

From ESG Adoption to Systemic Integration: A Structured Review and TBL-Aligned Framework for Sustainable Banking

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Abstract

Banks are confronted with converging challenges. Climate-related financial risks, changes in regulation and growing stakeholder expectations have pushed many banks towards adopting ESG initiatives. ESG practices have become more common across the banking sector. However, their impact has not been uniform, and the extent to which banks have integrated them into their existing practices varies considerably. Reporting has advanced most rapidly while governance, risk management and capital allocation have received less attention. As a consequence, the banking sector appears more sustainable on paper than in practice. This paper seeks to address the question of how banks can transition from fragmented to integrated ESG practices. The research is based on a literature review of peer-reviewed studies published between 2000 and 2024, which used stakeholder theory, institutional theory, legitimacy theory and SF theory as analytical tools. In this respect, common themes, best practices, and challenges experienced by the banks were identified through the analysis. Four barriers were highlighted consistently in the literature. The lack of standardization in sustainability measurement coupled with underdeveloped governance and accountability structures, the pressure on profitability goals that runs counter to the goals of sustainability, and the absence of meaningful transformation of lending portfolios. Based on these findings, we propose a Triple Bottom Line aligned ESG Integration Framework. The framework brings together sustainability metrics, governance accountability, climate-related considerations in capital allocation and portfolio transformation. These elements are considered within the same organizational framework rather than being treated as separate activities. Three operational indicators accompany it the Portfolio Decarbonization Ratio, the Sustainable Financing Share and the Transition Readiness Index developed specifically to support consistent implementation across different banking institutions. We find that SF creates more value when banks embed it in governance, enterprise risk management and strategic capital allocation, rather than treating it primarily as a reporting obligation. Reporting alone is not enough. The proposed framework offers banks a practical way to

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build organizational resilience and support long-term sustainable development.

Keywords: sustainable finance, triple bottom line, ESG integration, banking strategy, climate risk, portfolio transition

Introduction

Over the past 20 years, the role of banks has changed considerably. Governments, regulators, investors and communities have increased their expectations from financial institutions, while banks have also had to maintain their own financial stability. Climate change is another concern in this respect. It is not only an environmental challenge but can also create financial risks that affect investment decisions, financial stability and economic performance (Bolton et al., 2020; NGFS, 2021).

Concerns about climate-related risks have also been raised by international organizations such as the Financial Stability Board and the NGFS. Financial institutions are being encouraged to include climate considerations in their strategies, business planning, risk management and financial decision-making. This has also changed the expectations placed on banks. Lending, underwriting, investment and portfolio management are now expected to consider the transition towards low-carbon economies along with financial performance.

International initiatives such as the Paris Agreement and the United Nations Sustainable Development Goals have increased the need for financial resources to support activities that can contribute to long-term ESG value (United Nations Framework Convention on Climate Change [UNFCCC], 2015; United Nations, 2015). Banks therefore face pressure from different directions. Their financial decisions are increasingly connected with wider environmental and social expectations, while the need to remain financially stable continues.

SF has therefore moved beyond voluntary corporate responsibility. It is increasingly viewed as a strategic, regulatory and competitive priority for banks.

Progress, however, has been uneven. ESG ratings continue to vary considerably because of differences in methodologies, weighting approaches and indicator selection. This reduces consistency and comparability between institutions (Friede et al., 2015).

The green bond and sustainability-linked financial product market has grown rapidly, but many banks still have significant exposure to carbon-intensive sectors (Hickel, 2021). Sustainability reporting has also become more common. However, reporting alone does not bring about measurable changes in lending portfolios or capital allocation. This has

resulted in continuing concerns about the real intent behind these practices and the possibility of greenwashing (Gray et al., 2014).

Information connecting ESG performance with financial returns also remains mixed. And this is creating uncertainty for executives seeking to integrate sustainability into enterprise risk management and long-term strategic planning (Clark et al., 2015).

Over the years, studies on sustainable banking have grown substantially. And this too in the past two decades. However, most of this work has been on individual aspects of ESG, including financial performance, disclosure practices, governance arrangements, climate-related financial risk, and sustainable financial products. It is also observed that these issues are reviewed independently rather than as interconnected components of banking strategy. And therefore, the limited focus on how governance, sustainability measurement, enterprise risk management, and capital allocation. ESG initiatives therefore often remain layered onto existing banking practices rather than driving broader organizational transformation.

The challenge now is no longer if sustainability should be incorporated into organizational decision-making. But determining how sustainability can be embedded in ways that produce measurable and lasting organizational change. SF will only achieve its intended impact when sustainability becomes integral to the way financial institutions assess risk, allocate capital, and manage long-term portfolio resilience. This literature has generated valuable insights into ESG disclosure, governance mechanisms, financial performance, and sustainable financial products. However, these areas are typically considered in isolation, with relatively little emphasis on how they can be integrated into a combined organizational approach. This paper contributes to that discussion by presenting a Triple Bottom Line (TBL) Aligned ESG Integration Framework that links as interconnected elements of sustainable banking.

This paper is guided by the following research question:

How can banks move from disjointed ESG practices towards a systematic approach that integrates sustainability, profitability, risk mitigation and long-term decarbonization goals?

To answer this question, the authors conducted a systematic literature review of peer-reviewed research articles published between 2000 and 2024. Applying stakeholder theory, institutional theory, legitimacy theory and SF theory helped us extract meaningful insights from the literature to identify systemic barriers to effective ESG integration in the banking sector. Based on our analysis, we designed a Triple Bottom Line (TBL) Aligned ESG Integration Framework that includes practical indicators to enhance governance, sustainability

reporting, transition risk modelling, and long-term resilience in the banking sector.

Theoretical Foundations

Understanding how SF becomes embedded within banking systems requires multiple theoretical perspectives. Relying on a single explanatory lens is insufficient. The development of ESG initiatives has been shaped by organizational, institutional and regulatory influences, yet the extent of implementation continues to differ across banking institutions. There are variations in governance arrangements, strategic priorities, stakeholder expectations and regulatory settings. And understanding these better will help explain why some banks have embedded sustainability within core business decisions, compared to others continuing to apply ESG through fragmented policies and initiatives.

It is attempted to draw on stakeholder theory, institutional theory, legitimacy theory and SF theory to examine these differences. Each theory contributes a distinct perspective on ESG adoption. And thereby explaining the organizational, regulatory and strategic factors that influence sustainable banking practices. As a whole, these theoretical perspectives provide the foundation for the proposed TBL, aligned ESG Integration Framework. And thereby demonstrate how it can be applied within contemporary banking.

Stakeholder Theory

Stakeholder theory gives a useful way to understand why banks are paying more attention to ESG. It says that the success of an organization does not depend only on shareholders. Banks also have to consider investors, regulators, customers, employees and the wider community (Freeman, 1984). This is important for banks because their work is closely connected with public trust, regulation and the confidence of different stakeholders.

These expectations have grown in recent years. Investors want more information about how banks are performing on ESG issues. Customers also tend to prefer banks that show more responsible business practices. Regulators have increased the requirements for climate-related financial disclosures as well (Greenwood, 2013; Freeman et al., 2020). Because of this, many banks have increased their sustainability reporting and ESG risk assessment.

But this does not mean that ESG has been fully integrated into banking practices. Material progress has not been uniform. In many institutions, ESG is still separate from core governance, lending, enterprise risk management and capital allocation. These activities are not always

connected with the main strategic decisions of the bank (Huo et al., 2022; Jones, 2021). This helps explain why ESG adoption has grown so quickly while meaningful integration remains a challenge. From a stakeholder perspective, banks still need to connect stakeholder expectations with governance, risk management and strategic capital allocation.

It also reinforces the need for an integrated framework. The framework should align stakeholder expectations with governance, risk management and strategic capital allocation.

Institutional Theory

DiMaggio and Powell (1983) explain why banks operating in different jurisdictions frequently adopt similar ESG reporting practices, despite having different organizational strategies (DiMaggio & Powell, 1983). This theory suggests that organizations gradually conform to external norms, rules and expectations established within their institutional environments. Bitektine & Haack in a study conducted in 2015 explains that 'In the field of sustainable finance, banks face institutional pressures from regulators, industry standards, and peer behavior'. These pressures promote the isomorphic adoption of ESG practices (Bitektine & Haack, 2015). Institutional theory explains why banks often adopt similar reporting formats, sustainability commitments and governance structures, although the motivations behind these decisions may vary.

ESG has become an expectation rather than a choice in many developed economies. Campbell et al. (2021) point to climate stress tests, mandatory disclosures and standardized taxonomies as evidence of how quickly that shift has happened. Banks respond because they have to, not always because they want to.

Responding to pressure and actually changing are two different things. Many banks meet ESG requirements without revisiting their strategic priorities. This is what the paper calls compliance without commitment. Capital reallocation gets deprioritized. Hess (2020) and Luo et al. (2023) both find that compliance-driven adoption rarely reaches risk management or lending decisions, which is where it would need to have an effect.

This is what institutional theory helps to explain. SF grows in volume and visibility across the sector, while the underlying operational picture stays largely the same.

Legitimacy Theory

Suchman (1995) makes a straightforward observation: organizations survive by appearing legitimate to the people and institutions around them. For banks, that means maintaining public confidence, earning investor trust and staying credible with regulators. Reputation is not a soft asset in banking. It is operational.

Sustainability reports and ESG-linked financial products have become the most visible way banks signal that legitimacy. Deegan (2019) is skeptical about what that signaling actually represents. Publishing a sustainability report and embedding sustainability into how a bank makes decisions are genuinely different activities, and the literature suggests banks have been far more consistent at the former than the latter.

Patten (2021) studied how organizations use sustainability reporting, and the findings are telling. Many banks report publicly on accountability and stakeholder commitments, but their governance structures and day-to-day practices rarely follow suit. Banks are no exception. Lending, investment and capital allocation decisions frequently continue to follow traditional financial criteria, even where ambitious sustainability commitments appear in annual reports and public disclosures.

ESG ratings tell conflicting stories depending on who does the measuring, and reporting practices vary widely (Journal of Business Ethics, 2022; Milne & Gray, 2013). Lending portfolios on the other hand appear to be largely unchanged. Publishing sustainability commitments will address neither concern. What legitimacy theory really requires is that sustainability penetrate into governance, risk management, strategic decision-making and capital allocation the realms in which the banking actually takes place.

Sustainable Finance Theory

Schoenmaker and Schramade (2019) push back against the idea that environmental and social factors sit outside the core concerns of finance. Long-term financial performance, in their view, cannot be separated from how a bank handles its environmental and social footprint. Conventional finance built itself around shareholder returns. SF asks institutions to hold economic performance, environmental stewardship and social responsibility in the same frame, and to treat financial institutions as active participants in building economic resilience rather than passive intermediaries.

Climate-related risks are financial risks. This is the core claim made by SF theory makes, and is backed by literature. Asset valuations, credit quality and portfolio performance are all vulnerable to climate

impacts, and so is the stability of the wider financial system (Bolton et al., 2020; NGFS, 2021). Banks that ignore these exposures do not avoid the risk; they simply absorb it unmanaged. Regulatory expectations are moving in one direction only, and institutions are increasingly required to fold climate risk into their core risk management and decision-making. SF theory goes further than treating sustainability as an add-on. It connects sustainability indicators, climate risk assessment and governance directly to long-term financial goals.

Synthesis of Theoretical Perspectives

Any single framework does not capture the theoretical landscape of SF in modern banking. Each captures a different dimension of ESG adoption and the challenges of achieving meaningful integration. Stakeholder theory draws attention to the competing expectations that investors, regulators, customers, employees and society place on banks. Institutional theory accounts for why banks adopt ESG practices in response to external pressure, even when those practices never fully embed. Legitimacy theory takes a different angle. Sustainability reporting can build credibility, but business practices do not always change alongside it

Sustainable finance theory adds the financial perspective by linking environmental and social factors with risk management, capital allocation, and long-term planning.

Together, these theories show that SF requires more than reporting and compliance. It requires governance, measurement, risk management, and strategic capital allocation to work together. This understanding supports the proposed TBL aligned ESG Integration Framework. The framework combines measurement, governance, accountability, and decision-making to address gaps in the literature and support sustainability integration in banking.

Methodology

A structured systematic literature review was undertaken to examine the evolving relationship between SF and ESG integration within the banking sector. This review was supported by a thematic matrix to blend and organize the evidence. This was identified across the selected studies. A systematic review approach was appropriate methodological approach because it provides a transparent and demanding process for identifying, evaluating and blending existing research within an emerging field.

The methodology followed the PRISMA guidelines, which support transparency, consistency and reliable review processes (Moher et al., 2009; Page et al., 2021). This approach helped identify key themes, research gaps, and challenges in ESG integration and SF literature.

Search Strategy and Data Sources

The four databases include Scopus, Web of Science, JSTOR and Google Scholar. Any of the databases mentioned above has extensive coverage of finance, accounting, corporate governance and sustainability research areas and, therefore, all the relevant scholarly articles were included for the review. Only peer-reviewed journal articles were selected for consideration.

The search strategy was developed step by step. Each stage used specific keywords to retrieve articles covering different aspects of sustainable banking. The search was kept broad enough to identify relevant studies, while also being specific enough to ensure that the results addressed the research question. The following keywords were used:

- “sustainable finance” AND “banking”
- “ESG integration” AND “financial institutions”
- “green finance” AND “capital allocation”
- “climate risk” AND “banks”
- “triple bottom line” AND “financial strategy”

Boolean operators were used to improve search accuracy by combining related concepts and reducing irrelevant results. Citation chaining was also used to identify key studies that may not have been found through keyword searches alone (Tranfield et al., 2003).

The review included studies published between 2000 and 2024. The year 2000 was selected as the starting point because it represents an important period in the development of ESG reporting, responsible investment and sustainability practices in the financial sector (UNPRI, 2021). The year 2024 was selected as the end date to provide a comprehensive overview of developments in SF regulation and banking practices.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria were an important part of the search process. Studies were included if they: (1) investigated sustainable finance, ESG integration or climate risk in banking institutions; (2) appeared in peer-reviewed journals; (3) provided theoretical, empirical or governance insights into capital allocation or risk management; and (4) were published in English.

Studies were excluded if they focused exclusively on non-financial corporations, relied on industry reports or consultancy white papers, lacked methodological transparency, or treated sustainability mainly as advocacy rather than as an area of analytical inquiry.

The screening process ensured that the final pool of literature remained focused on academic research rather than descriptive or promotional material.

Selection Process

The selection process was organized with four steps corresponding to PRISMA process (Moher et al., 2009): identification, screening, eligibility and inclusion.

This first search returned approximately 520 results. After removing duplicate and obviously irrelevant titles, 271 articles were left for abstract screening, and 310 articles were then abstracted. Following abstract review and applying the inclusion criteria, 140 articles were included for full text evaluation. All methodologically sound and thematically relevant articles were taken into consideration for the final analysis and a total of 82 articles were selected.

And the final sample is interdisciplinary, across the different disciplines of finance, accounting, sustainability and governance. Most of the selected studies were published in the past ten years (2015-2024), reflecting the rapid development of the research field on SF since the Paris Agreement and the growing regulatory activities.

Data Extraction and Thematic Coding

The data were analyzed to find out what themes, perspectives, approaches and structures were repeated. The following set of articles has been coded following the basis of:

- Theoretical foundation
- ESG measurement approach
- Governance mechanisms
- Portfolio allocation implications
- Profitability and risk outcomes

Regulatory Context

In order to identify commonalities across studies, a thematic analysis approach was followed (Braun & Clarke, 2006). The analysis was not directed towards statistical results but rather towards structural results regarding the phenomenon of measurement divergence, institutional pressures, gaps in governance, and issues with portfolio transformation. The qualitative synthesis can help identify systemic influences and inconsistencies which may not be captured in quantitative metanalysis.

Limitations of the Review

This review was structured and systematic with some limitations. First, it eliminates the analysis of other languages because of the requirement that only English language peer reviewed journals are to be considered. Second, the publication bias could affect the findings as studies that result in a statistically significant relationship between ESG and performance will be published more readily (Tranfield et al., 2003). Third, the changes in SF may affect the relevance of previous results as the conditions of the regulation and markets are continuously evolving. With these limitations in mind, the structured approach is important to enhance transparency and analytical rigor. The objective is to develop an interdisciplinary synthesis of the research and to lay the groundwork for developing an integrated ESG model for banks.

Thematic Findings: structural barriers to systemic ESG integration in banking.

Thematic Findings: Structural Barriers to Systemic ESG Integration in Banking

The structured review reveals that the field of SF is moving towards being large and visible, but is not being taken up by banking systems evenly and in a consistent manner. The four structural barriers that emerge both in theory and practice and across the governance literature are the following:

- 1) the different ways in which investors evaluate ESG
- 2) lack of governance and accountability
- 3) the tension between profitability and sustainability and
- 4) the mismatch between the portfolios and the decarbonization pathways.

All of these impediments contribute to the fact that ESG is sometimes only symbolic rather than transformative.

ESG Measurement Divergence and Rating Inconsistency

One of the most persistent challenges found in the literature is the lack of a harmonized approach in measuring ESG. ESG ratings can significantly differ between providers, depending on how they weight the indicators, which indicators they use and how they design the methodology (Berg et al., 2022; Friede et al., 2015). These variations lead to a loss of comparability and the value to investors and regulators of ESG scores.

Studies indicate that there are inconsistencies in rating conclusions between absolute and relative ratings when it comes to ESG performance (Berg et al., 2022). The mismatch is problematic in the banking industry for risk assessment because the ESG scores are increasingly being used in risk assessment, in capital allocation and in portfolio risk assessment. Instead of substantive enhancement of performance, banks can determine and optimize disclosures with respect to a particular rating methodology if there are no uniform metrics.

In addition, the focus of ESG measurement frameworks is more on disclosure of past impacts than future risk of transition. Reporting frameworks such as the Global Reporting Initiative (GRI) and the Task Force on Climate-related Financial Disclosures (TCFD) promote transparency and accountability, but they do not ensure that reporting methods will be uniform (Global Reporting Initiative (GRI), 2020; Task Force on Climate-related Financial Disclosures (TCFD), 2017). This means that measuring and assessing ESG is quite inconsistent at this moment, and the systemic effects of implementing ESG in the banking sector are still limited.

From this, it is seen that it is important to have harmonized indicators for measuring the progress towards decarbonization and the exposure of energy portfolios to climate risk. Without having the metrics in the same way, it could be a reputation instead of a strategic risk management indicator.

Governance and Accountability Gaps

The second structural barrier relates to the governance structure and the accountability mechanism. Few banks have established sustainability committees and ESG reporting frameworks. Yet, even with such a governance structure, this does not automatically ensure that the ESG criteria are embedded within the key organizational decision-making process (Hess, 2020; Luo et al., 2023). The ESG process control is generally conducted outside of the credit risk committees, asset liability management committee, and capital allocation committee.

The institutional theory implies that organizations may implement their governance structure based on the regulatory pressure and the existing institutional environment. However, this does not always entail organizational change (DiMaggio & Powell, 1983).

In reality, the extent to which ESG governance can be effective, both in terms of influence over whether to make the loan and the level of sectoral exposure, might be constrained. This disconnect means we don't have some form of governance in place between our sustainability commitments and our actions in our operations.

Legitimacy pressures also help to contribute to governance failure. Most banks have sustainability commitments and net zero targets for public disclosure, but not much detail or transparency around any intermediate steps or pathways of transitions specific to sectors (Patten 2021). A commitment to sustainability can be one of those unobtainable goals without accountability measures or a metric to measure it.

There is also no systematic relationship between executive compensation and ESG outcomes and performance incentives (Eccles et al., 2020). Sustainability targets are typically not part of the remuneration package and if they are, they typically are not given much weight when compared to other financial indicators. Misalignment makes it more difficult to get all incentives working better for deep portfolio reallocation. The evidence, taken together, indicates that there is a need for governance that links sustainability measures to risk management and capital allocation and accountable governance by management.

Profitability and Sustainability Tensions

A third recurring theme involves the contested relationship between ESG integration and financial performance. There is mixed evidence from empirical studies. The links between ESG performance and profitability are also positive, according to other research; for instance, sustainability creates greater resilience, reduces reputational risk and reduces the cost of capital (Friede et al., 2015; Clark et al., 2015). Other studies indicate short-term costs stresses from environmental investments and the compliance costs (Bolton & Kacperczyk, 2021).

A few questions remain for the managers and that is whether they are ready to fully adopt ESG. Old shareholder value models may be short-term focused and be against investing in long-term developments. This is in contrast with the theory of sustainable finance, which considers environmental and social risks to be financial risks and includes these risks as part of the longterm value creation challenge (Schoenmaker & Schramade, 2019).

This profitability is even more evident in the rule of return on equity and the rule of capital adequacy, which are still under pressure now and then on the banking management. Competitive capital markets may result in perceived trade-offs with the allocation of capital to lower-carbon but potentially lower-yielding assets. This could help banks enhance the development of green financial products while maintaining their investment in carbon-intensive industries.

The literature indicates that profitability tensions can thus only be resolved when the risk of transition is included in financial valuation models (sustainability is not added on top of financial valuation). This is not an integration, but ESG is still a complementary measure to financial.

Portfolio Misalignment with Decarbonization Pathways

Portfolio misalignment is one of the most common challenges in the literature. Even though green bonds and sustainability-linked lending practices have seen a significant rise, the banking sector remains heavily exposed to carbon-intensive sectors (Hickel, 2021; Rainforest Action Network, 2023). SF products have been mostly used as an addition to the status quo in mainstream financing.

The review revealed that the banks in question were implementing only minor adjustments to their overall lending principles in order to meet SF criteria (Bolton et al., 2020). As a result, there is an observable sectorial skew in the transition paths, financed emissions are hard to quantify, and climate stress-testing practices are not mature enough to support adequate risk management and capital allocation (NGFS, 2021). These issues greatly limit the banks' capacity to embed transition risk assessment in business planning and decision-making on an ongoing basis.

These dynamics can be explained mainly by institutional and legitimacy drivers. Banks can pursue SF-related goals without changing their overall business model. They can expand SF products while still maintaining high exposure to carbon-intensive industries. As a result, banks may gain legitimacy from their SF activities without making major changes to their lending portfolios and business models.

The fragmentation of sustainability-related regulations is another challenge sustainability-linked banking faces at present. The differences in taxonomy between various jurisdictions create additional difficulties for multinational corporations hoping to operate in more than one region (European Commission, 2020). At present, there is no unified set of sustainability-related regulations, with each jurisdiction having developed its own approach to sustainability-linked banking.

With the available evidence, it is possible to conclude that SF products alone are insufficient in terms of creating truly sustainable lending practices. Transformative change requires active rethinking of the bank's strategy, risk assessment practices, capital allocation principles and, most importantly, commitment to decarbonization.

Structural Blend

The review identified four key barriers to ESG integration in banking. Despite increased adoption, banks have not witnessed widespread organizational change. Sustainability performance measurement across the industry remains disparate and inconsistent. Governance and accountability are weak, profitability is at odds with sustainable objectives, and lending portfolios have changed little. The barriers are interdependent; addressing each one in isolation will likely have limited impact.

Individual barriers are unlikely to result in significant or lasting change if addressed in isolation. Enhanced reporting and SF product offerings, although desirable, are only useful when incorporated holistically into business processes. The literature demonstrates a need for integrated approaches to governance and accountability, sustainability performance measurement, and deployment of risk management and capital allocation policies in pursuit of a low-carbon economy.

These findings provide the foundation for the TBL aligned ESG Integration Framework discussed in the next section. The framework combines key themes from the review and provides a structured approach for integrating sustainability into governance, risk management, performance measurement and strategic capital allocation in modern banking.

These insights provide the conceptual foundation for the proposed TBL aligned ESG Integration Framework presented in the following section.

ESG Integration Framework (Triple Bottom Line Aligned)

From the analysis, it is clear that structural fragmentation is not due to a lack of awareness of SF in the banking sector, but rather a constraint. Different measures of ESG, the lack of governance enforcement mechanisms and profit conflicts continue, as well as an ongoing exposure to carbon heavy sectors. To tackle these obstacles, it is suggested a "Triple Bottom Line Aligned ESG Integration Framework", which aims to integrate sustainability into the framework of allocating capital, governance structure, and risk management.

The framework draws on stakeholder theory, institutional theory, legitimacy theory, and SF theory. The Triple Bottom Line is a way of measuring all three aspects of sustainability environmental integrity, social equity and the economy – in an equal manner (Elkington, 1997). Banking needs to integrate this harmoniously in the metrics, governance in-built, measurable paths to transition, and integration of forward-looking risk.

The proposed model comprises 4 interrelated pillars.

Pillar One: Harmonized Sustainability Metrics

The first pillar is related to the measurement divergence of ESG. Banks do not encode and decode performance; they go out of their way to make sure they disclose as much as possible. Harmonized metrics need to go beyond just disclosure, and include forward-looking transition risk and portfolio alignment, on top of SF theory.

Three operational indicators are proposed:

Portfolio Decarbonization Ratio (PDR)

This is ratio of the carbon emissions reduction from the bank's carbon-intensive lending portfolio to its overall lending portfolio for a given reporting time period. The PDR will be built specifically to assess the actual transition of the portfolio out of high-carbon and towards low-carbon economic activities, rather than reporting practices, as is typically done in current ESG disclosures. Because of this, it can provide a foresight into the transformation of a portfolio, and could inform strategic financial risk decisions with regard to climate change.

Portfolio Decarbonization Ratio may be calculated as:

$$\text{PDR} = (\text{Reduction in carbon-intensive lending exposure} \div \text{Total lending portfolio}) \times 100$$

Carbon-intensive lending exposure can be identified by applying recognized financed emissions methodologies, including those developed by the Partnership for Carbon Accounting Financials (PCAF). Banks can also use internal loan portfolio classifications, borrower emissions disclosures and sectoral climate-risk assessments. Additionally, climate scenario analysis and transition pathways developed by the Network for Greening the Financial System (NGFS) can be used to track changes in portfolio exposure over time (Bolton et al., 2020; Network for Greening the Financial System, 2021).

The indicator should preferably be monitored quarterly through internal executive reporting and communicated annually in sustainability or integrated reports. The PDR can be reported to the relevant governance bodies to assess progress towards the portfolio decarbonization objective. It can also inform strategic investment decisions and regulatory disclosures by Boards, Executive Leadership Teams and Risk Committees

Sustainable Financing Share

Sustainable Financing Share (SFS) = the share of sustainable financing provided by the bank in relation to the total financing provided. The indicator is a measure of the lending process's success and investment decision-making, based on the elements of sustainable economic development and transition towards a low-carbon economy.

Sustainable Financing Share may be calculated as:

$$\text{SFS} = (\text{Total value of sustainable finance commitments} \div \text{Total financing portfolio}) \times 100$$

SF commitments should be identified using the SF taxonomies applied, especially the national SF framework and/or the EU Taxonomy (where applicable) or in the form of SF lending criteria, which are approved internally and are based on the internationally recognized SF principles. Examples of data sources are loan portfolios, investments, issuance of green bonds, green bond lending programmes and internal financial reporting systems.

This disclosure of Sustainable Financing Share will be made on an annual basis (as to be reported for sustainability) and quarterly (for management). This indicator can then be monitored by the executive management and also the Boards to gauge strategic progress on making sustainable finance, benchmark against time and identify whether the capital allocation is aligned with the organization's sustainability commitment.

Transition Readiness Index

The Transition Readiness Index (TRI) is a way to assess a bank's readiness for decarbonization pathways and the regulatory expectations are increasingly shifting for banks in a changing climate. The TRI is a long-term examination of how well an organization is prepared for the low-carbon economy – unlike the more traditional ESG framework, which is based on past performance.

Transition Readiness Index is a weighted index of various organizational indicators, such as portfolio alignment with science-based transition pathways, climate stress-testing results, financed emissions, governance maturity and implementation of climate-related risk management practices. These elements could be given a score by a bank in line with the organization's priorities and regulatory expectations to establish an overall score for transition readiness.

The indicators directly tackle the measurement fragmentation problem mentioned in the literature (Berg et al., 2022; Friede et al., 2015). Harmonization has a number of benefits, including increased comparability and reduced selective disclosure options.

Climate scenario analysis, internal enterprise risk management system, financed emissions reporting, governance assessment and sustainability performance reporting should be used to gather data for the TRI. The indicator should be continually monitored and reviewed annually as part of the strategic planning and enterprise risk management processes.

The TRI offers a holistic evaluation of organizational readiness for climate transition at the governance level, to Boards and Executive Leadership Teams. It is used to guide long-term capital allocation, portfolio resilience, regulatory preparedness/strategic planning and to give additional information on organizational capability development needs.

Pillar Two: Governance and Accountability Integration

The effective integration of ESG into a business is reliant on governance mechanisms that embed sustainability considerations into organizational decision-making processes as opposed to viewing it as an independent reporting function or compliance requirement. Governance is the process by which Boards of Directors and Executive Leadership Teams establish, oversee, and evaluate the implementation of strategic decision-making, risk management, and accountability practices related to ESG integration at an organizational level.

Governance is not only about checking ESG reports. It also means including ESG issues when banks make decisions about risk management, strategy, capital allocation and executive compensation. Different people should also have clear responsibility for these issues, including the Board, executive teams, risk committees and sustainability officers. This can help make ESG part of the normal decision-making process. ESG can also be included in executive compensation and performance reviews, which can encourage executives to pay more attention to sustainability.

An integrated governance approach can also make sustainability efforts more transparent. Sustainability goals need to be connected with performance indicators, reporting and accountability. Governance by itself

is not the main goal. It helps banks include sustainability in their organisational culture, decision-making and investment strategies.

This type of governance can also help with one of the main barriers to sustainability discussed in the literature. There can be a tension between being accountable to the organization and giving enough attention to corporate sustainability (Eccles et al., 2020; Hess, 2020; Luo et al., 2023). When ESG responsibilities are included in governance, banks can make sustainability part of enterprise risk management and capital allocation instead of keeping it as a separate activity.

Pillar Three: Risk and Capital Allocation Alignment

The third pillar is about the allocation of capital models, including for climate and sustainability risk. The concept of SF is that environmental and social risks are financial risks (Schoenmaker & Schramade, 2019). Not recognizing and managing transition risk puts banks at risk of having stranded assets, credit deterioration and systemic instability.

This pillar requires:

- Widely used models in credit risk management are typically developed without considering climate risk. Credit risk models typically do not include climate risk.
- Specific exposure limits in sectors/and/or decarbonization scenarios
- Transition risk dynamic risk weighting of risk-weighted assets (RWA)

Profits vs. sustainability goals and profitability conflict and reconciliation of capital allocation have been identified in the literature. Unlike the notion that ESG is a 'compromise with return' and risk integration is to ensure long-term financial stability (Bolton & Kacperczyk, 2021).

The current study suggests that some firms actually ignore ESG and risk integration claims. It argues that some firms actually do not pay attention to claims of ESG and risk integration, but do not believe that this compromise is necessary for achieving long-term financial stability, as suggested in the traditional literature.

Banks can be more inclusive in credit and risk assessment by incorporating transition risk, enabling them to consider the economic and environmental aspects.

Pillar Four: Portfolio Transformation and Strategic Reallocation

The fourth pillar has to do with the transformation of the balance sheet. If the amount of carbon is not reduced, GFI can't have a systemic effect. Conscious portfolio restructuring is a plan Aiden by and the

portfolios are moving away from polluting industries and towards sustainable ones.

Strategic reallocation involves:

- Creating targets for decreases in the sectors that are measurable.
- Avoid funding of activities that are not aligned with decarbonization paths.
- Increase investment in renewable energy, sustainable industries, and climate-resilient sectors.

This pillar sits within the Triple Bottom Line framework, addressing environmental and social goals and how they shape the overall portfolio. Aligning banking activities with global climate targets takes more than policy commitments lending portfolios themselves need to shift (UNFCCC, 2015). That shift is what leads to long-term resilience.

Integrated Framework Logic

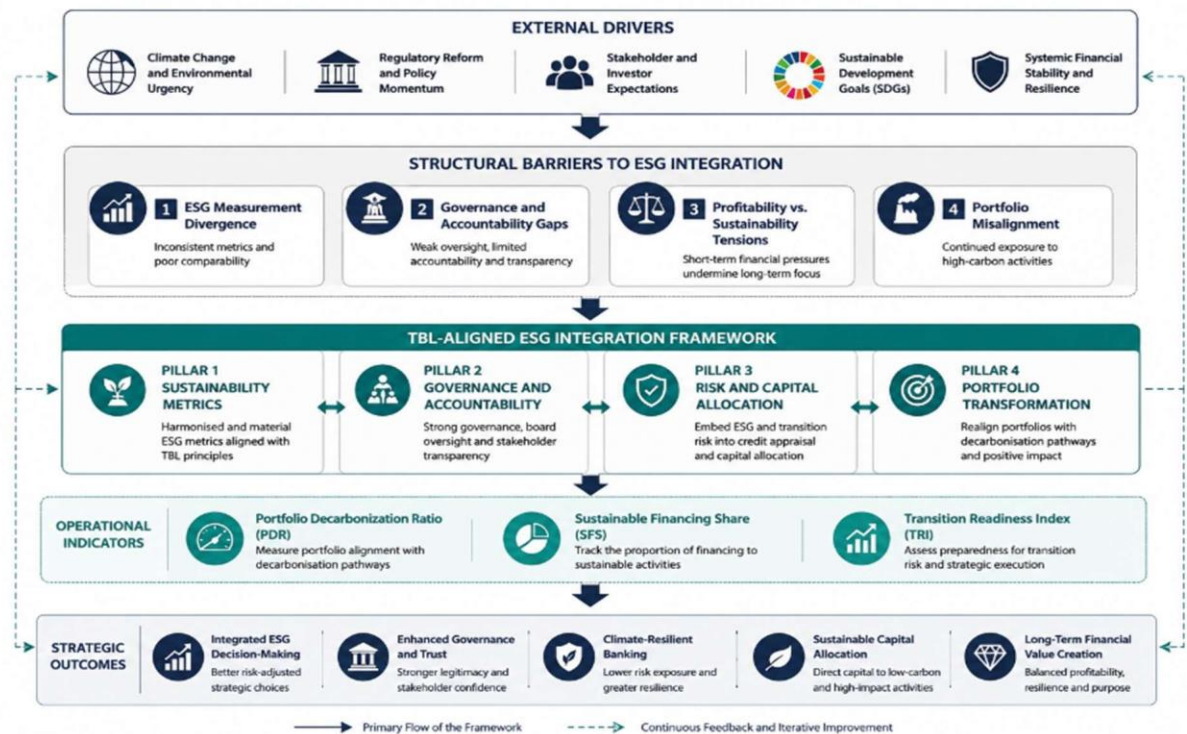


Figure 1. Proposed Triple Bottom Line Aligned ESG Integration Framework for Sustainable Banking

The four pillars of the TBL Aligned ESG Integration Framework were designed to complement each other. The review showed that sustainability measurement, governance, risk management and portfolio strategies provide limited benefits when applied independently. However, using the four pillars together can strengthen ESG integration. First, the combined approach improves measurement accuracy and accountability. It also helps ensure that climate change considerations are included in the bank's risk management practices. Second, it supports greater transformation of the bank's portfolio strategy.

In other words, the four pillars were designed to address the challenges identified in the literature review. For instance, standardized sustainability measurement can improve ESG reporting accuracy and accountability. Improved governance can also help embed climate change considerations into the bank's decision-making processes. Finally, the ESG risk management pillar helps the bank balance financial and non-financial performance while rebalancing the lending portfolio in line with SF objectives.

It also positions SF as part of banking governance, risk management, capital allocation and performance evaluation. It provides a practical approach to integrating sustainability, resilience, and profitability while supporting the transition to a more sustainable financial system.

Implementation Roadmap

The proposed Triple Bottom Line (TBL) Aligned ESG Integration Framework should be phased and structured, enabling the banking institutions to progressively embed sustainability in various aspects of governance, risk management, and capital allocation in a progressive manner. The transition of banks to another organization should not be undertaken in one big leap; it is important to do it in phases, and build their capacity, learn from the organization, and continually improve.

Figure 2. Implementation Roadmap for the TBL-Aligned ESG Integration Framework*A phased pathway for banks to operationalise ESG integration and achieve portfolio transformation*

Note. The figure shows one way of implementing the TBL Aligned ESG Integration Framework in banking institutions. The roadmap illustrates how these four governance commitments for SF can be combined and used together to move towards the operationalization of SF and long-term organization resilience, using ESG measurement and data integration, risk and capital allocation and portfolio transformation.

Phase 1: Governance and Strategic Commitment

The first phase is on organisational commitment and governance accountability. Boards of Directors and Executive Leadership Teams need to make sustainability a strategic goal by embedding it in the organization's strategy, Governance charters and risk appetite statements. The Board Risk Committees and Executive Risk Committees need to be clear about the accountability of the exec, and there needs to be a peer responsibility for finance, risk and sustainability.

Phase 2: Measurement and Data Integration

After establishing governance structures, organizations should create reliable systems for collecting and monitoring sustainability data. This

includes setting baseline measures for the Portfolio Decarbonization Ratio, Sustainable Financing Share and Transition Readiness Index. Sustainability data should feed directly into existing financial, lending and risk management systems, rather than sitting alongside them as a separate reporting layer.

Phase 3: Risk Management and Capital Allocation

This phase moves from planning into practice. Climate risks are embedded into credit assessment, lending, portfolio management and capital allocation as part of daily banking activity. Scenario analysis, stress testing and transition assessments need to become genuinely embedded in enterprise risk management. Right now, many banks treat them as regulatory checkboxes. Lending and investment decisions are expected to weigh long-term sustainability goals alongside traditional financial criteria.

Phase 4: Continuous Monitoring and Portfolio Transformation

Static frameworks prove to be a failure. This stage includes the continuous assessment of the model to ensure that it is updated, taking into account new data, changes in regulations or market dynamics. In addition, the board of directors and executive leadership teams are provided with information about the implementation and progress of ESG integration initiatives, which contributes to its visibility at the governance level. The bank also makes adjustments to the transition to reduce the share of capital allocated to carbon-intensive industries and to reallocate funds to sustainable industries. These two factors, regulatory and strategic contribute to resilience in the long term.

Illustrative Application of the TBL Aligned ESG Integration Framework

To show how the TBL Aligned ESG Integration Framework works in practice, we walk through a hypothetical banking scenario. The example is illustrative only and is not based on any specific organization or real-world event. It is not dependent on any specific financial institution, but rather it provides an understanding of how the framework can contribute to the strategic decision-making, governance and sustainable capital planning of the financial sector in the face of growing financial risks and regulatory demands related to climate change. It is not specific to a particular financial institution but it can be used to support financial institutions' strategic decision-making, governance and sustainable capital planning as their exposure to financial risks and regulatory requirements increases in response to climate change (Bolton et al., 2020; Network for Greening the Financial System [NGFS], 2021).

Implementing these steps would be to formally approve sustainability as a strategic organization priority of the Board. The Board of Directors would integrate the ESG targets in the bank's corporate strategy, governance framework and enterprise risk management (ERM) processes, and monitor and hold the executive (CEO, CRO, CFO, CSO) accountable for it. The Board Risk Committee would oversee the activities to ensure that activities related to sustainability are included in strategic planning, risk management and money allocation (Eccles et al., 2020; Schoenmaker & Schramade, 2019).

Once governance arrangements are set, the bank will implement the three operational indicators that were recommended. The Portfolio Decarbonization Ratio would then be the ratio of the exposure to carbon-intensive companies of the activities financed by the portfolio and the Sustainable Financing Share would be the ratio of the financing to the activities that would be both environmentally and socially sustainable. The Transition Readiness Index would provide an overall assessment of organizations' readiness, using a recognized pathway, based on measuring each aspect of organisational readiness – governance maturity, financed emissions and integration of climate risk and transition pathways. These would set measurable targets of performance and allow management to track progress towards the strategic sustainability targets (Partnership for Carbon Accounting Financials [PCAF] 2022; Task Force on Climate-related Financial Disclosures [TCFD] 2021).

The operational indicators would be included in quarterly executive performance reports and the annual sustainability reporting and made available to support decision-making based on facts. Excluding these, existing credit assessment and enterprise risk management processes could be enhanced with climate scenario analysis and portfolio stress tests and transition scenario assessments by sector, where applicable, to guide lending decisions and capital allocation, in light of financial and climate risks (NGFS, 2021; TCFD, 2021). This would enable the Boards and Executive Leadership Teams to receive clear information on the performance of the portfolio; it would enable progress towards regulations and long-term decarbonization targets.

Implementing the framework would be supported by building governance accountability, building strategic capital allocation, increasing the resiliency of the organization to climate finance risks and increasingly shifting the lending portfolio towards sustainable economic activities. The governance, risk management, and financial aspects of the framework demonstrate how banks can integrate sustainability into their governance, risk management, and financial decision-making processes, beyond the

compliance-driven ESG reporting to a more strategic, measurable and operational approach to SF as a way to create long-term value (Elkington, 1997; Schoenmaker & Schramade, 2019).

Implications & Conclusion

The shift towards SF is a major strategic change for the banking sector. Although ESG initiatives have grown, the literature shows that organisational integration has been slower. Four main barriers were identified. These are inconsistent sustainability measures, weak governance and accountability, conflicts between profitability & sustainability goals and limited alignment of lending portfolios with decarbonization pathways. These challenges explain why embedding sustainability into governance, risk management and capital allocation remains difficult for many banks.

The mere adoptions of small initiatives are not enough while sustainability reporting and green financial products for reporting banks have little effect on transforming the banks' core processes. SF practices make a big difference if integrated into governance, risk management, and capital allocation decisions at the heart of banks' operations.

In this regard, the TBL Aligned ESG Integration Framework, which seeks to embed SF-related indicators, governance accountabilities, and climate-informed capital and portfolio allocation, was developed to provide a viable avenue for banks to make the shift to sustainability-centric performance (Bolton et al., 2020; Schoenmaker & Schramade, 2019).

The implications of SF-related initiatives go beyond a single bank – the boards of directors, Executive Leadership Teams, and Risk Committees of financial institutions should consider integrating ESG factors into the decision-making process and implement ESG-based incentive compensation policies. Incentive compensation policies, taking climate risk into account when considering, valuing, and monitoring loans, and standardized ESG-related performance metrics can improve governance and risk management practices. SF practices can thus be thought of as capabilities that generate insights and competitive advantages that banks can use to improve their performance.

The role of banks in the transition towards a sustainable economy is important. However, regulators and policymakers need to focus on standardizing sustainability-related metrics, disclosure requirements and supervisory approaches. This can help improve banking sector performance at the level of individual institutions, national economies and global markets. Current differences in taxonomy, disclosure and supervisory approaches make it more difficult for banks and nations to

address climate-related risks and opportunities in a consistent and transparent manner.

Greater regulatory coordination and harmonized climate stress-testing methodologies can contribute to financial stability and more effective regulation at both the national and global levels (NGFS, 2021; European Commission, 2020).

The research has limitations that should be noted. The framework and indicators are based on a systematic review of published articles. Their application therefore needs to be examined further in different banking systems and regulatory environments.

Future research can build on these findings through empirical testing of the framework in the banking sector. It can also compare its implementation across different countries. Another area for further study is its applicability to Islamic banks. The relationship between sustainability-related indicators and long-term decisions about capital allocation, governance and risk management also requires further investigation.

SF is not just about reporting. It also requires long-term changes in how banks operate. Sustainability needs to be included in governance, risk management and capital allocation. It should not be treated as a separate activity that runs alongside the main banking activities.

Banks can become more resilient when environmental, social and economic issues are considered in their daily operations. This can also support sustainable development in the long term. However, making these changes requires continued leadership and commitment. Banks need to consider not only the adoption of sustainable banking practices but also how these practices are implemented and maintained over time.

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