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ANALYZING THE INTEGRATION OF SUSTAINABILITY REPORTS OF THE BANKING SECTOR IN TERMS OF THREE DIMENSIONS OF SUSTAINABLE DEVELOPMENT GOALS

BANKACILIK SEKTÖRÜNÜN SÜRDÜRÜLEBİLİRLİK RAPORLARININ SÜRDÜRÜLEBİLİR KALKINMA HEDEFLERİNİN ÜÇ BOYUTU AÇISINDAN ENTEGRASYONUNUN ANALİZİ

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Keywords
Sürdürülebilir Kalkınma Amaçları (SKA), Bankacılık Sektörü, Kamu ve Özel Bankalar, Sürdürülebilirlik Raporlaması, Doğal Dil İşleme (NLP)

ÖZ

This study investigates the integration of the Sustainable Development Goals (SDGs) in the banking sector. For this purpose, the annual and integrated sustainability reports of 100 banks were examined, covering the years 2015 and 2022. In the study, the analysis of the SDG reports was conducted in terms of the three fundamental dimensions of sustainability: economic, social, and environmental, using the Triple Bottom Line (TBL) approach. At the same time, the study, which employs natural language processing (NLP) and text analysis techniques, focuses on the reporting trends of public and private banks, revealing the differences between the two types of banks in terms of sustainable integrated reports. In terms of social and environmental dimensions, public banks use SDG targets at a higher level in their reports; however, when viewed from an economic dimension, it has been concluded that there is no significant difference between public and private banks in sustainability reporting. When all the findings are evaluated, it is believed that the frameworks for sustainability reporting in the banking sector, developing policies about reports, and following technological innovations will make reporting practices faster and more accurate. At the same time, the banks' significantly increasing contributions to achieving the SDG goals in recent years is also a remarkably noteworthy point of value. All these results are seen as valuable insights for policymakers, practitioners, and literature interested in sustainable development goals and the close relationship with the banking sector in recent years.

ABSTRACT

Bu çalışma Sürdürülebilir Kalkınma Hedefleri'nin (SKH) bankacılık sektörüne entegrasyonunu araştırmaktadır. Bu amaçla, 100 bankanın 2015 ve 2022 yıllarını kapsayan yıllık ve entegre sürdürülebilirlik raporları incelenmiştir. Çalışmada SKA raporlarının analizi, Üçlü Sonuç Çizgisi (TBL) yaklaşımı kullanılarak sürdürülebilirliğin üç temel boyutu olan ekonomik, sosyal ve çevresel açıdan yapılmıştır. Aynı zamanda doğal dil işleme (NLP) ve metin analizi tekniklerinin kullanıldığı çalışma, kamu ve özel bankaların raporlama eğilimlerine odaklanarak sürdürülebilir entegre raporlar açısından iki banka türü arasındaki farkları ortaya koymaktadır. Sosyal ve çevresel boyutlar açısından kamu bankalarının SKA hedeflerini raporlarında daha yüksek düzeyde kullandıkları; ancak ekonomik boyuttan bakıldığında sürdürülebilirlik raporlamasında kamu ve özel bankalar arasında anlamlı bir fark olmadığı sonucuna ulaşılmıştır. Tüm bulgular değerlendirildiğinde, bankacılık sektöründe sürdürülebilirlik raporlamasına yönelik çerçevelerin, raporlara ilişkin politikaların geliştirilmesi ve teknolojik yeniliklerin takip edilmesinin raporlama uygulamalarını daha hızlı ve doğru hale getireceği düşünülmektedir. Aynı zamanda bankaların son yıllarda SKH hedeflerine ulaşılmasına önemli ölçüde artan katkıları da çalışmanın dikkat çekici bir diğer noktasıdır. Tüm bu sonuçlar, sürdürülebilir kalkınma hedefleri ve bankacılık sektörünün son yıllardaki yakın ilişkisi ile ilgilenen politika yapıcılar, uygulayıcılar ve literatür için değerli katkılar olarak görülmektedir.

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1. Introduction

The banking sector has a big potential to foster changes toward sustainability. Banking sectors are being confronted with complex issues related to environmental, social, and economic dimensions. They are now much more active on issues of compliance or regulation, as well as how to assure in practice the alignment with the approach of a more demanding customer who prefers to create a relationship with someone they see as being socially aware and concerned about environmental issues. Compared to the stock market investor, this customer regards banks as central to human relations and expects their values to be consistent with their own (Abbasi et al., 2022; Park & Kim, 2020). Financial institutions are particularly sensitive to these new concerns of society. This commitment means that they want to help promote a sustainable banking sector and that the operations of all banks can, in turn, be aligned with the goals of sustainable development for humankind. This sector encompasses the banking community, both in developed and developing countries. It means a clear commitment from retail banks and others across the board in terms of size, geography, and scale of activity in society. There is a need for a bank to take a leadership position at the policy level to signal to the rest of the world that the implementation of this effort is feasible and of real value (Akomea-Frimpong et al., 2022; Lee, 2020; Muganyi et al., 2021).

Following the adoption of the 2030 Agenda for Sustainable Development and the offering of 17 Sustainable Development Goals (SDGs), together with 169 targets as an urgent call for action by all countries and the global community in a broad partnership, there have been calls for an unpacking of the agenda to list the potential roles and responsibilities of different stakeholders and sectors. The achievement of the SDGs requires an integrated and multidimensional approach, and thus a shift of the economic, social, and environmental dimensions from being trade-offs towards harmonization. As part of the finance sector, banks hold a significant position and can potentially also contribute to the SDGs (Kara et al., 2021; Ziolo et al., 2021).

Banks are facing greater challenges to incorporate the significance of environmental and social issues in recent years because, firstly, economic activities have become more systemic; and secondly, social responsibility, social activism, and social pressure on sustainability have grown sharply from both sides of public society and stakeholders, including investors. These, among other signals, are pointing to a realization at the societal level that social and environmental goals go beyond ethics and philanthropy, and that they represent an essential factor in the financial prosperity of companies and societies. Several of the largest international corporate law firms completed this risk in a liability context. Against this complex context, the literature indicates strong arguments in favor of considering socially and environmentally responsible banking. At the heart of many of these studies stands an analysis of dilemmas around responsible lending and investing, and a subsequent inquiry regarding the choice of responsible banking governance structure. At the same time, there is an ongoing process at the global and regional levels, where a fundamental reshaping of finance operations to align with global, societal, and economic transformations is underway to manage the financing of the SDGs. The Leadership Commitment, as a collective pledge of the 28 leading banks and banking associations willing to actively participate in the process, represents an ambition to develop and implement existing initiatives in the banking sector to align with the SDGs and a consultation of the question, “What does it mean for the practice of banking at a global level to responsibly finance the needs and aspirations of individuals, companies, and markets, while at the same time contributing to the sustainable development of the planet?” (Bătae et al., 2021a; Chen et al., 2022; Park & Kim, 2020).

In recent years, sustainable development has become an increasingly important topic around the world. In 2015, 193 member countries of the United Nations committed themselves to implementing 17 Sustainable Development Goals (SDGs) in economic, social, and environmental dimensions. These goals cover a wide range of issues. SDGs are applicable in the economic, social, and environmental fields, as it is necessary to pursue them at the same time for the effective implementation of all 17 goals. The objectives have set 169 targets and intended an integrated manner to achieve the goals and targets (Carlsen & Bruggemann, 2022; United Nations, 2015).

There are 17 SDGs established by the United Nations, each with more specific tasks to help achieve them. For example, managing poverty, inequality, climate change, environmental degradation, peace, and justice. The objectives of sustainable development have been assessed and found to be beneficial in many ways for many business sectors, including the banking sector. As of 2016, there are 12 out of 17 SDGs that are closely related to banks in providing financial services. In general, banks play a role in finance in supporting the implementation of SDGs. Implementing some of the funding will open a range of opportunities such as new innovations and competitive advantage by the presence of products, services, and organizational strategies, and drive resources to finance projects, use of environmental and social standards, and measure the effects of business activities in financial performance (Jan et al., 2023; Sardianou et al., 2021).

The fact that the banking sector and Sustainable Development Goals meet is justified. The rapid development of the banking sector can change the structure of economic sectors and increase capital flows, influence production processes via incentives, and improve the country's financing conditions. In addition, the financing of such projects might appeal to foreign investors and thus eventually contribute to the development of capital markets (Bătae et al., 2021b).

Bebbington & Unerman, (2018) stated in their study that analyzing the three dimensions of sustainable development goals will create new areas of study. At the same time, Bebbington et al., (2017) stated that the dimensions of sustainable development and their relationship with other sectors, especially the banking sector, have recently been included in new studies and have started to attract attention. Thus, the importance of new studies in this field is increasing. The banking sector plays a role in the global financial markets as the financiers of the projects carried out to achieve the United Nations 2030 targets. However, the following question inevitably comes to mind. What is the state of the banking sector's relations with the SDGs? To reveal this situation, since it is of great importance to examine the sustainability reports that provide the integration of banks with sustainable development goals, analyses in this direction have been preferred in this study.

Thus, two basic research questions were formed for the study. What is the status of sustainability in the banking sector, and does the reporting of the three dimensions of SDGs vary according to the capital structure of the bank? The sustainable reports of 100 major banks identified by S&P Global Market Intelligence between 2015 and 2022 were analyzed with Python software. To answer the two main research questions, descriptive and inferential statistical analyses were used. While other studies in the literature focus on European banks, this study follows a new path and focuses on a data set covering South American, American, and Asian banks. In addition, the capital ownership of banks is also used as an independent variable.

Focusing on the Triple Bottom Line (TBL) approach to assess the adoption and reporting of SDGs into banks' processes, this study investigates trends in environmental, social, and economic reporting. The study aims to uncover the sector's contribution to sustainable development by evaluating the level of SDG integration in the banking sector to inform future policy and practice recommendations. For instance, taking the case of differentiating between public and private banks, this will aid us in sourcing a primary platform to drive sectorial transformation.

In the following sections of the study, firstly the literature review is presented, and then the methodology and hypotheses used in the study are presented. In the next section, the results of the analyses obtained, and the discussions related to these results are given, and then the study is concluded with the conclusion section.

2. Literature Review

Economic, social as well as environmental dimensions of the Sustainable Development Goals (SDGs) are being integrated into the banking sector. In recent work Dariah et al., (2019) offer an Islamic framework for SDG integration, relating God, humanity, and environment in economic activities. Semenova & Kormishkin, (2023) in Russia consider the environmental, social and governance (ESG) transformation of banks, the application of ESG principles in the development strategies and the relevance of the UN SDGs for representative commercial banks. (Khant, 2024) also provides a case study of United Amara Bank in Myanmar, showing how banks can utilize green practices for sustainability adoption. This study particularly highlights how the bank is aligned with the SDGs 3, 4, 8, and 9. Together, these studies demonstrate a variety of approaches for integrating sustainability within banking, supplemented by faith based, national, and bank-based initiatives in sustainable development in banking.

SDGs adopted by the United Nations in 2015 are 17 goals aimed at addressing global challenges like poverty, inequality, and environmental degradation (United Nations, 2015). Financing and implementation of these goals is, in many respects, dependent on the banking sector, which, in turn, in India at least, plays a strategic role in delivering these goals with the entrepreneurial fervor characteristic of a sector defined by its rapaciousness and high rates of return. The SDGs compel banks to strive for social and environmental targets that surpass financial profit objectives (Levine, 2004). Several studies have shown that banks' corporate social responsibility (CSR) and sustainability policies lead to more innovation and trust among stakeholders (Adams et al., 2016).

According to John Elkington, the Triple Bottom Line (TBL) approach involves measuring corporate performance outside of financial results and taking environmental and social factors into account (Elkington, 2018). Banks can base reducing environmental impacts, increasing social responsibility, and supporting economic sustainability in the TBL framework, by their assessment of sustainability goals. This research demonstrates that this approach considerably extends the scope of sustainability reports in the banking sector and obviates the anticipated resulting dissatisfaction of the stakeholders (Adams & McNicholas, 2007).

The first is environmental sustainability – one of the cornerstones of the SDGs – and the banking sector has a key role to play in connecting financial flows with the transition to a low carbon economy. Many studies show that banks try to minimize their environmental impact by financing projects aligning with SDG 13 (Climate Action) and SDG 15 (Life on Land). Nevertheless, these contributions are frequently incomplete and inconsistency in environmental sustainability reporting has been revealed (Adams et al., 2016).

The second biggest contribution of the banks in the fulfilment of the SDGs is their implementation of social policy which aims at improving the standard of living. For instance, SDG 5 (Gender Equality) and SDG 8 (Decent Work and Economic Growth) emphasize the importance of banks developing policies that increase social equity (Adams & McNicholas, 2007). According to the literature, public banks have a more social mission than private banks and generate more complete reports in this area.

Banks' acceptance of the SDGs impacts economic sustainability, or the impacts on financial performance and resource management. Research shows that reporting of SDGs leads to long term financial success and gives banks a competitive edge (Levine, 2004). Despite this, the economic dimension ought to receive less priority over environmental or social considerations and be less frequently reported.

There are important differences as to how often, and what kind of, SDG reporting public and private banks complete. Private banks normally put more emphasis on economics while public banks on social and environmental sustainability. Ownership structures are said to be the reason for these differences among public banks, which are oriented at delivering social benefits in addition to market success (Elkington, 2018).

SDG reporting often encounters various operational and technological challenges. The accurate collection, analysis, and presentation of data are critical for ensuring the reliability of reporting (Adams et al., 2016). The literature frequently highlights inconsistencies and gaps in the reporting of certain SDG targets, underscoring the need for more comprehensive and consistent practices (Hahn et al., 2015).

Table 1. Summary of Literature

Author	Topic	Main Findings
United Nations, (2015)	The Scope and Objectives of the SDGs	The SDGs focus on core issues such as poverty eradication, environmental protection, and equality.
Levine, (2004)	The Role of Banks in Economic Development and Sustainability	Banks contribute to sustainable development by facilitating resource allocation and fostering innovation.
Adams et al., (2016)	The Scope and Practices of SDG Reporting	SDG reporting is crucial for long-term success and stakeholder trust.
Hahn et al., (2015)	Challenges in SDG Reporting	Data gaps and inconsistencies complicate SDG reporting.
Adams & McNicholas, (2007)	Corporate Transparency and Stakeholder Expectations	SDG reporting is essential for transparency and accountability.
Ferri et al., (2014)	The Role of Public Banks in Sustainable Development	Public banks focus more on social goals compared to private banks.
Elkington, (2018)	Reevaluating the TBL	Measuring sustainability achievements solely through financial outcomes is insufficient.
Hummel & Szekely, (2022)	Natural Language Processing Methods in SDG Reporting	SDG reporting can be analyzed more efficiently using natural language processing tools.
Price Water House Coopers, (2018)	Global Trends in SDG Reporting	SDG reporting became widespread among banks in 2018 and has been increasing every year.
Avrampou et al., (2019)	Advancing the Sustainable Development Goals: Evidence from Leading European Banks	The contribution of the examined leading European banks to the SDGs is generally low. Each bank's contribution varies significantly across individual SDG targets. Instead of focusing on the most critical GRI indicators that could impact multiple SDGs, the banks' strategies have determined which SDGs are addressed most comprehensively.

3. Methodology

The paper studies reporting trends of the SDGs in the banking sector. The dataset on which the study is based consists of the annual and integrated reports of the hundred largest banks in the world in the period of 2015 to 2022. The analysis phase will first start with an individual examination of each SDG. Then all SDGs will be analyzed. Finally, a grouping stage was carried out in terms of the three dimensions of sustainability for the banking sector. Thus, the frequency of SDGs in the sustainability reports of the banking sector is compared according to the type of banks (private and public). Excel, Python, and SPSS programs were used in all these analyses. The text analysis method has been used in the examination of annual and integrated sustainable documents belonging to banks. This method has been gaining attention as a more frequently used approach in recent years (Berger et al., 2020; Colón-Ruiz & Segura-Bedmar, 2020; Loughran & McDonald, 2019). Again, the use of the natural language processing method (NLP) in the study allows for the analysis of textual data in a short amount of time, regardless of its size, which is one of the main reasons for using these techniques (Cole & Jones, 2005; Jones & Shoemaker, 1994).

3.1. Sample Selection

The sample was obtainable through the S&P Global Market Intelligence published "World's Largest 100 Banks" list. These banks are diversified based on geographic regions and accounting standards, with the following distribution:

- **Regional Distribution**: Asia-Pacific (41%), Europe (37%), Americas (21%), Middle East (1%).
- **Accounting Standards**: IFRS (56%), U.S. GAAP (14%), PRC GAAP (8%), Others (22%).

However, 800 reports were intended to be targeted; however, due to technical issues and missing reports, our analysis was performed on 720 reports from 90 banks.

3.2. Data Collection and Processing

During the data collection process, the annual and integrated reports of the banks were downloaded from their websites and prepared for text analysis. The reports were converted from PDF to text format for analysis. The text analysis process included the following steps:

- **Preprocessing:** Line breaks, tab spaces, and repetitive characters were removed; the texts were converted to lowercase and tokenized on a word basis.
- **Natural Language Processing (NLP):** Using Python's "nltk" library, keywords related to the SDGs were scanned within the reports.

3.3. Definition of Variables

The text analysis used for the study is a method developed by (Hoberg & Maksimovic, 2015). Accordingly, the process of scanning SDG-related words from sustainability reports was carried out. For this, a word block consisting of 5 words was searched in a window in the reports. The words in this window block are different for each SDG. For example, for SDG 1, words such as poverty, low-income, human ['human'], poverty ['poverty'] groups of at least 5 words were obtained for each SDG. Thus, values for 17 SDGs were obtained by giving a value of 1 if at least one of the words in these word groups is present or 0 otherwise.

These variables were calculated using the following formulas:

$$SDG_{ij=}\begin{cases} 1, if\ the\ SDG\ term\ is\ in\ the\ report \\ 0, otherwise \end{cases}$$

The overall SDG reporting rate (SDG_{rr}) was calculated as follows:

$$SDGrr_{ij} = \frac{\sum_{j=1}^{17} SDG_{ij}}{17}$$

In this equation above, index i represents banks, while index j corresponds to SDG values.

3.4. Grouping of SDGs by Dimensions

The following equations show the classification of the SDGs according to TBL.

- Environmental Dimension (ENV):

$$ENV = \frac{SDG_2 + SDG_6 + SDG_{13} + SDG_{14} + SDG_{15}}{5}$$

- Social Dimension (SOC):

$$SOC = \frac{SDG_2 + SDG_3 + SDG_4 + SDG_5 + SDG_6 + SDG_7 + SDG_8 + SDG_{15}}{8}$$

- Economic Dimension (ECO):

$$ECO = \frac{SDG_3 + SDG_7 + SDG_8 + SDG_{11} + SDG_{14}}{5}$$

The hypotheses of the study were tested using a t-test. The hypotheses to be tested are given below. These hypotheses are determined to reveal the differences in the reporting of sustainable development objectives of public and private banks.

H1: Sustainability reports of public banks contain more sustainability objectives than those of private banks.

H2: There is a difference between public and private banks analyzed in terms of the economic dimension of sustainability in terms of SDGs expressing the economic dimension.

H3: There is a difference between public and private banks analyzed in terms of the environmental dimension of sustainability in terms of SDGs expressing the environmental dimension.

H4: There is a difference between the public and private banks analyzed in terms of the social dimension of sustainability in terms of SDGs expressing the economic dimension.

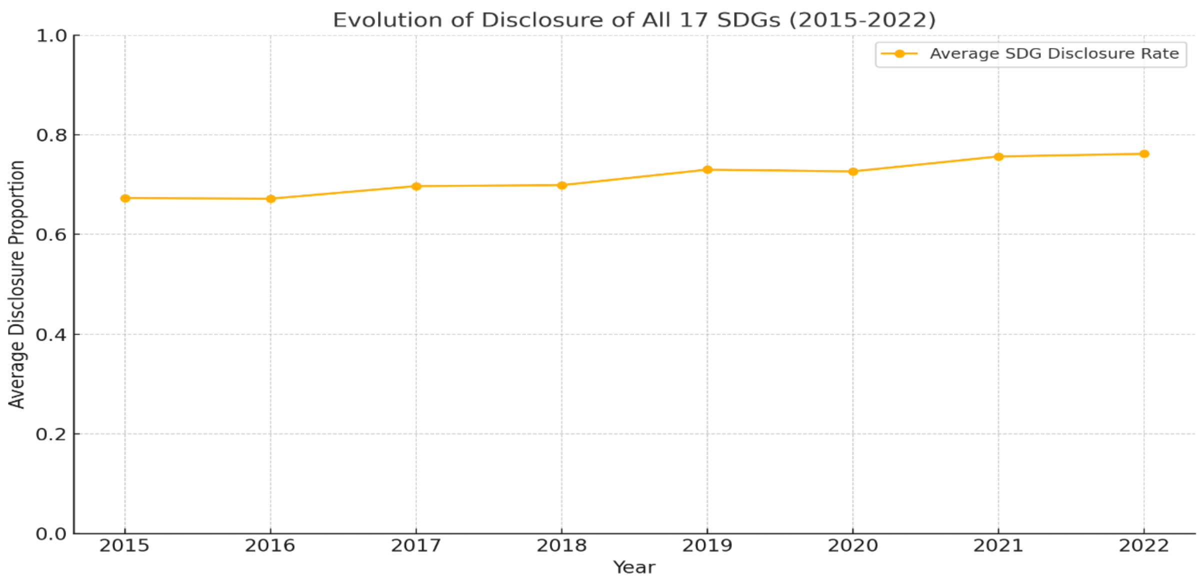
4. Analysis and Discussion

4.1. SDG Reporting Trends

616 reports from 77 private banks and 104 reports from 13 public banks on the three dimensions of sustainable development goals were analyzed and numerical values for each SDG were calculated according to the presence of words mentioned with SDGs in these reports and a general variable called "SDG_{rr}" was created and the total value of the SDG values in the reports of each bank was assigned to this new variable.

$$SDGrr_{ij} = \frac{\sum_{j=1}^{17} SDG_{ij}}{17}$$

Figure 1. Evolution of Disclosure of All 17 SDGs (2015-2022)

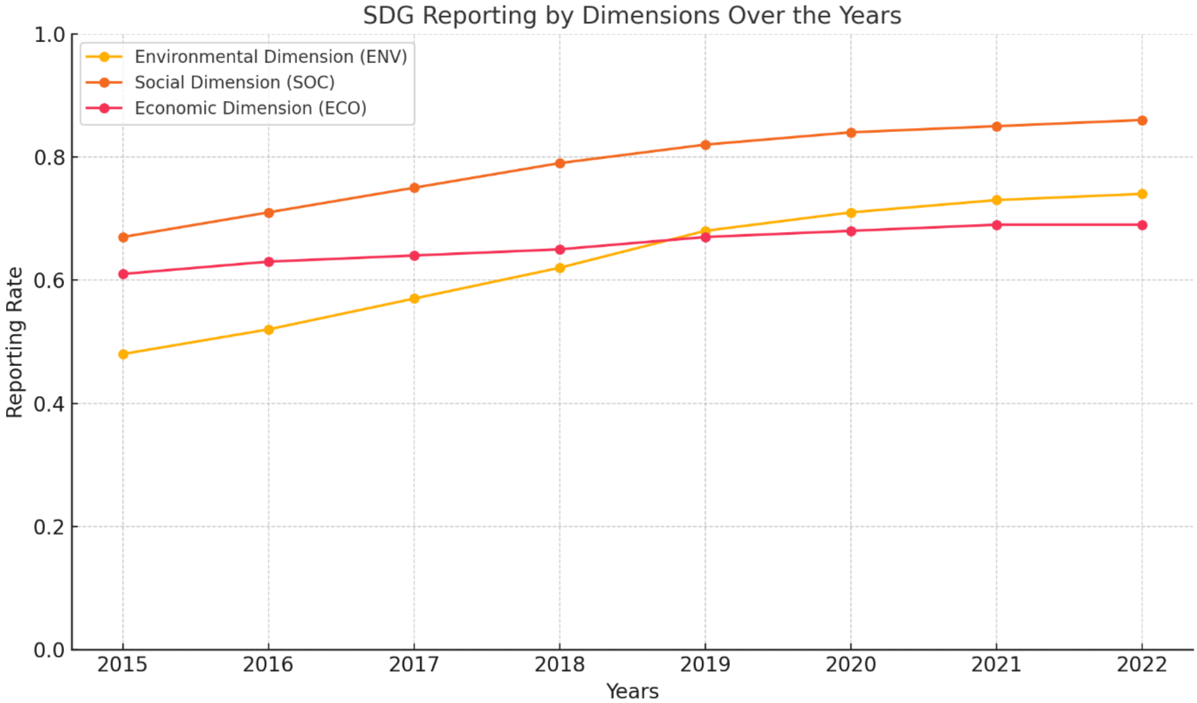


This formula measures each bank's SDG reporting ratio over the years. Pearson correlation analysis revealed a positive and significant relationship between time and SDG reporting ($r=0.23$, $p<0.01$).

4.2. Analysis of SDGs according to Dimensions

The SDGs have been grouped into three dimensions. Reporting ratios for each dimension were analyzed over the years. Annual analyses indicate that the social dimension was the most frequently reported category, followed by the environmental and economic dimensions. The reporting ratio for the social dimension increased from 67% in 2015 to 86% in 2022. The environmental dimension rose from 48% to 74% during the same period. However, the economic dimension showed comparatively lower growth, increasing from 61% to 69%.

Figure 2. SDG Reporting by Dimensions Over the Year



When the Pearson correlation analysis was applied, the results indicated that the values of the economic, social, and environmental factors, which are dimensions of sustainable development goals, have shown an increasing trend over the years. The results are as follows: Economic Dimension: Pearson Value=0,174 ($p<0,01$); Social Dimension: Pearson Value=0,231 ($p<0,01$); and Environmental Dimension: Pearson Value=0,262 ($p<0.01$).

Thus, the above figure shows that the reporting rates in the banking sector in environmental, social, and economic dimensions have increased over the years. This also reveals that banks' interest in sustainable development goals has been steadily increasing. Looking at the figure, it can be said that the social dimension has outperformed other sustainability dimensions in all years, and this situation can be attributed to banks placing greater importance on social sustainability, such as social equality, employee rights, social responsibility projects, etc.

4.3. Differences Between Public and Private Banks

An independent samples t test is used to compare the SDG reporting trends of state-owned banks (SOBs) and privately owned banks (POBs). The analysis of results showed public banks reported significantly more on the environmental and social dimensions than do private banks, while no significant difference was noted for economic dimension.

Environmental Dimension (ENV): $t = 3{,}234$ ($p < 0{,}01$)

Public banks reported significantly more on the environmental dimension compared to private banks ($Mean_{SOB} = 0{,}68$ / $Mean_{POB} = 0{,}61$).

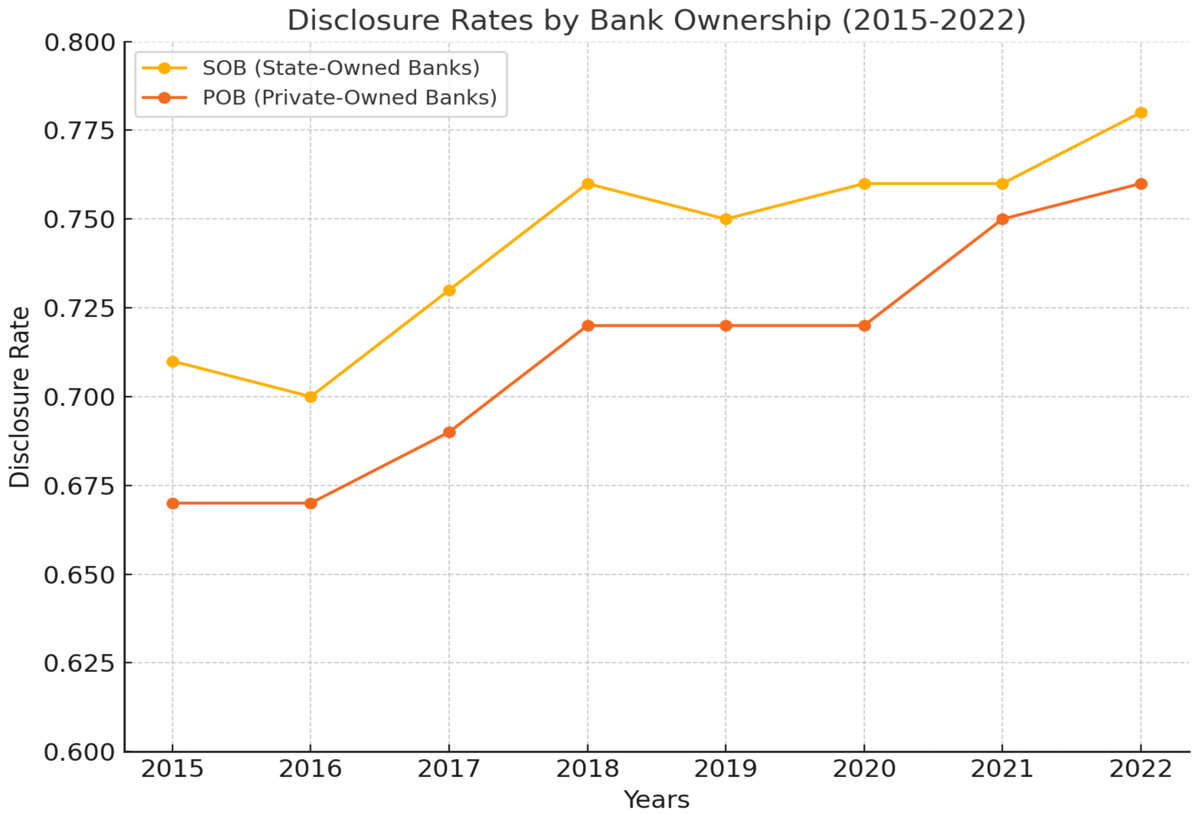
Social Dimension (SOC): $t = 4{,}001$ ($p < 0{,}01$)

Public banks also demonstrated higher reporting rates in the social dimension than private banks ($Mean_{SOB} = 0{,}86$ / $Mean_{POB} = 0{,}81$).

Economic Dimension (ECO): $t = -0{,}584$ ($p > 0{,}05$)

No significant difference was observed between public and private banks in the economic dimension ($Mean_{SOB} = 0{,}68$ / $M_{POB} = 0{,}69$).

Figure 3. Disclosure Rates by Bank Ownership (2015-2022)



The figure illustrates the disclosure rates for state-owned banks (SOBs) and privately-owned banks (POBs) between 2015 and 2022. The data reveal that SOBs generally exhibit higher disclosure rates compared to POBs, and both types of banks show an increasing trend over the years.

Table 2. The Comparison State-Owned Banks and Private Banks

	State-Owned Banks (Means)	State-Owned Banks (Stand. Dv.)	Privately-Owned banks (Means)	Privately-Owned banks (Stand. Dv.)	t-Value
SDGrr	0,751	0,123	0,723	0,145	2.09*

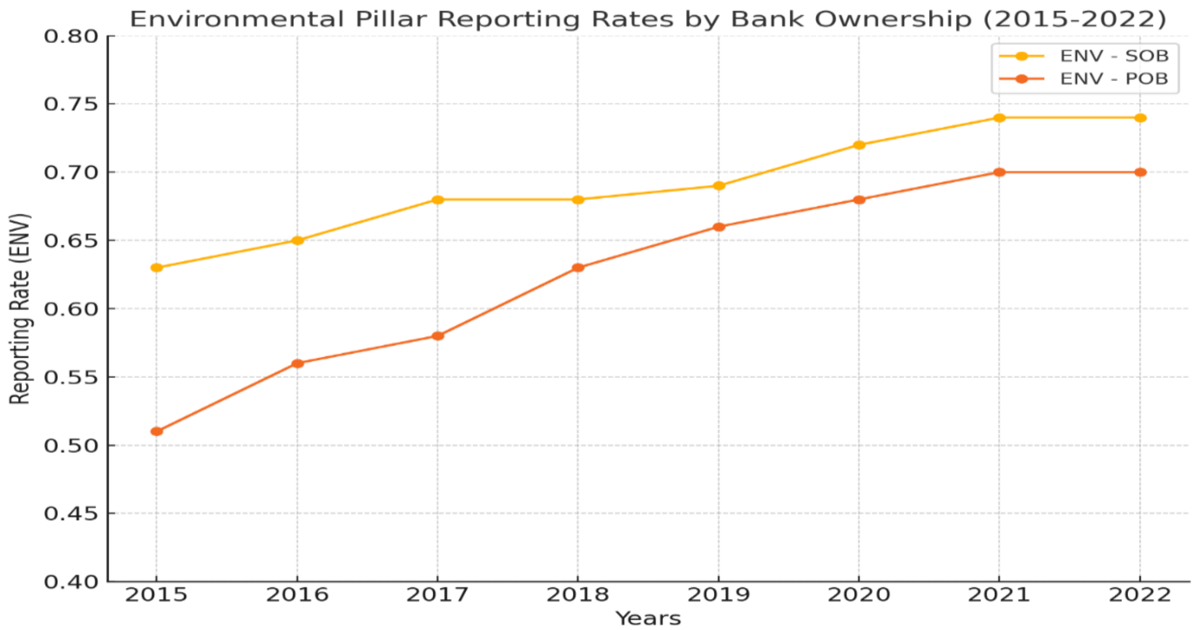
*** Indicates significance at the 5% level.**

This table shows that there is a statistically significant difference SDG reporting between banks of state ownership (SOBs) and banks of private ownership (POBs) ($t = 2{,}09$-$p < 0.05$).

This suggests that the banking sector is more and more inclined to react in a proactive way to sustainability issues. This indicates that public banks have higher performance in the social and environmental dimensions because they are prioritizing activities of common interest to the public. Yet the absence of a substantial difference in the economic dimension suggests that financial sustainability has the same importance for all banks.

The reported findings are consistent with previous literature. Private banks, have social and environmental sustainability goals, but as public banks there is a greater focus on social and environmental sustainability. Yet, it is pointed out in the literature that the elevations in the environmental dimension are insufficient and should be backed up by more policy support (Elkington, 2018).

Figure 4. Environmental Pillar Rates



To show the changes in environmental dimension (ENV) reporting rates for state-owned banks (SOBs) and privately-owned banks (POBs), this figure shows annual ENV reporting rates from 2015 to 2022. The reporting rate for the environmental dimension went up from 63% of public banks in 2015 to 74% in 2022. In 2015, it was 51% and by 2022, it had risen to 70% for private banks.

The results of these data suggest that, in general, public banks consistently outperformed private banks in environmental sustainability reporting, with the percentage of banks reporting on the environmental dimension rising steadily over time for both types of banks. Moreover, over the 2015–2022 period, public banks experienced an 11 percent increase while private banks recorded a 19 percent increase. It shows that the institutional awareness of environmental sustainability goals is growing.

Figure 5. Social Pillar Rates

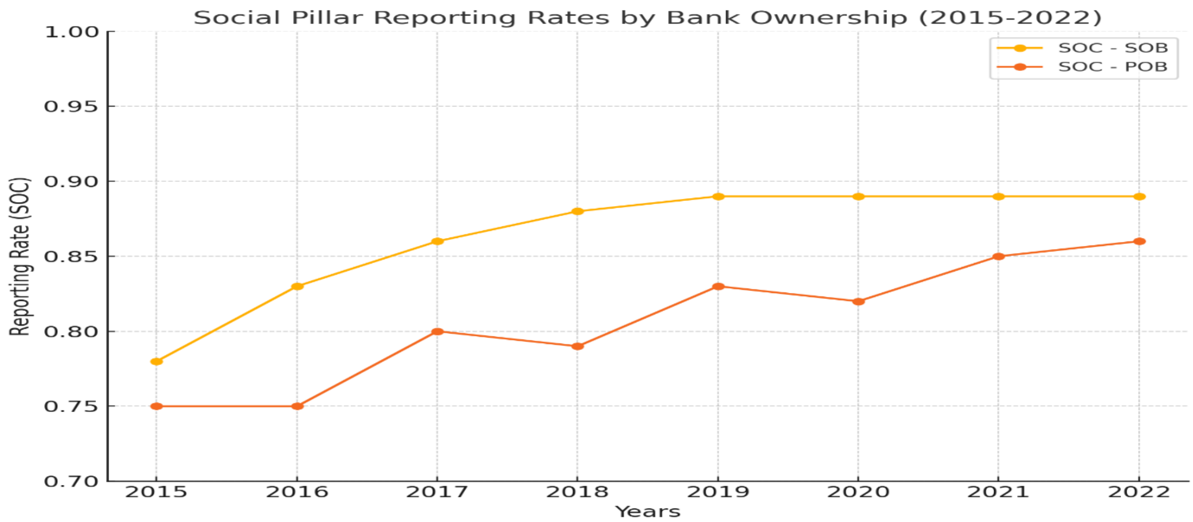


Figure 5 above shows the reporting rates of the social dimension (SOC), one of the dimensions of the sustainable development goals, by banks between 2015 and 2022. As can be seen from the figures, these annual changes reflect the situation of public banks (POB) and private banks (POB).

As shown in Figure 5 above, the banks' reporting rates for the social dimension (SOC) of the SDGs from 2015 to 2022 are analyzed. The figure highlights the annual changes in reporting for state-owned banks (SOBs) and privately-owned banks (POBs).

- **State-Owned Banks (SOBs):** In 2018, the reporting rate for the social dimension of the SDGs increased from 78% to 88% for state-owned banks. By 2019, this rate stabilized at 89%. This suggests that public banks maintain a more consistent approach to reporting on social sustainability issues.
- **Privately-Owned Banks (POBs):** For privately-owned banks, the reporting rate for the social dimension of the SDGs rose from 75% in 2015 to 79% in 2018. It then increased to 82% in 2020 and reached 86% in 2022. This reflects steady growth in social dimension reporting among private banks.

Overall, public banks have demonstrated long-term stability, with higher reporting rates for the social dimension compared to private banks. However, despite starting with a lower initial rate, private banks achieved an 11% increase during this period. This trend indicates an increasing focus on social sustainability for both types of banks.

Figure 6. Economic Pillar Rates

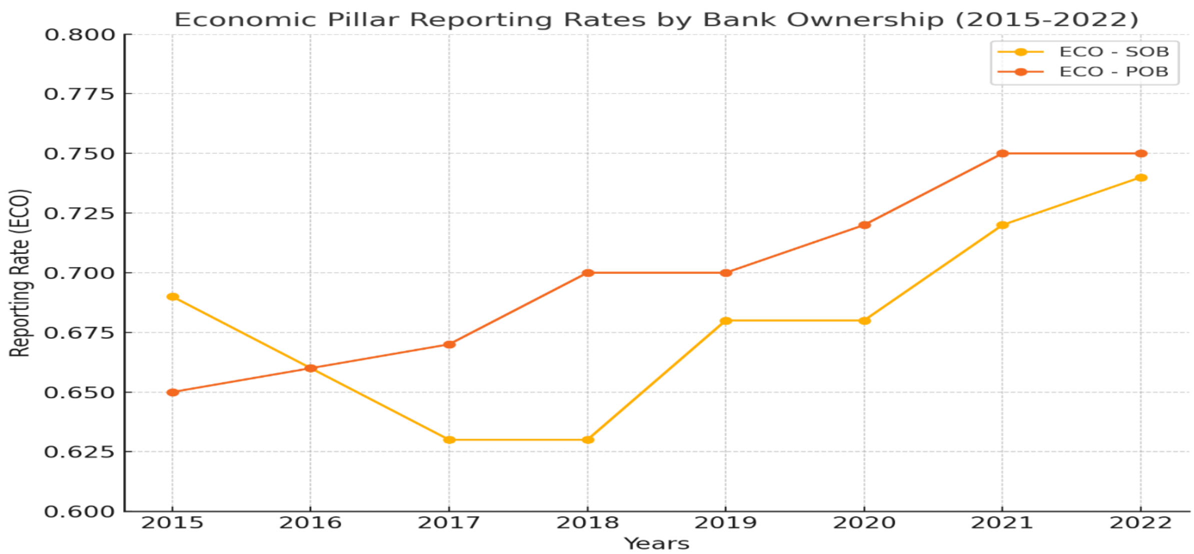


Figure 6 shows how reporting reflecting the economic dimension of sustainable development objectives changed between 2015 and 2022 for publicly owned banks (POBs) and privately owned banks (POBs).

The reporting rate of the economic dimension in state-owned banks (SBs) decreased from 69 percent in 2015 to 63 percent in 2017. Then, by 2022, this rate increased again to 74 percent. The figure shows that although there was a decrease in the reporting of the economic dimension at the beginning, there has been a continuous increase since 2018.

A t-test was used to compare the means of independent samples for hypothesis testing. Statistically significant differences were noted for the SDG_{rr} value ($t = 2,09$ / $p < 0,05$). State-owned banks included a greater number of SDGs in their annual documents than privately-owned banks. The t-test value for the environmental dimension of sustainability is 3.234 ($p<0.01$) and the t-test value for the social dimension is 4.001 ($p<0.01$), which are statistically significant and indicate a difference between public and private banks for these dimensions. These findings support H1. Research indicated that state-owned banks included a much greater number of SDGs in annual documents than to privately processed financial institutions. The findings seem to corroborate H2 and H3. Empirically, H4 is unsupported since no statistically significant changes were observed ($t = -0, 584$ / $p > 0,05$). Nonetheless, based on the sample data, private banks report a greater number of SDGs associated with the economic component compared to state banks.

Conclusion and Suggestions

This study provides significant findings on the integration of the three dimensions of the SDGs into the reporting processes of the banking sector. Additionally, the study compares the reporting trends of public and private banks, enabling a deeper understanding of how ownership structures influence SDG reporting practices. The analysis reveals that public banks place greater emphasis on SDGs, particularly in the environmental and social dimensions, compared to private banks. However, no statistically significant difference was observed in the economic dimension.

The fact that public banks have higher reporting rates in environmental and social dimensions (Adams et al., 2016; Elkington, 2018) is consistent with the findings in the literature. However, the lack of a significant difference in the economic dimension is in line with the reporting deficiencies in previous studies (Hummel & Szekely, 2022). This is an important contribution to literature. In addition, recommendations that address the limitations of the study and provide guidance for future studies are also included. For example, more widespread use of natural language processing (NLP) methods in sustainability reporting is suggested (Colón-Ruiz & Segura-Bedmar, 2020).

The findings indicate that public banks demonstrate a stronger commitment to social and environmental sustainability. This can be attributed to their broader responsibilities, which align with public policies and regulations. On the other hand, private banks exhibit a similar level of performance to public banks in economic sustainability reporting. These differences may be linked to private banks' focus on market pressures and profitability objectives.

As a result of the findings obtained in the study, the following recommendations are offered to both public and private banks:

Developing a Policy on SDG Reporting: According to the results of the study, the public authority may introduce regulations to encourage private banks that lag public banks in SDG reporting. Incentives and obligations can be created for private banks and even for the entire banking sector in the country to encourage environmental and social sustainable reporting.

Training and awareness-raising for the Continuity of Sustainability Reports: Awareness-raising training and campaigns can be organized to emphasize the importance of SDGs, covering the entire banking sector. Specific training programs can be developed for private banks to catch the SDG awareness levels of public banks.

Banks' Data Integration and Use of Technology: For the banking sector to create more comprehensive and more accurate sustainability reports, natural language processing (NLP) innovations that have become available with the developing technology should be utilized. In addition, technologies such as optical character recognition (OCR) can reveal the deficiencies in banks' existing reports and prevent these errors from being made in future reports.

The Importance of International Cooperation of Banks: Just as capital adequacy ratio can be determined by agreements such as BASEL to minimize the risks that banks will face on a global scale, a cooperation can be made on SDG reporting and implementation with a global standard.

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