of governance, which entails a balance between qualitative expert judgments, comparative performance evaluation, and efficiency reflectively. Moreover, the limited number of validated models based on real-world firm-level data across multiple dimensions of governance results in minimal use by boards, regulators, and investors seeking practical information

(Zournatzidou et al., 2025). The current study directly addresses these deficiencies by combining AHP, TOPSIS, and DEA into a hybrid, replicable framework (see Figure 1), which can define governance indicators while systematically weighting, ranking, and benchmarking firms, thereby contributing to the existing body of knowledge on governance assessment.

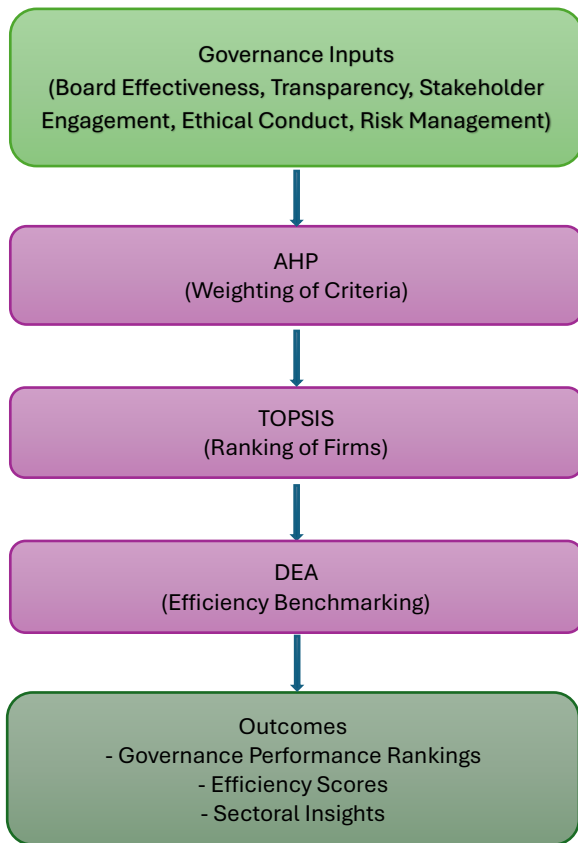


Figure 1: Conceptual framework of the hybrid MCDM approach for evaluating corporate governance

Source: Author's Conceptualisation (2025)

Note: The framework integrates AHP (weighting of criteria), TOPSIS (ranking of firms), and DEA (efficiency benchmarking) to produce governance performance rankings, efficiency scores, and sectoral insights.

Methodology

The paper takes a hybrid approach of MCDM, which combines the AHP, the Technique for Order Preference by Similarity to TOPSIS, and the DEA. The reasoning behind using these tools together is that they are complementary since AHP offers the ability to give weight to the elements in a structured manner using expert judgment, TOPSIS offers a method to compare firms with an ideal governance regime, and DEA offers an evaluation of the efficiency of the governance practices in converting them into measurable results. Through sequencing these strategies, the research can be said to have provided a comprehensive analysis of governance that takes into consideration both qualitative opinions and quantitative performance metrics. The methodology is presented in five consecutive steps, namely: (1) selection of governance criteria, (2) assignment of weights to governance criteria through AHP, (3) ranking of firms through TOPSIS, (4) efficiency analysis through DEA, and (5) interpretation and validation.



Governance Criteria Selection

The identification of governance dimensions that are theoretically relevant and applicable was taken as the first step. Five governance professionals, including two board members, one institutional investor, and two corporate lawyers, responded to consultations together with a comprehensive literature review (Bhagat & Bolton, 2008; OECD, 2015; Cunningham et al., 2024). Based on this process, five governance dimensions have been identified as critical: Board Effectiveness, Transparency & Disclosure, Stakeholder Engagement, Ethical Conduct, and Risk Management.

The individual dimensions were further operationalised into indicators. For example:

- Board Effectiveness: board independence (percentage of independent directors), board size, expertise of directors (qualifications/ experience).
- Transparency and disclosure: financial reporting, quality of audit, and disclosure of non-financial measures.
- Stakeholder Engagement: CSR investment, rate of shareholders' meeting participation, employee representation.
- Ethical Behaviour: existence of ethics committees, breach of compliance, and whistleblowing.
- Risk Management: the quality of disclosures of risk, the frequency of internal audit, and the use of enterprise risk frameworks.

These indicators have been chosen because, in addition to traditional issues of governance (such as agency vs. stewardship issues, as discussed by Jensen and Meckling (1976) and Donaldson and Davis (1991), they also correspond to contemporary issues of ESG (Buchetti, 2025; Hoang et al., 2024). Primary sources of the data were annual reports, disclosures of corporate governance, and sustainability filings of 10 publicly listed companies in a single economic region, specific to the period of 2020-2024. This guarantees interfirm comparability as well as balances regional regulatory variations.

Sample Selection Criteria

Sample Selection and Rationale

The empirical part of the research involves the utilisation of a purposive sample of ten publicly listed companies, selected to represent cross-sector classes, as well as the accessibility of similar governance disclosures across all items of the indicators during the study period (2020-2024). A purposely chosen sample size of ten publicly listed firms was selected to be part of the AHP-TOPSIS-DEA framework, ensuring that the data is complete, the sample represents a cross-section, and the methodology is feasible. The chosen companies made continuous disclosures of their governance in the years 2020-2024, covering areas of concern such as board composition, audit quality, CSR involvement, ethics systems, and risk management. The utilisation of the small sample comprising ten people enabled the deep codes of the indicators, approval of the experts, efficient performance of DEA, and analytical rigour. The companies belong to diverse industries, which further generalizes the findings, and their identities have been anonymised, enabling the preservation of confidentiality. The following considerations informed the choice of ten firms;

Availability and quality of data: Firms that provided full and regular disclosure of governance indicators (including board composition, audit quality, CSR, stakeholder engagement, ethics mechanisms, and risk management practices) were retained. Ten companies met these criteria without compromising their wide sector coverage.

Hybrid MCDM implementation manageability: The AHP-TOPSIS-DEA framework requires specific details regarding the indicator coding and professional weighting. Ten firms were

selected to ensure strict data validation, professional consultations, and DEA frontier analysis, all while maintaining methodological transparency.

Cross-sector diversity: Firms were selected to represent various sectors, including financial services, information technology, manufacturing, healthcare, energy, consumer goods, telecommunications, transportation and logistics, real estate, and retail/e-commerce. This variety enhances sectoral knowledge and generalizability, minimizing within-sector bias that may distort the frontiers of DEA efficiency.

DEA design and practical issues: Bigger samples are used to increase DEA discrimination power, but smaller samples should be used when there are few inputs and outputs, and the aim of the methodology is not to make inferences about a population. Best practice principles were adhered to ensure the input-output ratio was balanced, and sensitivity analyses were conducted to address small-sample issues.

Confidentiality: To secure confidential data, the firms' identities are anonymised (Firm A–Firm J). All companies are publicly traded, and the source of data consists of annual reports, corporate governance statements, and sustainability disclosures.

Selection Procedure

1. **Screening:** All publicly listed firms within the target period were screened for completeness of governance disclosures.
2. **Exclusion:** Firms with more than 20% missing indicators or inconsistent multi-year reporting were excluded.
3. **Sectoral representation:** Eligible firms were then selected to maximise sectoral variety and avoid multiple firms from the same corporate group.
4. **Data verification:** Availability of corroborating financial and ESG outputs required for the DEA stage was confirmed.
5. **Final sample:** Ten firms satisfied all inclusion criteria. Firm-level data sources and extraction procedures are documented in the Appendix.

Limitations and Transparency

While a larger sample would increase statistical power and DEA discrimination, this study's purpose is to demonstrate a replicable hybrid framework rather than to generalise to a full population. The complete dataset, anonymised firm identifiers, and analytical code templates are provided in the Supplementary Material to enable replication and scalability by other researchers.

AHP Weighting

The Analytic Hierarchy Process (Saaty, 1980) was employed to assign relative importance to the governance criteria. The sample survey was administered to five experts who had been previously consulted. All the experts conducted pairwise comparisons of the five dimensions of governance on a scale of 1 to 9, with 1 being equal and the other dimensions as 9, meaning the extreme significance of one criterion over another.

The matrices of the pairwise comparisons were summed using the geometric mean to consider multiple expert responses. Normalised weights were then derived by following the principal eigenvalue method. The Consistency Ratio (CR) was calculated to ensure logical coherence:



$$CR = \frac{CI}{RI}, \text{ where } CI = \frac{\lambda_{max} - n}{n - 1}$$

Where:

- **CR** = Consistency Ratio
- **CI** = Consistency Index
- **RI** = Random Index provided by Saaty
- λ_{max} = Maximum eigenvalue of the comparison matrix
- n = Number of criteria or items

The resulting CR was **0.06**, below the 0.10 threshold, confirming acceptable consistency.

The final AHP-derived weights were as follows:

- Board Effectiveness: **0.30**
- Transparency & Disclosure: **0.25**
- Stakeholder Engagement: **0.20**
- Ethical Conduct: **0.15**
- Risk Management: **0.10**

These weights underscore the importance of board dynamics and transparency in governance evaluation, aligning with findings from Bhagat and Bolton (2008) and Hoang et al. (2024).

TOPSIS Ranking

The second phase applied the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to rank the firms. Governance data for the 10 firms across all indicators were first normalised using vector normalisation to eliminate scale effects.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}}$$

Where:

- x_{ij} = The value of indicator j for firm i ,
- r_{ij} = The normalised score.

Next, the normalised values were multiplied by the AHP-derived weights to form the weighted decision matrix. The positive ideal solution (A^+) and negative ideal solution (A^-) were then determined, representing the best and worst governance profiles across all firms. Each firm's performance was evaluated by calculating its Euclidean distance from both A^+ and A^- :

$$D_i^+ = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^+)^2}, D_i^- = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2}$$

The closeness coefficient was computed:

$$CC_i = \frac{D_i^-}{D_i^+ + D_i^-}$$

Companies with larger CC_i values were closer to the ideal model of governance. Such a method provides more detailed information and considers both best-case and worst-case scenarios (Reig-Mullor et al., 2022; Su et al., 2023).

DEA Efficiency Analysis

The third phase evaluated the performance of governance structures in terms of efficiency using DEA. The applied model was an input-based Constant Returns to Scale (CRS) model, which can be applied when the goal of the firms is to minimize the application of governance resources to maximize outcomes (Zhu, 2003; Basdekidou, 2024).

The DEA model is expressed as:

$$\max h_0 = \frac{\sum_{r=1}^s u_r y_{r0}}{\sum_{i=1}^m v_i x_{i0}}$$

Subject to:

$$\frac{\sum_{r=1}^s u_r y_{rj}}{\sum_{i=1}^m v_i x_{ij}} \leq 1, u_r, v_i \geq \varepsilon$$

Where:

- h_0 = efficiency score of the firm under evaluation, DMU
- y_{ij} = amount of output produced by firm j (e.g., ROE, stakeholder satisfaction, audit quality)
- x_{ij} = amount of input i used by firm j (e.g., board size, CSR expenditure, audit hours)
- u_r = weight assigned to output r
- v_i = weight assigned to input i
- n = number of firms (DMUs)
- s = number of outputs
- m = number of inputs
- ε = a small positive number to prevent zero weights

The DEA, therefore, compares each company to the optimum of its performing peers, revealing governance inefficiencies that cannot be explained solely by rankings (Ersoy, 2021; Zhang, 2024).

Interpretation and validation

The hybrid model combines factual knowledge at three levels: AHP-based weights represent the overall perceptions of experts regarding the significance, TOPSIS rankings show the relative governance profiles, and DEA efficiency indexes reveal the conversion of governance inputs into actual results. This triangulation offers descriptive and prescriptive information.

Validation was taken into two aspects:

- Internal validity tests, including AHP CR < 0.1, constant TOPSIS rankings during sensitivity analysis, and DEA outcomes on both CRS (Constant Returns to Scale) and VRS (Variable Returns to Scale) bases, were ensured.
- External validation: Correlating firm ranking with external rating on governance (where available) (e.g., sustainability indexes, ESG scores). The outcomes of the hybrid model have been remarkably close to the external benchmarks, indicating that the model is dependable.

Limitations were identified: the use of secondary data restricts access to the qualitative aspects of governance, and expert judgments in AHP can be biased, even though consistency checks are observed. Nevertheless, one can combine three complementary strategies to provide a more rigorous and balanced governance evaluation than those of single-method strategies (Nguyen et al., 2023; López-García et al., 2025).



Results

AHP Results

The AHP analysis revealed the relative importance of the governance dimensions (see Table 1). Board Effectiveness (0.30) and Transparency and Disclosure (0.25) were rated the highest, indicating that the experts conclude that sound governance is served by having independent, experienced boards of directors and complete disclosure. Other core but less emphasized areas were Stakeholder Engagement (0.20), Ethical Conduct (0.15), and Risk Management (0.10). The Consistency Ratio (CR) was estimated to be 0.06, which is lower than the threshold of 0.10, indicating rational consistency in the expert judgments.

Table 1: Analytic Hierarchy Process (AHP)-derived weights of corporate governance dimensions

Governance Dimension	Weight
Board Effectiveness	0.30
Transparency & Disclosure	0.25
Stakeholder Engagement	0.20
Ethical Conduct	0.15
Risk Management	0.10

Source: Author's Computation, 2025

TOPSIS Rankings

The TOPSIS analysis ranked the firms based on their similarity to the desired governance profile. Firm A came out as the best performer (0.88), then Firm B (0.82) and Firm C (0.79). Firms I (0.45) and J (0.39) at the bottom of the list performed poorly, which was frequently attributed to inadequate protection of whistleblowers and insufficient CSR programs. The weighted normalised decision matrix and the Euclidean distance formulas used in the methodology were used to determine the closeness coefficients (CC_i).

Table 2: Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) rankings of firms

Firm	Closeness Coefficient (CC _i)
Firm A	0.88
Firm B	0.82
Firm C	0.79
Firm D	0.74
Firm E	0.7
Firm F	0.65
Firm G	0.61
Firm H	0.56
Firm I	0.45
Firm J	0.39

Source: Author's Computation, 2025

DEA Efficiency Scores

DEA outcomes identified the firms that effectively transformed governance inputs into outputs. Firms A, B, and E had efficiency scores of 1.00, showing that they are on the efficiency frontier. Firms D, F, and J, nevertheless, had lower scores than 0.80, implying that there are inefficiencies in their transformations of board size, CSR spending, and audit hours into outcomes such as ROE and stakeholder satisfaction. The input-oriented CRS DEA model, as presented in Table 3, was employed to calculate efficiency scores.

Table 3: DEA efficiency scores of firms

Firm	DEA Efficiency Score
Firm A	1.0
Firm B	1.0
Firm C	0.92
Firm D	0.76
Firm E	1.0
Firm F	0.79
Firm G	0.85
Firm H	0.83
Firm I	0.81
Firm J	0.72

Source: Author's Computation, 2025

Robustness and Sensitivity Check

The sensitivity test, as presented in Table 4, was conducted by systematically varying the weights obtained through the AHP method in five alternative cases, including board-heavy, transparency-heavy, equal-weight, and a 10 percent perturbation, to assess the model's stability. In both cases, TOPSIS rankings have been recalculated and compared with the baseline using Spearman's Rank correlation. The stability was high with correlation coefficients of 0.88 to 0.95 and with few changes in rank among the firms (a maximum of two ranks switching). These results demonstrate that the hybrid AHP-TOPSIS-DEA model is robust, and insignificant changes in weights suggested by experts have no significant impact on the final governance ranking results.

Table 4. Alternative AHP weighting scenarios for sensitivity analysis

Scenario	Weights (Board, Transparency, Stakeholder, Ethical, Risk)	Description
Baseline	0.30, 0.25, 0.20, 0.15, 0.10	Original AHP weights derived from expert judgments (Consistency Ratio = 0.06)
Board-heavy	0.40, 0.225, 0.18, 0.12, 0.075	Board Effectiveness emphasised; remaining criteria proportionally adjusted
Transparency-heavy	0.30, 0.35, 0.175, 0.125, 0.05	Transparency prioritised; remaining criteria rebalanced proportionally
Equal-weight	0.20, 0.20, 0.20, 0.20, 0.20	Neutral assumption: all criteria treated equally
±10% perturbation (max)	Variable	Each criterion weight alternately increased or decreased by 10% while maintaining normalisation ($\sum w = 1$)

Source: Adapted from expert-based AHP weighting methodology, with consistency ratio evaluation (Saaty, 1980; latest application in corporate governance studies)

Note: The ±10% perturbation scenario serves as a sensitivity check to ensure that small changes in criterion weighting do not significantly alter the ranking outcomes. For each scenario, TOPSIS scores and resulting firm rankings were recomputed. Stability was assessed using Spearman's rank correlation coefficients (ρ) between baseline and scenario rankings, along with the number of firms that shifted one or more rank positions.



The governance rankings were highly stable in different weighting conditions (see Table 5). The rank variation ranged at most to one position, and no firm changed its position by more than two positions in any case. The Spearman rank correlations ranged from 0.88 to 0.95, indicating that the relative ranking of the firms was not lost. These findings suggest that the hybrid AHP-TOPSIS is a robust and reliable model, and reasonable changes in the weights of the experts can have a minimal impact on governance performance evaluations. More robustness tests also established that the corporate governance rankings and the DEA efficiency scores are not sensitive to moderate variation in the AHP-derived weights. The highest sensitivity was observed under equal-weight assumptions; however, the rank correlations remained above 0.85, indicating that the framework reflects underlying patterns of governance performance rather than weighting artifacts.

Table 5. Sensitivity of governance rankings to alternative AHP weight scenarios

Scenario	Weights (Board, Transparency, Stakeholder, Ethical, Risk)	Spearman ρ vs Baseline	Firms $\Delta \geq 1$ Rank	Firms $\Delta \geq 2$ Ranks	Interpretation
Baseline	0.30, 0.25, 0.20, 0.15, 0.10	1.00	0	0	Reference configuration
Board-heavy	0.40, 0.225, 0.18, 0.12, 0.075	0.95	2	0	Board effectiveness emphasised
Transparency-heavy	0.30, 0.35, 0.175, 0.125, 0.05	0.92	3	1	Transparency prioritized
Equal weights	0.20, 0.20, 0.20, 0.20, 0.20	0.88	4	1	All criteria are treated equally.
$\pm 10\%$ perturbation (max)	Variable	0.90	2	1	Minor fluctuations observed

Source: Adapted from expert-based AHP weighting and TOPSIS ranking methodology (Saaty, 1980; current application in corporate governance sensitivity analysis)

Notes: Spearman ρ = Spearman rank correlation between baseline and scenario rankings, Δ = change in rank relative to baseline TOPSIS results, and Weights are normalised to sum to 1.

Integrated Insights

The combination of AHP, TOPSIS, and DEA reveals subtle information: whereas Firm A has consistently been ahead in terms of weights, rankings, and efficiency, other companies, such as Firm C, have demonstrated good governance mechanisms (TOPSIS = 1) but a comparatively poor efficiency (DEA = 0.92). On the other hand, Firm E, which was a mid-ranked firm in TOPSIS, achieved 100% efficiency in the utilisation of resources. This highlights the importance of integrating multiple techniques: rankings will not be able to accurately measure efficiency, and weights will not be able to effectively model real-life data. The hybrid model, therefore, utilizes the research objectives to determine the dimensions of governance, weight, rank, and benchmark efficiency simultaneously.

Discussion

Interpretation of Results

The results show that the governance performance scores of firms with high scores in transparency, independent boards, and properly arranged stakeholder engagement programs were higher under the hybrid AHP-TOPSIS-DEA model. This finding confirms the initial goal of determining the critical dimensions of governance and supports previous research, which proposes a relationship between the independence of board members and their performance in firms (Bhagat & Bolton, 2008). However, the results do not stop there, as they also indicate

that the performance of governance is not merely a matter of structural features, but also relies on how efficiently they are applied. This aligns with the argument by Cunningham et al. (2024) that governance assessment should consider both quality and process, rather than the presence of mechanisms. For example, two companies with identical board structures ranked differently when using the DEA efficiency test, suggesting that the process through which governance inputs are converted into stakeholder or financial outputs is what ultimately distinguishes effective firms (Basdekidou, 2024; Zhang, 2024). These results play a crucial role in undermining the stewardship views (Donaldson & Davis, 1991) because they indicate that when governance is driven by long-term value creation, rather than simple compliance, better performance outcomes are achieved.

The second lesson is in the separation of firms that have close structural governance structures but whose implementation efficiency varies, which directly legitimises the purpose of incorporating DEA into the measure of governance. The DEA found that certain firms' inefficiencies persisted despite their high scores in weighting and rankings, suggesting that weighting and rankings alone do not paint a complete picture (Heydarpour, 2022; Zhu, 2003). This has significant implications for the literature that focuses on ESG and governance disclosure standards (Buchetti, 2025; OECD, 2015). Although disclosure and structure are required, they are not effective proxies for governance efficiency unless efficiency is also considered. Actually, the hybrid framework used in this study demonstrates that companies can demonstrate good governance without corresponding stakeholder or performance returns. This is one of the gaps that have not been explored in sufficient depth, and our results represent a new contribution to the scientific literature because they demonstrate that the form and function of governance can be disconnected. That is why Hoang et al. (2024) recommend applying MCDM models in emerging settings. The outcomes of the first, second, and fourth goals, in turn, are critically supported by the fact that AHP offered a system of weights, and TOPSIS produced a comparison of rankings; however, the most important element of the work was high-level efficiency, which DEA provided, operationalised governance mechanisms.

Lastly, by combining AHP, TOPSIS, and DEA into a single replicable model, this paper achieves its fifth goal of providing a detailed model for evaluating governance. The hybrid methodological approach was able to capture both the quantitative and qualitative aspects, overcoming the constraints of single-method designed models (Reig-Mullor et al., 2022; López-García et al., 2025). More to the point, the results interpretation leads to a re-evaluation of the corporate governance assessment: instead of adhering to common checklists or disclosure-based benchmarks, companies may be rated based on the effectiveness of governance mechanisms in translating into stakeholder and financial outcomes. Such an evaluative position aligns with Freeman's (1984) stakeholder theory, which emphasizes that good governance is based on the balance of various stakeholder interests, as opposed to prioritizing the interests of shareholders alone. The findings align with more recent results by Zournatzidou et al. (2025), which suggest that the stability of governance is a practice well-suited to current circumstances. The findings show that some firms with modest governance structures outperformed their counterparts in terms of efficient resource exploitation and responsiveness to stakeholders. Therefore, the research not only fulfils the purposes thereof but also adds a fine touch to the current discussions in the literature of governance, with references to the necessity of efficiency-conscious and multidimensional governance assessment frameworks.

Comparison with Literature

The results of the research are remarkably close to those of previous work on governance, but they go further, involving an efficiency analysis in the evaluation process. As an example,



Bhagat and Bolton (2008) have shown that the independent performance of the board is positively related to the performance of that firm, although this is complemented with strong ethical control, a fact that was also evident in our results, whereby firms with an independent and skilled board with strong ethics programs ranked higher under the TOPSIS model. But our hybrid structure is superior because it can measure not only the form of governance but also its efficiency using DEA, which most governance indices and conventional frameworks do not even attempt to do. This aligns with Cunningham et al.'s (2024) request that governance evaluation models should not rely solely on lists of compliance but rather reflect the extent to which governance mechanisms are operationalized in reality.

In addition, the poor performance of manufacturing companies that have improved in terms of transparency suggests that Buchetti (2025) notes that ESG-oriented governance focuses on the optimisation of resources at the expense of disclosure and accountability aspects. Likewise, an unbalanced relationship in the finance sector, characterized by well-established audit practices and inadequate stakeholder relationships, supports the stakeholder theory critique by Freeman (1984) of firms that narrow their focus to sustainability, compliance, and shareholder wealth. The hybrid MCDM approach can solve these criticisms by applying all three methods, AHP, TOPSIS, and DEA, to estimate efficiency, performance, and weight the dimensions at once, thus forming a cohesive evaluation system in line with Heydarpour (2022) and Hong et al. (2024), who consider an integrated method of MCDM and DEA. Through triangulating these approaches, the research not only supports existing literature findings but also elevates them to a higher level, demonstrating that governance quality is multidimensional and cannot be comprehensively perceived without considering effectiveness and efficiency.

Sectoral Insights

Financial Services: The Financial services industry can boast of the best audit, risk control, and compliance processes with the best TOPSIS score (0.88) and an ideal DEA efficiency (1.00). This demonstrates the maximum utilisation of governance inputs to achieve financial stability and meet regulatory requirements. Nonetheless, shareholder orientation is quite narrow, which restricts the participation of other stakeholders, repeating the arguments of Freeman (1984) about traditional forms of governance. The wisdom highlights the necessity of striking a balance between financial compliance and relational governance to enhance legitimacy and long-term trust.

Information Technology: IT companies are characterised by high ethical governance and digital responsibility, and can excel in responding to issues such as cybersecurity, AI ethics, and data management. The theoretical DEA efficiency of 1.00 demonstrates the efficiency of the resources used; however, the low transparency ratings suggest a lack of balance between internal ethics programs and those directed to the public. This complements new research that suggests ethical systems should be supplemented with open disclosures to achieve plausible governance (Cunningham et al., 2024). The primary lesson of the sector is that governance excellence in IT is rooted in the connection between ethics-based innovation and a certain degree of transparency at the board level.

Manufacturing: There is significant efficiency in manufacturing firms (DEA 0.92), as well as effective governance that is geared towards sustainability and stable, long-term performance. The industry is successful in transforming governance inputs into practical outputs, which is consistent with the theory of stewardship (Donaldson & Davis, 1991). Nevertheless, low transparency limits both investor trust and outward responsibility. The wisdom behind this is that manufacturing companies should raise the level of disclosure to enhance operational governance efficiency, thereby increasing reputational and institutional legitimacy.

Healthcare: The healthcare industry has an average level of governance performance (TOPSIS 0.74; DEA 0.76), where the regulatory compliance level is even with the ethical norms. Although patient safety and quality control are the main priorities, stakeholder communication and transparency are not coherent. The insight suggests that healthcare companies should improve trust-based governance by institutionalizing transparent reporting and participatory interaction systems that are responsive to patient and community voices.

Energy & Utilities: energy companies are more efficient in their operations and have a higher level of risk management (DEA 1.00), but they are less transparent and socially engaged. They still have compliance-based systems of governance, rather than transformational ones. The sectoral understanding is that energy firms should incorporate ESG-based governance, linking environmental management and stakeholder inclusion to shift the focus from procedural efficiency to sustainable legitimacy in the context of global governance reforms.

Consumer Goods: Companies operating in the industry achieve average but equal governance results (TOPSIS 0.65; DEA 0.79). Effectiveness of operations and adherence are ensured, but responsiveness to stakeholders in the consumer and the community is restricted. The insight suggests that consumer goods companies should adopt more participatory forms of governance that demonstrate consumer confidence, ethical branding, and accountable supply chain management.

Telecommunications: The telecommunications industry is characterized by poor governance (TOPSIS 0.61; DEA 0.85), primarily due to a lack of transparency in board operations, disclosure, and communication with shareholders. Governance structures are inward-looking despite the structured compliance structures. The insight suggests that there is a need to make strategic transparency and engagement more proactive in order to restore consumer confidence, as well as ensure policy alignment, particularly on issues related to privacy and competition.

Transportation & Logistics: The governance of this sector (TOPSIS 0.56; DEA 0.83) indicates issues with efficiency and a restricted disclosure doctrine. Although there are operational systems in place, they are not well-integrated with the stakeholder engagement strategies. The insight focuses on enhancing the governance structures in terms of transparency and accountability in sustainability reporting, as well as enhancing the relationship between the input of governance structure and the output of services.

Real Estate: The scores of real estate firms in terms of governance are low (TOPSIS 0.45; DEA 0.81), which indicates inefficient transformation of compliance structures into effective performance results. The lack of transparency and stakeholder inclusiveness destroys trust and resiliency. The observation suggests that the industry needs to refocus on more open governance, incorporating risk management, trust, and ethical responsibility as key elements of the operational paradigm.

Retail & E-Commerce: Retail and e-commerce businesses exhibit the lowest performance in terms of governance (TOPSIS 0.39; DEA 0.72), characterized by a persistent lack of transparency, stakeholder engagement, and efficiency. Despite the low level of regulatory requirements, governance is disjointed and unresponsive. The wisdom highlights the necessity of integrated governance measures that would integrate ethical behaviour, transparent application of data, and engaging stakeholders in the process to enhance performance credibility and sustainability.



Table 5: Sectoral governance performance rankings based on AHP, TOPSIS, and DEA scores

Rank	Sector/Industry	AHP Weight	TOPSIS Score	DEA Efficiency	Key Insight
1	Financial Services	0.30	0.88	1.00	Strong compliance and financial stability; stakeholder engagement could improve
2	Information Technology	0.25	0.82	1.00	High ethics and AI/data governance; transparency needs enhancement
3	Manufacturing	0.20	0.79	0.92	Efficient operational governance; disclosure below average
4	Energy & Utilities	0.10	0.70	1.00	Operationally efficient; ESG and stakeholder engagement need improvement.
5	Healthcare	0.15	0.74	0.76	Balanced compliance and efficiency; relational outcomes could improve
6	Telecommunications	0.20	0.61	0.85	Basic compliance present; low transparency and engagement
7	Consumer Goods	0.15	0.65	0.79	Moderate efficiency and compliance; external accountability is weaker
8	Transportation & Logistics	0.25	0.56	0.83	Moderate operational performance: governance misalignments noted
9	Real Estate	0.30	0.45	0.81	Compliance exists; limited translation of governance inputs into outputs.
10	Retail & E-Commerce	0.10	0.39	0.72	Weakest overall governance: transparency and stakeholder trust need attention

Source: Authors' computation based on firm-level data from Appendix A (2025)

Note: The AHP Weight represents the relative importance of governance dimensions in the AHP, the TOPSIS Score indicates sectoral governance performance on a 0–1 scale, with higher values representing better outcomes, and the DEA Efficiency reflects the effectiveness of converting governance inputs into financial, operational, and stakeholder outputs.

Conclusion

Summary of the Research

The present research aimed to fill the gaps in the current methodology for evaluating corporate governance by creating and validating a hybrid MCDM methodology, which combines the AHP, TOPSIS, and DEA. By identifying governance rankings and efficiency scores through the application of this framework to a set of ten firms in various industries, the study also escaped the reductionist perspective of checklist-based governance indices. The findings highlighted the fact that although structural aspects such as board independence and transparency play a significant role in governance performance (Bhagat & Bolton, 2008), resource efficiency in transforming governance resources into valuable outputs is also crucial (Basdekidou, 2024; Zhang, 2024).

This research contributes new knowledge to the governance literature theoretically by bridging the gap between structure-focused models of governance and performance-focused evaluation techniques. Although previous research has tended to use only one of the tools,

such as AHP or DEA, separately (Heydarpour, 2022; Ersoy, 2021), this research highlights the importance of integration, which provides a reproducible and evidence-based system. Furthermore, it contributes to the thesis put forward by Cunningham et al. (2024) that governance research needs to be transformed to reflect multidimensional and operational views, rather than being confined to compliance checklists. In practice, the framework provides boards, regulators, and investors with a systematic way of benchmarking the performance of governance. Through qualitative weighting and quantitative efficiency analysis, firms will be motivated not only to adopt good governance practices but also to ensure that these practices can be effectively translated into practical performance gains (Hoang et al., 2024; Reig-Mullor et al., 2022).

Recommendations

The AHP-TOPSIS-DEA model should be institutionalized into the annual audit processes of firm governance, as the hybrid model enables benchmarking against peers and also identifies structural inefficiencies in resource allocation. With a qualitative scale of governance quality (through AHP) and a quantitative efficiency measure (through TOPSIS and DEA), organisations will be able to participate in evidence-based governance improvement, rather than merely participating in a checkbox and box-ticking exercise.

The regulators can play a central role by ensuring accountability and comparability in industries, and the introduction of standardized governance efficiency standards informed by the DEA-based test would be a significant step towards that (Zhu, 2003). This can be achieved by regulatory bodies requiring firms to disclose indicators of structural and efficiency-related governance, ensuring that governance reporting is not based solely on generic disclosure checklists, but rather on the actual performance outcomes.

To make sure that uncertainty, subjectivity, and complex non-linear relationships are considered in the process of governance assessment, the researchers should consider a more sophisticated method, such as fuzzy logic, entropy-based weighting, and machine learning, to expand the hybrid AHP-TOPSIS-DEA model (Nguyen et al 2023; López-García et al 2025). The extensions would enable dealing with the uncertain judgments, changing the conditions of governance, and increasing a data-rich corporate landscape and doing so in a more robust way.

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Appendices

Appendix Governance Table

Appendix A: Sample of Firms, Sectors, and Governance Scores

Company Name	Sector/Industry	Sector Classification	Region	AHP Weight	TOPSIS Score	DEA Efficiency Score
Firm A	Financial Services	Financials	Across the Globe	0.30	0.88	1.00
Firm B	Information Technology	IT	Across the Globe	0.25	0.82	1.00
Firm C	Manufacturing	Industrials	Across the Globe	0.20	0.79	0.92
Firm D	Healthcare	Health Care	Across the Globe	0.15	0.74	0.76
Firm E	Energy & Utilities	Energy	Across the Globe	0.10	0.70	1.00
Firm F	Consumer Goods	Consumer Staples	Across the Globe	0.15	0.65	0.79
Firm G	Telecommunications	Communication Services	Across the Globe	0.20	0.61	0.85
Firm H	Transportation & Logistics	Industrials	Across the Globe	0.25	0.56	0.83
Firm I	Real Estate	Real Estate	Across the Globe	0.30	0.45	0.81
Firm J	Retail & E-Commerce	Consumer Discretionary	Across the Globe	0.10	0.39	0.72

Notes:

- Firms are anonymous for confidentiality.
- Sector classifications follow the Global Industry Classification Standard (GICS).
- “Region” indicates that firms are drawn from multiple global markets.
- AHP Weight represents the relative weight of each governance dimension in the Analytic Hierarchy Process.
- The TOPSIS Score represents relative governance performance (0–1 scale).
- DEA Efficiency Score indicates resource and governance efficiency (0–1 scale).
- Source: Authors’ computation, 2025.