Scoring environment pillar in environmental, social, and governance (ESG) assessment

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ABSTRACT

With technological advancements, many interconnected environmental issues have been worsening, including soil, water, and air pollution, climate change, loss of biodiversity, and over-exploitation of natural resources. With the inception of the term “sustainable development”, many market participants, including institutional and private investors, want to consider environmental sustainability in their investment decisions. However, until the upsurge of Environmental, Social, and Governance (ESG) investing, which is closely associated with sustainability, achieving sustainable development is challenging. ESG, the three critical areas identified by analysts, can significantly impact the financial aspect of a company. As a result, Renewable Energy 100%, the carbon neutrality approach, and the circular economy concept are widely used nowadays as environmental management tools. However, the limited comparability, the biased scoring metrics, the aggregated nature of diverse environmental factors, different methodologies implemented by rating providers, and the lack of robust datasets have resulted in limited usefulness of E (Environmental) scoring as a tool for greening the financial sector. Hence, to improve the relevance of the E pillar, the E in ESG must compose of a set of metrics to address different environmental aspects, thus avoiding unforeseen environmental disasters at a later stage. The inconsistency in the metrics’ scope and its evaluation criteria are the main drawbacks, which must be addressed for the E pillar to become an effective tool for allowing sustainable finance and development.

With the rapid pace of globalization, every single individual is chasing the technology while ignoring environmental changes accelerated as a consequence (Hironaka, 2002). As discussed by Chichilnisky (1997), human activities have invaded the ecological balance of the nature. Economic amplification, worldwide population growth, technological advancements, and lack of quality education can be driving forces of these global environmental issues (Jianping et al., 2014; Varela-Losada et al., 2021; Vlek & Steg, 2007). Following the publication of the report “Our Common Future” by Brundtland (1987), the world started to pay attention to sustainable development and utilization of available resources without compromising but respecting the needs of future generation (Brundtland, 1987; Fergus & Rowney, 2005)

According to Jianping et al. (2014) global warming, land desertification, water and soil pollution, freshwater resource shortage, ozone depletion and destruction, sharp fall of forest cover, decline of biological diversity, and acid rain can be identified as critical global environmental issues that we face right now. Very recently, the pandemic of COVID-19 is also causing environmental issues in terms of hazardous and hospital wastes generation, their disposal, and increasing private transport usage, leading to high carbon emissions (Barouki et al., 2021). As poor environmental quality can be a major threat to economic development, all market participants, including institutions, investors, and customers, should consider ways to make themselves more sustainable (Goodland & Ledece, 1986). For this reason, Environment, Social, and Governance (ESG) reporting...
has emerged as a platform to analyze the sustainability of various institutions. This analysis could be named as a set of investment products mainly used as tools to assess ESG-related risks and growth opportunities (Boffo et al., 2020; Li & Polychronopoulos, 2020). ESG is based on the philosophy that environmental, social, and governance components can impact a company’s success and market revenues. Moreover, it has been found that companies with a strong ESG performance tend to remain sustainable over the years by managing business goals successfully (Thomson Reuters, 2017). Although the ESG practices can enhance business performance, the disclosure of ESG reports, if not satisfactory, might damage the company’s reputation and eventually put the company’s image in a dilemma (Thomson Reuters, 2017). The most acute threat is mainly due to the challenge of meeting green and sustainable development concepts because green procedures and actions might reduce the company’s profit margin. Continuous sustainability risk management programs and green initiatives that cause changes of production processes are among major attributes with concerns of profit margins. Despite the above fact, companies tend to disclose their ESG data due to policies imposed by the Governments in order to remain listed as sustainable (Thomson Reuters, 2017) or to avoid any associated financial penalties (Chatzitheodorou et al., 2019). Recently, investors and stakeholders have developed an interest in ESG scores so that they could be enriched with information to make long-term decisions (Balluchi et al., 2021).

The E pillar in ESG has received considerable attention as it assesses the industrial impact on the natural environment. E pillar asks the following key question: “how does a company’s behavior affect the environment?” (Dragomir, 2020). E pillar considers key issues such as an institution’s dependence on fossil fuel, management of water and other resources, levels of pollution, climate change, hazardous waste generation and their disposal, and the carbon footprint as these factors could pose a risk to a company’s long-term financial well-being and survival. Investors consider environmental opportunities such as switching to renewable energy sources, utilizing processes that can conserve resources and minimize pollution, and reducing carbon footprint. Ultimately, the consideration of E pillar would generate competitive advantages of eco-friendly products and services (Boffo et al., 2020; Dragomir, 2020). The high capital cost towards renewable and alternative technologies is still a barrier for the uptake of green E approaches by companies, especially for smaller companies. However, with a clear sustainability agenda or goal to make a social or environment impact with their products and services, they are more likely to lure sustainability-oriented investors and green business opportunities (Nordea Equity Research, 2017).

A recent review done by the Organization for Economic Co-operation and Development (OECD) on ESG has put a great effort to assess which E score methodologies match expectations of institutions and investors who use those (Boffo et al., 2020). The report has used data and information from key rating providers, including Thomson Reuters, Morgan Stanley Capital International (MSCI), and Bloomberg, to analyze the E pillar. When comparing the E pillar score with the overall ESG score based on different rating providers, both high and low correlations are observed. This happens because of different methodologies adopted by rating providers in assessing each parameter (Boffo et al., 2020). Li and Polychronopoulos (2020) have also reported that ESG disclosures have no consistent data sets that can ultimately lead to very controversial outcomes in the analysis. By analyzing parameters such as total CO₂ and CO₂ equivalent emissions, total waste produced, total energy used, and total water withdrawal, the report suggests that a higher score on the overall E pillar does not always correlate with a low environmental impact. Interestingly, results showed a positive correlation between total CO₂ emissions and the overall E pillar score. According to two providers, the highest ESG scored companies on average pollute more in terms of emission of CO₂ (Boffo et al., 2020) (Figure 1). Another similar finding indicates that institutes that are responsible for higher amounts of hazardous and non-hazardous waste generation have received higher E pillar scores depending on different data providers (Boffo et al., 2020). If this is true, can we expect a higher “E” pillar decile for a company that emits high quantities of CO₂ or produces large quantities of waste?

It is essential to note that different rating providers aim to give emphasis on different ESG measurements. Some providers focus more on the environmental assessment, giving higher weight to environmental issues, while other providers consider financial materiality and other social governance measures as their primary focuses. According to various methodologies, rating providers have their unique sets of categories to assess E pillar, while the usage of key performance indexes (KPIs) for different ESG score calculation is also prominent (Sustainalytics, 2021; Thomson Routers, 2017).

LG, a world-renowned South Korean multinational conglomerate corporation, obtained a “BBB” rating in November 2020 according to MSCI, which was
downgraded from a rating of “A” obtained in November 2019. According to MSCI, LG is among the average category compared with 36 peer industries and considered a leader in clean technology but lagging in corporate governance, labor management, and supply chain labor standards (MSCI, 2021). Based on Sustainalytics ESG risk ratings, LG falls under the severe risk category with a score of 45.5 following very high exposure to different material issues and weak management (Sustainalytics, 2021). Therefore, the same company can be positioned differently by various rating providers.

Table 1 provides information on how E pillar indicators vary among different rating providers. As discussed by Boffo et al. (2020), variations in these indicators can also have a notable impact on the E pillar rating. Aligning with this, differences in weights that determine each indicator’s contribution to the E pillar can also affect the overall ESG score (Li & Polychronopoulos, 2020). Each indicator typically comprises 5–30% of the total ESG Rating (Morgan and Stanley Capital International, 2019). The weight percentage is considered based on the contribution of the industry relative to its peer industries and the positive or negative impact on the environment or society (Morgan and Stanley Capital International, 2019; Refinitiv, 2021). According to this criterion, one provider may give the highest weightage for total CO₂ emission and CO₂ equivalent emission, while another provider may give priority to total water withdrawal or total waste produced. The final E pillar score is the weighted average score of each key issue followed by a normalization procedure by the industry. It could account for E score differences between ESG rating providers. Another major drawback of ESG scoring is the deficiency of quality ESG ratings data (Bennani et al., 2018; Li & Polychronopoulos, 2020). As highlighted by Bennani et al. (2018), ESG studies still rely on ancestral data of the last 25 years.

Figure 2 elaborates the framework of ESG score calculation methodology. In general, almost all rating providers collect data from publicly available sources such as sustainability, annual or corporate social responsibility (CSR) reports, company websites, financial and non-financial disclosure documents, stock exchange filings, government regulatory and non-governmental organization (NGO) datasets, or third-party rating agencies. Since data quality plays a vital role in scoring, data collection is undoubtedly the first important step in E scoring (Boffo et al., 2020; Sustainalytics, 2021; Thomson Reuters, 2017). As the second step, the collected data are processed via individual methodologies developed by each rating provider based on identified key indicators such as emissions, pollution control, water management, climate change strategies, biodiversity management, and environmental standards (Baier et al., 2020) as defined by the world environmental standards. These identified indicators are further categorized based on their characteristics and various types such as greenhouse gas emissions, Fluorinated gas emissions, NOx, SOx emissions, if emission indicator is considered (Hournieux et al., 2014).

Empirical model development based on hypothetical analysis (Hsieh & Shannon, 2005) can be considered as the next stage. Multivariate regressions including dependent, independent, and control variables with different methods such as pooled regression, random, and fixed effects (Garcia et al., 2017) followed by further statistical analyses such as
Figure 2. Framework of the ESG score calculation methodology.
Table 1. Differences in environment (E) pillar categories covered by different rating providers

| Rating provider | Categories       | Themes                                                                 | Reference                      |
|-----------------|------------------|------------------------------------------------------------------------|--------------------------------|
| Refinitiv       | Resource use     | Water, energy                                                          | Refinitiv (2021)                |
|                 |                  | Sustainable packaging                                                  |                                |
|                 |                  | Environmental supply chain                                             |                                |
| Emissions       | Emissions        |                                                                        |                                |
|                 | Wastes           |                                                                        |                                |
|                 | Biodiversity     |                                                                        |                                |
|                 | Environmental management systems |                                      |                                |
| Innovations     | Product innovations |                                                |                                |
|                 | Green revenues   |                                                                        |                                |
|                 | Research and Development |                                              |                                |
|                 | Capital expenditures |                                          |                                |
| MSCI            | Climate change   | Carbon emissions                                                        | Giese et al. (2021)             |
|                 |                  | Product carbon footprint                                               |                                |
|                 |                  | Financing environmental impact                                          |                                |
|                 |                  | Climate change vulnerability                                           |                                |
| Natural capital | Water stress     |                                                                        |                                |
|                 | Biodiversity and land use |                                      |                                |
|                 | Raw material sourcing |                                           |                                |
| Pollution and waste | Toxic emissions and waste |                                         |                                |
|                 | Packaging materials and waste |                               |                                |
|                 | Electronic waste |                                                                        |                                |
| Environmental opportunities | Opportunities in clean technology |                               |                                |
| S and P Global ESG Scores | Biodiversity | Building materials                                                  | S&P Global Market Intelligence (2020) |
|                 | Climate strategy |                                                                        |                                |
|                 | Co-processing    |                                                                        |                                |
|                 | Electricity generation |                                      |                                |
|                 | Environmental policy and management systems |                      |                                |
|                 | Environmental reporting |                                      |                                |
|                 | Fuel efficiency  |                                                                        |                                |
|                 | Genetically modified organisms |                              |                                |
|                 | Low carbon strategy |                                          |                                |
|                 | Mineral waste management |                                        |                                |
|                 | Operational eco efficiency |                                      |                                |
|                 | Packaging        |                                                                        |                                |
|                 | Product Stewardship |                                         |                                |
|                 | Raw material sourcing |                                      |                                |
|                 | Recycling strategy |                                                                        |                                |
|                 | Resource conservation and resource efficiency |                      |                                |
|                 | Sustainable forestry practices |                                |                                |
|                 | Transmission and distribution |                                     |                                |
|                 | Water operations  |                                                                        |                                |
|                 | Water related risks |                                         |                                |
| Bloomberg       | Carbon emissions |                                                                        | Boffo and Patalano (2020)       |
|                 | Pollution        |                                                                        |                                |
|                 | Climate change effects |                                    |                                |
|                 | Waste disposal   |                                                                        |                                |
|                 | Renewable energy |                                                                        |                                |
|                 | Resource depletion |                                         |                                |

descriptive, prescriptive, and predictive analyses can be identified as the core of the methodology for score calculations. Weighted scores are based on the exposure to risk and criteria used by individual rating providers (MSCI, 2021). Finally, the output ESG score is given relative to peer industries. Assessing or scoring E pillar is an important approach for sustainable operation of a company, in order to identify environmental issues that are mainly driven by industries. E pillar evaluates a wide range of information on outputs such as waste and emission, climate change, and risk management. E scores from data providers often align with environmental emissions. This gives rise to the question that, to what extent ESG can be utilized as a tool to promote sustainable development and greening of the financial system. The scoring approach can be made more successful by addressing drawbacks involved so that investors have no doubt about the E score. E pillar scores and scoring methodologies need to be developed and improved further. They should consider a set of environmental risks that can directly align with financial objectives of firms. Moreover, having a consensus on scoring systems or a standard method employable across particular type of companies can be
considered as a timely need, although achieving it seems very challenging.

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**PUBLIC INTEREST STATEMENT**

With increased interest in United Nations Sustainable Development Goals (SDGs), sustainable finance approaches have grown rapidly. Recently market participants, including various institutional and private investors, are paying attention to Environmental (E), Social (S), and Governance (G) investing approaches with the ambition to make their investments more sustainable towards a low-carbon transition. The E pillar in ESG is important for capturing negative effects of business activities on the environment, including carbon emissions, waste generation, natural resource utilization and depletion. Hence, E scoring must be a tool for foreseeing and making business portfolios more resilient to water scarcity, hazardous waste generation and climate transition risks.

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