A Materiality Analysis Framework to Assess Sustainable Development Goals of Banking Sector through Sustainability Reports

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Abstract

The intensifying demand of stakeholders for sustainability information, the severe effects of the recent financial crisis and the role of the financial sector on sustainable development have obliged many banking institutions to provide sustainable disclosures. Their main disclosure strategy is to meet the needs of stakeholders and assure the stability of the financial system. To this end, they have recently aligned their sustainability disclosures with the 17 Sustainable Development Goals (SDGs) of the Agenda 2030 (e.g. global poverty, prosperity, planet protection, decent work, economic growth and equality in education) incorporating the materiality concept which implies the identification of economic, social and environmental issues that concern an organization and have an impact on the organization itself but also on stakeholders by promoting the notion of sustainability in the long run. To examine the materiality of the banking sector disclosures regarding SDG issues, this paper develops an SDG Materiality Analysis Framework (SDGs_MAF). It was applied in a sample of 37 European banking institutions which publish corporate social responsibility or sustainability reports. Findings show the high priority of the banking sector for certain SDGs as well as a number of managerial implications in relation to its strategic planning and communicating of sustainability disclosures.

Keywords: Sustainable Development Goals, materiality framework, CSR report, business sustainability, banking sector

1. Introduction

Today, there are several interest groups (stakeholders) which influence and are influenced by corporate operations (Seuring and Gold, 2013). While previously the focus had been on addressing the concerns of shareholders now the focus is on meeting the needs of stakeholders (Seow *et al.*, 2006). To sufficiently inform the most demanding stakeholders, organizations have incorporated sustainability information into their accounting and reporting processes (Perrini and Tencati, 2006; Kaur and Lodhia, 2018). Essentially, they have employed techniques of sustainability accounting and reporting to record and disclose necessary sustainability information to their stakeholders in a systematic and transparent way (Rinaldi *et al.*, 2014). It is worth noting that sustainability information has also been necessary mainly since the recent financial crisis where the absence thereof appears to be responsible for many financial risks both for businesses but also for the society (García-Benau *et al.*, 2013). To ensure the transparency of such information, principles such as accountability, corporate governance and the materiality should be tested (Bergmann, 2014).

Information has lately been disclosed showing the progress of organizations in sustainability issues (Foran *et al.*, 2005). Many disclosure practices have been adopted by organizations to provide sustainable information to stakeholders using the triple bottom-line approach. The type and terms of sustainability information have evolved in a similar way to the concept of sustainable development from focusing only to environmental protection to promoting SDGs of United Nations 2030 Agenda, which place for-profit organizations at the heart of environmental and social policy. Indeed, several for-profit organizations have adopted the latest ways to address the SDGs (Raith and Siebold, 2018; Rosati and Faria, 2019b) and techniques to incorporate SDGs in reporting (Tsalis *et al.*, 2020).

These techniques have recently also been identified in banking institutions which try to contribute to SDGs (Jones *et al.*, 2017; Avrampou *et al.*, 2019). However, few academics have investigated the level of alignment of banking institutions with the SDGs and how they have recorded relevant information in their sustainability reports (Cosma *et al.*, 2020); many have focused on examining the content of banking sustainability reports regarding SDGs (Avrampou *et al.*, 2019). It is known that the majority of such studies are at a very early stage without verification or concrete techniques to analyze the most important and relevant topics of banking sustainability reports (Eccles *et al.*, 2012; Jones *et al.*, 2016).

Materiality analysis is a relatively new approach in the literature on sustainability reporting (Whitehead, 2017). The m*ateriality* concept *relates* "*to identifying and prioritising the most relevant sustainability topics, taking into account the effect each topic has on an organisation and its stakeholders*" (AccountAbillity, 2018, p. 20), where a topic is defined as material when it "will substantively influence and impact the assessments, decisions, actions and performance of an organisation and/or its stakeholders in the short, medium and/or long term" (AccountAbillity, 2018, p. 20). In order to contribute to this under-researched field, an innovative materiality analysis framework concerning SDGs (SDGs_MAF) has been designed in order to clarify the content of banking sustainability reports. It is based on scoring–rating techniques appropriate for analyzing the content of sustainability reports. A set of materiality items are presented classified according to the categories of SDGs and the relevant literature. This framework aims to answer the following research questions.

RQ1: How do firms incorporate SDGs in sustainability reports and what is their interrelationship with materiality assessment?

RQ2: Which SDGs are highlighted and assessed as important through the process of materiality analysis framework?

RQ3: What is the quality of the sustainability reports in relation to the SDGs?

RQ4: Which dimension of sustainability is most relevant to the material issues of firms as presented in the sustainability reports and how is this explained?

Finally, the SDGs_MAF was applied to a sample of 37 European banking institutions.

The rest of this paper is organized as follows: The next section describes the theoretical background in the field of corporate sustainability, reporting and SDGs and materiality analysis in corporate sustainability. The next section analyzes the building blocks of the suggested framework in order to identify the materiality analysis of the banking sector's sustainability reports. The fourth section includes an application of the framework, and the fifth section includes some key concluding remarks.

2. Literature review

This section describes the key findings of the literature which plays a critical role in building the materiality analysis framework suggested. It consists of three sub-sections to examine the current experience of the relationship between SDGs, corporate sustainability and sustainability reporting as well as to record the current knowledge of materiality analysis of reporting

sustainability. Primarily, the first sub-section analyzes the most crucial findings of the current literature concerning the ways in which organizations meet the SDGs, while the next sub-section provides information about the current status of sustainability reporting for SDGs. The final sub-section includes insights regarding materiality analysis from the literature of sustainability reporting.

2.1 The current experience of the business community and SDGs

Today, the current literature offers numerous definitions of corporate sustainability which can be classified in various categories. Some of these definitions refer to the corporate organizational level and strategic management where sustainability practices could be explained as a result of five key drivers: a) alignment with relevant legislation, b) aiming to profit through sustainable development strategies, c) the balancing of three aspects of sustainability (economic, environmental and social), d) win-win solutions for firms and stakeholder cooperation, and e) a complete strategy for corporate sustainability(Van Marrewijk, 2003; Van Marrewijk and Werre, 2003). Other academics have suggested various criteria to classify corporate sustainability such as Corporate Social Responsibility (CSR) or Corporate Sustainability (CS) orientation (Montiel, 2008), or through a natural, societal or business orientation (Dyllick and Hockerts, 2002).

Another key criterion to analyze the concept of sustainability in organizations is the progress of sustainable development. The examination of the relationship of the concept of sustainable development and sustainability of organizations is a very significant task since it offers the context to make this concept more widely understood and identify all notable milestones of its evolution from only one goal (environmental protection) to a broader set of 17 goals of sustainable development (e.g. environmental protection, economic development and social cohesion). The evolution of the definition of sustainable development has also been apparent into the evolution of the definitions of sustainability of organizations (Nikolaou and Tsalis, 2020). The analysis of some milestones is necessary to shed light on these relationships. Starting the analysis from the first known milestone which is tied with the concept of sustainable development, as this was presented in the Brundtland report, means that economic development has to meet the needs of the current generation without compromising the abilities of future generations to meet their needs (WCED, 1987). The key points of this definition are mirrored in the relevant definition for organizations to meet *''the needs of a firm's direct and indirect stakeholders without compromising its ability to meet the needs of future stakeholders as well*''

(Dyllick and Hockerts, 2002: p. 131). The emphasis of this definition is mainly on the protection of the natural environment and the promotion of social equity by seeking a well-balanced and fair allocation of natural resources between current and future generations.

After the 1992 UN Summit for Development and the Environment and Agenda 21, sustainable development has consisted of three dimensions: economic development, environmental conservation and social equity. Based on this definition, the discussion focuses upon determining the content of each dimension and identifying the proper ratio of each dimension in the overall concept. Part of the academic debate has focused on clarifying the content of the economic, environmental and social dimensions of sustainable development. Essentially, this debate stemmed from the economic theory of capital where the economic dimension (economic capital) includes man-made capital (Foy, 1990), the environmental dimension takes into account the protection of natural resources including quality and quantity and the social dimension promotes social equity and cohesion issues (Haque, 2000; Dempsey *et al*., 2011). Based on the economic theory of capital, significant academic debate has placed more emphasis on identifying the acceptable level of substitution among the three types of economic, environmental and social capitals. When any amount of capital can be freely substituted this is referred as the concept of weak sustainability. While strong sustainability implies that the level of substitution follows a standard ratio in order to maintain a minimum critical amount of each of the three types of capitals (Hediger, 2006).

These academic debates are present in the evolution of the field of corporate sustainability. Initially, the concept of weak sustainability is mirrored in corporate sustainability through the terms of business case of sustainability (economic or financial side of corporate sustainability). Then it evolves to environmentally friendly firms, to eco-efficiency firms (economic and environmentally sufficient) and to stakeholding firm (more emphasis on environmental sustainability). Finally, the concept of strong sustainability is mirrored in corporate sustainability as good citizen firm, corporate responsibility and business ethics (mainly more social sustainable firm) (Valor, 2005; Sinkin *et al.*, 2008). The term corporate weak sustainability also encompasses the concept of corporate social responsibility (CSR) and the triple-bottom-line approach, which allows unlimited substitution among economic, environmental and human capital (Elkington, 1998; McWilliams *et al.*, 2006). The term of corporate strong sustainability includes theories that seek to introduce specific limits, mainly for natural capital, by utilizing the concepts of planetary boundaries (Whiteman and Perego, 2012; Whiteman *et al.*, 2013) or by defining boundaries in which firms should operate with the

intention of maintaining a minimum amount of the three types of capital (Nikolaou and Tsalis, 2020.

Finally, the concept of corporate sustainable development evolves in line with the 17 SDGs of Agenda 2030 (Griggs *et al.*, 2013). A number of academics have suggested the alignment of corporate sustainability with SDGs (Rosati and Faria, 2019a). To this end, Topple *et al.* (2017) identify efforts to integrate SDGs into the strategic management of a sample of 112 multinational enterprises in countries of South-East Asia. Furthermore, Moldavska and Welo (2019) developed an original framework to assist firms in recognizing suitable sustainability strategies in order to achieve many of the SDGs. Similarly, Vildåsen (2018) has considered SDGs as a good strategic tool in order for firms to provide appropriate solutions for current social and environmental problems with the assistance of stakeholders. Additionally, they have pointed out the critical role of SDGs in improving corporate organizational learning. Rather than focusing on the incentives of the business community to adopt SDGs, Scheyvens *et al.* (2016) have classified many barriers faced by firms in their attempt to address SDGs. To overcome such barriers for firms to address SDGs, they suggested certain institutional interventions. Similarly, Ike *et al.* (2019) have studied the awareness of stakeholders regarding SDG practices adopted by a sample of MNEs in specific countries (ie the Philippines, Indonesia, Thailand and Vietnam). They pointed out that public authorities in the host countries should prepare suitable education programs and assure strong institutional procedures in order to demarcate the operations of MNEs under SDGs. Finally, ElAlfy *et al.* (2020) have analyzed the way in which and the period when firms communicate information regarding SDGs on social media aiming to increase their legitimacy.

2.2 The level of alignment of sustainability reporting with SDGs

The field of sustainability reporting has evolved in a similar way with the evolution of the concepts of sustainable development and corporate sustainability. As analyzed in the previous section, three key milestones provide the context for the analysis of the evolution of sustainability reporting. The first milestone emerges from the Brundtland reports where the majority of corporate reporting focused on disclosing information regarding the environmental management and practices of organization (Niskala and Pretes, 1995). The second milestone is associated with the triple bottom line approach where the emphasis has been made on the three pillars of sustainable development: economic development, environmental preservation and social equity. In line with this approach, sustainability accounting and reporting provides

techniques to record and disclose information regarding these three categories (Milne and Gray, 2013). To facilitate organizations to disclosure sustainability information in line with the three pillars of sustainable development, the international organization Global Reporting Initiative (GRI) launched in the late 90s as popular and useful guide.

The last milestone refers to SDGs which has of late been included in corporate sustainable reporting. Some academics have suggested methods and techniques to incorporate SDGs into corporate accounting, while others have focused on examining the level of integration of SDGs in corporate sustainability reporting (Avrampou *et al.*, 2019). The former approach focuses in including a number of normative frameworks which facilitate the introduction of SDGs into corporate sustainability accounting (Sapovadia, 2017; Frostenson, 2019). Sapovadia (2017) has provided a framework to introduce SDGs into International Financial Reporting Standards (IFRS) which is useful to standardize corporate disclosures regarding SDGs. Frostenson (2019) has pointed out the crucial role of corporate accounting in order for firms to transfer the wealth of experience for SDGs from macro-level to a more early stage micro level of firms. Another significant framework has been developed by Bebbington and Unerman (2018) in order for the business community to integrate some of the SDGs. Furthermore, Charnock and Hoskin (2020) have offered an approach to evaluate SDGs through corporate sustainability accounting. Finally, Bebbington and Unerman (2020) have found that there is a delay in integrating the essential information regarding SDGs in corporate accounting.

The most recent approaches in literature focuses on analyzing existing corporate reporting in relation to SDGs (Fonseca and Carvalho, 2019). Specifically, Rosati and Faria (2019a) conducted a survey to examine the way in which 27 institutional factors in a sample of 90 countries affect the content and the structure of corporate sustainability reporting regarding SDGs. They also investigated the relationship between a set of organizational factors and SDG in corporate reporting by elaborating a logit model in a sample of 408 firms worldwide (Rosati and Faria, 2019b). Tsalis *et al.* (2020) have suggested an evaluation framework to detect the amount of disclosure topics from CSR/sustainability reports regarding SDGs by utilizing scoring-benchmarking systems. Similarly, Van der Waal and Thijssens (2020) have examined through 2,000 sustainability reports the way in which firms address SDG by utilizing logistic and quintile regressions. Finally, Izzo *et al.* (2020) have examined 134 European firms which disclose information using integrating reporting (IR) guidance, which is utilized to cover issues in relation to SDGs.

2.3. The materiality status of sustainability reporting

A primarily and necessary clarification regarding the concept of materiality is its origin from the financial reporting literature where it assists in assuring sufficient auditing procedures for financial accounting (Calabrese *et al*., 2017; Steinbart, 1987; Whitehead, 2017). To explain the content of materiality, a classical definition is provided by the Financial Accounting Standards Board (FASB) as the information which "*if omitting it or misstating it could influence decisions that users make on the basis of the financial information of a specific reporting entity"* (Eccles *et al*., 2012: p. 66).The materiality analysis is also useful for investors offering a clear signal regarding the significance of disclosure information in financial reports (Khan and Serafeim, 2016; Whitehead, 2017).

Expanding the original concept, many academics and firms use materiality analysis for both financial and sustainability issues (Morrós Ribera, 2017). Similarly, another international organization for the sustainability issues of organizations, GRI, provides an explicit framework to designate the content of sustainability reports including, *inter alia*, the materiality analysis process (Calabrese *et al*., 2017). However, in a very short period, materiality analysis has been utilized as a multiple purpose instrument in the sustainability reporting field, including research studies focusing on developing certain procedures to analyze the materiality significance of disclosures and identify the most significant groups of stakeholders for organizations (Torelli and Balluchi, 2020). Calabrese *et al*. (2019) have developed a framework to conduct materiality analysis especially for firms with limited experience in sustainability disclosures. The implementation of materiality analysis has been empirically used to prioritize sustainable information with the intention of identifying the relationship between sustainability disclosures and the performance of organizations (Calabrese *et al*. 2016; Whitehead, 2017; Beske *et al*., 2020; Lindman *et al.*, 2020). Although there is an increasing attention to sustainability topics and many firms disclose some sustainability issues, materiality analysis is very limited (Beske *et al*., 2020). Materiality analysis may also play a critical role for firms strengthening their ability to gather appropriate information in a systematic way and related to the needs of stakeholders (Ranängen and Lindman, 2020).

Some studies seek to identify the materiality level of corporate sustainability reporting by also examining sector-specific characteristics and firm size (Bellantuono *et al*., 2016; 2018, Calabrese *et al*., 2016). The most common and significant approach of recent studies is primarily to determine the accurate content of materiality items. For example, Hsu and Chao (2013) have emphasized in the technology sector by means of failure modes and effect analysis

(FMEA) in order to determine appropriate criteria to select certain and key materiality items. Similarly, Lindman *et al*. (2020) have focused on a sample of Nordic mining industry to examine differences in the priorities of materiality among different companies. Additionally, Whitehead (2017) has used materiality analysis to clarify sustainability priorities in a sample of firms in the wine industry. By analyzing a range of external drivers of sustainability, he identified that environmental matters are higher priority followed by social issues especially related to employee wellbeing. A positive contribution, *inter alia*, of this work is the re-evaluation of what is significant for stakeholders and the ways in which materiality analysis can redefine the content of sustainable reporting and corporate social responsibility by taking into account the needs of stakeholders. The amalgamation of these multiple needs can improve the organization strategy and respond to stakeholders expectantions (Font *et al*., 2016). Furthermore, in a sample of Spanish SMEs, Muñoz-Torres *et al*. (2013) have provided a materiality analysis framework to address the most significant environmental, social and corporate governance items that enables stakeholder groups to monitor sustainability performance.

It is generally accepted that some firms adopt strategies to protect natural resources and society. These are considered either as profit-driven strategies or as a response to meet the needs of stakeholders. In the case of increased environmental and social awareness of stakeholders, firms take into account stakeholder beliefs in their behavioral intentions and production choices. Thus, firms increase their transparency and accountability in order to establish long lasting relationships and for organizations goals' to be achieved (Calabrese *et al*., 2017; Calabrese *et al*., 2015; De Villiers and Van Staden, 2010). To implement this strategy a materiality framework should be designed to analyze the content of sustainability reports and response to the preferences of stakeholders. Calabrese *et al.* (2015) have proposed a framework to evaluate materiality items in the context of social responsibility from the perspective of different stakeholders groups, encouraging stakeholder engagement processes into business-sustainability strategy. It is worth noting that a higher level of stakeholder comprehensiveness is positively associated with a higher quality of analysis of materiality of sustainability reports. There are many examples which suggest the connection of materiality analysis with stakeholder engagement (Beske *et al.*, 2020), while there are examples which shows a connection of materiality analysis with management opinion. By utilizing integrated reporting (IR), Lai *et al.* (2017) have designed a materiality analysis framework which connects sustainability information with various capital contributors (e.g. human, intellectual capital) and shareholders.

Organizations with less sustainability disclosures seem to have substandard communication with their stakeholders (Torelli and Balluchi, 2020). In the context of social value, materiality analysis is a useful tool in order to determine the level of alignment between social benefits and corporate profits (Saenz, 2019). Additionally, sustainability investments have better potential for growth for those cases where organizations disclosures are based on the materiality principles (Khan and Serafeim, 2016).

A few studies have focused on the materiality analysis of SDG issues through sustainability reporting (Betti *et al.*, 2018). Van Tulder and Lucht (2019) have developed a framework to analyze materiality items in the context of SDGs. Similarly, Schönherr *et al.* (2017) have examined the role of materiality items in assisting mainly transnational firms in adopting SDGs. Similarly, a framework has been developed by Garcia-Torres *et al.* (2017) which was based on content analysis techniques to examine sustainability reporting of SDGs. The majority of such frameworks seem to be in the initial stages and much more work should be conducted in order to make the materiality analysis of SDGs more comprehensive.

3. Methods

It is worth emphasizing two important aspects in relation to the methodology. The first focuses on describing the research questions of this study and the second concentrates on developing a suitable methodological framework to answer them. Specifically, four research questions are developed in sub-section 3.1 regarding materiality disclosures of CSR and sustainability reports. The other sub-sections (3.2, 3.3, 3.4 and 3.5) providing the basic steps of the suggested methodological framework are analyzed in order to evaluate the level of materiality of SDGs information arisen from corporate sustainability reports. Predominantly, this framework aims to identify organizations' priorities to align their sustainable strategies with SDGs. It is based on ideas of materiality analysis by selecting the key items of materiality analysis through the relevant literature per category for the SDGs. The other basic aim of the suggested framework is to identify key SDG items considered vital by stakeholders and the organizations themselves.

3.1 Research questions

Firms use sustainability and CSR reports to present economic and non-economic information related to their sustainability activities. As previously mentioned, a number of evaluation procedures are used to present the content of the information they want to

communicate. Therefore, many firms have started to disclose information on activities related to sustainable development goals as set out in Agenda 2030. This is a key point for many firms because results of their strategies could offer insights for the material issues according to their activity and their areas of interest. An additional critical issue to be considered is the examination of the relationship of each with the goals of sustainable development. Thus, a key research question is:

RQ1: How do firms incorporate SDGs in sustainability reports and what is their interrelationship with the materiality assessment?

SDGs cover a wide range of key issues related to the overall well-being of the environment and society as a whole. A critical point is to identify the most relevant SDGs and significant topics of a firm as presented in the sustainability reports. The results of the materiality analysis determine the topics of each firm which indicates different importance in specific goals. The basic aim is to identify the goals given the most importance and the least and to explain this difference. Thus, the key research question is:

RQ2: Which SDGs are highlighted and assessed as important through the materiality analysis framework?

In addition to identifying through materiality analysis the most important goals is defining the quality of information provided by a firm. The purpose of many firms is to examine the information of the content of each objective as it arose from the significant topics presented in the reports. This is examined through the evaluation of the quality of the information for all the material topics that correspond to the overall set of SDGs. Thus, a significant research question is:

RQ3: What is the quality of the sustainability reports in relation to the SDGs?

Another critical point is to examine whether and to what extent firms promote the general level of sustainability concept and if emphasis is placed on one of the three pillars of sustainable development. This evaluation can consolidate the results of the efforts and actions provided by firms. In this way, the significance provided by the material topics and SDGs is discernible. Then, it is possible to identify any weaknesses or failures in identifying issues and their

contribution to enhancing sustainability within the business unit, offering opportunities for improvement. Thus, the significant research question is:

RQ4: Which dimension of sustainability is most relevant to the material issues of firms as presented in the sustainability reports and how is this explained?

3.2 The structure of the SDGs_MAF

The suggested SDGs_MAF has been classified in three interrelated steps (Figure 1). In the first step (Figure 1: [S1]), the key items for the materiality analysis are determined. This procedure is based on two further activities. The former activity focuses on analyzing the SDGs and the latter activity drawing information from relevant literature regarding the preference of stakeholders. These activities are defined as the inputs of the suggested SDGs_MAF. In the second step (Figure 1: [S2]), a scoring system has been designed to evaluate key items which were determined in the previous step. The final step (Figure 1: [S3]) implies an application of SDGs_MAF in a sample of corporate sustainability reports. In this step, two further tasks have been made: sample selection and analysis of results. This is essentially the output of the suggested SDGs_MAF.

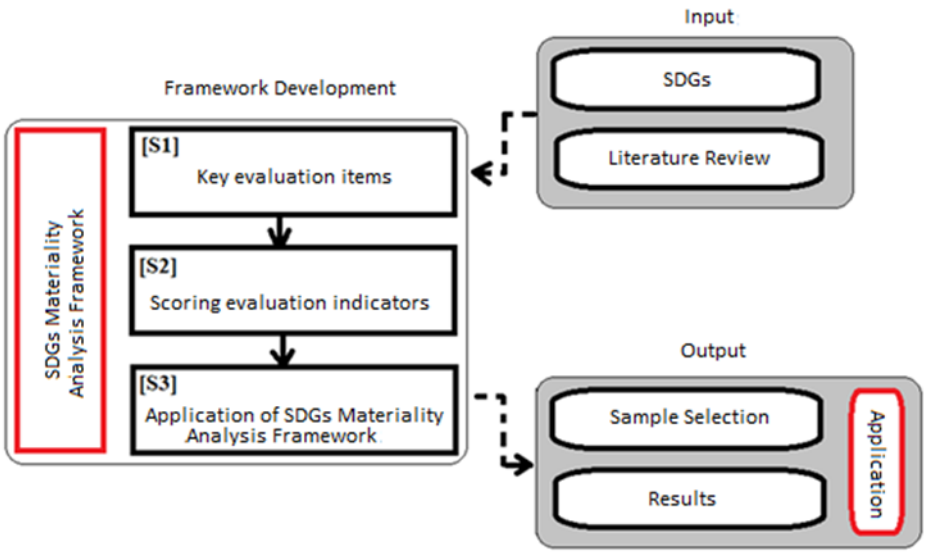

Figure 1. Structure of the framework

3.3 Key materiality items

A number of frameworks have been suggested to evaluate the materiality of corporate sustainable disclosures (Cinelli *et al.*, 2014; Escrig-Olmedo *et al.*, 2014). Sustainable scoring-rating frameworks are common accepted tools to benchmark and evaluate disclosures as well as to construct specific indicators in sustainability reporting literature, providing a widely used statistical technique and evaluation method in this area (Singh *et al*., 2009). In the field of SDGs and corporate sustainability reporting, few previous studies exist which adopt scoring-rating systems to evaluate corporate sustainability reports (Avrampou *et al*., 2019; Morhardt *et al*., 2002; Rebai *et al*., 2016; Skouloudis *et al*., 2010; Tsalis *et al*., 2020). The majority of such frameworks focused only on the triple-bottom-line and GRI guidance; they have focused more on evaluating the quality of corporate sustainability reports regarding SDGs and very little on materiality analysis.

The suggested SDGs_MAF aims to fill the gap of the previous frameworks. Specifically, it aims at evaluating the materiality of the disclosed information in the corporate social responsibility reports. The selection of materiality items was made through the content of SDGs and the literature review. Table I shows the final selection of materiality items suitable to be evaluated in corporate sustainability reports.

Table I. Materiality items selection

SDGs	Description	Materiality Items (MI)	Literature
SDG_1	End poverty in all its forms	MI_1: Impact on local communities MI_2: Contribution to poverty reduction MI_3: Contribution to employability MI_4: Community engagement, micro-insurance for social protection, soft loans	Apostolakis *et al.*, 2015; Asongu and Odhiambo, 2019; Bakhtiari, 2006; Donou-Adonsou and Sylwester, 2016; Idowu and Oyeleye, 2012; Piot-Lepetit and Nzongang, 2014
SDG_2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	MI_5: Investment in sustainable agriculture MI_6: Sustainable business opportunities in food sector MI_7: Supporting nutrition demand MI_8: Promote food security MI_9: Financial protection against natural disasters	Annano *et al*. 2021; Cortés and Strahan, 2017; DeLonge *et al*., 2016, Grindle *et al.*, 2015; Munang *et al*., 2011; Papargyropoulou *et al*. 2014; Vogl *et al*., 2017
SDG_3	Ensure healthy lives and promote well-being for all at all ages	M_10: Occupational health and safety M_11: Healthcare investments M_12: Health promotion activities, worklife balance M-13: Personal development M_14: Customer satisfaction	Alsamawi *et al*., 2017; Chatzoglou and Vraimaki, 2009; De Witte *et al.*, 2010, Levesque and McDougall, 1996; McDonald and Rundle-Thiele, 2008; Ramos *et al.*, 2020; Rivera and Currais, 2003; Tsalis *et al.*, 2018
SDG_4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities	M_15: Financial literacy M_16: Finance education projects M_17: Business management training M_18: Lifelong learning M_19: Training opportunities, supporting culture M_20: Promoting environmental and social awareness	Chatzoglou and Vraimaki, 2009; Cole *et al.*, 2009; Donmez-Turan and Kiliclar 2021; Ferraz and Gallardo-Vazquez, 2016; Liu *et al*., 2020; Perron *et al.*, 2006; Pinzone *et al.*, 2016; Rustam *et al.*, 2020; Xie *et al.*, 2020
SDG_5	Achieve gender equality and empower all women and girls	M_21: Gender pay equity M_22: Women's employment	Barrios *et al.*, 2020; Nadeem *et al.*, 2017; Oehmichen *et al*., 2014; Rubery, 1995; Yarram and Adapa, 2021
SDG_6	Ensure availability and sustainable management of water and sanitation	M_23: Supporting investment in water and sanitation infrastructure M_24: Water risks in investment evaluation	Aust *et al*., 2020; Dong *et al*., 2018; Murray *et al.*, 20019; Nikolaou *et al.*, 2014; Pryke and Allen, 2019; Tortajada, 2016

SDG_7	Affordable, reliable, sustainable and modern energy	M_25: Supporting renewable energy investments, expanding portfolio including carbon markets	Aust *et al*., 2020; D'Orazio and Löwenstein, 2020; Geddes *et al.*, 2018, Sim, 2018; Weber, 2005
SDG_8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work	M_26: Financial stability, investment in low income economies M_27: Expand microfinance M_28: Talent management M_29: Responsible financing, responsible investing M_30: Decent working conditions M_31: Managing business risk	Aktar and Ali, 2012; Cui *et al*., 2020; Gangi *et al*., 2019; Goyal and Joshi, 2011; Jeucken, 2010; John *et al*., 2018; Kempf and Osthoff, 2007; Oh *et al*., 2013; Trinks and Scholtens, 2017, Zwetsloot, 1995
SDG_9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	M_32: Innovation investments M_33: Digitalization M_34: Accessibility of services M_35: Cyber security	Aliyu and Tasmin, 2012; Chen *et al.*, 2017; Evanoff, 1988; Fontin and Lin, 2019; Prior and Argandoña, 2009; Yip and Bocken, 2018
SDG_10	Reduce inequalities	M_36: Equal opportunity employment remuneration policy, age, race, disability, sex discrimination M_37: Transparency and fairness in customer relations M_38: Financial inclusion	Fontin and Lin, 2019; Hoffmann and Birnbrich, 2012; Konrad and Linehan, 1995; Konrad and Linnehan, 1995; Zahid *et al.*, 2020; Zaid *et al.*, 2020
SDG_11	Make cities and human settlements inclusive, safe, resilient and sustainable	M_39: Commitment to the community M_40: Investing in local community M_41: Supporting transport infrastructure investment	Bagheri *et al.*, 2018; Boyer and Laffont, 1997; Rotmans *et al.*, 2000; Yeung, 2011, Zhan *et al*., 2018
SDG_12	Sustainable consumption and production	M_42: Support customers' work for sustainable production and lifestyle M_43: Responsible suppliers M_44: Internal consumption	Hoek *et al*., 2021; Islam *et al.*, 2017; Keating *et al.*, 2008; Liu *et al*., 2020; Meehan and Bryde, 2011; Roman, 2017; Weber, 2005
SDG_13	Take urgent action to combat climate change and its impacts	M_45: Reduce own greenhouse gas emissions, energy consumption M_46: Green loans M_47: Green investments M_48: Internal environmental performance	Baker *et al*., 2018; Ballestero *et al.*, 2012; Cui *et al.*, 2018; Eyraud et al., 2013; Falcone, 2018; Li *et al.*, 2018; Jeucken and Bouma, 1999; Martin, 2016; Nishitani and Kokubu, 2020; Tang and Zhang, 2020; Thompson and Cowton, 2004

SDG_14	Sustainable sea resources	M_50: Supporting coastal M_51: Marine biodiversity M_52: Wastewater management	Bakir, 2001; Bayraktarov *et al*., 2016; Murray *et al*., 2009; Rahm *et al.*, 2013; Massoud *et al*., 20019; Santo, 2013
SDG_15	Sustainable use of terrestrial ecosystems and biodiversity	M_53: Supporting biodiversity conservation projects M_54: Supporting land and forest protection	Fitzsimons *et al*. 2012; Myllyviita *et al*., 2019; Sumaila *et al.*, 2017
SDG_16	Peaceful, justice and strong institutions	M_55: Data privacy, security, fraud, anti-financial crime M_56: Corporate governance M_57: Ethics, strong customer relationship M_58: Business integrity	Ahmad and Al-Zu'bi, 2011; Aliyu and Tasmin, 2012; Barth *et al.*, 2009; Cowton, 2002; Favarel-Garrigues *et al.*, 2011; Green, 1989; Hardouin, 2009; Hoffmann and Birnbrich, 2012; Laeven, 2013; Nier, 2005; Nobanee and Ellili, 2020; Shy and Stenbacka, 2016; Toader *et al.*, 2018; Zerlang, 2017

3.4 Scoring – rating system

The suggested scoring system ranges from 0 to 5 indicating a weak to strong relationship between materiality items (MI) and SDGs. Table II displays the description of each number point.

Table II: Description of score system

Scale	Description
0	No relationship exists between materiality items and SDGs.
1	A minimum relationship exists between a materiality item and SDGs.
2	A weak relationship exists between a materiality item and SDGs.
3	A moderate relationship exists between a materiality item and SDGs.
4	A strong relationship exists between a materiality item and SDGs.
5	A very strong relationship exists between a materiality item and SDGs.

While the materiality analysis prioritizes the issues that are most significant to a firm and its stakeholders, it should be emphasized that the significance of materiality items differentiates amongst the various stakeholders groups and the firm itself. For this purpose, the significance of such criteria is weighted by three experts in CSR and corporate sustainability. To estimate the weighting of each materiality item, the ratio among two factors A and B, given as A=2B (or B=A/2), was utilized. The first factor A represents the higher score of materiality items with the greater significance (the integer value of the scale), and B indicates the less significant materiality items.

To measure the materiality score from corporate social responsibility or sustainability reports concerning SDGs, a composite index to estimate the score of separate SDGs as well as their overall score was designed. Equation 1 shows the total score for each SDG for an organization. Specifically, it is estimated as the sum of the scores of each materiality item for each SDG.

$$SDG_i = \sum_{i=1}^{z} SDG_i * A + \sum_{p=z+1}^{n} SDG_p * B \qquad (1)$$

Where

i = 1 ,…, 16 represents the number of examined SDGs, k = 1 ,…, z denotes the number of materiality items with higher significance, p=z+1 ,…, n denotes the number of materiality items with the less significance.

The maximum score for the SDGs depends on the number of the materiality items covered in corporate social responsibility or sustainability reports. It should be noted that the 17th goal of sustainable development has been excluded from the suggested framework due to the fact that the aim of this goal is mainly to encourage the worldwide partnership of governments and organizations to promote sustainable development goals (Stafford-Smith *et al.,* 2017). This goal might be a difficult if not impossible to be quantified through corporate and sustainability reports.

3.5 Sample selection and data collection

The SDGs_MAF was applied in a sample of banking institutions by drawing information and data from their published annual corporate social responsibility and sustainability reports. The selection of the sampled banking institutions is based on some specific criteria. Firstly, the information necessary was only drawn from the GRI Sustainability Disclosure Database (https://database.globalreporting.org/, date of visit: 23/08/2020). The GRI database provides free access to a number of CSR and sustainability reports. Secondly, the study focused on a specific sector to ensure comparability of the results and in order to be able to generalize findings for the banking sector. The focus is on the banking sector due to its fundamental intermediate role in economic development and in promoting the concept of sustainable development through lending procedures (Evangelinos *et al.*, 2009). Although, banking institutions are not directly connected with environmental and social impacts, they fund projects which impact the environment, society and economy to varying degrees. Banking institutions are related through the activities of their customers and funding of multiple investment projects (Biswas, 2011; Gordon *et al*., 2013; Sobhani *et al*., 2012). The sample was limited to the European banking sector.

Thirdly, the reports selected are the most current available (e.g. published in 2018). Fourthly, reports without a section on materiality assessment have been excluded. Finally, the sample was limited to those CSR and sustainability reports published in English. The final sample included 37 European banking institutions (Table III).

Table III: Sample characteristics

Bank	Country status	Size	Type	Listed	Total assets
BI_1	OECD	Large	Private company	Listed	61.007
BI_2	OECD	Large	Private company	Listed	61.880
BI_3	OECD	MNE	Private company	Listed	57.984
BI_4	OECD	MNE	State-owned company	Listed	91.536
BI_5	OECD	Large	Private company	Listed	45.857
BI_6	OECD	Large	Private company	Listed	11.982
BI_7	OECD	Large	Private company	Listed	109.022
BI_8	OECD	Large	Private company	Listed	122.390
BI_9	OECD	Large	Private company	Listed	205.223
BI_10	OECD	Large	Private company	Listed	102.893
BI_11	Non-OECD / Non-DAC	Large	Private company	Listed	164.574
BI_12	OECD	MNE	Private company	Listed	507.900
BI_13	OECD	Large	Public institution	Non-listed	347.017
BI_14	OECD	Large	Private company	Listed	1.348.137
BI_15	DAC-UMICT	MNE	Subsidiary	Non-listed	19.818
BI_16	OECD	Large	Private company	Listed	292.191
BI_17	OECD	Large	State-owned company	Non-listed	46.818
BI_18	OECD	Large	Private company	Listed	241.200
BI_19	OECD	Large	Private company	Listed	21.716
BI_20	OECD	Large	Private company	Listed	551.408
BI_21	OECD	Large	State-owned company	Non-listed	26.392
BI_22	OECD	Large	State-owned company	Non-listed	339.579
BI_23	OECD	Large	Partnership	Not applicable	28.714
BI_24	OECD	Large	State-owned company	Listed	45.375
BI_25	OECD	Large	Private company	Non-listed	590.437
BI_26	OECD	Large	Private company	Listed	140.115
BI_27	OECD	Large	Private company	Listed	760.370
BI_28	Non-OECD / Non-DAC	Large	State-owned company	Listed	392.464
BI_29	OECD	Large	Private company	Listed	10.683
BI_30	OECD	Large	Private company	Listed	16.168
BI_31	OECD	Large	Private company	Listed	21.007
BI_32	OECD	Large	Private company	Listed	220.355
BI_33	OECD	Large	Private company	Non-listed	10.868
BI_34	OECD	Large	Private company	Listed	60.948
BI_35	OECD	Large	Private company	Listed	23.851
BI_36	OECD	MNE	Private company	Listed	65.095
BI_37	OECD	Large	Private company	Listed	142.869

The majority of the banking institutions sampled are privately-owned banks listed on Stock Exchange Indexes. The country status characteristic refers to whether the bank is situated in a country which is a member of the Economic Co-operation and Development (OECD), if it receives any development aid through the OECD Development Assistance Committee (DAC), or if it belongs to an Upper Middle Income Countries and Territories (DAC-UMIC). For the size of the sample, the GRI database follows the EU definition regarding large, MNE and small organizations. Specifically, large organizations are considered to be those which fulfill one of the following criteria: turnover of over €50 million, the value of balance sheet is greater than €43 million and employs more than 250 employees. The same conditions as large are applied

for the MNE, including staff numbers greater or equal to 250 and multinational organizations. Table III also refers to the value of total assets (in thousands of €) and Table IV presents the distribution of sampled firms per country.

Table IV: Country of origin

Country	**BI**
Austria	2
Belgium	1
Finland	1
Denmark	1
Germany	3
Greece	4
Hungary	1
Ireland	1
Netherlands	6
Norway	5
Poland	1
Russian Federation	3
Serbia	1
Spain	1
Sweden	4
Switzerland	1
UK	1

4. Results and Discussion

This section presents the application of the proposed methodological framework and addresses the above research questions. The first research question (RQ1) derives from the process of materiality analysis which appears on a variety of sustainable items for an organization. It includes items which have a direct or indirect relationship with the wider range of sustainability issues of organizations. Through the process for identifying topics with significance, each organization presents an unspecified number of material issues having a consequential impact on its activities. This leads to a non-consolidated amount of material topics which also implies a different maximum score for each financial institution as Table V presents.

Table V. Maximum score of each SDG

BI	SDG_imax^*	BI	SDG_imax^*	BI	SDG_imax^*
BI_1	67.5	BI_14	60.0	BI_27	90.0
BI_2	70.0	BI_15	50.0	BI_28	120.0
BI_3	80.0	BI_16	115.0	BI_29	100.0
BI_4	55.0	BI_17	62.5	BI_30	50.0
BI_5	133.0	BI_18	62.5	BI_31	55.0
BI_6	62.5	BI_19	65.0	BI_32	60.0
BI_7	50.0	BI_20	25.0	BI_33	90.0
BI_8	77.5	BI_21	40.0	BI_34	80.0
BI_9	60.0	BI_22	92.5	BI_35	75.0
BI_10	62.5	BI_23	60.0	BI_36	60.0
BI_11	90.0	BI_24	52.5	BI_37	80.0
BI_12	65.0	BI_25	62.5		
BI_13	30.0	BI_26	40.0		

* max score of each SDGi

For reasons of comparability and simplicity, the SDG_i scores are normalized by dividing them with the $SDG_{i,max}$ scores for every banking institution, as showed in Appendix 1(Tsalis *et al*., 2020). The normalized scores range from 0 to 1. The total score of each SDG (TSDG) for the total sampled firms ranges from 0 to 37 where a score near to 37 points indicates a strong relationship of the materiality item to the corresponding SDG, while a score near to 0 indicates a weak or non-existing relationship between the materiality item and SDG.

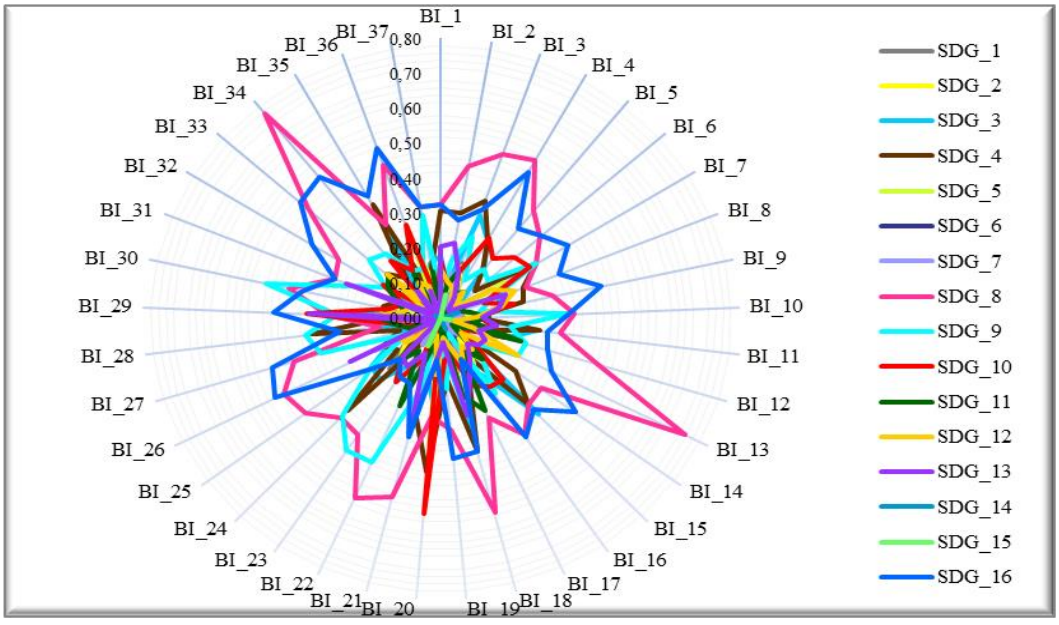

Figure 2: The emphasis of sampled banking institutions per SDG

The second (RQ2) and third research questions (RQ3) are examined in Figure 2 and Figure 3. Specifically, Figure 2 illustrates the total scores of the banks sampled per SDG. The findings show that the majority of the sample highlight promoting 'Peace and Justice Strong Institutions' and 'Decent Work and Economic Growth' (SDGs 16 and 8). Specifically, the highest scores were achieved by bank 34 (BI_34: 0.756 points) and bank 13 (BI_13: 0.733 points). The majority of the banks sampled have placed significant emphasis on 'Industry, Innovation and Infrastructure' (SDG_9). As can be observed, the vast majority of financial institutions score zero on issues related to SDG 15, 'Sustainable use of terrestrial ecosystems and biodiversity' and SDG 16, 'Sustainable sea resources'. Banks do not include in their strategic planning process and core business topics actions related to land and sea conservation as indicated by these objectives. Exceptions are topics such as 'facilitation of water safety, climate mitigation and biodiversity' and 'supporting biodiversity conservation projects' from banks BI_11 and BI_22, that are characterized as significant and have a moderate relationship with the relevant SDGs.

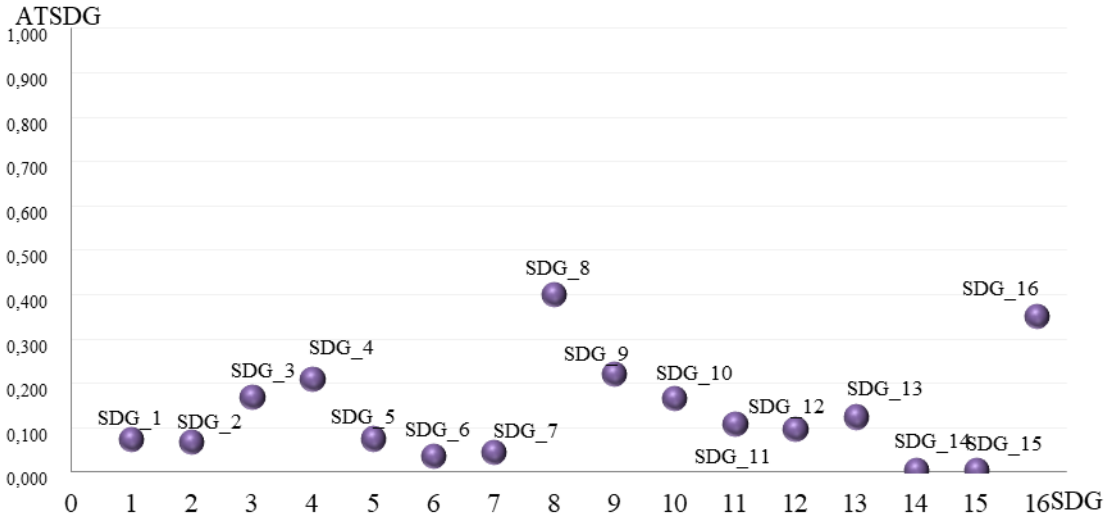

Figure 3: Average total score for each SDG

Thereinafter, Figure 3 represents the average total score for each SDG. The highest scores as expected are observed for SDGs_8 (score: 0.401) and SDG_16 (score: 0.352) and items strongly linked with the major objective of the banking sector. This implies that the results of materiality analysis of many of the sampled banks naturally put more emphasis on the promotion of economic growth and simultaneously on their employees' welfare. They are directly involved with its core business which are the various types of money transactions,

indicating that the emphasis is on the economic dimension of sustainability (Roca and Searcy, 2012). Additionally, many institutions focus on the promotion of sustainability issues in society and strive to improve the quality of institutional procedures and simultaneously increase their business efficiency focusing on providing data protection, transparent and fair service. This is a logical finding since the banking sector has frequently been blamed since the economic crisis for the failure of the economic system (Tadesse, 2006) and for the ineffective dealing with financial crime and corruption. Furthermore, a great emphasis has been given to SDG_9, focusing on access to financial services for all, innovation, IT and cyber security and digitalization. Another SDG with a high score is SDG 4 (score: 0.209). This implies a strategy to assure a high quality education, which in the case of banks, refers to topics such as training opportunities, employee development, and financial literacy. Conversely, banks achieved extremely low scores for SDG _15 (score: 0.005), SDG_14 (score: 0.006), SDG_6 (score: 0.036) and SDG_7 (score: 0.046) referring to areas that are not related to primary activities of banking sector. Topics related to biodiversity protection, water protection and sanitation are not in the main interests of both the stakeholders and the banking sector. Over 80% of the sample scored zero for SDGs_14 and 15 (Table VI).

Table VI. Results overview

	SDG_1	SDG_2	SDG_3	SDG_4	SDG_5	SDG_6	SDG_7	SDG_8	SDG_ 9	SDG_10	SDG_11	SDG_12	SDG_13	SDG_14	SDG_15	SDG_16
BI_1	0.044	0.044	0.178	0.311	0.133	0.030	0.030	0.326	0.081	0.170	0.022	0.141	0.207	0.000	0.000	0.326
BI_2	0.036	0.021	0.100	0.307	0.071	0.043	0.136	0.443	0.171	0.100	0.100	0.107	0.221	0.000	0.071	0.286
BI_3	0.169	0.156	0.313	0.356	0.075	0.075	0.094	0.500	0.250	0.138	0.144	0.094	0.144	0.000	0.000	0.331
BI_4	0.091	0.091	0.255	0.255	0.091	0.000	0.000	0.518	0.127	0.264	0.082	0.055	0.073	0.000	0.000	0.482
BI_5	0.075	0.060	0.181	0.177	0.053	0.008	0.011	0.396	0.181	0.223	0.098	0.098	0.030	0.000	0.000	0.332
BI_6	0.008	0.008	0.056	0.120	0.040	0.000	0.000	0.352	0.168	0.264	0.000	0.048	0.032	0.000	0.000	0.360
BI_7	0.000	0.000	0.160	0.300	0.200	0.000	0.060	0.300	0.300	0.280	0.080	0.160	0.060	0.000	0.000	0.400
BI_8	0.039	0.039	0.168	0.239	0.032	0.052	0.058	0.245	0.142	0.123	0.058	0.213	0.187	0.052	0.000	0.342
BI_9	0.083	0.083	0.158	0.225	0.083	0.033	0.058	0.308	0.108	0.200	0.083	0.167	0.158	0.000	0.000	0.442
BI_10	0.024	0.000	0.088	0.096	0.088	0.056	0.032	0.360	0.344	0.104	0.128	0.096	0.112	0.000	0.000	0.344
BI_11	0.100	0.100	0.261	0.267	0.067	0.078	0.050	0.322	0.189	0.133	0.083	0.033	0.150	0.028	0.028	0.289
BI_12	0.046	0.046	0.185	0.115	0.038	0.015	0.015	0.438	0.238	0.185	0.223	0.092	0.108	0.000	0.000	0.300
BI_13	0.017	0.017	0.050	0.000	0.000	0.000	0.000	0.733	0.233	0.067	0.033	0.233	0.133	0.000	0.000	0.333
BI_14	0.025	0.025	0.050	0.250	0.108	0.033	0.000	0.333	0.117	0.100	0.050	0.067	0.125	0.000	0.000	0.450
BI_15	0.180	0.140	0.380	0.340	0.100	0.060	0.060	0.340	0.160	0.240	0.160	0.120	0.100	0.000	0.000	0.360
BI_16	0.070	0.070	0.191	0.130	0.157	0.061	0.026	0.400	0.261	0.235	0.104	0.096	0.139	0.000	0.000	0.409
BI_17	0.024	0.024	0.152	0.176	0.080	0.144	0.144	0.312	0.048	0.208	0.288	0.144	0.184	0.032	0.000	0.128
BI_18	0.216	0.184	0.312	0.360	0.080	0.032	0.096	0.528	0.064	0.096	0.208	0.072	0.264	0.000	0.000	0.360
BI_19	0.040	0.040	0.093	0.173	0.067	0.000	0.040	0.320	0.200	0.120	0.027	0.053	0.067	0.000	0.000	0.400
BI_20	0.120	0.120	0.240	0.440	0.360	0.000	0.000	0.280	0.000	0.560	0.120	0.160	0.120	0.000	0.000	0.120
BI_21	0.050	0.050	0.150	0.275	0.000	0.100	0.000	0.525	0.200	0.000	0.075	0.050	0.300	0.000	0.000	0.350
BI_22	0.036	0.007	0.179	0.086	0.036	0.107	0.043	0.564	0.450	0.129	0.271	0.086	0.107	0.079	0.086	0.200
BI_23	0.000	0.000	0.164	0.073	0.091	0.000	0.091	0.400	0.455	0.218	0.109	0.018	0.164	0.000	0.000	0.200
BI_24	0.200	0.162	0.238	0.362	0.000	0.048	0.048	0.390	0.381	0.152	0.171	0.038	0.152	0.000	0.000	0.162
BI_25	0.115	0.115	0.231	0.146	0.038	0.008	0.008	0.454	0.231	0.077	0.054	0.115	0.000	0.000	0.000	0.246
BI_26	0.100	0.075	0.150	0.175	0.000	0.000	0.200	0.475	0.100	0.075	0.000	0.125	0.275	0.000	0.000	0.500
BI_27	0.034	0.034	0.090	0.117	0.000	0.021	0.000	0.414	0.338	0.062	0.090	0.000	0.028	0.000	0.000	0.476
BI_28	0.117	0.108	0.167	0.350	0.033	0.000	0.000	0.167	0.367	0.117	0.125	0.017	0.050	0.000	0.000	0.275
BI_29	0.180	0.180	0.315	0.140	0.075	0.140	0.140	0.305	0.280	0.360	0.175	0.180	0.355	0.000	0.000	0.450
BI_30	0.060	0.060	0.060	0.160	0.100	0.000	0.000	0.420	0.480	0.140	0.100	0.100	0.000	0.000	0.000	0.380
BI_31	0.109	0.109	0.109	0.127	0.000	0.145	0.145	0.309	0.255	0.109	0.127	0.091	0.273	0.000	0.000	0.309
BI_32	0.117	0.133	0.125	0.142	0.083	0.033	0.008	0.325	0.175	0.183	0.167	0.050	0.042	0.017	0.000	0.408
BI_33	0.056	0.067	0.122	0.194	0.056	0.000	0.000	0.478	0.256	0.033	0.189	0.194	0.044	0.000	0.000	0.506
BI_34	0.019	0.019	0.100	0.150	0.031	0.000	0.006	0.756	0.238	0.213	0.038	0.056	0.106	0.000	0.000	0.519
BI_35	0.120	0.120	0.267	0.373	0.013	0.027	0.113	0.307	0.160	0.160	0.147	0.120	0.000	0.000	0.000	0.400
BI_36	0.000	0.000	0.083	0.083	0.233	0.000	0.000	0.467	0.150	0.283	0.000	0.100	0.083	0.000	0.000	0.517
BI_37	0.038	0.038	0.163	0.150	0.100	0.000	0.000	0.325	0.300	0.050	0.138	0.000	0.013	0.000	0.000	0.325
TSDG	2.757	2.546	6.282	7.742	2.814	1.348	1.713	14.837	8.197	6.170	4.067	3.589	4.606	0.207	0.185	13.016

Generally, the findings reveal a very low relationship between the materiality items of the sample with SDGs (Table VII). Particularly, six of the SDGs (e.g. SDG_3, 4, 8, 9, 10 and 16) have achieved scores above the average (ATSDG score) which is 0.135 and none achieved scores above the mean of data range (0 to 1) which is 0.5 (Table VI). The findings are in line with Fonseca and Carvalho (2019) research which found a moderate low level quality of disclosure information of sustainable development goals in published reporting. This research has introduced an approach addressing the complex relationship between the emerging research fields of sustainable development goals from the organizational strategy towards sustainable development expecting higher financial earnings and asset quality through enlarged reputations gains. Banking institutions have become more interested in addressing sustainability aspects in non-financial reports, acknowledging the potential risks to their corporate image and reputation and improving stakeholder relationships (Carnevale and Mazzuca, 2014), but there is limited degree of contribution in sustainable development as it is set up through the SDGs.

Table VII. The mean of ATSDG score per SDG

SDGs	ATSDG	Above/below mean score	Above/below 0.5
SDG_1	0.075	x	x
SDG_2	0.069	x	x
SDG_3	0.170	√	x
SDG_4	0.209	√	x
SDG_5	0.076	x	x
SDG_6	0.036	x	x
SDG_7	0.046	x	x
SDG_8	0.401	√	x
SDG_9	0.222	√	x
SDG_10	0.167	√	x
SDG_11	0.110	x	x
SDG_12	0.097	x	x
SDG_13	0.124	x	x
SDG_14	0.006	x	x
SDG_15	0.005	x	x
SDG_16	0.352	√	x
mean score	0.135		0.5

X: represents ATSDG value below mean, √: represents ATSDG value above mean

Finally, RQ4 is examined in Figure 4. In order to address the above research question, the following analysis is based on the triple bottom line approach (i.e. economic, environmental and social) as this has been the main paradigm for the majority of businesses and the banking institutions (Sweeney *et al.*, 2001). Based on the classification of Nikolaou and Tsalis (2020), the first dimension of

sustainability (economic) could encompass SDGs_8, 9, and 12, the second dimension (environmental) SDGs_6, 7, 11, 13, 14 and 15 and final dimension (social) might encompass the remaining SDGs_1, 2, 3, 4, 5, 10 and 16.

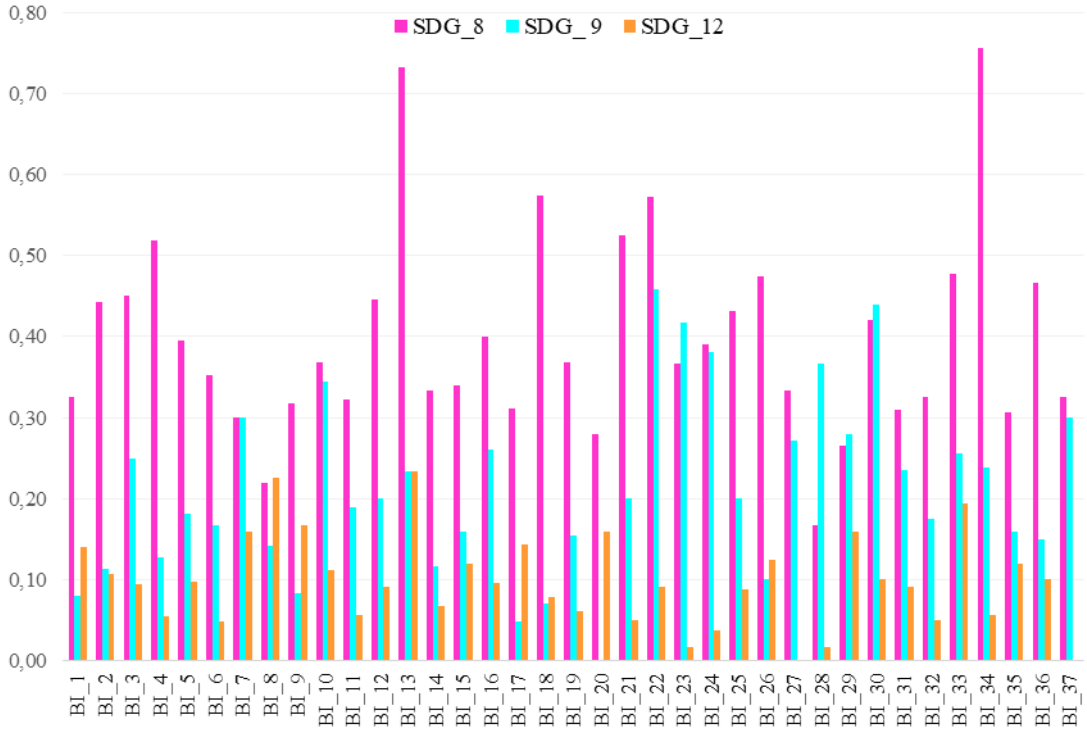

Figure 4. SDG analysis with emphasis on the economic dimension

Figure 4 shows the economic dimension of firms sampled. It indicates that the majority of the banks sampled have focused on promoting sustained economic growth and improving work conditions for their employees as it has been mentioned above. This approach has lately become extremely common in the banking sector as their operations requires higher levels of productivity and skilled employees, not merely staff who are part of a well-organized automated production line. Firms adopt sustainability projects mainly to create new knowledge (the knowledge-based view theory) and new resources and capabilities (the resource-based view theory) (Rousseau, 2017; Nikolaou, 2019). This shows that employees play a crucial role not only in meeting the goals of sustainability but also in achieving the traditional goals of the institutions including viability, profitability, and productivity (primarily SDGs_8 and 9). The banks sampled have placed less emphasis on issues such as sustainable consumption and production (SDG_12) which are two areas where the majority of the business community has shown increasing interest (Artiach *et al.*, 2010; Gianni *et al.*, 2017). The difference in these results is easily explained by the focus of banks on financial services and not on the production processes of the corporate sector. Banks are labor-intensive businesses, not capital-

intensive, which justifies the emphasis placed on employees rather than on making their production or consumption procedures directly sustainable.

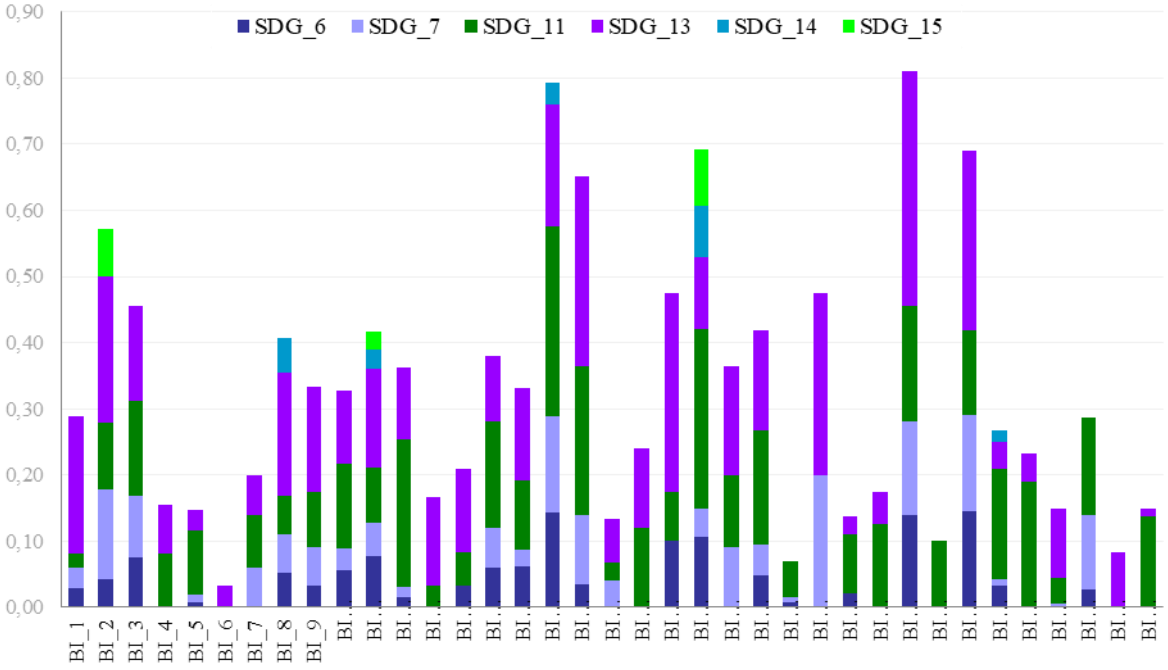

Figure 5: SDGs sustainability analysis with emphasis on the environmental dimension

In the environmental dimension, the sampled banking institutions have emphasized on issues related to urban sustainability and climate change. These are two fundamental issues that can be understood by the way in which banks operate within society and cities as well as the indirect contribution to climate change issues. Many banks have recently given emphasis to climate change issues, either directly through practices adopted to reduce their impacts on climate change (Achua, 2008) or indirectly through greening their lending procedures to force borrowers (firms and organizations) to eliminate their direct impacts on climate change (Piscicelli *et al.*, 2015). Less but equally important emphasis is given by banks to providing affordable energy to all citizens as a result of their overall strategy to promote sustainable cities and practices to eliminate climate change. For example, some of the sample (e.g. BI_17, BI_23 and BI_26) have achieved a higher score in SDG_7 and they adopt strategies such as green bonding for local energy infrastructures, providing energy market services by developing innovative energy projects, renewable projects for hydroelectric power plants in transition economies, environmentally banking products and services oriented to clean energy. The lowest score was for SDGs_14 and 15 which refer to the protection of the land and sea. This is explained by the nature of the work of banks concerning financial services not directly related to the protection of the natural environment.

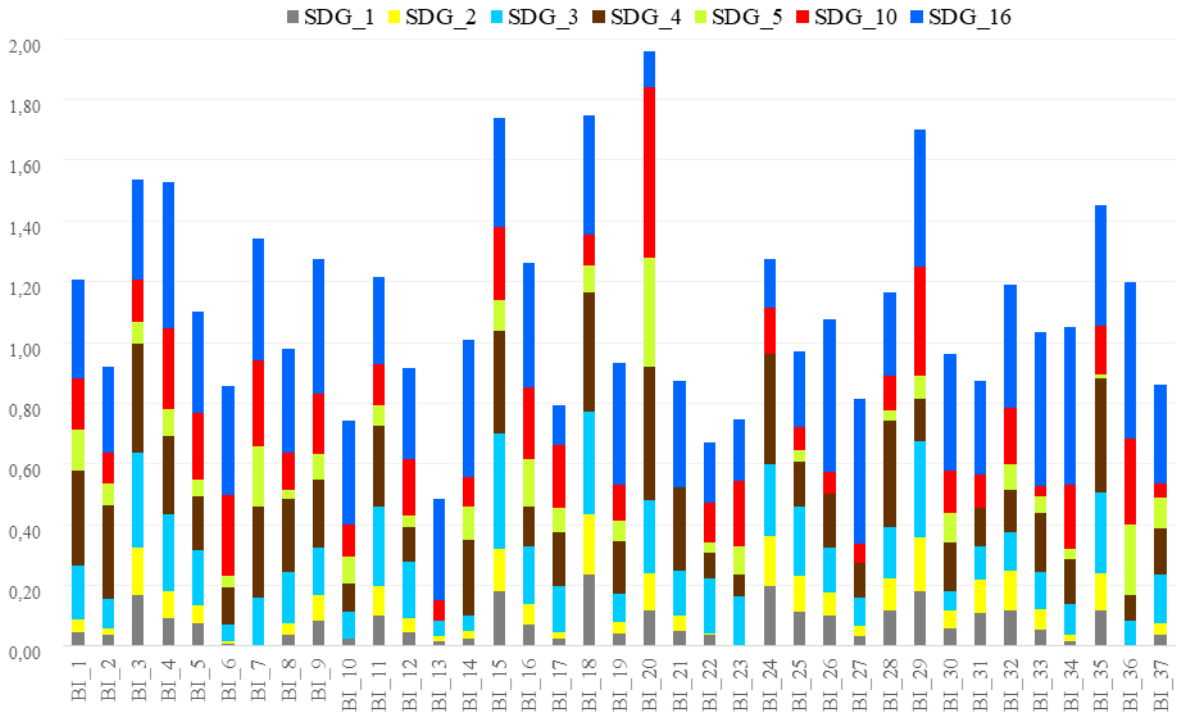

Figure 6. SDGs materiality analysis with emphasis on the social dimension

In the social dimension of sustainability, most of the sample place great emphasis on the development and promotion of peaceful, just and strong institutions, namely they promote SDG_16. A lot of emphasis has been also given by the banks to SDGs_3, 4 and 10. That is, banking institutions promote SDGs such as health, education and the reduction of inequalities in society. These findings are in line with the work of Fluch (2007) who identified that 30 central banks in different countries offered certain financial products to promote educational programs. Finally, they place less importance on issues such as poverty (SDG_1), hunger (SDG_2) and gender equality (SDG_10).

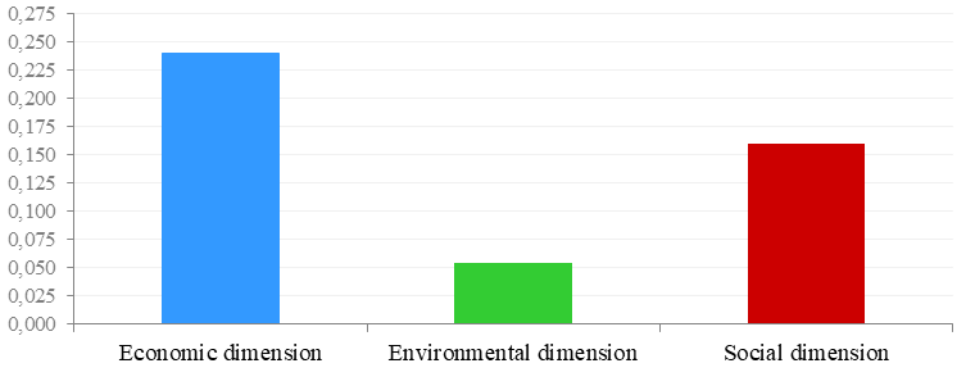

Figure 7. SDGs materiality performance per sustainability dimension

Figure 7 shows the banks put major emphasis on the economic dimension, followed by the social dimension and finally the environmental dimension. Based on the classification of Nikolaou and Tsalis (2020), the economic dimension was calculate - the average of the scores achieved by the 37 banks for SDGs 8, 9, and 12. Respectively, the environmental dimension is the average scores for SDGs 6, 7, 11, 13, 14 and 15 and for the social dimension the average for the SDGs 1, 2, 3, 4, 5, 10, and 16 for the 37 banking institutions. The emphasis on the economic dimension is expected since the banking sector primarily pays greater importance to economic issues, then social issues based on promoting human resources issues (as human capital-intensive business). Finally, the results showed that banking institutions put less emphasis to environmental issues mainly by eliminating indirect impacts on the natural environment. Nevertheless, some efforts are evident in fronts. One is to reduce their environmental footprint including energy, water, paper and fuel usage. The other focuses on the strengthening and financing of green investments, green loans and bonds, and the inclusion of environmental criteria. These findings are in line with previous research that disclosure of environmental information is generally excluded from annual reports and websites of banks and therefore is an area for improvement (Menassa, 2010; Sobhani et al., 2012).

5. Conclusions

This paper suggests an innovative framework to evaluate materiality of social responsibility and sustainability reporting concerning SDGs suitable for banks. The findings show that the sample has put more emphasis on some SDGs mainly in relation to the main scope of their mission. Specifically, the findings showed that the banks sampled put more emphasis on promoting economic growth and better working conditions. The main concern focuses on their workforce since it is a work-intensive sector. The well-organized structure and the need for satisfactory working conditions are a driving force for enhancing productivity and employee satisfaction. Employee welfare including satisfaction and decent working conditions in all areas o 23f the banking sector is an area for improvement.

The key focus of the banking sector refers to issues regarding the financial flows of the economic system and allocation procedures of social welfare. The positive and stable economic situation of financial institutions implies an ethical stance on issues related to the fair and legal management of specific topics. The results of the research confirmed that the second most important goal is the management of issues such as financial corruption, financial crime and the management of personal data issues, which is a very sensitive subject for bank customers and is often disputed.

Furthermore, it can be concluded that the most material topics are related to the economic dimension. This can include either topics which maintain a profitable and financially sustainable

business or issues related to staff management, the promotion and development of employee talents and skills. Additional topics were related to improving customer service and it included the facilitation of services such as digitization, innovation techniques, cyber security and internet banking. The next important dimension of material issues were related to the social dimension and the objectives contained in it with the main one as the above mentioned the fair and legal management of various within the organization. In addition, areas that have been emphasized include the strengthening of the education of the society such as financial literacy, human capital management, training opportunities and skills development of talents and of the workforce. With regards to the environmental dimension, the overall results give a rather limited linkage of the material topics and the sustainable goals in the banking sector. One reason could be that they do not have a direct impact on the natural environment like other sectors such as heavy industry, the chemical industry and any kind of commercial production. The connection of the main activity with their responsibility for the protection of the environment is not visible.

Finally, despite the assessment of some sustainable goals which receive higher reporting scores than others, the overall results give a rather weak linkage of the topics that emerge from the materiality analysis and sustainable goals in the banking sector**.**

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