




## Article

# Developing a Compliance Index to Improve the Performance of Major State-Owned Enterprises: An Analysis of South Africa

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## Abstract

Performance evaluation frameworks are essential for monitoring and enhancing the performance of state-owned enterprises (SOEs). Nonetheless, the existing frameworks exhibit particular deficiencies in delivering a comprehensive assessment of SOE performance or facilitating significant improvement. This study developed a comprehensive compliance index (PCI) to measure SOE performance. The PCI was developed through a systematic and integrative review of the current performance frameworks and refined using the Delphi technique via an online questionnaire. This study contributes to public sector performance evaluation research by offering a more integrated tool that captures the full scope of SOEs' performance, including financial, non-financial and developmental dimensions, based on the South African context. It is recommended that policymakers, especially the National Treasury, promote the adoption and use of the PCI to assist SOEs in assessing, monitoring, and improving their performance.

**Keywords:** performance; compliance index; state-owned enterprises; Delphi technique



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## 1. Introduction

Persistent organisational underperformance within the public sector reform has emerged as a critical concern, particularly in developing nations such as South Africa. This inefficiency has significantly undermined the capacity of public institutions to deliver essential socio-economic services as outlined by the UN Sustainable Development Goals (UNSDG) 2030. Notably, these phenomena cut across state-owned enterprises (SOEs), which are entities formally constituted by the government to undertake commercial operations on its behalf (Notununu, 2024). SOEs are expected to fulfil dual mandates: advancing public sector objectives such as creating public value while simultaneously achieving private sector imperatives like profitability and competitive positioning (OECD, 2021; Bruton et al., 2015). However, SOEs encounter many issues, causing the National Treasury, the Department of Planning, Monitoring, and Evaluation (DPME), and other government agencies to implement some institutional frameworks. These initiatives strive to improve the public sector's effectiveness, accountability, and governance systems.

To enhance both individual and institutional performance and thereby improve the quality of service delivery, the South African government (DPME) introduced the Performance Management and Development System (PMDS) in 2003 (Makhooa, 2018). Despite the system incorporating financial incentives to reward excellent employee performance,

persistent inefficiencies and the continued inability of government departments and SOEs to deliver fundamental services signalled significant shortcomings in its effectiveness. In response to these enduring performance deficits, the Government-Wide Monitoring and Evaluation System (GWMES) was launched in 2005. This framework was designed to standardise monitoring and evaluation processes across all spheres of government and extend their applicability to both the private and non-profit sectors 9 ([The Presidency, 2017](#)).

Further attempts by DPME to rectify performance inefficiencies led to the development of the Management Performance Assessment Tool (MPAT) in 2010, with its formal implementation occurring in 2012. MPAT was explicitly aimed at enhancing managerial performance within the public sector through systematic assessment of compliance with established standards and regulatory frameworks, with the ultimate objective of improving service delivery ([DPME, 2012](#)). Consequently, a more integrative approach was adopted in recent years, comprising three interrelated mechanisms: the legislative provisions of the Public Finance Management Act (PFMA), corporate governance frameworks, and institutionalised performance reporting practices. This framework aims to provide a more robust and accountable system for monitoring and enhancing the operational performance of SOEs ([Mohuba, 2023](#)).

Notwithstanding the establishment and implementation of various performance enhancement frameworks, significant limitations persist across these mechanisms. For instance, PMDS suffers from both structural and operational deficiencies. These include a disjunction between individual performance evaluations and the broader strategic objectives of the organisation, inadequate integration of performance metrics with national developmental goals, minimal stakeholder engagement, and an excessive reliance on quantitative indicators, which often fail to capture the nuanced dimensions of public services performance ([Khumalo, 2022](#)). Similarly, GWMES has been critiqued for its narrow focus on efficiency and procedural relevance, frequently neglecting the assessment of effectiveness in achieving long-term developmental goals. According to [Masombuka and Thani \(2023\)](#), these limitations, particularly concerning the depth and scope of available data, undermine the system's capacity to support evidence-informed policy decisions and inhibit the cultivation of a performance-oriented culture within SOEs.

The implementation of MPTA, however, has encountered notable challenges, particularly regarding inconsistencies in practice and the entrenchment of informal organisational behaviour. A salient example is the reluctance of senior management to interrogate or challenge self-assigned performance ratings by subordinates, thereby undermining the credibility and objectivity of the performance assessment. Moreover, the broader performance frameworks currently in use are not without inherent limitations. For instance, non-compliance with legislation such as the PFMA can result in poor financial management, misuse of assets, and lack of transparency and accountability ([G. Naidoo, 2004](#)). [Moolman and Van Der Waldt \(2022\)](#) note that an inadequate review of audit frameworks by the board further erodes the efficacy of oversight, potentially enabling operational inefficiencies and fostering conditions conducive to corruption. Lastly, incomplete performance reporting may fail to reflect the full range of SOE's objectives, omitting critical financial indicators like socio-economic imperative and economic growth ([Mikael & Mabhungu, 2024](#)).

Despite the development and implementation of these various performance management frameworks by DPME and the National Treasury, all of these mechanisms have fallen short of enhancing the performance of SOEs, let alone offering a comprehensive assessment of their performance based on financial and non-financial indicators. This contrasts with OECD guidelines, which advocate for performance measurement systems that integrate financial and non-financial indicators, closely aligned with SOEs' strategic and developmental objectives ([OECD, 2021](#)). Therefore, a substantial body of literature

has investigated this phenomenon by analysing a mixed performance framework that integrates financial and non-financial metrics. The results are still inconclusive (Abang'a et al., 2022; Phi et al., 2021; Singh & Chen, 2020; Sithomola, 2019). For instance, Phi et al. (2021) observed that even such an integrated approach has not achieved consensus on its effectiveness in capturing the full complexity of SOEs' performance.

This study develops a comprehensive compliance index for measuring SOE performance by addressing these gaps. While building on existing frameworks that combine financial and non-financial indicators, its key innovation is the addition of a third-dimensional developmental performance. This makes it one of the first studies to assess SOE performance holistically across three dimensions: financial viability, operational effectiveness, and developmental contribution. Using this tripartite approach, the research provides a more comprehensive and policy-relevant assessment framework that is better linked with SOEs' various mandates and their vital role in promoting socioeconomic and developmental goals on behalf of the state.

Therefore, this research is focused on the following thematic questions:

1. Can a performance compliance index (PCI) be developed to effectively measure and improve the performance of state-owned enterprises (SOEs)?
2. What key indicators should be included in a PCI to assess SOE performance comprehensively?

The hypotheses are as follows:

**H1a:** *The Performance Compliance Index (PCI) developed for SOEs does not provide a reliable and valid measure of their performance.*

**H1b:** *The Performance Compliance Index (PCI) developed for SOEs provides a reliable and valid measure of their performance.*

**H2a:** *Including additional indicators beyond financial and non-financial metrics does not improve the comprehensiveness of the PCI in improving SOE performance.*

**H2b:** *Including additional indicators beyond financial and non-financial metrics significantly improves the comprehensiveness of the PCI in measuring SOE performance.*

## 2. Literature Review

This literature review is structured around two interrelated thematic areas. First, it explores the role of SOEs in the economy, particularly emphasising a comparative analysis across BRICS countries. The reason for drawing the empirical study on BRICS countries, consisting of Brazil, Russia, India, China, and South Africa, is their rapid growth, positioning themselves as the emerging and powerful economic bloc within the global economy. Second, the literature review will examine the ownership and governance model, which are the principles that underpin their persistent poor performance. Together, these dimensions provide a comprehensive foundation for understanding SOEs' challenges and strategic potential in emerging economies.

### *The Role of State-Owned Enterprises in the Economy*

State-owned enterprises (SOEs) are essential to the global economic structure, achieving socio-economic and developmental objectives. As a result, these entities are frequently classified into two main categories: non-commercial and commercial. Non-commercial state-owned enterprises are typically founded to provide commodities and essential services on the government's behalf, fulfilling vital social missions (Phaladi, 2021). OECD

(2014) defines commercial SOEs as entities that function in competitive market environments, conducting business transactions under conditions designed to maintain parity with private sector counterparts.

According to the [International Monetary Fund \[IMF\] \(2020\)](#), SOEs contribute a total aggregate value of approximately US\$45 trillion, representing nearly half of the world's gross domestic product (GDP). Of this, BRICS nations collectively contribute around US\$16.6 trillion, underscoring their substantial role in the global economy. Table 1 presents an overview of the economic landscape of the BRICS countries.

**Table 1.** BRICS's GDP economic indicators.

Country	Population	Annual GDP US\$	GDP per Capita US\$	Human Development Index	Debts US\$	Debt as % of GDP	Deficit as % of GDP
Brazil	209,469,333	1,867,818	8.917	0.759	1,641,023	87.89	−7.23
Russia	1,395,380,000	13,368,073	9.580	0.752	6,766,845	50.64	−4.82
India	1,352,617,328	2,718,732	2.010	0.640	1,849,402	68.05	−6.40
China	146,800,000	1,657,290	11.289	0.816	241,945	14.61	2.92
South Africa	57,939,000	368,135	6.354	0.699	208,683	56.71	−4.42

Source: Adapted from [Kanyane and Sambo \(2021\)](#).

The BRICS countries display significant differences in their economic profiles; China has the highest GDP per capita (US\$11,289) and the strongest Human Development Index (HDI) score (0.816), while maintaining the lowest debt-to-GDP ratio (14.61%) and a budget surplus of 2.92%. In contrast, India has the lowest GDP per capita (US\$2010) and the lowest HDI (0.640), with a debt-to-GDP ratio of 68.05% and a budget deficit of −6.40%. Brazil shows a high debt burden, with debt reaching 87.89% of GDP and a significant budget deficit of 7.23%, despite having a moderate GDP per capita (US\$8917) and an HDI of 0.759. Russia recorded a relatively strong GDP per capita (US\$9580) and moderate debt levels (50.64% of GDP) but faces a fiscal deficit of −4.82%. South Africa has the smallest economy among the BRICS in terms of GDP, a GDP per capita of US\$6354, and a moderate HDI (0.699), but carries substantial debt (56.71% of GDP) and a deficit of −4.42%.

Although SOEs from BRICS nations contribute substantially to the global economy, they continue encountering systemic challenges that hinder their performance in fulfilling their intended mandates. In the case of Brazil, for example, government- and SOE-related credit accounted for 61.88% of GDP in 2020 ([Ponela, 2020](#)). This economic contribution positioned Brazil as the tenth-largest economy globally, as reported by the World Bank in 2020 ([World Bank Group, 2022](#)). However, despite their macroeconomic significance, Brazilian SOEs encounter notable structural challenges. A key issue pertains to governance, wherein agency conflicts tend to be exacerbated under the conditions of state ownership, thereby complicating effective oversight and performance management ([Coelho et al., 2024](#)).

In the Russian context, SOEs have maintained a substantial presence within the national economy. In 2015, SOEs accounted for approximately 29–30% of the country's GDP, while the broader public sector contributed close to 70%, marking a significant increase from 35% in 2025 ([Abramov et al., 2017](#)). Despite their economic prominence, Russian SOEs also face persistent structural and governance-related challenges. As [Le et al. \(2023\)](#) highlight, state ownership often brings complications such as politically driven mandates, conflicting organisational objectives, and the absence of a clearly defined ownership structure. These issues collectively undermine SOEs' autonomy, foster politicised decision-making processes,

weaken profit-oriented incentives, and hinder the implementation of efficient performance management systems.

According to [Agarwal et al. \(2022\)](#), India, recognised as one of the world's fastest-growing economies, presents an intriguing case for examining the relationship between SOEs and economic development. The association appears to support the idea that SOEs can coexist with each other and potentially contribute to sustainable economic growth. According to the World Bank's development indicators, the ratio of the credit extended to the government and SOEs relative to GDP stood at 22.79% in 2020. As of the end of the 2019/20 financial year, the central government maintained ownership of 366 SOEs. Of these, 256 were operational and generating income, ninety-six were in developmental phases or yet to report operational revenues, and fourteen were either undergoing closure or liquidation ([Macheda & Liu, 2025](#)). While SOEs play a significant role in India's economic framework, their scale and influence remain comparatively modest when contrasted with their counterparts in China.

The People's Republic of China is currently the world's second-largest economy, with a nominal GDP of US\$17.795 trillion. However, recent reports from the National Bureau of Statistics of China ([NBSC, 2024](#)) indicate a decline in the country's average annual growth rate. Between 2001 and 2011, China experienced an average decline rate of 10%, which slowed to 6% between 2012 and 2023. This catastrophic phenomenon has prompted a paradigm shift in China's economic strategy. The country is transitioning from a growth model heavily reliant on the intensive use of traditional production factors to one that prioritises high-quality, sustainable development ([Wang et al., 2021](#)). China's largest economic presence is further demonstrated by its more than 150,000 SOEs, which collectively generate 84.72 trillion yuan in operating revenue and contribute approximately 25% to 40% of the national GDP. Most Chinese SOEs operate in a competitive market, often facing rivalry from other SOEs, because it is uncommon for an SOE to hold a monopoly, except in naturally monopolised sectors. This competitiveness structure contrasts sharply with the situation of SOEs in South Africa.

As of the third quarter of 2024, South Africa's GDP was estimated at US\$400.19 billion, with a purchasing power parity (PPP) adjusted GDP of US\$1.275 trillion ([Statista, 2025](#)). After contracting by 0.1% in the third quarter of 2024, the economy experienced a modest recovery with a 0.6% expansion in the fourth quarter (October–December) ([StatsSA, 2025](#)). Despite the above, South Africa's long-term economic performance has declined over the past decade. According to [Chitiga-Mabugu et al. \(2022\)](#), this downward trend is driven by several factors, including persistently low business confidence, weak revenue collection, and rising government expenditure to support the poor performance of SOEs. These SOEs contribute approximately 13% to the national GDP, yet their financial instability remains a significant concern.

The [World Bank Group \(2025\)](#) reported that between 2010 and 2025, South Africa's GDP growth rate fell from 3.0% to 1.5%, while public debt escalated from 34.7% to 55.6%, mainly due to the fiscal risks posed by struggling SOEs. According to [CorruptionWatch \(2025\)](#), the government has spent an estimated R521 billion over the past 15 years on SOE bailouts, reflecting the scale of the problems in South Africa. For example, in 2019, South African SOEs collectively recorded losses of R34 billion, with specific enterprises such as SA Express and Transnet posting losses of R590 million and R12 billion, respectively. [Galane \(2025\)](#) opines that this persistent financial strain led the South African government to pursue the partial privatisation of South African Airways (SAA), with an attempt to sell a 51% stake to the Takatso Consortium in 2021. However, the proposed transaction sparked significant public opposition, and the deal was ultimately cancelled in 2024.

In conclusion, the role of SOEs in BRICS countries is significant, and their impact on the global economy is undeniable. Despite their important contributions, SOEs across these countries face common challenges, including governance failures, corruption, political interference, and socio-economic pressures (Chitiga-Mabugu et al., 2022). Another concern is the misalignment of executive remuneration across SOEs, especially that of the chief executive officers (CEOs). For example, during a South African Parliamentary Q&A session, it was revealed that CEOs of the South African SOEs can earn up to R15 million annually, equivalent to approximately R42,400 per day. This phenomenon persists despite a regulatory framework intended to govern the salaries of SOE CEOs.

### 3. Theoretical Framework

This section outlines the literature's theoretical foundation, specifically ownership property rights and agency theory concerning financial sustainability.

#### 3.1. The Ownership Property Rights Theory of State-Owned Enterprises

The concept of ownership and control of the firm was brought to the fore by a seminal contribution paper by Berle and Means (1932), under the book title *"The Modern Corporation and Private Property"*. This concept was expanded thoroughly by Grossman and Hart (1986), under the theme of ownership as the allocation of residual control rights over assets when contracts are incomplete, and later by Hart and Moore (1990) under Property rights and the nature of the firm. This theory examines the entitlements to utilise, benefit from, and dispose of resources and the mechanisms for allocating and enforcing such rights (Grossman & Hart, 1986; Hart & Moore, 1990). Moreover, advocates of corporate governance, such as Gogineni et al. (2022), extended their insights on how ownership structure affects agency problems and control in private firms, establishing a conceptual foundation for examining the significance of ownership identity (private shareholder, state, or mixed ownership) on company conduct and performance.

Over the past decade, empirical and comparative literature has refined and complicated this idea, with the majority supporting a mixed reform approach. For instance, an empirical study by Huo et al. (2024) demonstrated a significant positive association between mixed ownership and investment efficiency, confirming the mediating function of agency costs in this relationship. This mechanism indicates that mixed-ownership reform alleviates funding limitations and enhances risk-taking, enabling SOEs to adopt a differentiation strategy (Yuan et al., 2024). Despite the ability of ownership and control, particularly mixed ownership (change to property structure), to improve the performance of SOEs in some contexts, it may also have conflicting and diluted interests if not correctly managed.

For example, research by Ma et al. (2015) on the Pecking order of mixed ownership: The logic of market, indicates that a mere combination of ownership does not enhance the performance of SOEs. Ning et al. (2025) substantiate this finding by presenting evidence that regulating state-owned equity impedes innovation performance in MOEs. Conversely, the dominance of state shareholding in mixed ownership reforms can hinder the innovative capacity of private shareholders (Musacchio & Lazzarini, 2018). These theoretical and empirical findings have a strong policy resonance because governments and policymakers treat ownership and property rights control as fundamental to SOEs' reform. Despite the divergence in findings, these empirically substantiated findings provide significant insights for developing successful policy measures to advance mixed-ownership reforms in emerging economies (Ning et al., 2025).

### 3.2. Agency Theory and Financial Sustainability of State-Owned Enterprises

The agency theory emanates from the seminal work of [Meckling and Jensen \(1976\)](#), which examines the relationship between owners (principals) and managers (agents). They argue that the latter is more vulnerable to information asymmetry, competing interests, and opportunistic behaviour. On the other hand, when the state owns a significant shareholding, the principal-agent problems require distinctive features such as political objectives, multiple principals, and non-commercial mandates, which weaken the alignment between managerial incentives and financial sustainability. [Zejnnullahu \(2021\)](#) defines agency theory as the relationship structure between the principal and the agent, with the former giving authority to act on his behalf to the latter. This theory is founded on the notion of rationality, and it uses two basic rational models to describe the acts of agents and principals in agency theory.

A growing body of empirical literature has applied agency theory to identify the mechanisms that link ownership, governance, and performance of SOEs. Systematic reviews by [Mauludina et al. \(2023\)](#) on the determinants of SOE's performance: A systematic literature review shows that corporate governance features (ownership, board makeup, and CEO compensation) are among the most commonly researched drivers of SOE stability and profitability. Recent empirical literature has established that political involvement impacts the sustainability of SOEs. For instance, [Lee et al. \(2022\)](#), The financial sustainability of state-owned enterprises in an emerging economy, revealed that excessive political interference introduces pricing constraints, political appointments, and mission drifts that cause agency costs and reduce the long-term variability of SOEs. Agency problems in SOEs are often more complex than those in the classic single model due to the multiple role players, such as ministries, authorities, political parties, and regulators.

Qualitative and mixed research methods, particularly in emerging economies, demonstrate that these multiple-principal dynamics force managers to respond to competing objectives such as profit enhancement, job preservation, fiscal transfer, and financial sustainability, making decisions more difficult ([Apriliyanti et al., 2024](#)). From the agency's point of view, it believed that having many principals increases monitoring expenses and reduces the ability to construct cohesive incentive programs. At the same time, the literature describes cases in which institutional improvements minimise agency frictions and increase SOE performance. Studies on China's anti-corruption campaigns and governance reforms show that by reducing rent-seeking and bolstering state oversight, high-pressure political reforms can realign managerial behaviour with performance goals, improving cost control and operating efficiency in specific industries ([Bae et al., 2024](#)).

## 4. Methodology

This section outlines the methodology used to achieve the study's primary objective: to develop a compliance index to measure the performance of state-owned enterprises (SOEs) in developing economies. This research adopted a qualitative approach, specifically the Delphi technique, administered through an online structured questionnaire. This method is appropriate for obtaining consensus at the development stage of an index or framework from professional experts, and experts are characterised as informed persons possessing expertise about the subject matter being discussed ([V. Naidoo et al., 2023](#)). Therefore, the questionnaire was designed to gather expert opinions and reach consensus on the performance checklist's comprehensiveness and completeness, aiming to develop a performance compliance index (PCI). This method aligns with existing empirical literature, in which the Delphi technique has been applied to develop various indices and frameworks ([Chikutuma, 2024](#); [Matemane et al., 2022](#); [Ambe, 2021](#); [Denhere & Moloi, 2020](#); [De Oliveira](#)

et al., 2019). The continuous application of the Delphi technique across numerous studies demonstrates its reliability and suitability for producing credible and meaningful results.

According to Jones (2018), the Delphi technique was developed in the 1950s by mathematicians Helmer and Norman Dalkey at the Rand Corporation, a global non-profit organisation focused on policy and decision-making. The Delphi technique is a structured group process involving interaction between the researcher and a panel of selected experts on a specific topic, typically conducted through multiple questionnaires (Yousuf, 2007). As noted by Niederberger and Spranger (2020), the primary aim of the Delphi technique is to generate expert consensus on complex epistemological questions. Beyond its strength in statistical aggregation, the Delphi technique offers several practical advantages over other methods of gathering experts' opinions. It is especially valuable when in-person discussions are not feasible. The key advantage of this method lies in preventing the omission of crucial information, a potential drawback associated with open-ended questions in the initial round (Vitacca et al., 2020).

In this study, the Delphi technique was conducted over two consecutive iterative rounds to achieve consensus among the panel of experts. This approach aligns with scholars such as Vitacca et al. (2020) and Mikuls et al. (2021), who suggest that a two-round Delphi process is often sufficient to reach a practical and usable level of agreement among experts. Experts with knowledge of the governance, oversight, and operations of SOEs were approached and recruited to participate in the Delphi questionnaire. The study target purposive sample was 30 panels of experts, evenly distributed across five categories based on their experience in SOEs: CEOs and CFOs, chairpersons and audit committee members, board members of SOEs, academics and researchers, and professionals from the accounting and auditing sectors such as the Chartered Institute of Management Accountants (CIMA), South African Institute of Chartered Accountants (SAICA), South African Institute of Public Accountants (SAIPA), Association of Chartered Certified Accountants (ACCA), and the Institute of Internal Auditors South Africa (IIA SA). The sample size of participating experts was 20 and 16 in the first and second rounds, respectively, and it was considered sufficient. The numbers fall within the acceptable threshold; for instance, Sourani and Sohail (2015) recommend 7 to 15 participants, Worrell et al. (2013) suggest 10 to 30 participants, and Hallowell and Gambatese (2010) propose a range of 8 to 16 participants.

The expert recruitment followed the five categories outlined in the previous section, and each expert was approached individually. After securing their verbal consent to participate, a formal follow-up email was sent, including an invitation letter, consent form, and all necessary ethical documentation. Participants were asked to complete these forms, which clearly stated that signing them did not obligate continued participation and that they were free to withdraw at any time without penalty. All ethical guidelines were carefully followed, including obtaining an ethics clearance certificate from the University of South Africa (UNISA), and ensuring that participants' personal information remained confidential, in accordance with the Protection of Personal Information Act (POPIA) of South Africa.

Data was collected using a self-developed Delphi online questionnaire distributed through a hyperlink of Microsoft Forms and later converted into Excel. A dichotomous index was employed, where each indicator was rated as either 1 (indicating that the indicator should be reported as part of the performance measures or 0 (indicating that the indicator was irrelevant and should not be included). Consensus was defined as an indicator receiving a minimum overall rating of 51% from participants. Indicators scoring below this threshold were excluded from the formulation of the final index. This approach allowed for a precise, objective determination of which indicators were considered essential by the expert panel. Participants were given 30 min to complete the questionnaire at their

convenience. The Delphi online questionnaire was administered over 30 days, both the first and second rounds. During this process, participants were asked to identify any missing information or errors within the questionnaire.

Additionally, they were requested to validate the draft performance checklist based on four main performance variables, specifically the Public Finance Management Act (PFMA), corporate governance, human capital, and development performance. Table 2 presents the process flow of the Delphi technique as applied in this study.

**Table 2.** Delphi process flow.

NO	Step	Description
1	Identify potential experts	Experts with the necessary expertise and knowledge regarding the subject matter, specifically the disclosure performance SOE about sustainability or social reporting.
2	Selection of experts	Once potential experts were identified, they were selected based on the abovementioned criteria.
3	First round	A hyperlink to the online questionnaire was sent to experts, allowing them to review the performance checklist for potential omission and error, validate its content, and rate each item based on its importance and relevance to SOEs.
4	Feedback from the first round	The response was consolidated to identify common themes, suggestions, and emerging issues.
5	Collect and analyse the rated indicators	The rated indicators were assessed using a binary scale ranging from 0 to 1, whereas a score of "1" was assigned to items reported as relevant performance indicators and a score of "0" was assigned to items deemed not relevant or not applicable.
6	Second round	The refined questionnaire, incorporating feedback from the first round, was subsequently distributed to participants for further evaluation.
7	Consolidation of final inputs	Feedback from this round was collected, and the final inputs from the panel of experts were integrated into the results.
8	Development of performance compliance index (PCI)	This process involved integrating the feedback related to the four non-financial indicators, and combining it with the Z-score to develop the final performance compliance index (PCI)

Source: Researchers (2025).

Notwithstanding the Delphi process outlined in Table 2, the results of the process are presented in the following section. These results correspond closely with the steps described above, and no shortcomings or challenges were identified during the iterative rounds with the panel of experts.

## 5. Empirical Results

As detailed in the methodology, the study initially targeted thirty participants for the Delphi online questionnaire across both interactive rounds. In practice, twenty participants completed the first round, and sixteen participated in the second round. The target for each group was six responses; however, Group E (Professional accounting and auditing) scored the highest, with 35% and 31% in both rounds. Followed by Group A (CEO and CFO), which scored 25% in both rounds; Group B (chairperson or member of the AC), which scored 15% and 25%; and Groups C (board member of SOCs) and D (academic and

researcher), which scored 15% and 13% and 10% and 6%, respectively, in both rounds. The response rates are captured in Table 3 below.

**Table 3.** Response from the Delphi online questionnaire.

Group of Panel Experts	Target	Actual Response		Response Percentage %	
		1st Round	2nd Round	1st Round %	2nd Round %
CEO and CFO	6	5	4	25%	25%
Chairperson or member of the AC	6	3	4	15%	25%
Board member of SOCs	6	3	2	15%	13%
Academic and researcher	6	2	1	10%	6%
Professional accounting and auditing	6	7	5	35%	31%
TOTAL	30	20	16	100%	100%

Source: Researchers (2025).

The validation of the selected factors, including those demonstrating high internal consistency and measurement reliability through Cronbach's alpha, further strengthens the validity and reliability of the results of this study. In line with the approaches adopted by researchers such as Ambe (2021) and Abu Al-Ajeen et al. (2020), the internal consistency achieved in this study ( $\alpha = 0.80$ ) exceeded the commonly accepted minimum threshold of  $\alpha = 0.70$ . Furthermore, the final Cronbach's alpha value of 0.918 indicates excellent internal consistency, confirming the robustness and reliability of the data collected and supporting the credibility of the study's findings. Table 4 presents the main results derived from participants' responses.

**Table 4.** Results.

Public Financial Management Act (PFMA) Checklist									
No	Category	First Round—Rating (N = 20)				Second Round—Ratings (N = 16)			
		1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting	1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting
1	Integrated report (AFS and AR)	20	0	100	0	16	0	100	0
2	Financial misconduct procedure report	19	1	95	5	15	1	94	6
3	Projection of revenue, expenditure	14	6	70	30	10	6	63	37
4	Corporate plan	12	8	60	40	10	6	63	37
5	Quarterly reports on the above, reflecting actual borrowings	12	8	60	40	9	7	57	43
6	Shareholders compact	18	2	90	10	14	2	88	12
7	Irregular, fruitless, wasteful and unauthorised expenditure	20	0	100	0	16	0	100	0
8	Enterprise Risk Management Report (ERM)	14	6	70	30	14	2	88	12
9	Compliance Report	20	0	100	0	16	0	100	0
10	Material Losses	16	4	80	20	14	2	88	12
11	Investment Report	19	1	95	5	15	1	94	6
12	Internal audit report					14	2	88	12
13	Whistle-blowing report					2	14	12	88

Table 4. Cont.

Corporate Governance Checklist									
No	Category	First Round—Rating (N = 20)				Second Round—Ratings (N = 16)			
		1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting	1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting
1	Ethical and effective leadership	19	1	95	5	16	0	100	0
2	Board diversity (age, gender, etc.)	18	2	90	10	15	1	94	6
3	Board size	14	6	70	30	15	1	94	6
4	Audit committee	20	0	100	0	16	0	100	0
5	Structure and policies	15	5	75	25	14	2	86	14
6	Effective internal controls	17	3	85	15	14	2	86	14
7	CEO's and chairperson's report	18	2	90	10	8	8	50	50
8	Independent external auditors	20	0	100	0	16	0	100	0
9	Board committees	19	1	95	5	15	1	94	6
10	Declaration of interest	18	2	90	10	1	15	6	94
11	Whistle-blowing reports	14	6	70	30	7	9	44	56
12	Business continuity plan					15	1	94	6
Human Capital Checklist									
No	Category	First Round—Rating (N = 20)				Second Round—Ratings (N = 16)			
		1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting	1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting
1	Number of employees	19	1	95	5	16	0	100	0
2	Composition of the workforce	18	2	90	10	16	0	100	0
3	Remuneration for executives	18	2	90	10	15	1	94	6
4	Training and development	18	2	90	10	15	1	94	6
5	Recruitment costs	13	7	65	35	10	6	68	32
6	Working environment policies	12	6	60	40	10	6	68	32
7	Absence rates	13	7	65	35	10	6	68	32
8	Accidents on duty rates	16	4	80	20	13	3	81	19
9	Employee wellness	17	3	85	15	14	2	87	13
10	Disciplinary proceedings					5	11	31	69
11	Termination of employment					8	8	50	50
12	Staff expense					6	10	37	63
13	Succession and retention plan					13	3	81	13
Developmental Performance Checklist									
No	Category	First Round—Rating (N = 20)				Second Round—Ratings (N = 16)			
		1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting	1 = Reporting	0 = Non-Reporting	% Reporting	% Non-Reporting
1	Economic growth (GDP)	14	6	70	30	12	4	75	25
2	Corporate social and environmental responsibility (CSR)	19	1	95	5	16	0	100	0
3	Enterprise and supplier development programmes	18	2	90	10	15	1	94	6
4	Skills development	19	1	95	5	15	1	94	6
5	Economic transformation	18	2	90	10	15	1	94	6
6	Regional integration and industrial capability building	13	7	65	35	11	5	69	31

Table 4. Cont.

7	Developmental impact assessment in the economy	16	4	80	20	13	3	80	20
8	National integration	15	5	75	25	12	4	75	25
9	Environmental, social and governance (ESG)					16	0	100	0
10	Sustainability report					12	4	75	25
11	Sustainable Development Goals (SDGs)					11	5	69	31
12	Business/inherent risks					1	15	6	94
13	Community involvement					3	13	20	80
14	National Development Plan targets					14	2	88	12

Source: Researcher (2025).

Table 4 presents the results of the Delphi online questionnaire based on the two iterative rounds. It is important to note that some additional items were introduced following the feedback in the first round. These newly suggested items, along with the original ones, were included in the second round for further expert evaluation to determine whether they should be retained. This study established a minimum consensus threshold of 51% for an item to be retained in the final performance checklist. The 51% threshold represents a simple majority, meaning that more than half of the participants agreed on the item's inclusion. This approach is consistent with existing Delphi literature regarding the consensus threshold. For instance, [De Lima and Seuring \(2023\)](#) recommend a 50% retention threshold, [Louw et al. \(2023\)](#) advocate for an 80% threshold, and [Maaß et al. \(2024\)](#) suggest a 70% consensus level.

#### 5.1. Public Financial Management Act (PFMA) Index (PFMAi)

In the first round, the Public Financial Management Act (PFMA) checklist initially consisted of eleven items, exceeding the established 51% consensus threshold. Notably, items such as financial misconduct and investment reports received 95% consensus, followed by the shareholders' compact with 90%, material losses, enterprise risk management (ERM), and income and expenditure forecast with 70%. The corporate plan and quarterly reports received 60%, and participants recommended two new items: the internal audit and the whistleblowing report.

In the second round, integrated reports (including annual financial statements and annual reports), compliance reports, and fruitless, wasteful, and unauthorised expenditure (FWUE) reports all received 100% consensus. The financial misconduct and investment report received 93%, while the internal audit report, which included the shareholders' compact and material losses, received 88% consensus. The entire ERM framework was supported by 75% of participants. Income and expenditure forecast, business plan, and quarterly borrowing scored 63%, 63%, and 57%, respectively. However, the whistleblowing report received only 12%, falling below the minimum consensus threshold for inclusion.

#### 5.2. Corporate Governance Index (CGI)

In the first round, a unanimous consensus was reached to retain all corporate governance performance checklist items. The audit committee (AC) and the external audit report received 100% consensus. Ethical leadership followed closely with 95% support, while board diversity and declaration of interest achieved 90% consensus. Internal control, governance structure, and the whistle-blower policy received 85%, 75%, and 70% support, respectively. Based on the first-round evaluation, participants recommended including additional items, specifically the CEO and chairperson's report, whistle-blower report, declaration of interest, and corporate social responsibility (CSR).

The second round of this category consisted of twelve items. Ethical leadership and the external audit report maintained 100% consensus. Then, governance principles, including board (diversity, board size, gender representation), board committee, and business continuity plan (BCP), each received 94% support. Structure, policies, and effective internal control scored 86%. However, the CEO and Chairperson's report, declaration of interest, and whistleblowing were excluded from the final corporate governance checklist as they fell below the minimum consensus threshold of 51%.

### 5.3. Human Capital Index (HCI)

In the first round of this category, participants reached a unanimous consensus in support of all listed items, as none were rated below the 51% threshold. For example, the number of employees received overwhelming support at 95%, followed by workforce composition, training and development, achieving 90% consensus. Employee wellness received 80% support, while recruitment costs and absenteeism rate each scored 65%, and working environment policies received 60% agreement. Notably, no items from the initial checklist were recommended for exclusion. Instead, participants suggested the addition of four items: disciplinary proceedings, termination of employment, staff expenses, and retention plans.

In the second round of this category, the number of employees and workforce composition received unanimous support, each achieving 100% consensus. Similarly, remuneration, training, and development attained 94% agreement among participants. Employee wellness was followed by 87% support, while accident of duty rates and retention plan recorded 81% consensus. Recruitment costs, working environment policies, and absenteeism rates each received 68% support. However, disciplinary proceedings, termination of employment, and staff expenses were excluded from the final human capital performance checklist, as they did not meet the minimum consensus threshold of 51%.

### 5.4. Developmental Performance Index (DPI)

The developmental performance checklist initially comprised eight items in the first round of the Delphi questionnaire. Among these, corporate social responsibility (CSR) and skills development received strong support, each achieving 95% consensus. Enterprise and supplier development (ESD) and economic transformation followed with 90% agreement. The developmental impact was supported by 80% of participants, while the national integration and economic growth received 75% support each, and regional integration scored 79%. Based on the first-round evaluation, participants recommended the addition of six new items to the checklist: environmental, social, and governance (ESG) reporting, sustainability reports, sustainable development goals (SDGs), business risk, community involvement, and the national development plan (NDP).

The second round of this category included fourteen items, incorporating the six additional items proposed by participants in the first round. CSR and ESG reporting received unanimous support, each achieving 100% consensus. ESD, skills development, and economic transformation followed with a 94% consensus. 88% and 80% of participants supported NDP and developmental impact, respectively. Economic growth and national integration scored 75%, while SDGs and regional integration achieved 68% consensus. However, an item such as business risk was excluded from the final developmental performance checklist as it scored only 6%, failing significantly below the minimum consensus threshold of 51% established for this study.

## 6. Discussion of Findings

This section presents the final stage of the study, which focuses on developing the performance compliance index (PCI). The PCI is constructed by integrating the re-

sults of the four-dimensional non-financial indexes discussed in the preceding sections with the financial dimension represented by the Z-score. As previously noted, the Z-score is calculated using the following equation:  $1.2A + 1.4B + 3.3C + 0.6D + 0.99E$  (where A = Working Capital/Total Assets; B = Retained Earnings/Total Assets; C = Earnings Before Interest and Taxes (EBIT)/Total Assets; D = Market Value of Equity/Total Liabilities; E = Sales/Total assets). The interpretation and application of this equation suggest that: A company with a score greater than 2.99 is considered financially stable, while a score less than 1.81 indicates financial distress.

This research adopted the Z-score because it combines multiple dimensions, such as working capital, retained earnings, earnings before interest and taxes, market value of equity, and sales, into one index. Comparatively, it complements the limitations and challenges that other single dimension suffers, for instance, Return on Assets (ROA) and Return on Equity (ROE), which only focus on profitability and overlook solvency and liquidity. Debt ratios, such as Debt-to-Equity and Interest Coverage, only focus on leverage and ignore operational efficiency and liquidity aspects. Although these ratios are important, their single-dimensional focus limits their effectiveness; thus, the Z-score integrates them into a single index to offer a comprehensive financial evaluation. The Altman Z-score can therefore be used to measure the financial performance of state-owned enterprises, particularly as a proxy for assessing the financial health of default risk. This model is unlike the traditional profit-based metrics; the Z-score synthesises multiple balance sheet ratios into a single indicator of financial stability (such as working capital, retained earnings, earnings before interest and taxes, market value of equity, and sales). Furthermore, previous studies have employed the Z-score to assess the financial health of state-owned enterprises, as demonstrated by [Tristanti and Hendrawan \(2020\)](#), [Kurniawan and Daryanto \(2022\)](#), and [Widnyana et al. \(2024\)](#).

By combining the financial and non-financial dimensions, the PCI offers a comprehensive measure of performance and compliance for SOEs. The prolonged absence of a comprehensive performance index has contributed to a persistent culture of non-compliance, lack of accountability, and governance deficiencies within SOEs. This study responds directly to these challenges, particularly those of SOEs in developing economies. One of the primary objectives of the PCI is to address the inconsistencies and, at times, misleading approaches to performance reporting while incorporating measures that emphasise long-term sustainability and developmental priorities. The developed PCI comprises forty-two indicators categorised across four key dimensions: PFMAi, CGI, HCI, and DPI. In addition, the financial dimension is represented by a single indicator: the Z-score. Collectively, these indicators are designed to promote strategic alignment, enhance accountability, and support the long-term sustainability of SOEs.

Through the PFMAi dimension, the PCI offers the potential for customisation of public finance management practices, making it applicable across diverse public sector entities, including national and provincial departments, municipalities and SOEs. Tailoring the index to each entity's specific mandate and operational contexts enhances the relevance and effectiveness of performance evaluations. It is recommended that this index be integrated into the performance planning, mid-term reviews, and final evaluation to ensure continuous alignment and accountability. Furthermore, through the CGI, the PCI supports aligning interests between management and shareholders by fostering transparency, accountability, and equitable treatment. Implementing the PCI through CGI components at the beginning of the performance cycle is advisable to establish a sound governance philosophy and framework. Early adoption enables the timely identification and correction of governance deficiencies, thereby preventing potential adverse effects on performance outcomes.

Implementing the PCI through HCI may be effectively aligned with the organisation's financial planning cycle to maximise its impact. Ideally, the beginning of the financial year

is the most suitable time to introduce training programmes and strategic recruitment initiatives, as these are synchronised with budget allocation. Additionally, mid-year evaluations offer a valuable opportunity to assess the effectiveness of these human capital interventions, enabling timely adjustments and improvements before the close of the final year. Implementing the PCI through the DPI dimension allows for the integration of performance benchmarks into annual planning and budgeting processes, ensuring that performance expectations are set from the outset. Through the DPI dimension, it stands as a critical tool for advancing the performance and impact of SOCs globally. Table 5 below presents the Performance Compliance Index (PCI).

**Table 5.** Performance Compliance Index (PCI).

1. Public Finance Management Act Index (PFMAi)			2. Corporate Governance Index (CGI)			
No	Category	Dichotomous		Category	Dichotomous	
		1	0		1	0
1	Internal audit report			Ethical leadership		
2	Integrated annual report (AFS & AR)			Board diversity (age, gender, demographics, and qualifications)		
3	Financial misconduct procedure report			Board size		
4	Projection of revenue, expenditure			Audit committee		
5	Corporate plan			Structure and policies		
6	Quarterly reports on the above, reflecting actual borrowings			Effective internal controls		
7	Irregular, fruitless, wasteful & unauthorized expenditure (IFWUE)			Independent external auditors		
8	Shareholders compact			Board committees		
9	Enterprise Risk Management Report (ERM)			Business continuity plan (BCP)		
10	Compliance Report					
11	Material losses					
12	Investment Report					
3. Human Capital Index (HCI)			4. Developmental Performance Index (DPI)			
No	Category	Dichotomous		Category	Dichotomous	
		1	0		1	0
1	Number of employees			Economic growth (GDP)		
2	Composition of the workforce			Corporate social responsibility (CSR)		
3	Remuneration (executives and board)			Enterprise and supplier development programmes		
4	Training and development			Skills development		
5	Recruitment costs			Economic transformation		
6	Working environment policies			Regional integration and industrial capability building		
7	Absence rates			Developmental impact assessment in the economy.		
8	Accidents on duty rates			National Integration		
9	Employee wellness			Environmental, social and governance (ESG)		
10	Succession and retention plan			Sustainability report		
11				Sustainable Development Goals (SDGs)		

Table 5. Cont.

5. Alman Z-score Index	$1.2A \times 1.4B \times 3.3C \times 0.6D \times 0.99E$	Score	
		Solvency	Insolvency
Interpretation and application of the outcome—if the company is greater (2.99) or less (1.81)		2.99	1.81

Source: Researchers (2025).

A dichotomous index was applied, where a score of “0” indicated that an item should be reported, and a score of “1” indicated that an item should not be reported. A binary scoring system (1 or 0) was used for each performance indicator. A score of “1” was given when an indicator needed to be reported, and “0” was given when it was not required. During the calibration of the final Performance Compliance Index (PCI), indicators with a minimum score of 51% or higher were included in the PCI, while those below this threshold were excluded. Following the iterative rounds, the refined PCI consisted of forty-two performance reporting items distributed across four categories: PFMAi (Public Financial Management Act), CGI (Corporate Governance Index), HCI (Human Capital Index), and DPI (Developmental Performance Index). Additionally, the Z-score was incorporated as the proxy for financial performance information, complementing the non-financial indicators to develop the comprehensive performance compliance index (PCI). The findings of this research do not align with any previous studies, as the development of this index is novel in the field. However, similarities with existing literature lie in using the Delphi technique to develop frameworks and indices (Matemane et al., 2022; Ambe, 2021; Jamil et al., 2020; Chikutuma, 2019).

As a result, the findings of this study directly addressed the research questions and hypotheses developed. First, the findings support the development of PCI that would effectively improve the performance of SOEs, confirming Hypothesis 1 by demonstrating that the PCI is reliable and valid. Second, the analysis in Table 5 identifies key indicators that should be included in the PCI to provide a comprehensive assessment of SOEs’ performance, supporting Hypothesis 2, by showing that incorporating additional metrics (developmental) beyond traditional and financial measures significantly enhances the index’s comprehensiveness. Thus, the study provides empirical evidence that the PCI can serve as a robust measure to improve the performance of SOEs through a multidimensional evaluation approach.

## 7. Conclusions

This study developed a performance compliance index (PCI) that will be used to measure the performance of SOEs. The current performance frameworks and tools only give a limited performance picture consisting of financial and non-financial data. Thus, this PCI seeks to address the current shortcomings of the existing frameworks and bring an additional developmental dimension that gives a holistic performance overview. This synthesis of multiple performance measures improves accountability and transparency and guarantees that SOCs are assessed in a way that considers their larger social implications. The resultant index advances theory and practice by providing policymakers, regulators, and managers with a powerful, contextually relevant instrument for monitoring, guiding, and improving SOCs’ strategic orientation towards sustainable and equitable growth.

Like any study, this research had its limitations, including the potential subjectivity involved in developing the PCI and the coding procedures applied during the content analysis. To address this, the study employed the Delphi technique, which involved iterative engagements with a panel of experts to achieve consensus and reduce individual bias. Nevertheless, some degree of subjectivity may have influenced the selection of

indicators and the interpretation of the data. Despite this limitation, the study's findings provide a valuable foundation for future research. Policymakers in developing economies could adopt the PCI as a strategic tool to capitalise on its international applicability to evaluate, oversee, and continuously enhance SOEs' performance. The South African Treasury, in conjunction with the DPME and the Auditor-General, should institutionalise the PCI as a standardised tool for application across all SOEs.

Therefore, policymakers and the Treasury should issue a directive mandating the implementation of the PCI across all SOEs. SOEs should fully adopt this index because its multidimensional design encompasses developmental imperatives, aligning with frameworks such as the UNSDG, National Development Plan (NDP) and specific government policies such as Treasury Regulation and the PFMA. Future studies should be undertaken, incorporating input from multiple expert panels across different disciplines to better contextualise and validate the findings. The study recommends that future research replicate the PCI within developing economies to enhance understanding of key issues by synthesising socially shared perspectives from a broader and more diverse pool of experts in the SOE sector.

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**Data Availability Statement:** The data used in this study cannot be shared due to legal and ethical restrictions designed to protect the privacy of participants involved in the survey and interviews. As mandated by law, the data are strictly for use within this research project and its related publications. We are not authorized to share the data with other researchers or external parties. For inquiries about the research findings, please refer to the published results or contact the corresponding author for further information.

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