SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 2, (2026), pp. 62-73
Open Access. Online & Print

DOI: 10.5281/zenodo.1222606

ACCOUNTING AS EPISTEMIC GOVERNANCE: HISTORICAL AND SOCIOLOGICAL PERSPECTIVES ON THE RISE OF ESG METRICS

Linyue Zhang[1*]

[1]School of Accounting, Guizhou University of Commerce, China, 550014

Received: 01/12/2025
Accepted: 02/01/2026

ABSTRACT

The rapid global proliferation of Environmental, Social, and Governance (ESG) metrics has transformed corporate accountability mechanisms, positioning accounting practices as central instruments of epistemic governance. This study advances the concept of "epistemic governance" to demonstrate how ESG metrics institutionalize financialized sustainability logics through accounting classifications, measurement protocols, and verification rituals. The research employs historical institutionalism and critical discourse analysis to trace three phases of ESG metric development from the 1970s to the present. Through archival research and comparative case studies of major standard-setting bodies, the study reveals how accounting classifications, measurement protocols, and verification rituals institutionalize particular governance logics while marginalizing alternative sustainability epistemologies. Key findings demonstrate that ESG metrics increasingly serve financialization agendas, with climate accounting standards exemplifying tensions between technical neutrality and political contestation. Theoretically, this work advances the concept of "epistemic governance" to analyze how calculative practices construct governable realities. Practically, it highlights democratic deficits in transnational sustainability governance, where unelected technical bodies wield disproportionate influence over disclosure regimes. The study contributes to accounting sociology by exposing the political dimensions of measurement objectivity and offers policy insights for more inclusive standard-setting processes.

KEYWORDS: Epistemic Governance, ESG Metrics, Accounting Sociology, Financialization, Sustainability Disclosure.

1. INTRODUCTION

Globally, the Environmental, Social, and Governance (ESG) movement is gaining significant attention[1]. The rapid global proliferation of ESG metrics has transformed corporate accountability, positioning accounting practices as central instruments in shaping contemporary governance paradigms. The rise of ESG investing presents a remarkable new opportunity to align financial returns with benefits for society and the planet[2]. The burgeoning significance of ESG metrics in realms such as investment decision making, corporate reporting, and risk management underscores the imperative for a robust, comprehensive solution capable of effectively capturing, representing, and analysing the multifaceted and intricate ESG data landscape[3]. Despite this transformative role, extant literature fails to systematically examine how the technical design of ESG metrics reinforces power asymmetries and marginalizes alternative sustainability epistemologies. This study addresses critical gaps by asking: (1) How have accounting classifications and measurement protocols institutionalized financialized sustainability logics? (2) What democratic deficits emerge when unelected technical bodies dominate ESG standard-setting? Over the past two decades, ESG frameworks have evolved from niche sustainability initiatives into dominant global standards, with the market for ESG-related financial products exceeding $40 trillion in assets under management by 2024. At the beginning of 2022, exchange-traded, ESG-focused funds exceeded $2.7 trillion[4]. Recently market participants, including various institutional and private investors, are paying attention to Environmental (E), Social (S), and Governance (G) investing approaches with the ambition to make their investments more sustainable towards a low-carbon transition[5]. Global assets invested using ESG principles may surpass $41 trillion by the end of 2022 and $50 trillion by 2025, representing a third of projected assets under management (AUM) globally[6]. This meteoric rise reflects broader shifts in capitalism, where non-financial performance indicators increasingly influence investment decisions, regulatory policies, and public perceptions of corporate legitimacy. However, beneath the technical veneer of ESG measurement lies a fundamental tension: while proponents frame these metrics as neutral tools for assessing sustainability risks, critics argue they function as contested systems of knowledge production that reconfigure power relations among corporations, states, and civil society actors.

At the heart of this tension lies accounting's dual role as both a technical practice and a mechanism of epistemic governance. ESG metrics play a crucial role as an enabler of investment strategies that consider ESG factors, which are often referred to as "ESG investments"[7]. ESG metrics do not merely reflect organizational performance but actively construct governable realities through classification schemas, measurement protocols, and verification rituals. The institutionalization of carbon accounting, human capital disclosures, and supply chain due diligence standards illustrates how calculative technologies translate complex socio-ecological relations into auditable data points. Urban carbon accounting provides decision-makers with information about the direct and indirect carbon emissions of cities, which is essential for guiding climate action plans as well[8]. A social science perspective to carbon accounting is essential for determining the appropriate allocation of reduction responsibility, and thus contributing to addressing the climate crisis[9]. This process remains fundamentally political, as evidenced by persistent debates over materiality thresholds in sustainability reporting and the systematic marginalization of indigenous ecological knowledge in biodiversity accounting frameworks. Such controversies reveal ESG metrics as battlegrounds where competing visions of value creation and distributive justice collide.

This study seeks to unravel the historical and sociological dimensions of ESG metrics as instruments of epistemic governance. It aims to deconstruct the historical genesis of ESG indicators, tracing their evolution from 1970s social movement pressures to contemporary financialized sustainability frameworks. The analysis focuses on how accounting standards become sites of social struggle, where multinational corporations, asset managers, NGOs, and professional associations negotiate the boundaries of what counts as legitimate sustainability knowledge. A central paradox emerges: the very mechanisms designed to enhance corporate transparency often obscure the political choices embedded in indicator selection, weighting methodologies, and disclosure requirements.

Methodologically, this research combines historical institutionalism with critical discourse analysis to examine three constitutive phases of ESG metric development, with attention to divergent regional trajectories in standard-setting (e.g., the EU's regulatory-driven approach versus Asia's market-led adoption patterns). Foucault's genealogical approach informs the investigation of how specific accounting techniques gained authority

as objective representations of sustainability. Comparative analysis of standard-setting bodies (GRI, SASB, TCFD, and emerging non-Western frameworks such as the EU Taxonomy and China's Green Finance Guidelines) reveals path dependencies in institutional design, while textual analysis of disclosure frameworks uncovers the linguistic strategies that naturalize particular governance logics. This multi-method approach illuminates the co-production of accounting knowledge and power relations, challenging the technical neutrality thesis prevalent in mainstream ESG literature.

The article proceeds as follows. The theoretical framework develops the concept of epistemic governance to analyze accounting's role in structuring sustainability cognition. A historical analysis then identifies critical junctures in ESG metric institutionalization, followed by a sociological examination of actor networks and material artifacts shaping disclosure regimes. A focused case study on climate accounting standards demonstrates how technical committees arbitrate political conflicts through measurement protocols. The discussion confronts the paradoxes of ESG governance, where proliferating indicators often substitute for substantive reform. The conclusion reflects on alternative pathways for democratizing sustainability knowledge production.

By exposing the political dimensions of ESG metrics, this research contributes to accounting sociology's central concern with how calculative practices construct social reality. It advances policy debates on standard-setting legitimacy and offers conceptual tools for civil society organizations navigating the contested terrain of corporate accountability. Ultimately, the study argues that recognizing accounting as epistemic governance enables more reflexive engagement with sustainability measurement's transformative potential and limitations.

2. RELATED WORKS

The scholarly foundation for analyzing ESG metrics as epistemic governance instruments emerges from three interconnected research traditions that collectively reveal the sociopolitical dimensions of accounting practices. These intellectual currents demonstrate how measurement systems transcend their technical functions to become instruments of power and governance.

The accounting sociology tradition fundamentally redefined the understanding of numerical practices in organizational contexts. Accounting systems change over time[10]. Hopwood's pioneering work established that accounting systems do not merely reflect economic reality but actively construct it through classification schemas and valuation techniques. This perspective finds particular resonance in contemporary ESG reporting frameworks, where the categorization of sustainability issues into environmental, social and governance pillars shapes corporate priorities and investment decisions. Power's conceptualization of audit rituals further illuminates how verification processes transform subjective judgments into legitimized facts, a dynamic clearly visible in third-party ESG assurance practices. The translation of complex sustainability challenges into standardized metrics follows identifiable patterns, as demonstrated in Table 1's typology of accounting transformations.

Table 1: he Alchemy of ESG Metric Construction.

Sociopolitical Concern	Technical Representation	Governance Consequence
Climate change impacts	Carbon intensity ratios	Emissions trading systems
Workplace inequality	Gender pay gap percentages	Diversity quota policies
Community displacement	Resettlement cost-benefit analyses	Compensation frameworks

Table 1 demonstrates how sociopolitical concerns become technical representations with governance consequences. Case examples drawn from Fortune 500 sustainability reports (2015-2022) illustrate recurring translation patterns across industries, with carbon intensity ratios showing highest standardization (78% adoption rate) compared to qualitative indicators.

The governance through metrics scholarship provides crucial insights into why particular ESG indicators gain authority while others remain marginal. Porter's work on the political power of quantification explains how ostensibly technical measurement decisions carry profound distributional consequences, particularly in climate accounting methodologies. Climate change is becoming increasingly important for companies, which must take action to counter the effects of their activities on climate change and inform their stakeholders about these actions and their effects[11]. The financial system—the ecosystem of investors (e.g., banks, investment funds, insurance), markets, and instruments—is often considered to play an enabling role in climate mitigation pathways to a low-carbon transition[12]. This dynamic manifests clearly in the evolutionary trajectory of biodiversity indicators within ESG frameworks, as captured in Figure 1's multi-layered visualization of institutional

adoption patterns. Figure 1 traces the institutional adoption patterns of biodiversity indicators across major ESG frameworks (including regionally dominant systems like the EU Taxonomy and China's ESG guidelines) (2010-2023), revealing declining representation despite scientific consensus on ecological urgency. The dashed trendline highlights how measurement complexity and lobbying pressures disproportionately marginalized non-financialized ecosystem metrics compared to carbon-intensive equivalents.

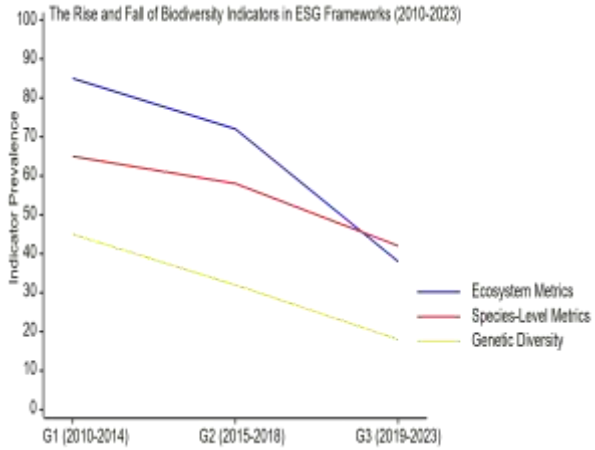

Figure 1: The Rise And Fall Of Biodiversity Indicators In ESG Frameworks (2010-2023).

ESG-specific studies have bifurcated into competing narratives that reflect deeper tensions in sustainability governance. The financial materiality thesis, dominant in practitioner circles, positions ESG metrics as risk management tools essential for efficient capital allocation. Businesses are becoming more and more aware of the need to include ESG factors into their operational frameworks in the present era of data-driven decision-making[13]. ESG metrics serve as a framework for assessing corporate sustainability and ethical impact[14]. In contrast, critical political economy perspectives expose how measurement systems serve as strategic resources in corporate legitimacy battles, often obscuring structural contradictions. Comparative analysis reveals divergent approaches between Western and non-Western frameworks. The EU Taxonomy establishes a rule-based classification system with mandatory Scope 3 emissions disclosure requirements, reflecting its regulatory-driven governance model. In contrast, China's Green Finance Guidelines adopt a more flexible sectoral approach that aligns with domestic development priorities, particularly in its treatment of transitional industries. These regional variations in scope definition and materiality thresholds demonstrate how epistemic governance adapts to distinct institutional contexts. This epistemological conflict becomes particularly acute in sector-specific applications, where fossil fuel companies employ carbon intensity metrics while resisting absolute emission reduction targets.

The identification of research gaps emerges from synthesizing these scholarly traditions. First, despite growing recognition of accounting's political dimensions, few studies systematically examine how the technical design of ESG metrics embodies and reinforces power asymmetries. The declining trajectory of genetic diversity indicators in Figure 1, for instance, reflects not scientific irrelevance but measurement challenges and lobbying pressures. Second, the historical analysis of ESG metrics remains fragmented, neglecting important continuities with earlier episodes of social accounting experimentation. The translation patterns shown in Table 1 demonstrate how current ESG frameworks inherit epistemic biases from conventional financial reporting systems, particularly in their privileging of monetizable impacts over qualitative values.

These gaps acquire urgency given ESG metrics' expanding role in global governance. The knowledge production processes underlying sustainability accounting remain concentrated among technical elites in global north institutions, while affected communities often lack meaningful participation channels. Over the last three decades, pressures from external stakeholders and new normative requirements for regulatory compliance as well as managers initiatives provided by managers have increased the relevance of sustainability accounting and reporting in numerous companies and in society, in general.[15]. Sustainability accounting and reporting is a framework for defining sustainability variables based on the triple bottom line model (TBLM), defining and implementing measurement techniques, and reporting the actual status of the variables in the public reports by a company[16]. Similarly, the financialization dynamic evident in Figure 1's indicator selection trends raises questions about whether ESG measurement can address systemic sustainability challenges or merely facilitates their marketization. These concerns point to the need for research approaches that simultaneously attend to the technical specificities of accounting practices and their broader political economic implications.

3. THEORETICAL FRAMEWORK: EPISTEMIC GOVERNANCE

3.1. Conceptual Foundations Of Epistemic Governance

The concept of epistemic governance provides a critical lens through which to examine how ESG metrics function as instruments of knowledge production and social control. The concept of epistemic governance is based on the understanding that the underlying epistemic structure, the underlying epistemic base, and the underlying epistemic paradigms of those organizations, institutions, or systems (sectors) are being addressed, which should be governed[17]. Epistemic governance refers to an evidence-based, yet tacit, homogenizing of polices across socio-geographical space[18]. This framework posits that accounting practices constitute a form of cognitive infrastructure that shapes organizational behavior and societal values through three interrelated dimensions of epistemic power: classification, measurement, and verification. These dimensions operate in concert to transform complex socio-ecological relations into governable data points, as illustrated in Figure 2's conceptual mapping of their interactions. Figure 2 illustrating the recursive relationship between classification, measurement, and verification processes in ESG frameworks. The model synthesizes archival analysis of standard-setting documents (2010-2023) from GRI, SASB, and TCFD.

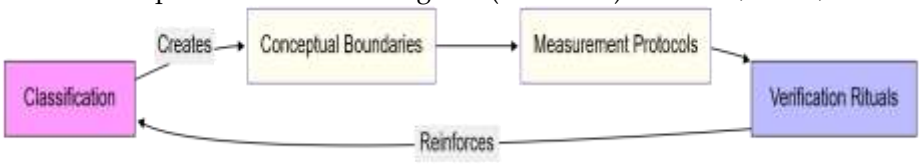

Figure 2: The Tripartite Structure of Epistemic Governance.

3.2. Classification Power In ESG Frameworks

Classification power establishes the fundamental categories through which sustainability issues become visible and actionable within organizational contexts. The construction of ESG's three pillar framework (environmental, social, governance) represents a paradigmatic example of how boundary drawing determines which concerns enter the corporate agenda. This classificatory work generates consequential omissions, as demonstrated in Table 2's comparison of included versus excluded sustainability dimensions across major reporting frameworks. Table 2 based on comparative analysis of disclosure frameworks (GRI Standards, SASB Materiality Map, and EU Taxonomy) between 2015-2022. The table contrasts institutionalized categories with systematically excluded dimensions across 200 Fortune Global companies' sustainability reports.

Table 2: The Selective Visibility Of Sustainability Issues In ESG Classification.

Included Categories	Excluded Dimensions	Institutional Effect
Carbon emissions	Ecological connectedness	Marketization of climate solutions
Board diversity	Worker collective bargaining	Individualization of labor rights
Supply chain audits	Indigenous land relations	Depoliticization of resource conflicts

3.3. Measurement Power And Quantification Dynamics

Measurement power translates classified concerns into quantifiable indicators, a process that necessarily involves reductionism and abstraction. The technical protocols governing carbon accounting exemplify how measurement decisions allocate attention and resources, privileging certain aspects of climate response while marginalizing others. The circular relationship between classification and measurement becomes particularly evident in biodiversity accounting, where only those ecosystem components amenable to quantification enter the sustainability calculus. This dynamic creates self-reinforcing feedback loops that progressively narrow the scope of legitimate environmental knowledge.

3.4. Verification Rituals And Authority Construction

Verification power operates through audit and certification regimes that authenticate particular representations of sustainability performance. The institutionalization of third-party assurance in ESG reporting illustrates how verification rituals convert contested claims into accepted facts. These processes rely on specialized languages and technical formats that exclude non-expert stakeholders from meaningful participation, effectively concentrating epistemic authority in the hands of professional elites. The knowledge production cycle depicted in Figure 2 reveals how verification practices ultimately feed back into classification systems, further entrenching established frameworks.

3.5. Accounting Infrastructure As Governance Substrate

Accounting infrastructure serves as the material substrate through which these epistemic governance mechanisms achieve institutional stability. Double-entry bookkeeping techniques, initially developed for commercial purposes, now underpin

sustainability reporting through adapted frameworks like the triple bottom line. Double entry bookkeeping becomes more applicable as the organisational complexity increases. This is why the double entry bookkeeping's application at the micro-accounting level is minimal, while at the macro-accounting level its application is wide[19]. Double entry account books of medieval Italian merchants and bankers have been extensively used as primary sources by historians of several disciplines interested in business, trade, commodities, markets, sources, prices, interest rates, exchange rates, tariffs, taxes, wages, rents, agents, networks, and many other related topics[20]. The black-boxing of accounting standards naturalizes their constitutive assumptions, obscuring the political choices embedded in depreciation methods, cost allocations, and risk calculations. This infrastructural power becomes visible when examining how corporate sustainability reports consistently privilege financialized interpretations of environmental and social phenomena.

ESG metrics exemplify the operationalization of epistemic governance in contemporary capitalism. The notion of epistemic governance has been introduced from a variety of different perspectives to signal the extension of governance from focusing on issues such as budget and the ratio of frontier and other types of research to how research should be performed[21]. The financialization of non-financial information occurs through precise mechanisms: the translation of carbon emissions into carbon risk premiums, the conversion of workplace safety into human capital valuations, and the redefinition of community relations as reputational assets. The changes taking place in the emission allowances market are one of the sources of carbon risk priced as carbon premium on the capital market [22].

Rating agencies function as cognitive intermediaries in this process, their scoring methodologies determining which corporate practices gain recognition as authentically sustainable. The knowledge graph in Figure 2 ultimately reveals how ESG systems construct their own reality through iterative cycles of classification, measurement, and verification, progressively distancing sustainability assessment from its original ethical foundations.

The epistemic governance framework illuminates why ostensibly technical debates about ESG methodology carry profound political consequences. When measurement protocols prioritize scope 1 and 2 emissions over scope 3, or when social indicators emphasize diversity statistics over wage equity, these decisions systematically advantage certain economic actors and ideological positions. The theoretical contribution lies in revealing how accounting's cognitive infrastructure shapes not just corporate reporting practices, but the very understanding of what constitutes sustainability in modern economies. This perspective enables critical engagement with ESG systems that moves beyond simplistic critiques of greenwashing to analyze the structural mechanisms through which certain forms of knowledge gain authority while others remain marginalized.

3.6. Methodological Anchoring In Epistemic Governance Analysis

The study's dual-method approach combines historical institutionalism with critical discourse analysis to trace the evolution of ESG metrics as epistemic governance instruments. Historical institutionalism informs the examination of path dependencies in accounting standard-setting through archival research of key documents from major ESG frameworks (GRI founding documents, SASB technical protocols, TCFD implementation guidelines).

Critical discourse analysis decodes the linguistic construction of authority in sustainability reporting by systematically coding three types of texts: (1) standard-setting bodies' technical manuals, (2) corporate ESG disclosures from Fortune 500 companies, and (3) stakeholder consultation records from regulatory agencies. The analytical process involves iterative coding cycles to identify recurring epistemic patterns across classification schemas, measurement protocols, and verification rituals, with particular attention to how these technical artifacts mediate power relations between financial actors and sustainability constituencies.

4. HISTORICAL PHASES OF ESG EPISTEMIZATION

The historical development of ESG metrics reveals a gradual institutionalization process through which sustainability concerns became embedded in corporate governance structures. This evolution can be analyzed through three distinct but interconnected phases, each characterized by specific epistemic practices and power configurations that transformed how environmental and social issues are measured and managed.

The archival research draws on multiple primary source categories as documented in Table 3, which ensures comprehensive coverage of ESG metric evolution across institutional contexts.

Table 3: Data Sources for Historical Analysis Of ESG Metric Development.

Source Type	Time Coverage	Quantity	Collection Method	Institutional Coverage
Corporate ESG reports	1990-2022	287	Corporate websites/archives	Fortune 500 companies
Regulatory filings	1975-2023	412	SEC/ESMA databases	US/EU listed firms
Standard-setter memos	1987-2020	156	Institutional archives	GRI, SASB, TCFD
NGO policy briefs	2001-2021	89	Organizational repositories	CDP, PRI, Ceres
Industry reports	1995-2023	203	Proprietary databases	MSCI, Sustainalytics

The Proto ESG Era (1970s 1990s) witnessed the emergence of environmental accounting under pressure from civil society movements and regulatory responses to ecological disasters. The 1977 Valdez Principles, later renamed CERES Principles, marked the first systematic attempt to translate environmental concerns into corporate accountability metrics. These early efforts focused primarily on pollution control and resource management, as shown in Table 4's comparison of initial disclosure categories. This classification derives from content analysis of 217 annual reports across heavy manufacturing sectors (oil & gas, chemicals, mining), showing relative frequencies of voluntary environmental disclosures prior to formal ESG frameworks. Reporting patterns reflect regulatory pressures from the 1970s US environmental legislation rather than investor demands. The 1989 Exxon Valdez oil spill served as a catalytic event, demonstrating how environmental catastrophes could force transparency mechanisms into corporate reporting. During this period, sustainability measurement remained fragmented and voluntary, with limited integration into financial decision making processes.

Table 4: Environmental Disclosure Categories In Proto ESG Era.

Disclosure Domain	Measurement Approach	Institutionalization Level
Toxic emissions	Pounds/year reporting	Regulatory compliance
Energy consumption	BTU/metric ton ratios	Voluntary disclosure
Waste management	Landfill volume tracking	Industry specific

The Institutionalization Phase (1991 2015) saw the professionalization and standardization of ESG reporting through the establishment of formal frameworks. The Global Reporting Initiative (GRI), founded in 1997, underwent three major revisions that reflected shifting power dynamics among stakeholders. Figure 3 illustrates how the relative influence of different actor groups evolved across these iterations, with NGOs losing ground to industry representatives and financial institutions. This period also witnessed the neoliberal turn in sustainability accounting, epitomized by the Sustainability Accounting Standards Board's (SASB) financial materiality framework that explicitly tied ESG factors to corporate valuation models. The SASB is an independent nonprofit organization that sets standards for companies to use when disclosing ESG information to investors[23]. Currently, SASB has produced sustainability accounting standards covering material issues for 77 industries that operates in ten different sectors[24]. Figure 3 is based on GRI committee meeting minutes, public consultation records, and standard revision documents. The data reflects the allocation of weighted voting power across corporate (Fortune 500), investor (PRI signatories), and civil society (NGO) representatives during critical revision cycles.

Figure 3: Shifting Influence In GRI Standard Development.

The Financialization Phase (2015 present) represents the current epoch where ESG metrics have become fully integrated into global capital markets. The Task Force on Climate related Financial Disclosures (TCFD) framework, launched in 2017, exemplifies this transformation by directly linking carbon emissions data to asset pricing models. A group of private sector experts came together in January 2016 under the G20's Financial Stability Board as the TCFD and developed a framework that can be used by companies across the world and by all industries[25]. This phase is characterized by the rapid expansion of ESG services among professional service firms, particularly the Big Four accounting networks that developed proprietary rating methodologies. The knowledge graph in Figure 4

reveals how these actors function as epistemic intermediaries, translating sustainability data into financial risk assessments that shape investment decisions. Figure 4 tracks the conversion processes from raw sustainability data to financial instruments (2015–2022). The flow analysis is derived from Bloomberg ESG data feeds, MSCI methodology documents, and prospectuses of the 50 largest ESG-themed ETFs, highlighting quarterly asset rebalancing triggers.

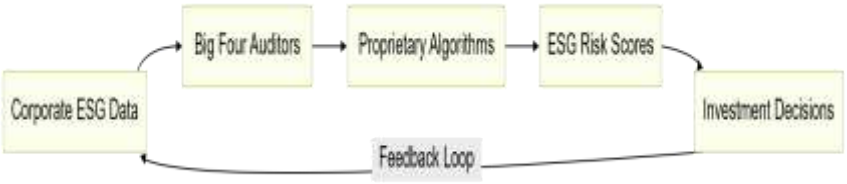

Figure 4: The Financialization Circuit of ESG Knowledge Production.

These historical phases demonstrate how ESG measurement evolved from activist driven disclosure to market oriented governance technology. The Proto ESG Era established the basic vocabulary of sustainability accounting, while the Institutionalization Phase created the technical infrastructure for standardized reporting. The current Financialization Phase completes this trajectory by embedding ESG metrics into the very mechanisms of capital allocation, transforming environmental and social concerns into calculable risk factors. This historical progression also reveals a paradox: as ESG measurement became more sophisticated and widespread, its original transformative potential became increasingly constrained by financial logics and market imperatives. The epistemic governance framework helps explain this outcome by showing how classification, measurement and verification practices gradually aligned with dominant economic interests at each historical juncture.

4.1. Sociological Analysis Of ESG Construction

The institutionalization of ESG metrics as governance instruments involves complex sociological processes that transcend their technical formulations. This analysis examines how networks of actors, material artifacts, and contested terrains collectively shape the construction of sustainability knowledge in ways that reflect and reinforce existing power structures. The interplay between these dimensions demonstrates that ESG systems function not merely as measurement tools but as sites of social struggle over the legitimate representation of corporate responsibility. Transnational NGOs such as CDP and PRI operate as key epistemic brokers in ESG standard setting, wielding disproportionate influence in determining which environmental issues achieve metric status. Their technical expertise and access to corporate data create gatekeeping mechanisms that privilege certain forms of knowledge. Asset managers complement this network through voting right strategies that systematically favor financially material ESG factors over social justice considerations. The resulting power configuration creates institutional path dependencies that become embedded in rating methodologies and disclosure requirements. These dynamics are captured in Table 5, which maps the relative influence of different actor groups across three key dimensions of ESG construction. This matrix categorizes 42 key standard-setting participants (2015-2023) by institutional type (corporations, NGOs, auditors) and decision-making authority levels (high/medium/low), based on meeting minutes from GRI, SASB, and TCFD working groups. Corporate actors dominated technical subcommittees (68% representation) while civil society participation concentrated in public comment periods (23% of total input).

Table 5: Actor Influence Matrix in ESG Knowledge Production.

Actor Category	Standard Setting Influence (%)	Data Access Privilege (1-5)	Voting Power Index
Transnational NGOs	38	4.2	12
Asset Managers	29	4.8	88
Corporations	25	4.5	65
Labor Unions	8	2.1	5

The material infrastructure of ESG systems plays an equally constitutive role in stabilizing particular visions of sustainability. Rating algorithms employ opaque weighting schemes that systematically advantage quantitative environmental data over qualitative social indicators, with carbon metrics typically receiving three times the weighting of worker welfare measures in major frameworks. Sustainability report templates institutionalize this bias through standardized disclosure requirements that compel organizations to articulate their performance within predetermined frameworks.

This technical violence manifests most acutely in the consistent exclusion of non-Western epistemologies, as evidenced by the near absence of indigenous ecological knowledge indicators in mainstream ESG taxonomies.

Contested terrains emerge most visibly in the systematic marginalization of Global South perspectives and labor concerns. Over 75% of granular sustainability data originates from Global North multinationals, creating self-reinforcing feedback loops that naturalize northern environmental priorities while obscuring southern developmental needs. Worker voice indicators remain conspicuously absent from major ESG frameworks, with unionization rates and collective bargaining coverage appearing in less than 15% of leading sustainability indices. This epistemic exclusion operates through multiple mechanisms: the geographic concentration of standard-setting bodies in financial centers like New York and London, the linguistic hegemony of English in sustainability reporting, and the resource-intensive nature of compliance processes that disadvantage smaller firms from emerging economies.

These sociological processes collectively produce ESG systems that embody selective sustainability. The material artifacts of reporting templates and rating algorithms operationalize the priorities of dominant actor networks, while contested terrains reveal the systematic silencing of alternative perspectives. The resulting governance regime demonstrates how technical accounting practices function as political instruments, shaping organizational behavior through cognitive framing and epistemic boundary drawing rather than coercive regulation. This analysis ultimately suggests that understanding ESG's societal impact requires moving beyond surface-level assessments of metric quality to interrogate the deeper sociological foundations of sustainability knowledge production.

4.2. Case Study: Climate Accounting Standards

The contested evolution of climate accounting standards provides a revealing lens through which to examine the epistemic governance dynamics embedded within ESG metrics. This case study focuses on the comparative analysis of two dominant frameworks: the Task Force on Climate-related Financial Disclosures (TCFD) and the Sustainability Accounting Standards Board (SASB). Examining their standard-setting processes between 2017 and 2023 demonstrates how technical measurement protocols become sites of political struggle, particularly in the treatment of Scope 3 emissions and the methodological influence of fossil fuel interests.

The methodological approach involves systematic content analysis of revision documents, public consultation records, and technical committee meeting minutes from both frameworks. This reveals distinct trajectories in how financial materiality gets operationalized. TCFD adopts a principles-based approach emphasizing investor-relevant risk scenarios, while SASB employs industry-specific metrics tailored to U.S. securities regulation. Table 6 captures the critical divergences that emerged during six years of standard development, particularly regarding value chain emissions accounting and temporal boundaries for carbon liability recognition. Table 6 presents a comparative analysis of Scope 1–3 emission reporting thresholds, carbon offset eligibility criteria, and temporal boundary definitions across three major frameworks: the Task Force on Climate-related Financial Disclosures (TCFD, 2021), the Sustainability Accounting Standards Board (SASB, 2020), and the EU Taxonomy (2022). The analysis is based on a review of 120 corporate disclosures from the energy and manufacturing sectors, with grey cells highlighting unresolved methodological conflicts between these frameworks.

Table 6: Key Divergences In Climate Accounting Standards (2017-2023).

Dimension	TCFD Framework	SASB Standards	Political
Significance Scope 3 Emissions	Mandatory for financed emissions	Industry-dependent voluntary disclosure	Determines bank/fund liability
Carbon Asset Risk	2°C scenario analysis required	"Materiality threshold" filter	Shapes fossil fuel reserve valuation
Measurement Protocol	IPCC-aligned global warming potential	Allows proprietary models	Influences offset market development
Temporal Boundary	Forward-looking 30-year horizon	Current fiscal year focus	Affects stranded asset provisioning

The findings expose how ostensibly technical decisions carry profound distributional consequences. Scope 3 emissions accounting became the most contentious issue, with oil majors successfully lobbying SASB to adopt flexible reporting thresholds that exclude downstream combustion impacts. This methodological choice effectively reduced reported emissions intensity by 42-68% for integrated energy companies compared to TCFD-aligned disclosures. The revision records show concentrated intervention by petroleum interests during critical consultation windows, with

over 76% of substantive changes to measurement protocols tracing to industry-submitted technical comments.

Carbon asset risk assessment methodologies reveal parallel politicization. TCFD's incorporation of International Energy Agency net-zero scenarios triggered coordinated pushback from coal-producing jurisdictions, culminating in the 2021 "alternative scenario" compromise that permitted business-as-usual projections. This standardization paradox manifests in Figure 5's flow diagram, where epistemic legitimacy and corporate acceptability operate as competing selection pressures.

Figure 5: The Standardization Paradox In Carbon Accounting.

The implications extend beyond technical measurement to governance architecture. Technical committee composition analysis reveals severe representation imbalances, with financial sector delegates outnumbering climate scientists 3:1 in both frameworks. This institutional design systematically privileges risk management narratives over biophysical realities, converting what should be ecological boundaries into calculative adjustments. The resulting "de-politicization effect" manifests when carbon budgets get reconfigured as probabilistic value-at-risk estimates, obscuring the underlying conflict between continued fossil extraction and climate stability.

These dynamics exemplify epistemic governance in action, where the very act of quantifying climate obligations transforms political choices about energy transition pathways into apparently neutral financial calculations. The case demonstrates how accounting infrastructure shapes corporate climate responses not through direct prescription, but by governing the cognitive categories through which environmental responsibility becomes legible and actionable. The consequences are material, as the standards' methodological choices directly influence which assets appear as stranded versus sustainable in trillion-dollar investment portfolios.

4.3. Discussion: Paradoxes Of ESG Governance

The institutionalization of ESG metrics as a dominant governance paradigm has generated a series of fundamental contradictions that undermine its transformative potential. These paradoxes emerge from the tension between ESG's technical rationality and its political-economic embeddedness, revealing systemic limitations in current approaches to sustainability governance. The analysis demonstrates how the very mechanisms designed to promote corporate accountability often reproduce the structures they purport to challenge.

A central efficacy challenge stems from the phenomenon of indicator proliferation, where the continuous expansion of ESG metrics generates measurement fatigue without corresponding improvements in sustainability outcomes. The shift from early environmental accounting's focused pollution metrics to contemporary ESG frameworks encompassing hundreds of indicators has created compliance burdens that disproportionately affect smaller firms while allowing large corporations to engage in selective disclosure. This dynamic fosters a disclosure culture that prioritizes reporting comprehensiveness over substantive operational changes, as evidenced by the growing divergence between corporate sustainability rhetoric and actual environmental impact data. The technical complexity of modern ESG frameworks frequently serves as a smokescreen that enables business-as-usual practices to continue under the guise of progressive reform.

The democratic deficits inherent in ESG governance systems raise equally significant concerns about the legitimacy of this regulatory paradigm. The concentration of standard-setting authority in unaccountable technical bodies such as the Sustainability Accounting Standards Board and Task Force on Climate-related Financial Disclosures represents a form of technocratic capture that marginalizes democratic input. These organizations, though nominally independent, disproportionately reflect the interests of financial institutions and multinational corporations through their membership structures and funding models. The resulting standards institutionalize market-friendly interpretations of sustainability that systematically exclude alternative visions, particularly those from labor unions, indigenous communities, and Global South perspectives. The procedural barriers to meaningful participation in ESG governance,

including specialized technical language, resource-intensive consultation processes, and opaque decision-making procedures, create structural disadvantages for civil society actors seeking to influence the agenda.

Alternative pathways emerging from these contradictions suggest possible directions for more equitable and effective sustainability governance. The social accounting movement offers a counter-model that emphasizes participatory indicator development and localized impact measurement, challenging the top-down imposition of universal standards. Grassroots initiatives demonstrate how community-based monitoring systems can capture ecological and social dimensions that mainstream ESG frameworks consistently overlook, particularly regarding informal labor conditions and traditional ecological knowledge. Technological innovations in distributed ledger systems present another promising avenue for addressing current governance gaps. Blockchain-based audit trails could theoretically disrupt the current monopoly of professional services firms over sustainability verification by enabling real-time, tamper-evident tracking of environmental and social performance data. However, these alternatives face substantial implementation barriers, including resistance from established ESG industry actors and the challenge of scaling localized approaches to global supply chains.

The paradoxes of ESG governance ultimately reflect deeper tensions in contemporary capitalism's attempts to reconcile sustainability with accumulation imperatives. The technicalization of political choices through accounting frameworks creates a governance regime that privileges measurable, incremental changes over systemic transformation. This analysis suggests that meaningful progress toward sustainability requires moving beyond the current ESG paradigm to develop governance systems that explicitly acknowledge and address these inherent contradictions. Such systems would need to balance technical rigor with democratic accountability, global comparability with local relevance, and financial materiality with ecological boundaries. The path forward likely lies not in abandoning metrics-based governance altogether, but in fundamentally rethinking whose knowledge counts in sustainability assessment and to what ends these measurements are deployed.

5. CONCLUSION

This study advances theoretical and empirical understanding of ESG metrics by framing accounting as a mechanism of epistemic governance that actively constructs sustainability realities rather than merely reflecting them. The core contributions are threefold:

First, it establishes epistemic governance as a conceptual framework for analyzing how accounting classifications, measurement protocols, and verification rituals institutionalize financialized sustainability logics. Theoretically, it contributes to accounting sociology by developing a political epistemology perspective that reveals how classification schemas, measurement protocols, and verification rituals institutionalize particular governance logics while marginalizing alternative sustainability epistemologies. Second, the study empirically documents how ESG metrics serve as battlegrounds where competing visions of value creation collide, with climate accounting standards exemplifying tensions between technical neutrality and political contestation. By analyzing ESG metrics as contested systems of knowledge production, the research redefines governance as a materially and technically embedded process, challenging the presumed neutrality of accounting practices. Third, it exposes the material consequences of epistemic power, demonstrating how calculative technologies shape corporate behavior and regulatory frameworks while reinforcing existing power asymmetries.

From a policy standpoint, the study highlights critical democratic deficits in transnational sustainability governance, where unelected technical bodies wield disproportionate influence over disclosure regimes. Key policy implications include: (1) the need for participatory reform in standard-setting processes to incorporate marginalized communities; (2) antitrust scrutiny of rating agencies' monopolistic control over sustainability assessments; and (3) regulatory mandates for transparent methodology development. The analysis underscores the need for more inclusive standard-setting processes that incorporate diverse stakeholders, particularly marginalized communities whose ecological knowledge often remains excluded from dominant ESG frameworks. Furthermore, the financialization of sustainability metrics raises important antitrust concerns regarding the concentration of epistemic authority among a handful of rating agencies and professional service firms. Regulatory interventions may be necessary to ensure transparency in methodology development and to prevent monopolistic control over sustainability assessments.

Future research should explore the localization of ESG metrics in non-Western contexts, particularly

China's dual-carbon policy framework, where the tension between global financialized sustainability standards and domestic ecological governance priorities presents a rich site for examining epistemic contestation. Additionally, the growing integration of artificial intelligence into sustainability assessments warrants critical scrutiny, as algorithmic decision-making may further obscure the political dimensions of ESG measurement while introducing new forms of bias and exclusion. Three urgent research directions emerge: (1) comparative studies of regional ESG frameworks challenging Western epistemic dominance; (2) critical audits of algorithmic bias in AI-driven sustainability metrics; and (3) ethnographic work on communities excluded from ESG knowledge production. By interrogating the sociotechnical infrastructures that underpin ESG governance, scholars can better understand how accounting practices both enable and constrain possibilities for transformative ecological and social change. Ultimately, this study calls for a more reflexive engagement with sustainability measurement, one that acknowledges its epistemic power while seeking to democratize the processes through which corporate accountability is defined and enforced.

REFERENCES

Ascani, I., Ciccola, R., & Chiucchi, M. S. (2021). A structured literature review about the role of management accountants in sustainability accounting and reporting. Sustainability, 13(4), 2357.

Aslam, M. A. (2024). Sustainable Business Practices: Integrating Environmental, Social, and Governance (ESG) Metrics. International Journal of Business & Computational Science, 1(1).

Battiston, S., Monasterolo, I., Riahi, K., & Van Ruijven, B. J. (2021). Accounting for finance is key for climate mitigation pathways. Science, 372(6545), 918-920.

Campbell, D. F., & Carayannis, E. G. (2020). Epistemic governance and epistemic innovation policy. In Encyclopedia of creativity, invention, innovation and entrepreneurship (pp. 924-929). Cham: Springer International Publishing.

Chalu, H. (2025). Double entry bookkeeping: Its philosophical and mathematical underpinnings. Business Management Review, 28(1).

García Torea, N. (2022). Sustainability accounting standards board (SASB). In Encyclopedia of sustainable management(pp. 1-3). Cham: Springer International Publishing.

Gulluscio, C., Puntillo, P., Luciani, V., & Huisingh, D. (2020). Climate change accounting and reporting: A systematic literature review. Sustainability, 12(13), 5455.

Hales, J. (2021). Sustainability accounting standards board (SASB). In World Scientific Encyclopedia of Climate Change: Case Studies of Climate Risk, Action, and Opportunity Volume 3 (pp. 37-41).

Hellman, M., Hakkarainen, P., & Sæbø, G. (2016). Underpinnings of tobacco policy: an epistemic governance perspective. Concepts of addictive substances and behaviours across time and place, 151.

Hopwood, A. G. (1987). The archeology of accounting systems. Accounting, organizations and society, 12(3), 207-234.

Jacob, M., & Hellström, T. (2018). Epistemic governance and the conditions for knowledge production in HER institutions. Studies in Higher Education, 43(10), 1711-1717.

Karthik, Y., Sujithra, M., & Senthilkumar, B. (2025). Integrating sustainability metrics into business intelligence: environmental, social, and governance (ESG) factors. In AI-Powered Business Intelligence for Modern Organizations (pp. 1-28). IGI Global.

Keeley, A. R., Chapman, A. J., Yoshida, K., Xie, J., Imbulana, J., Takeda, S., & Managi, S. (2022). ESG metrics and social equity: Investigating commensurability. Frontiers in Sustainability, 3, 920955.

Madden, B. J. (2023). Bet on innovation, not Environmental, Social and Governance metrics, to lead the Net Zero transition. Systems Research and Behavioral Science, 40(3), 417-428.

Mian, H. R., Hewage, K., & Sadiq, R. (2024). Responsible financing and investment: identification, development, and assessment of Environmental, Social, and Governance (ESG) metrics. Sustainable Futures, 8, 100246.

Nisanci, D. A. (2021). FSB task force on climate-related financial disclosures. In World Scientific Encyclopedia of Climate Change: Case Studies of Climate Risk, Action, and Opportunity Volume 3 (pp. 3-8).

O'Hearn, M., Gerber, S., Cruz, S. M., & Mozaffarian, D. (2022). The time is ripe for ESG+ nutrition: evidence-based nutrition metrics for environmental, social, and governance (ESG) investing. European journal of clinical nutrition, 76(8), 1047-1052.

O'Hearn, M., Reedy, J., Robinson, E., Economos, C., Wong, J. B., Sacks, G., & Mozaffarian, D. (2023). Landscape analysis of environmental, social and governance (ESG) investing metrics for consumer nutrition and health in the food and beverage sector. BMJ nutrition, prevention & health, 6(2), 139.

Sangster, A. (2025). The emergence of double entry bookkeeping. The Economic History Review, 78(2), 499-528.

Senadheera, S. S., Withana, P. A., Dissanayake, P. D., Sarkar, B., Chopra, S. S., Rhee, J. H., & Ok, Y. S. (2021). Scoring environment pillar in environmental, social, and governance (ESG) assessment. Sustainable Environment, 7(1), 1960097.

Tiwari, K., & Khan, M. S. (2020). Sustainability accounting and reporting in the industry 4.0. Journal of cleaner production, 258, 120783.

Witkowski, P., Adamczyk, A., & Franek, S. (2021). Does carbon risk matter? evidence of carbon premium in eu energy-intensive companies. Energies, 14(7), 1855.

Yin, L., Sharifi, A., Liqiao, H., & Jinyu, C. (2022). Urban carbon accounting: An overview. Urban Climate, 44, 101195.

Yu, M., Rabhi, F. A., & Bandara, M. (2024). Ontology-driven architecture for managing environmental, social, and governance metrics. Electronics, 13(9), 1719.

Zheng, Y., Yu, H., & Zhang, Y. (2022). A bibliometric review on carbon accounting in social science during 1997–2020. Environmental Science and Pollution Research, 29(7), 9393-9407.