Chapter 4
ESG Risk in Financial Decisions of Financial Markets and Companies

Magdalena Ziolo and Anna Spoz

Abstract This chapter discusses the need for financial markets to integrate environmental, social, and corporate governance factors (ESG factors) into decision-making processes. The chapter focuses on the importance of integration of ESG factors and sustainable development with financial decisions. The chapter discusses why enterprises and financial markets should adopt a systemic and long-term vision and to understand the financial significance of ESG factors within the full spectrum of threats and opportunities and identify these issues as the research gap needs to be covered. The chapter is based on a literature review, comparative analysis, and case studies. ESG factors can be material and can increase long-term, sustainable value of companies and financial markets.

1 Introduction

Financial markets and enterprises make decisions under the conditions of risk. Risk strongly influences the decision-making process (Terje, 2015). Over the last 5 years, as indicated by the Global Risks Report, the impact of nonfinancial factors on the risk economy (ESG risk) has been growing. Such risks have an impact on decisions made by the financial and business sectors—as could be seen, for example, during the COVID-19 pandemic (Global risks, 2021). Due to its power of influence, ESG risk is more and more often considered in decisions made by financial markets and businesses. It is particularly important to include ESG risk in financial decisions as it relates to the activities of financial markets and enterprises. From the perspective

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M. Ziolo et al. (eds.), *Fostering Sustainable Business Models through Financial Markets*, Strategies for Sustainability, https://doi.org/10.1007/978-3-031-07398-4_4

of financial markets, the most exposed to such risks are banking, insurance, and capital ones. In the case of financial institutions, legal changes create costs related to the need to adapt businesses to new requirements and standards, including adapting products and services to the requirements of sustainable development, implementing the green office model, implementing an ESG risk management system and fulfilling the obligation to report and disclose information on nonfinancial factors. Failure to comply with the regulations results in legal/financial sanctions as well as a risk to reputation and loss of customers. Environmental risk directly affects the profitability of business. ESG risk affects the operational risk of financial institutions, since it affects the value of receivables (e.g., loans granted to companies from the dirty business sector may be potentially nonperforming loans due to the transformation costs that these companies must incur to adapt to ESG requirements; the costs of the so-called sustainable adaptation have an impact on the company's situation and its financial standing).

For banks, credit risk is increasing, as greenhouse gas emission reduction policies can generate costs for sectors and companies with high carbon emissions. Price volatility in carbon markets (CO_2, oil, gas, coal) and climate-related goods leads to uncertainty in the financial projections. Climate change and climate policy are affecting insurance companies through increasing risks for their customers (McDaniels et al., 2017). Climatologists predict changes in the intensity and occurrence of extreme weather events (storms, floods), as well as the resulting risk of growing property claims—insurers likely consider climate change to be a threat, not an opportunity (Ahmed et al., 2013). Losses due to extreme weather events in 2004 amounted to a record EUR 32 billion. Climate change also generates higher risk for investors and asset managers, primarily because the availability of comparable and consistent data on companies' emission levels, as well as tools for assessing the relevant risk, remains limited (WWF Allianz, 2005). ESG risk has particular relevance to financial markets and companies. ESG risk factors can influence a company's financial performance through direct operations risk, supply chain risk, and product risk. On the one hand, financial market participants more and more often account for environmental, social, and management (ESG) criteria in their investment decisions and risk assessment. Companies, financial markets, and regulators are asking new questions, looking for new threats and looking for new opportunities in the markets of the future. This chapter aims to answer the following questions: What ESG factors have been incorporated by financial markets and companies in decision-making processes? How is ESG risk being managed and monitored in financial markets and companies?

The remainder of this chapter is organized as follows. Section 2 briefly reviews the related literature in the scope of financial decisions. Section 3 describes ESG risk and its impact on enterprises and financial institutions, Section 4 presents issues related to the implementation and management of ESG risk in these entities, and Section 5 concludes the chapter.

2 Financial Decisions[1]: Theoretical Framework

Decisions are an integral part of the management process accompanying any business activity (Terje, 2015). Financial decisions are made as part of financial management and, depending on the stage of managing the company, they have a different character. Financing decisions are concerned with shaping the proportion between external and internal sources of financing, so they have an impact on the structure of capital (Financing decisions, 2017). Financial decisions are usually treated more broadly and affect not only the capital structure but also the financing structure; in this context, they concern decisions on choosing a tax strategy, inter-alia. A. M. Dinu drew attention to another type of decisions, namely, capital decisions, which he treated as decisions in the field of financial management, consisting of placing specific investments or allocating capital at a specific time and generating specific flows of flows (benefits) in the future (Dinu, 2013). In the literature on the subject, it is noted that the scope of financial decisions includes decisions concerning the following (Kapoor, 2014; quora.com):

- Level of leverage—financial, operational, and total leverage
- Funding pattern for long-term capital requirements
- Funding pattern for short-term capital requirements
- Fundraising by issuing financial instruments
- Obtaining funds from financial investments
- Defining the demand for financial capital from banking and financial institutions and the capital market
- Managing working capital and determining the demand for said capital
- Burdening the financial result with interest and related charges (shaping the level of EBIT and EBITDA)
- Determining the rational level of debt and its changes as well as the influence of debt on the risk of insolvency and bankruptcy
- Shaping the level of interest and depreciation to reduce the company's tax liability
- Analyzing various ways to improve the earnings per share ratio and increase the market value of shares
- Shaping the cost of capital at the level of a single source of financing and the weighted average cost of capital

Both in the short and long term, a derivative of the decision-making choices made is the accompanying level of risk. This applies in particular to decisions regarding the company's cost structure (operating leverage) as well as capital structure (financial leverage). Therefore, when making financial decisions, it is impossible to ignore the achievements of the theories:

[1] The problem was discussed in more detail as a part of the monograph B. Oliwa, A. Spoz, M. Ziolo, Financing SMEs by banking sector. Risks, financial sources, strategies, Wyd. KUL, Lublin 2017.

- Trade-off theory
- Pecking order theory
- Asymmetric information theory
- Agency theory/financial agency theory

The trade-off theory, also known as the static theory of capital structure, was developed in the 1950s based on the research of Franco Modigliani and Merton Miller (Dahlström & Persson, 2010). This theory is based on the assumption that the share of debt in financing is determined by the costs and benefits of debt in relation to the owned and desired capital level. In terms of benefits, attention is paid to the phenomenon of the tax shield and tax benefits; in terms of costs, the impact of debt servicing costs on the level of operating profit is indicated. Thus, in the theory of substitution, equity is replaced (substitution) with debt or debt with equity depending on the moment of reaching the optimal capital structure, at which the goodwill is maximized and the average cost of capital is minimized. In turn, the optimal capital structure is the result of the relationship between benefits (tax shield) and costs (costs of bankruptcy, agency costs) related to debt financing. Based on the assumptions of this theory, a conclusion can be drawn that profitable companies will benefit from debt financing due to the benefits they can achieve in connection with the involvement of debt in the capital structure. The pecking order theory (Myers & Majluf, 1984) is, in contrast with the theory of substitution, a dynamic theory based on the assumption that the structure of capital is shaped by considering factors such as the cost of obtaining external capital (transaction costs) and information asymmetry (managers have more knowledge about the company's situation than external entities).

The pecking order theory explains a situation in which there are changes not only in the capital structure but also in the amount of capital involved. According to this theory, internal sources of financing (retained earnings) are preferred in the capital structure; if this source turns out to be insufficient, bonds are issued and, ultimately, shares are issued (Jahanzeb et al., 2013). Such a hierarchy of obtaining for sources of financing results from the anticipated behavior of investors who may decide to abandon/withdraw from investments financed with new share capital. Therefore, initially, retained earnings are used to finance investments; in the next steps, external financing is used, and then external/own financing. Profitable companies should, therefore, be characterized by low debt ratios, and only when the scale of their investments reaches a larger/more significant dimension, the debt of profitable companies may be higher than those companies that make investments on a smaller scale (Dahlström & Persson, 2010; Jahanzeb et al., 2013). The material scope of enterprises' financial decisions can be analyzed from a narrow and/or broad approach. In a narrow approach, these decisions will focus on issues related to shaping the capital structure and financing structure and are directly related to these decisions, costs, financial benefits, and financial risk (Table 4.1). Financial decisions also concern the choice of the donor of capital and thus, the financial institution—the entity providing capital. This applies in particular to external financing, although one should not forget the role of financial institutions in the transfer of risk

Table 4.1 ESG risk in financial decisions

Financial markets	Scope of financial decisions: profitability, liquidity, credit policy, tax policy, OpEx, CapEx, cash flow, interest margins policy, interest rate policy, credit rating, credit scoring, sustainable rating, collateral policy, asset management policy, solvency policy, stress tests
Companies	Scope of financial decisions: profitability, liquidity, debt policy, tax policy, OpEx, CapEx, cash flow, inventory policy, asset management policy, solvency policy

Source: own elaboration

and their advisory function, i.e., knowledge transfer, which may affect the effectiveness of the company's financial strategy.

All decisions, including financial decisions, are made through a decision-making process, where one may also discuss decision models (models of decision-making processes). A decision-making process in SMEs has its own specificity, as it entails more strategic behaviors than is commonly recognized. This aspect has been indicated in particular by Reboud and Mazzarol (2008). In turn, İbicioğlu et al. (2010) pointed out that the analysis of small and medium-sized enterprises (SMEs) management is dominated by qualitative aspects, with significant roles for creativity and intuition in the evaluation process. H. Simon and P. Drucker also emphasized the role of intuition in decision-making processes, stressing that it is an important element in the process of making effective, strategic decisions and that good decisions require a nonstandard approach. Other studies, including Kraus et al. (2007) and Kono and Barnes (2010), raised the question of the importance of communication skills, teamwork, and financial knowledge in the decision-making process. Decision-making determinants are also indicated by the theory of credit discrimination against SMEs by J.K. Galbraith, who argued that SMEs' difficulties in accessing credit are compounded by the following:

- Market structure (number and type of enterprises)
- The course of the business cycle
- Money supply

An extensive study on factors influencing risk perception in SME decision-making was carried out by Y.A. Al-Rashidi (2011) and distinguished the following groups:

- Cultural factors
- Motivational factors (internal and external motives)
- Economic factors
- Management style
- Risk perception and attitude
- Demographic factors
- Decision-making perspective
- Type of elections (collective, individual)

There are relationships between the financial performance or, more broadly, the financial situation of enterprises and ESG factors. Orlitzky et al. (2003)

demonstrated the existence of a positive correlation between social and environmental factors and the financial situation (Scholten, 2006, pp. 19–33). A study conducted by Velte (2017) on a group of 80 companies also confirmed the existence of such relationships, in particular the impact of ESG factors on ROA (Velte, 2017, pp. 169–178). Friede et al. (2015) analyzed the results of research presented in over 2,000 scientific articles and confirmed the dominant, positive influence of ESG factors on the financial situation (Friede et al., 2015, pp. 210–233). The impact of ESG on financial markets is also well recognized (Kiesel & Lucke, 2019, pp. 263–290). EBA (European Banking Authorities) discusses actions to reduce the impact of ESG-related risks on financial markets (Table 4.2.).

ESG risk impacts banking risk, particularly through the impact of environmental risk on credit risk. This is because environmental risk has an impact on the financial situation of market entities (especially enterprises) that operate in the so-called environmentally sensitive region. These entities are obliged to comply with environmental protection regulations and to adjust their activities in such a way as to meet environmental requirements. The cooperation of banks with entities violating environmental standards simultaneously creates the risk of losing reputation. Loss of the ability to generate revenues is also determined by health risk, included in the social risk category, which strongly affects the economy and creditworthiness of business

Table 4.2 Qualitative disclosures of ESG related risks—financial market perspective

Governance	The responsibilities of the management body in setting, overseeing, and monitoring the risk framework, objectives, strategies, and policies in the context of ESG risks The incorporation of nonfinancial risks in the organizational arrangements including role of risk committees, business lines and internal control functions Governance arrangements in terms of setting targets, escalation procedures and reporting Alignment of the remuneration policy with nonfinancial risks
Business model and strategy	Adjustment of the institution's business strategy to integrate ESG risks and factors Objectives, targets, and limits for the assessment of environmental risk in short term, medium term, and long term and performance assessment against these objectives and limits Policies and procedures relating to direct and indirect engagement with customers on their ESG risk strategies
Risk management	Current standards that institutions use for ESG risk management Processes to identify activities and exposures sensitive to environmental, social, and governance risks taking into account relevant channels and considerations specific to each risk categories Processes to identify and monitor exposures and activities that are subject to material ESG risks

Source: own elaboration based on: EBA Consultation Paper, Draft Implementing Standards on prudential disclosures on ESG risks in accordance with Article 449a CRR, EBA/CP/2021/06 No to be given by Communications, 01 March 2021 https://www.eba.europa.eu/implementing-technical-standards-its-prudential-disclosures-esg-risks-accordance-article-449a-crr (access 27.09.2021)

entities. This situation is noticed in the era of a pandemic, when actions taken by governments radically influenced basic macroeconomic parameters and the financial situation of monetary and nonmonetary institutions. The effects of COVID-19 include limited access to employees or disruptions to supply chains, a decrease in demand, and limited consumption and participation in organized events (Raport Odpowiedzialny Biznes w Polsce. Dobre praktyki, 2020). A decline in demand and a reduction in consumption, or a complete lack thereof due to the suspension of work of selected sectors of the economy, consequentially leads to the inability to generate revenues from core activities with the necessity to incur fixed costs, which has an impact on the deteriorating financial situation of local government units, enterprises, and households and, thus, has an impact on the ability of these entities to incur and service liabilities. Governments are attempting to take measures to reduce the effects of COVID-19 on the economy (including the Anti-Crisis Shield), but the scale of the pandemic's impact is so wide that government aid is dedicated to selected groups of entities. The role of banks as financial intermediaries means that the challenges posed by ESG factors for the financial system require them to take adjustment measures. The scope of these activities includes the development and implementation of ESG risk management systems; methodologies; the adjustment of the product and service offer so as to ensure support and promotion of good practices in the field of sustainable development; and, finally, the implementation of a business model based on creating sustainable value (Gerstlberger, 2014, p. 7). ESG risk management by including the risk of nonfinancial factors in the decision-making process of financial institutions requires the development and implementation of an ESG management strategy determined by the adopted model of ESG factor integration. The development of such a strategy is preceded by an analysis during which the financial institution determines the level of expectations and integration of ESG factors in the decision-making process and the type of ESG risk to which the financial institution is exposed. These activities are carried out in five steps (Gerstlberger, 2014, p. 22):

- Determining the level of expectations regarding the degree of integration of ESG factors
- Identification of risk exposure
- Determining the level of ESG risk acceptable to the institution
- Risk response
- Development of the ESG policy framework and implementation of the ESG strategy

Depending on the results of the analyses carried out in phases 1 and 2, financial institutions distinguish processes based on which they manage ESG factors and identify sectors they cooperate with that are exposed to ESG risk. For each of the financial institutions, Phase 1 will have a different dimension, depending on the specifics of its operations and customer segment. The banking sector (mainly banks) will focus on the qualitative analysis in terms of credit and political risk, and the capital market (e.g., funds and brokerage houses) will focus on the qualitative analysis in terms of investment risk, portfolio risk, and political risk. Similarly, Phase

2 in financial forecasting and modeling for banking sector institutions and capital market institutions will be based on other assumptions, including anticipated changes in regulations, macro- and microeconomic factors, and nonfinancial factors. As a result of these activities, decision-making processes are designed, and the importance of each factor (environmental, social, and managerial) for the institution is determined.

3 ESG Risk and Its Impact on the Performance of Enterprises and Financial Market Institutions

With the growing awareness and sensitivity to ESG issues among the general public, consumers, business partners, and investors, these issues increasingly affect economic operators, the ways they run their business activity, and their market environment. The Global Risk Reports 2010–2021 show the growing significance of environmental and societal risks in terms of both likelihood and impact. These risks are now ahead of economic, geopolitical, or technological risks. In 2021, among the five top-impact risks were infectious diseases, climate action failure, weapons of mass destruction, biodiversity loss, and natural resource crises. The risks with the highest likelihood, in turn, were extreme weather, climate action failure, human environmental damage, infectious diseases, and biodiversity loss.

The implementation of ESG factors in the operating strategies of enterprises and financial market institutions now becomes an inseparable element of building their long-term competitive advantage (Do sustainable banks outperform? Driving value creation through ESG practices, 2019; Cramer et al., 2018). The inclusion of environmental, social and governance factors in an entity's business model is a challenge for managers, especially in terms of the integration of ESG risk factors in the risk management model and model risk management.

Effective ESG risk management requires the entity to identify ESG risks to which it is exposed, taking into account the specificity of its activity, the adopted business model, and the implemented strategy. Although ESG factors are not a new concept, there is no single universal definition of ESG factors, nor is there a single definition of ESG risks or their types. According to the EBA Report on management and supervision of ESG risks for credit institutions and investment firms (2021), financial institutions use definitions contained in various international rules, and some follow their in-house definitions. EBA defines ESG factors as "The risks of any negative financial impact on the institution stemming from the current or prospective impacts of environmental factors on its counterparties or invested assets," while ESG risks are understood as "risks of any negative financial impact on the institution stemming from the current or prospective impacts of ESG factors on its counterparties or invested assets." ESG risks can be classified

by various criteria, such as asset classes, counterparties, sectors, products, or territories.

The ESG risks comprise environmental, social and governance risks. Each of these risk types entails the occurrence of specific risk drivers, has its transmission channels, and impacts on the organization.

Environmental risks are risks that have the greatest impact on enterprises and financial institutions. Most often they are understood as risks associated with a negative impact on the environment and overexploitation of natural resources (Hancock, 2001) and described as a combination of the likelihood of an environmental incident and its effects. A characterization of the environmental risk should include dynamics of this risk, as they show the tendencies for risk changes over time.

The environmental risks include:

- Physical risks—related to the impact of climate change and extreme weather events leading, among others, to damage to infrastructure, destruction of crops, and disruptions in the supply chain. The drivers of this type of risk are extreme weather phenomena (cyclones, typhoons), air pollution, soil degradation, rising sea levels, and water shortage. Physical risk can materialize as acute (i.e., irregular, individualized, due to weather-related events (weather disasters)) or as chronic (resulting from progressive climate change).
- Transition risks—resulting from the need to adapt the economy to climate change, in particular, to use low-emission, sustainable solutions. This risk may materialize, among others, through the need to adapt to new policies and technological changes, but also as a market risk resulting from the disruption of the current structure of demand and supply of electricity, natural resources, products, and services.

An example of the impact of environmental factors on enterprises and financial institutions is presented in Fig. 4.1.

The result of the materialization of environmental risk may be a reduction in the scope of an enterprise's business and a drop in its financial results, which causes the company's profitability to decline, and so does its creditworthiness. The credit risk of a lending financial institution increases. For financial market institutions and enterprises acting as investors, this creates a market risk, that is, a risk related to the volatility of the price of a share.

The exposure to environmental risk can translate into financial risk (Fig. 4.2)

The impact of environmental risks (physical and transition risks) on the financial risks of financial institutions (acting as lending institutions and investors) and enterprises (acting as investors) can be considered from a macro- and microeconomic point of view. From a macroeconomic perspective, the environmental risks can affect the size and structure of investments, productivity, prices of natural resources and goods and services, labor market, and the volume of demand and supply in the market. The intensity and frequency of extreme weather events as well as the value of the resulting damage have triggered an increase in the demand for insurance against adverse weather conditions, such as floods, hurricanes, and droughts. From

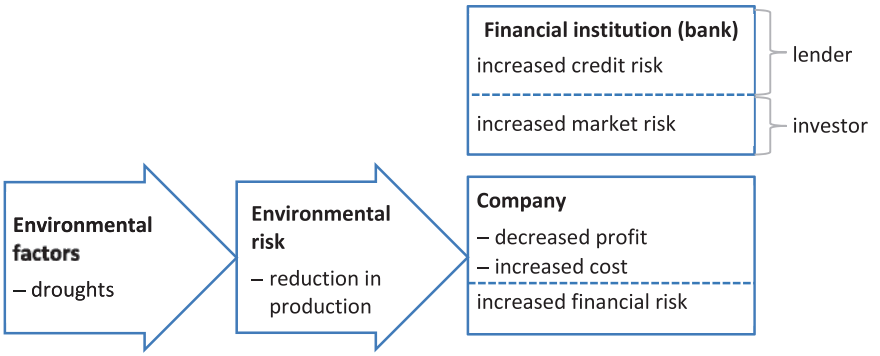

Fig. 4.1 Impact of environmental risk on the enterprises and financial market institutions. (Source: Adapted from EBA Report on management and supervision of ESG risks for credit institutions and investment firms, EBA, 2021, https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf)

a microeconomic perspective, the effects of extreme weather events (acute risk) can lead to business disruptions and material damage, thus harming enterprises' creditworthiness and the size of their surplus cash. Chronic effects associated with climate change may hinder business in specific areas (growing costs) or affect the productivity of labor and capital. Such changes will necessitate adaptation efforts to be taken by businesses, households, and governments.

Social factors are usually understood as issues related to the rights, well-being, and interests of individuals and communities and include factors such as (in)equality, health, work, workplace safety, and human right. The European Pillar of Social Rights defines social factors by means of 20 principles relating to, among others, equal opportunities and access to the labor market (including gender equality), social protection and social inclusion (including childcare and support to children, unemployment benefits, access to essential services and a minimum income), and decent and just working conditions (including pay and work).

In March 2021, the European Commission published the European Pillar of Social Rights Action Plan, which presents a list of actions that implement the adopted principles. Despite these efforts, social factors are still defined differently by various entities. Asset managers, investors, and rating agencies most often refer them to social criteria, such as violation of human rights, employee relations, customer interactions, etc. The analysis of these criteria aims to answer the question of how an analyzed company manages its relations with employees and external entities (customers, counterparties, local communities) (EBA Report on management and supervision of ESG risks for credit institutions and investment firms, 2021).

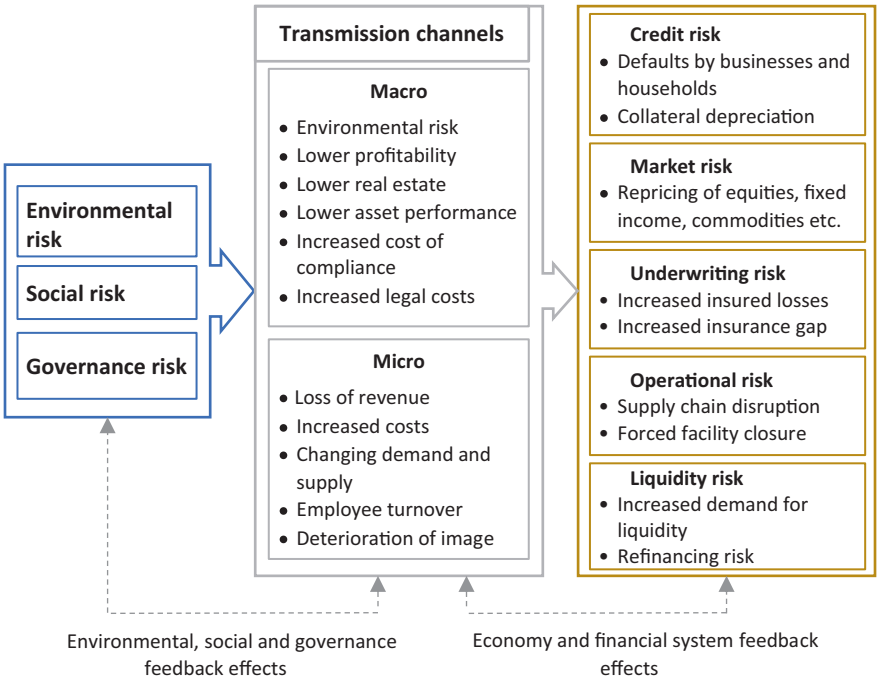

Fig. 4.2 Impact of ESG risk on the financial risk of enterprises and financial institutions. (Source: Adapted from "Overview of Environmental Risk Analysis by Financial Institutions, Network for Greening the Financial System," September 2020, p. 7)

An example of the impact of social factors on enterprises and financial market institutions is presented in Fig. 4.3.

Breach of employee rights (materialization of social risk) may result in employees leaving their job, difficulties in recruiting qualified employees, and loss of reputation. These problems cause the company's profitability to decline, and so does its creditworthiness and increasing credit risk of lending financial institution. An entity's loss of reputation may generate a market risk for investors.

Governance risks are risks related to the management of an enterprise, covering such issues as the independence of the management board, shareholders' rights, anti-corruption procedures, policies for the transparency of transactions, and regulatory compliance. There is no one-size-fits-all framework for governance factors. Most often they are governed by national legislation and are published in the form of good practices. At the EU level, in February 2021, a public consultation process was closed on "Sustainable corporate governance," which sets out to improve the EU regulatory framework for company law and corporate governance.

An example of the impact of governance risk on enterprises and financial market institutions is presented in Fig. 4.4.

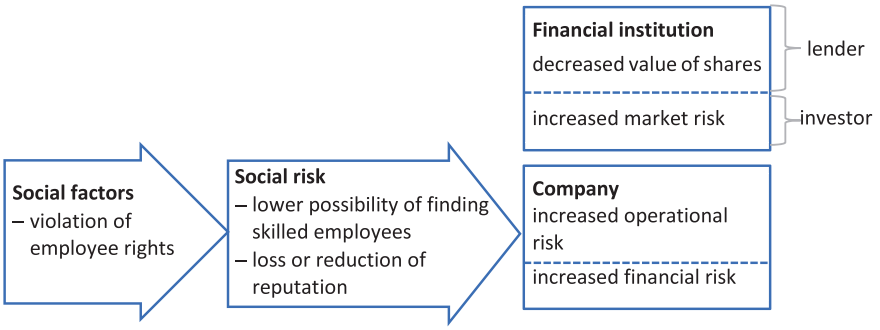

Fig. 4.3 Impact of social factors on enterprises and financial institutions. (Source: Adapted from EBA Report on management and supervision of ESG risks for credit institutions and investment firms, EBA, 2021, https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf)

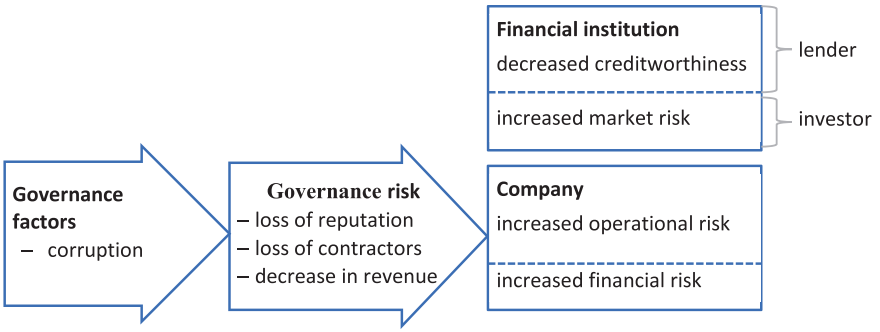

Fig. 4.4 Impact of governance risk on enterprises and financial market institutions. (Source: Adapted from EBA Report on management and supervision of ESG risks for credit institutions and investment firms, EBA, 2021, https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf)

In addition to identifying individual types of risks and determining their potential impact, an entity should also analyze the interdependencies between risks.

Regulations play an important role in protection against ESG risk. Some of them are mandatory and others voluntary. Frameworks addressing ESG factors are presented in Table. 4.3.

Regulations play an important role in hedging against ESG risk. The scope of including ESG factors in individual regulations and their impact on sustainable finance varies (Table 4.4).

The activities of the EBA are extremely important in the ESG risk management process for financial institutions. Their aim is to improve the current regulatory framework for financial market institutions (and thus contribute to the achievement of the SDGs and ESG risk management) and to introduce the concept of sustainable

Table 4.3 Frameworks concerning ESG factors currently used by financial market institutions

Frameworks addressing ESG factors	The United Nations Sustainable Development Goals (SDGs) The Principles for Responsible Investment (PRI) The United Nations Environment Programme Finance Initiative (UNEP FI) Principles for Responsible Banking The Global Sustainability Standards Board Global Reporting Initiative (GRI) The Equator Principles The World Economic Forum (WEF) report on Measuring Stakeholder Capitalism The International Integrated Reporting Council (IIRC) Integrated Reporting Framework The International Finance Corporation Environmental and Social Performance Standards (IFC Performance Standards) The OECD Due Diligence Guidance for Responsible Business Conduct The Committee of Sponsoring Organizations of the Treadway Commission (COSO) and the World Business Council for Sustainable Development (WBCSD) Guidance for Applying Enterprise Risk Management to ESG-related risks The Sustainability Accounting Standards Board (SASB) Standards
Frameworks specifically addressing environmental factors	The Natural Capital Protocol + Supplement (Finance) The recommendations of the Financial Stability Board Taskforce on Climate-related Financial Disclosures (TCFD) The Climate Bond Initiative Climate Bonds Standard The International Capital Market Association Green Bond Principles The Partnership for Carbon Accounting Financials Global GHG Accounting and Reporting Standard for the Financial Industry The Climate Disclosure Project (CDP), UN Global Compact (UNGC), World Resources Institute (WRI), and World Wildlife Fund (WWF) Science-Based Targets initiative (SBTi)
Frameworks specifically addressing social factors	The UN Guiding Principles on Business and Human Rights The UN Guiding Principles on Business and Human Rights The UN Guiding Principles on Business and Human Rights
Frameworks specifically addressing governance factors	COM (2012) Action Plan: European company law and corporate governance—a modern legal framework for more engaged shareholders and sustainable enterprises, Global Governance Principles—CalPERS, OECD Principles of Corporate Governance or ICGN Global Governance Principles

Source: Adapted from EBA report on management and supervision of ESG risks for credit institutions and investment firms eba/rep/2021/18, https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015656/EBA%20Report%20on%20ESG%20risks%20management%20and%20supervision.pdf (access 27.09.2021)

Table 4.4 Relationship between sustainable finance regulations and ESG factors

Regulation/criterion	Regulation (eu) 2019/2089 of the European Parliament and of the council of 27 November 2019	Regulation (eu) 2019/2088 of the European Parliament and of the council of 27 November 2019	Regulation (eu) 2016/1011 of the European Parliament and of the council of 8 June 2016	Directive (eu) 2017/828 of the European Parliament and of the council of 17 May 2017	Directive 2014/95/eu of the European Parliament and of the council of 22 October 2014	Revised Capital Requirements Regulation (CRR 2) and Capital Requirements Directive (CRD 5	Mifid II (Markets in Financial Instruments Directive) directive 2014/65/eu of the European Parliament and of the council of 15 May 2014
Dedicated[a] risk	E	E,S,G,	G	G	G	E	G
Comprehensive regulation in the context of ESG	Partial	Full	Partial	Partial	Partial	Partial	Partial
Coherence of implementation in individual institutions	Yes	Yes	Yes	Yes	Yes	Yes	difficult to achieve (differences in competence verification)
Impact on sustainable finances	Strong	Strong	Moderate	Strong	Moderate	Strong	Moderate

Source: Zioło M., (2020), Finanse zrównoważone, PWE, p. 124

[a]*E* environmental, *S* social, *G* governance

development into the institution's strategy and risk management, as well as to provide supervisors the appropriate tools to understand, monitor, and assess ESG risk in their supervisory practices (EBA action plan on sustainable finance, 2019). Overview of EBA mandates on sustainable finance is presented in Fig. 4.5.

The existence of many standards and guidelines for ESG reporting on the market significantly hindered the comparability of information published by financial institutions, thus reducing their credibility and usefulness (looking into the crystal ball of what the future holds for ESG reporting). The efforts of supervisors to develop uniform standards (e.g. Sustainable Finance Disclosures Regulation) that ESG-related risks, in particular the risk related to climate change, should be

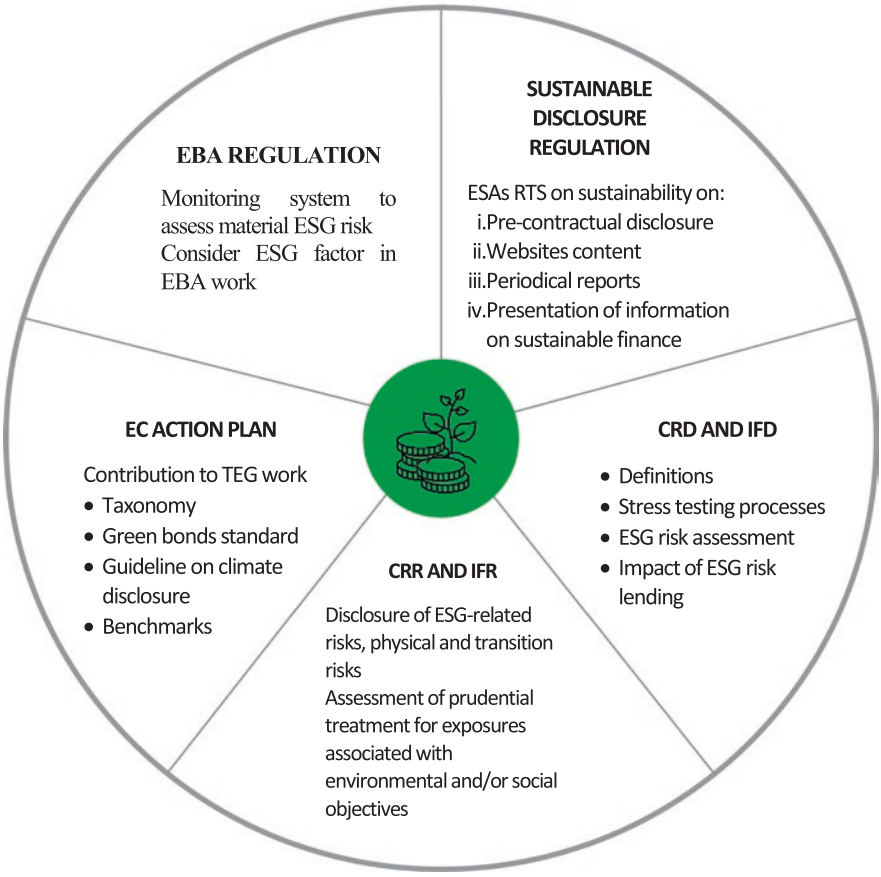

Fig. 4.5 EBA mandates on sustainable finance. (Source: 1. EBA action plan on sustainable finance (2019) European Banking Authority, December 2019, https://www.eba.europa.eu/sites/default/documents/files/document_library/EBA%20Action%20plan%20on%20sustainable%20finance.pdf. Accessed 27 Sep 2021)

comprehensively included in the risk management strategies and policies applied by institutions and should be treated equally to other risks.

4 ESG Risk in Financial Decisions Made by Financial Market Institutions

ESG risk management means the inclusion of ESG risk in the decision-making processes of organizations and requires the development and then implementation of an ESG management strategy (COSO, 2018). The basis for the development of such a strategy is to define the level of institution's expectations of the degree of integration of ESG factors, identification of risk exposure, determination of the risk level acceptable to institutions, and reaction to ESG risk (WWF, 2014; Zioło, 2016).

A financial market institution first identifies its goals regarding the inclusion of ESG factors in the decision-making process. Then, the exposure to ESG risk needs to be identified and assessed. Knowledge about the type of risk and the scale of exposure is the basis for making decisions in the field of product offer, rating, or contractual provisions in the form of contractual clauses and the choice of legal security for repayment. Tools for measuring this type of risk may include, for example, aggregated measures, indices, scoring, and ratings. The level of ESG risk acceptable to institutions on the financial market is determined by many factors, which include, among others, applicable legal regulations, the bank's current level of ESG risk, the desired (target) level of ESG risk integration, adaptation of the institution's mission and strategy to ESG risk requirements, the bank's reputation, its market position, and competitive advantage, as well as opinions and relations with stakeholders.

There are five levels of integration and foundations of institutions in the financial market with regard to the inclusion of ESG risk in the decision-making process (Fig. 4.6).

Financial market institutions react differently to ESG risks. Their reaction depends on many factors, and to the large extent, it depends on the type of financial institution (investment funds react differently from banks). One of the ways to minimize the ESG risks is adjustment of the product offer. Another is utilization of ESG ratings to make investment decisions, which is in line with the concept of socially responsible investment. Ratings created by rating agencies reduce the asymmetry of information and thus the risk associated with financial transactions.

Over the last decade, the correlation between a company's performance in terms of ESG factors and its investment value has become more and more visible. Research by Deloitte shows that 65% of investors in the capital market declare that they regularly use ESG ratings (at least once a week). Sustainable credit rating agencies evaluate enterprises' performance in terms of their impact on sustainability. Some agencies base their ratings solely on nonfinancial information, while others

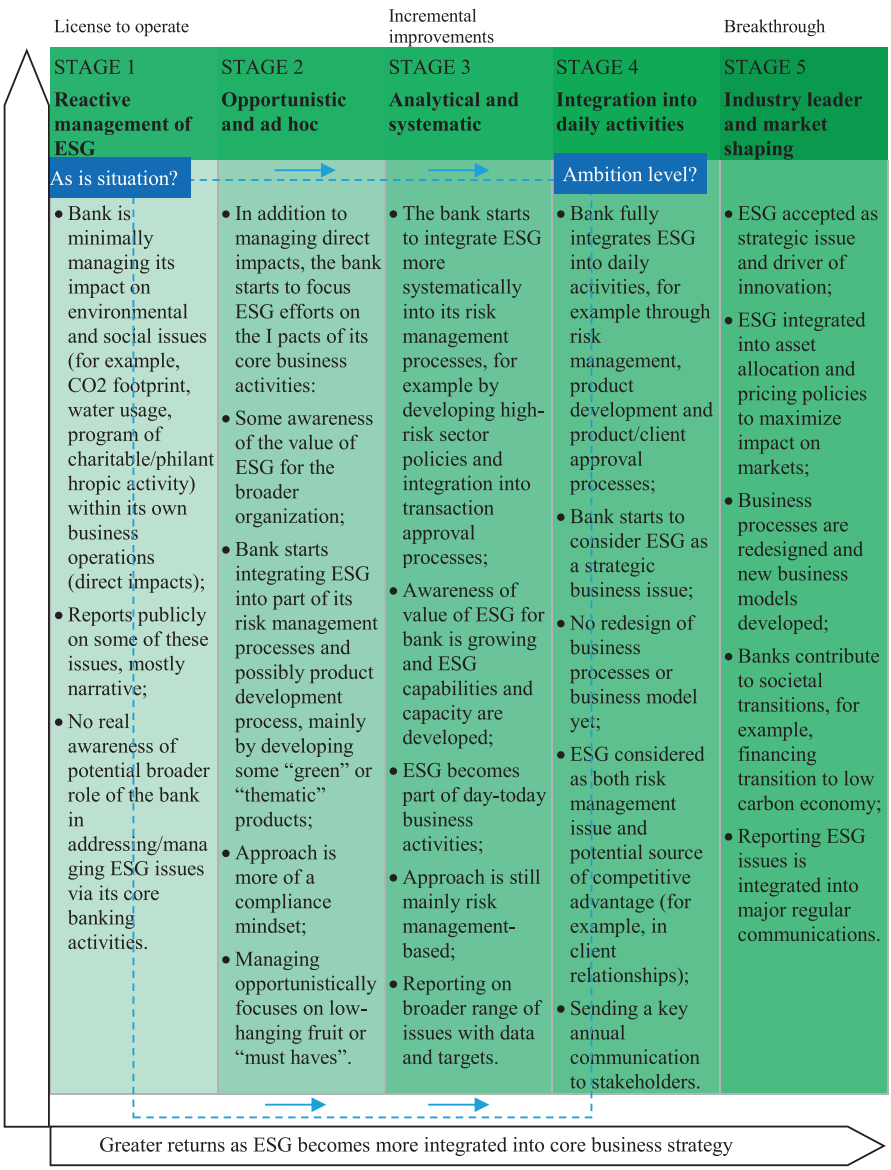

Fig. 4.6 ESG maturity grid model. (Source: WWF (2014) Environmental, Social and governance integration for banks: A guide to starting implementation. https://wwfint.awsassets.panda.org/downloads/wwf_environmental_social_governance_banks_guide_report.pdf. Accessed 27 Sep 2021)

combine financial and nonfinancial data. A big problem is the lack of consistency in the scope of the analysis and the quality of the data used to provide it (Pichola et al., 2021; Boiral et al., 2020). This is because not all entities report nonfinancial information, and if they do, the differences between their reporting make comparison of the results obtained very difficult.

The importance of ESG ratings causes that the activities of rating agencies are monitored by the European Commission. The legislative package on credit rating agencies, consisting of Regulation No 462/2013 and Directive 2013/14 / EU, aims to improve the quality of the rating process and make credit rating agencies more accountable for their activities, as well as reduce over-reliance on credit ratings and prevent conflicts of interest. This package is intended to attract more actors to operate in the field of credit ratings and increase transparency on sovereign debt ratings (regulating credit rating agencies).

The use of a credit rating agency can increase the credibility of the activities in the area of the ESG strategy. Companies can use their ESG risk assessment to obtain external capital and implement projects in line with the concept of sustainable development and for internal and external image-building activities.

The financial market institution can use one of the responsible investment strategies, i.e., best in class, engagement and voting, ESG integration, exclusion, impact investing, norms-based screening, and sustainability-themed investment.

5 Implementation and Management of ESG Risk in Enterprises and Financial Market Institutions

To ensure the effectiveness of the ESG risk management system in companies and financial market institutions, it must be comprehensive, transparent, and consistent with the risk management model in a given entity. The individual stages of developing an ESG risk management system should include definition and scoping of ESG risk management objectives, definition of standards to be adopted in this regard, design of ESG risk identification, valuation and management procedures, development of policies and procedures for employees (at individual levels) to understand the impact of ESG risks on operations of an entity, and development of procedures to be followed in the event of ESG risk (Lorenzo & Netto, 2014).

The main phases of ESG risk management include risk analysis and risk control, as shown in Fig. 4.7 (Smith, 2013).

Risk analysis is one of the main tools in ESG risk management in economic operators. It is primarily aimed at providing reliable information about the impact of ESG risks on an entity's business, determining the likelihood of specific ESG risks, determining the losses for the entity that may occur in the event of ESG risk materialization, and proposing appropriate actions to mitigate the likelihood of risk occurrence or the size of the losses suffered when it occurs.

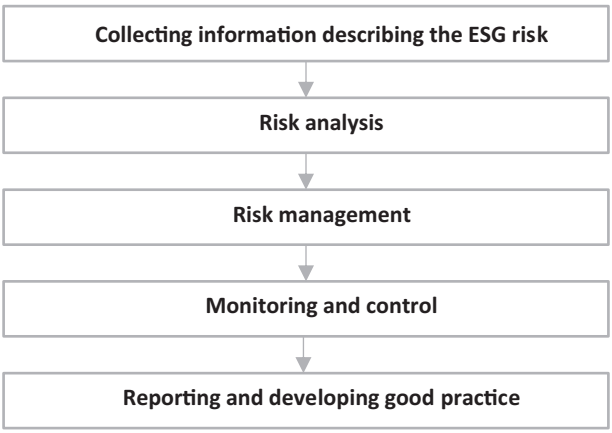

Fig. 4.7 ESG risk management phases in enterprises and financial institutions. (Source: Adapted from Smith K., *Environmental Hazards: Assessing Risk and Reducing Disaster*, London, Routledge, 2013)

The first stage of ESG risk analysis consists in making a detailed inventory of resources and drivers related to the occurrence of a specific risk, together with the assessment of the severity of an ESG-related resource for the business of an economic operator. Then, potential risks to each of the previously identified resources are determined. Special checklists can be used for this purpose. The next step of ESG risk analysis is to determine whether the identified potential risk may negatively affect the entity's business, and if yes, how. The last step of the analysis is to identify the ESG risk itself, which can be expressed either in qualitative (low/medium/high environmental risk) or quantitative terms (specific numerical values, e.g., quantifying financial losses) (Măzăreanu, 2007).

Effective ESG risk management requires a holistic approach to the process of integrating ESG risk into an entity's risk management system. A proper structure and operation of an entity's risk management system are fundamental. The scope of the necessary adjustments will depend on whether the ESG risk will apply to all or only to specific departments. Depending on the scope of ESG risk management, the roles and responsibilities within the existing entities should be defined.

The impact of ESG risk on an entity's business should be analyzed from the financial perspective, that is, from the point of view of its impact on the profits and costs generated, and adequately integrated into the system of forecasting financial results and building customer offers. From this perspective, the focus should be put on financial and reputational risks.

ESG risk management must be built into existing processes in an enterprise. The ESG risk management system also includes the Risk Control, Compliance, and Business Continuity Management (BCM) functions. The responsibility of the Risk Control Department is to develop methods, processes, and tools to deal with ESG risks and to report the results as appropriate. The Compliance Department will in turn verify whether the designed ESG risk management system meets the legal

requirements imposed on entities in this area. One should note at this point that the number of ESG regulations grows every year. Since 2018, 170 regulations have been passed in this respect, two-thirds of which were in Europe. Effective from 10 March 2021, the Sustainable Finance Disclosure Regulation imposes new obligations on financial institutions, including banks, in terms of transparency and disclosure of the approach to managing sustainable development risks as part of their investment activities and investment decisions made by an entity. According to the regulation, disclosures should include at least information about policies on the integration of sustainability risks in the investment decision-making process, disclosures on adverse sustainability impacts from investment decisions made, and information on remuneration policies in relation to the integration of sustainability risks.

The ESG risk management system is covered by the internal audit process, the objective of which is to verify that all relevant processes put in place follow the established procedures and that the adopted procedures are optimal (Fig. 4.8).

The ESG risk strategy adopted by an entity must be closely linked to its business strategy and must be continuously updated. The ESG risk management strategy should also be operationalized or detailed as regards specific actions taken within specified time limits. ESG risk planning horizons are usually much longer than 3–5 years (or the periods traditionally covered in business strategies). This applies in particular to the environmental aspects of ESG risk.

When planning an ESG risk management system, it is very important to both design it for each of the risks individually and take into account their cross-impacts. A similar approach should be used for risk identification.

The measurement and assessment of ESG risk are key processes. Noteworthy, ESG risks materialize in other types of risk and/or in other entities. For example, extreme weather conditions can manifest as financial risk in an enterprise and credit risk in a lending financial institution. Interconnectedness between market players may lead to the transmission or transfer of ESG risk to another entity. The main challenges in measuring ESG risk include:

- Acquisition and analysis of new data sources – the data on ESG risks must be collected, aggregated, and prepared for the development and use of ESG risk models.
- Integration – which covers the collection of data sets which have never been integrated before; harmonization of taxonomy, classification, and measurement used; non-harmonization of reporting frameworks in different jurisdictions; and non-adaptation of existing systems to the storage of ESG data.
- Standardization – no standardization in ESG risk measurement methodologies and no possibility to verify ratings provided by external entities.
- Data management – lack of experience in ESG reporting and maintaining transparency in the process of collecting and processing ESG data.

Forecasting the impact and assessing ESG risk require a wide range of expertise and are therefore an expensive process. From the point of view of financial market institutions, a key step in the ESG risk measurement and assessment process is the assessment of the current ESG exposure. This includes the integration of ESG risks

Risk strategy and appetite
- Consider ESG-related risks while establishing business objectives at various levels that align and support the strategies of the company

Risk governance
- Enhance terms of reference of current risks board committees to oversee ESG issues.
- Define roles and responsibilities on ESG issues for each function across the company.

Risk assessment and measurement
- Review material issues identified in the ESG report and review their accuracy. Consider how their related risks can be incorporated into current ERM process.
- Identify material ESG risks as part of the risk management from (i) current ERM processes, such as surveys, interviews, and workshops by expanding the scopes; and (ii) various analysis, such as megatrend analysis and materiality analysis to gauge feedbacks from stakeholders on material ESG topics.
- Tailor risk assessment criteria, in terms of impact and likelihood to assess and prioritise ESG risks.
- Obtain advice / insights from experts on ESG topics and potential risk responses, such as physical risks and transition risks of climate change.

Risk management and monitoring
- Set specific Key Performance Indicators (KPI) or directional / forward looking statements on ESG targets, including environmental- and social-related risks.

Risk reporting and insights
- Leverage existing ERM reporting mechanisms to set the frequency and form of reporting on ESG performance to the board / board committees.
- Enhance disclosure of ESG risks and discussion on how ESG issues are related to the business in the Directors' Report on ESG issues for each function across the company.

Risk culture
- Enhance an ESG risk awareness culture by embedding ESG elements into the mission, objectives and core values of the company

Data and technology
- Review current KPI tools for ERM to further enable ESG KPI reporting in terms of data availability and reliability.
- Enable automation to store, manage and report real-time risk data on KPIs, including ESG.

Fig. 4.8 Risk management system that considers ESG. (Source: *Environmental, Social and Governance An integration to long-term strategy via risk management,* KPMG, 2020, https://assets.kpmg/content/dam/kpmg/cn/pdf/en/2020/04/esg-an-integration-to-long-term-strategy-via-risk-management.pdf)

in the assessment of capital adequacy and calculation of an entity's regulatory and economic capital.

There are many methods for assessing ESG risk. For some types of risk, the solution may be to adjust the parameters of existing risk models (credit risk) or design new models. The assessment can be qualitative or quantitative. Quantification of sustainability risks in an accurate, rigorous, and credible way is difficult and in some cases even impossible (Boiral et al., 2020). For ESG, scenario analysis is the preferred method. It is worth remembering that the key element in the risk assessment process in an organization is the consistency of the adopted approach (ESG risks in banks. Effective strategies to use opportunities and mitigate risk, 2021).

The discussed issues are confirmed in practice, for example, the KPMG research from 2017, conducted on 36 banks. The presented report shows that over 88% of the banks planned to introduce regulations in the field of ESG risk management. Almost half of the surveyed banks considered risk assessment and measurement to be the most important and most difficult issue related to nonfinancial risk, and compliance risk was considered the most important type of nonfinancial risk (Navigating through uncertainty, 2017). A similar survey in 2020 was conducted by BCG and the International Association of Credit Portfolio Managers (IACPM) on 45 financial institutions. Financial institutions see nonfinancial risk as an economic issue and a regulatory imperative. However, these institutions draw attention to the complexity and difficulty of the process of integrating nonfinancial risk into the entity's existing risk management systems. The most important limitation is the lack or nonuniformity of legal regulations and taxonomies in force. Another but significant limitation is the lack or insufficient quantity or quality of ESG data. The lack of uniform regulations in the field of ESG makes it difficult to compare the data even if it can be obtained (Boiral et al., 2020; Alekseeva et al., 2021).

6 Conclusions

The growing impact of ESG risk on the operation of market entities (financial and nonfinancial) makes the system of its identification, measurement, and assessment, and then its effective management, a key challenge both in a micro- and macroeconomic context. From a macroeconomic perspective, the growing number of regulations is aimed at limiting the impact of this risk on the stability of the economy, especially in the financial sector. In terms of microeconomics, it has an impact on the operating conditions of economic entities and their financial performance.

The impact of ESG risks on the business of economic operators causes this risk to be more and more often integrated into the risk management system of organization. The measurement and assessment of ESG risk are among the biggest challenges in this area. The lack of uniformity and mutual compatibility of the introduced legal regulations, ranging from the definition of ESG factors to the ESG reporting rules, undoubtedly also hinders this process.

Financial institutions and enterprises, aware of the growing importance and impact of nonfinancial risk on their activities, undertake actions aimed at mitigating or preventing the materialization of ESG risks. Such activities may be undertaken at the individual or supply chain level.

From the perspective of an entity, a tool for reducing ESG risk is reviewing the applicable regulations, guidelines, and good practices in the field of ESG in terms of their validity in relation to the applicable law and their adequacy to the organization. Enterprises and financial institutions should include in their organizational structure and risk management system units responsible for ESG issues and disclosures made in this area. The scope and quality of ESG reporting—both mandatory and voluntary—affect the security and transparency of economic transactions, especially those of an investment nature. Therefore, entities should endeavor to ensure that ESG reporting is accurate, clear, and timely. A great facilitation for businesses is to develop and adopt appropriate good practices in area of ESG reporting and control their application on a regular basis (Lokuwaduge & Heenetigala, 2017).

ESG risk management should be addressed in a holistic way, i.e., throughout the entire supply chain. Entities can mitigate risks determining the standards and practices they expect from suppliers and then regularly monitoring compliance with these policies.

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