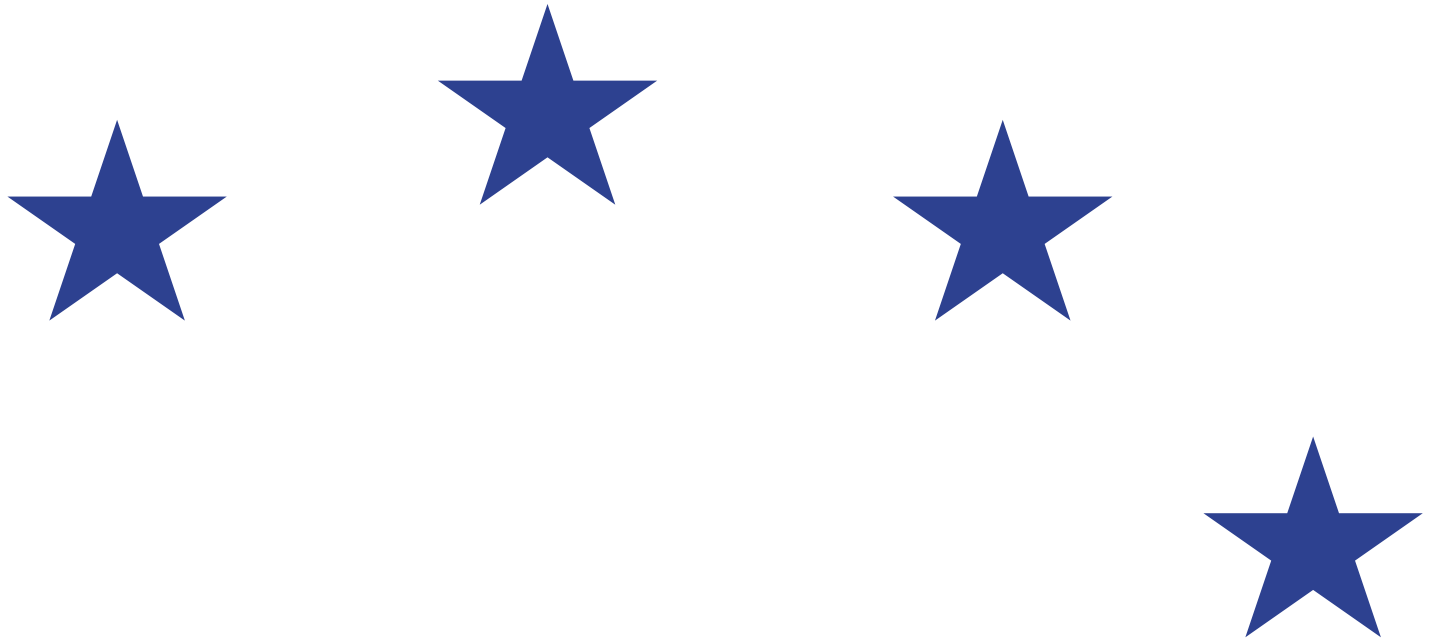




TRV Risk
Analysis

Monitoring environmental risks in EU financial markets



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European Securities and Markets Authority
(ESMA)
Risk Analysis and Economics Department
201-203 rue de Bercy
75012 Paris
FRANCE
Risk.analysis@esma.europa.eu

Financial Stability

Monitoring environmental risks in EU financial markets

Contact: julien.mazzacurati@esma.europa.eu ⁽¹⁾

Summary

Regulators and supervisors have started to incorporate environmental risks, especially those stemming from climate change, and their potential implications for the financial system into their work. The objective of this article is twofold: first, to depict how environmental risks can be expected to impact EU securities markets and their participants; and second, to lay out ESMA's approach to integrating environmental risks in the risk assessment and monitoring framework. In light of ESMA's financial stability, investor protection and orderly market objectives, and given the unique nature of climate risks and the challenges they entail for risk monitoring purposes, we propose to integrate climate risk as a new risk category alongside the existing liquidity, market, credit, contagion and operational risk categories. This risk category is intended to capture physical and transition risk drivers and their mitigants, in addition to the potential risks associated with green finance. As part of this framework, at the current juncture we identify three core risks to ESMA's objectives stemming from climate change: abrupt changes in market sentiment, greenwashing and weather-related hazards.

Monitoring environmental risks: mandate and context

There is broad agreement that climate change has become the challenge of our generation ⁽²⁾, with potentially substantial consequences for the global economy and economic agents (households, businesses and governments). As such, climate change will also have major implications for the global financial system, even as public understanding of the potential ramifications and transmission channels between climate change and financial risks is still progressing. In recent years, a broad consensus has nonetheless formed around one fundamental message: the potential costs of inaction over the many decades to come appear disproportionately high compared to those of actions taken today to address climate change or mitigate its impact.

While a number of (public and private) stakeholders and institutions are highly committed to the issue of climate change, a lack

of awareness combined with the long-term horizon of climate-related developments creates significant challenges for early action. This also applies to risks posed to the financial system, where early actions to tackle climate change can generate considerable benefits in reducing the nature and severity of disruptions (ECB and ESRB, 2020). Raising awareness around climate risks – including in the EU financial ecosystem of market participants, infrastructures, services providers, industry bodies and regulators – has therefore become an important priority for the EU. The European Commission has further highlighted the need for the financial system to play a key role in addressing the consequences of climate change (ECB and ESRB, 2020).

This article depicts how climate risks can be expected to impact EU securities markets and lays out our approach to integrating climate risks into ESMA's risk monitoring framework. In doing so, it contributes to ESMA's objectives of investor protection, financial stability and orderly markets.

Following the 2020 review of its founding Regulation, ESMA is now mandated to consider

⁽¹⁾ This article was written by Julien Mazzacurati, Sara Balitzky and Claudia Guagliano.

⁽²⁾ [UN Climate Change Conference](#), October 2017.

environmental, social and governance-related (ESG) factors in all of its tasks and powers ⁽³⁾. 'When carrying out its tasks ... ESMA will need to take account of innovation, innovative and sustainable business models, and the integration of ESG-related factors' (see Table 1 for an overview of ESMA's analytical mandate on ESG-related factors, including environmental risks).

In this context, in February 2020 ESMA adopted its Strategy on Sustainable Finance (ESMA, 2020). The strategy presented ESMA's approach to taking account of sustainable business models and integrating ESG-related factors across its four main activity areas of single rulebook, supervisory convergence, direct supervision and risk assessment. In its 2022 Annual Work Programme, ESMA further identified three key priorities:

- Developing rules on ESG disclosures and a risk identification methodology for ESG factors;
- contributing to the work on non-financial reporting; and
- working with national authorities to prevent the risk of greenwashing and to promote convergence in the supervisory approach (ESMA, 2021).

Aside from its legal mandate, the need to develop a climate risk monitoring framework also reflects broader developments in EU financial markets. A major shift in investor preferences towards sustainable investing can already be observed, especially in Europe. This shift is driven by growing public awareness of the climate emergency, climate-friendly public policies and pressure from civil society. This is most visible in the EU asset management industry where flows into EU ESG equity funds over the last three years have amounted to EUR 371 bn, compared to EUR 184 bn for non-ESG equity funds. ESG fund assets accounted for 19 % of the total assets of publicly marketed funds in the EU as of November 2021 (ESMA, 2022).

⁽³⁾ Consolidated text: [Regulation \(EU\) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority \(European Securities and Markets Authority\), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC.](#)

Table 1

Selected extracts of the ESMA Regulation ⁽⁴⁾
ESG factors in ESMA's analytical mandates

Article 8: Tasks and powers of the Authority

1a. When carrying out its tasks in accordance with this Regulation, the Authority shall:

[...]

(c) take account of ... the **integration of environmental, social and governance related factors**.

Article 23: Identification and measurement of systemic risk

1. The Authority shall, in consultation with the ESRB, develop criteria for the identification and measurement of systemic risk and an adequate stress-testing regime which includes an evaluation of the potential for systemic risk posed by, or to, financial market participants to increase in situations of stress, including potential **environmental-related systemic risk**.

Article 29: Common supervisory culture

1. The Authority shall play an active role in building a common Union supervisory culture ... The Authority shall carry out, at a minimum, the following activities:

[...]

(f) putting in place a monitoring system to assess material **environmental, social and governance-related risks**, taking into account the Paris Agreement to the United Nations Framework Convention on Climate Change.

Article 32: Assessment of market developments, including stress tests

2. The Authority ... shall develop:

(a) common methodologies for assessing the effect of economic scenarios on the financial position of a financial market participant, taking into account inter alia risks stemming from **adverse environmental developments**.

[...]

(d) common methodologies for assessing the effect of **environmental risks** on the financial stability of financial market participants.

Policy measures ensuring that investors and financial market participants factor the risks associated with ESG factors into their decision-making can further help to channel savings into sustainable investments. Examples include: requirements to integrate ESG factors into risk management processes of financial market participants, such as investment firms and asset managers; ESG risk disclosure requirements; or setting ESG-risk-related long-term strategic objectives for banks ⁽⁵⁾. Policy measures such as these establish incentives for supervised entities to 'green' their activities, e.g. by reducing

⁽⁴⁾ Regulation (EU) No 1095/2010 establishing ESMA and defining its mandate. The 1 January 2020 amendments introduced the concept of sustainability of ESG factors.

⁽⁵⁾ See e.g. ESMA (2019) and [Article 6 of Regulation \(EU\) 2019/2088](#) ... on sustainability-related disclosures in the financial services sector.

exposure to environmentally harmful activities or increasing their offering of sustainable investment products.

However, climate risk monitoring is subject to multiple challenges. The long-term horizon of climate change, alongside the rapid development of new scientific methods and tools to measure and assess its impact, make climate risk monitoring a moving target. Additionally, the effects of broader geopolitical and societal developments on climate change, and the risks they pose to the financial system, can imply expanding the monitoring scope far beyond the traditional areas of expertise of financial supervisors. While these challenges and the limitations they imply in terms of monitoring and accuracy of assessment must be acknowledged, ESMA's regulatory and supervisory scope remains on the risks posed to the financial system.

This article is therefore concerned with the assessment – i.e. the identification, monitoring and analysis – of climate risks from a financial regulatory and supervisory perspective⁽⁶⁾. For ESMA, risk assessments inform the Authority's regulatory work, support daily supervisory practices, contribute to supervisory convergence initiatives and help identify any market-wide or systemic problems at an early stage.

Thus, with this edition of the *ESMA Report on Trends, Risks and Vulnerabilities*, we introduce environmental risks as a new risk category into the regular ESMA risk assessment.

Environmental risks in EU securities markets context

Amongst environmental risks, climate-related risks feature most prominently. Climate change and the associated risks to the financial system have become one of the most pressing concerns given the scale of the challenges ahead, and the 'radical shift of resource allocation' required for the transition to a carbon-neutral economy (NGFS, 2020). Reflecting this, ESMA's risk monitoring efforts will focus, as a first step, on climate. Two other recent developments should further facilitate the development of climate risk indicators.

First, the relationship between environmental factors and financial risk has been much more thoroughly explored in the context of climate change. The momentum currently building around this issue further allows ESMA to leverage on the knowledge and expertise developed elsewhere, including not least in the central banking community and the private sector. Beyond climate, there is only a partial understanding of the possible interactions between other environmental issues and financial risks. For example, the linkages between biodiversity losses and financial stability are now just beginning to be explored (Biermann et al., 2021; NGFS, 2021a).

Table 2

Intergovernmental Panel on Climate Change Risk in the context of climate change

Several definitions of climate risks coexist. The scientific definition provided by the Intergovernmental Panel on Climate Change (IPCC) is the following (Reisinger et al., 2020):

'The potential for **adverse consequences for human or ecological systems**, recognising the diversity of values and objectives associated with such systems. In the context of climate change, **risks can arise from potential impacts of climate change as well as human responses to climate change**. Relevant adverse consequences include those on lives, livelihoods, health and wellbeing, economic, social and cultural assets and investments, infrastructure, services (including ecosystem services), ecosystems and species.

In the context of climate change impacts, risks result from **dynamic interactions between climate-related hazards with the exposure and vulnerability of the affected human or ecological system to the hazards**. Hazards, exposure and vulnerability may each be subject to uncertainty in terms of magnitude and likelihood of occurrence, and each may change over time and space due to socioeconomic changes and human decision-making ...

In the context of climate change responses, risks result from **the potential for such responses not achieving the intended objective(s), or from potential trade-offs with, or negative side effects on, other societal objectives**, such as the Sustainable Development Goals ... Risks can arise for example from uncertainty in implementation, effectiveness or outcomes of climate policy, climate-related investments, technology development or adoption, and system transitions.'

Second, the EU has taken a global lead in the development of rules related to environmental issues for the financial sector, including the establishment of a classification system for environmentally sustainable activities under the EU Taxonomy Regulation⁽⁷⁾. The Delegated Acts adopted thus far concern the objectives of climate change mitigation and adaptation⁽⁸⁾. This will facilitate risk monitoring activities by

⁽⁶⁾ This article does not cover the assessment of climate risk in the context of scenario-based analyses such as stress testing.

⁽⁷⁾ [Regulation \(EU\) 2020/852 on the establishment of a framework to facilitate sustainable investment](#). The

Delegated Acts on the four other environmental objectives are expected to be adopted in 2022.

⁽⁸⁾ Indeed, the EU Taxonomy foresees four additional objectives, namely 'use and protection of marine and water resources', 'transition to a circular economy',

introducing clear definitions, ensuring convergence across countries and sectors, and allowing for the development of standardised reporting requirements ⁽⁹⁾.

The Network of Central Banks and Supervisors for Greening the Financial System (NGFS) ⁽¹⁰⁾ defines climate risks as ‘financial risks posed by the exposure of financial institutions to physical or transition risks caused by or related to climate change, for example, damage caused by extreme weather events or a decline in asset value in carbon-intensive sectors’ (NGFS, 2020). Physical impacts can arise from the increasing severity or frequency of extreme climate-change-related weather events, as well as longer-term progressive shifts in the climate. Transition impacts relate to the process of adjustment to a low-carbon economy (NGFS, 2019).

This differentiation between physical and transition risks is at the root of much of the analytical work undertaken on climate risks, including in the EU (EBA, 2021; ECB and ESRB, 2021a; EIOPA, 2020). This approach is mainly intended to capture the risks to financial stability stemming from climate change, in line with the financial stability focus of most prudential supervisors. However, ESMA’s objectives also include investor protection and orderly market functioning, in addition to financial stability. For this reason, we believe that a broader approach to climate risks is better suited to ESMA’s risk monitoring purposes.

A broader approach should aim to also capture risks stemming from green finance or ESG investing of relevance in the context of climate change. This includes risks to investor protection from e.g. capital misallocation from greenwashing practices, or investor losses stemming from sudden asset repricing as a result of overvaluation. Such an approach also considers the role of green finance as a potential mitigating factor through e.g. reduced investor exposure to fossil fuel assets and portfolio diversification.

Some EU regulations have embedded the concept of double materiality (i.e. financial and

environmental materiality), such as the sustainability reporting standards for EU companies currently under development. According to this concept, businesses should not only consider how sustainability issues affect their business, but also the impact that they have on the environment ⁽¹¹⁾. However, the focus of our risk-monitoring framework is on financial risks, and environmental materiality considerations are only relevant insofar as they relate to financial risk or its mitigation.

One of the most fundamental differences between climate-related financial risks and other types of financial risks is their long-term horizon. This reflects the fact that temperature change projections typically span multiple decades, while the effects of climate change on the financial system may take years to fully materialise. As a result, monitoring climate risks comes with unique challenges (beyond the scoping issues already highlighted). These challenges include:

- a very high level of uncertainty (e.g. severity and frequency of extreme weather events);
- the relevance of transition strategies or policies and, related to this, the importance of forward-looking indicators; and
- the potential role of climate risk mitigants.

The long-term horizon also entails differences in terms of the nature and severity of the short-term risks posed by climate change and the long-term ones. A climate risk monitoring framework tailored to EU securities markets should cover both, considering the ability of investors to rebalance their portfolio at short notice and the speed of valuation adjustments in asset markets. However, due to data and methodological limitations, this level of granularity remains out of reach for now.

Given ESMA’s objectives, along with the unique nature of climate risks and the challenges they pose to risk monitoring, we integrate climate risks into our risk assessment and monitoring framework as a separate risk category, rather than feed into the existing risk categories (without, however, denying potential overlap; see next section). In doing so, we base our work on a

‘pollution prevention and control’ and ‘protection and restoration of biodiversity and ecosystems’, for which the Delegated Acts are still under development.

⁽⁹⁾ For example, under the EU Taxonomy Regulation, companies will have to disclose entity-level and product-level key performance indicators on the alignment of their economic activities with the taxonomy.

⁽¹⁰⁾ The Network of Central Banks and Supervisors for Greening the Financial System, launched in 2017, aims

to, on a voluntary basis, share best practices and contribute to the development of environmental and climate risk management in the financial sector, and to mobilise mainstream finance to support the transition toward a sustainable economy. For more information, see the [NGFS](#) website.

⁽¹¹⁾ European Commission proposal for a Directive as regards corporate sustainability reporting, 21 April 2021, [COM/2021/189](#) final.

definition of climate risks as risks posed to financial markets and their participants as a direct or indirect result of climate change, including potential mitigants.

Core climate-related risks in ESMA's remit

In keeping with the above definition, we capture risks from the three sub-categories identified as relevant to ESMA's risk monitoring framework: physical risks, transition risks and ESG investing.

Physical risks can materialise, for example, when weather-related hazards lead to the direct or indirect loss of physical assets or financial asset holdings, respectively. They occur through extreme weather events (e.g. floods, storms, droughts, tidal waves or wildfires) and can trigger spillover effects across markets, as observed, for example, in 2020 when an unusually cold storm in the US strongly affected energy market prices (Sullivan B. K., 2021).

Transition risks can result from the process of adjustment towards a lower-carbon and more circular economy prompted, for example, by changes in climate and environmental policy, technology or market sentiment (NGFS, 2020). For example, abrupt changes in climate risk perceptions impacting market sentiment may trigger large-scale investment portfolio reallocations and large valuation changes, driving market volatility higher and leading to mark-to-market losses on passive investments.

Risks from ESG investing can also be relevant in the context of climate risks, but are not directly captured under physical or transition risks. Climate-related ESG investing risks can arise from i) information asymmetries between investors and firms or service providers; ii) asset overvaluation and product mispricing; and iii) negative externalities from the integration of ESG-driven approaches. All three aspects have common limitations related to the availability and flow of information along the sustainable investment value chain. They are closely related, e.g. with overvaluation and mispricing sometimes (but not always) stemming from information asymmetries.

These three sub-categories also interlink with each other. For example, recurring weather-related hazards can prompt policy and legislative action to mitigate the damages caused by climate

change, leading to transition risks. Information asymmetries can lead to increased litigation claims brought forward either by investors against states of firms for failing to factor in or disclose climate risks, or by firms against governments in cases where new regulations lead to unexpected financial losses (NGFS, 2021b).

Importantly, climate risks also interlink with other risk categories (market, credit, liquidity, contagion and operational) that already form part of ESMA's regular risk assessment. Extreme weather events can derail the functionality and operability of systemic financial market infrastructures and consequently increase operational risk. Valuation changes and investment reallocation from changes in market sentiment would drive an increase in market risks. Climate policies intended to reduce greenhouse gas emissions may give rise to transition risks, and in doing so create stranded assets in some sectors, leading to increased liquidity and credit risks.

In line with its risk-based approach to supervision, ESMA's risk monitoring framework requires concrete risk drivers for the different areas in ESMA's remit to be identified. For example, in Europe, key physical risk drivers include floods, water stress and heat stress (ECB and ESRB, 2021), while potential direct or indirect losses from exposure to weather-related events in tropical areas are of less immediate concern. Meanwhile, the assessment of potential transition risks stemming from fiscal or monetary policy changes goes beyond ESMA's mandate. Risk drivers should be prioritised in accordance with (i) the size of their impact, (ii) their materialisation potential, and (iii) their relevance to EU securities markets. The long-term horizon of climate change also requires the availability and effectiveness of targeted mitigating actions to be considered. Indeed, risk mitigants can markedly influence either the likelihood with which a risk materialises (e.g. investments to build market infrastructure resilience) or the size of its impact (e.g. reduced losses from insurance coverage).

With this in mind, we identify three core risks to ESMA's remit⁽¹²⁾. The first being an abrupt change in market sentiment, which can be understood as investors' subjective opinion on the likelihood that climate risks materialise and their potential impact (on firms, sovereigns, etc.). This view can be shaped either by factual

⁽¹²⁾ Given the high level of uncertainty highlighted above and expected improvements in data availability and risk

assessment methodologies, these core risks will be re-evaluated on a regular basis and adjusted as needed.

considerations, e.g. an increase in the severity and occurrence of climate-change-related hazards, or by sentiment-driven ones, e.g. a shift in investor preferences in favour of 'green' assets. Abrupt changes in market sentiment may lead to sell-offs, stranded assets or asset repricing and volatility. Information on the potential exposure of financial institutions to climate risks and the policies in place to manage them can help mitigate the effects, as do clear transition plans towards more sustainable business models.

The second core risk to ESMA's objectives stems from potential greenwashing, which is now widely cited as a key concern for investors, issuers and the environment (Azzouz, M. and Merle, C., 2021). However, the absence of a legal definition in combination with the complex and multifaceted nature of the problem have given rise to the emergence of different understandings and measures of greenwashing, reflecting the various contexts in which the word is being used. In this respect, greenwashing has become a key priority for ESMA⁽¹³⁾, and future policy work in this area will directly inform our climate risk monitoring framework. Greenwashing practices can damage investor confidence and spur substantial capital reallocation (e.g. to more transparent products or firms), or create broader distrust in sustainable investing. Harmonised disclosure standards may help to mitigate these risks, but progress is still ongoing and considerable limitations remain.

The frequency and severity of weather-related hazards, the third core risk to ESMA's remit, have increased in recent years, turning into possible disasters that cause loss of life and capital stock, and disruptions to economic activity (IMF, 2020). Extreme weather events such as storms, floods or wildfires can either damage a firm's physical assets (direct losses) or lead to losses on financial asset holdings with potential spillover effects on other firms within the same sector or region (indirect losses). They can also induce broader economic effects, e.g. through price transmission mechanisms, as evidenced by the energy price surge in 2020 (Sullivan, B. K., 2021). Market infrastructures, such as trading venues or central counterparties, may also experience operational disruptions in cases where critical physical infrastructure is affected. Weather-related hazards can thus pose significant risks to financial market infrastructures, depending on the impact size and the frequency with which they occur. However, comparably robust mitigants to

address these risks exist, including extensive insurance coverage to mitigate losses or contingency plans (e.g. business continuity planning) and limit potential disruptions. In this respect, the EU Taxonomy Regulation, in laying down criteria defining substantial contribution to climate change adaptation, requires investees to perform climate risk and vulnerability assessments and implement recommended adaptation solutions⁽¹⁴⁾.

Indicators for climate risk monitoring

With these three core risks in mind, ESMA will aim to extend its quantitative analysis to empirically assess the probability, impact and potential losses stemming from climate risks over time. This section presents a few indicators that we deem relevant in the context of climate risk monitoring, for illustration purposes. Given current data limitations, ongoing progress in methodologies and the long-term horizon of climate risks, these indicators will be revised on a regular basis and improved over time. A preliminary set of the indicators we currently use can be found in the TRV Statistical Annex (Sustainable Finance section) (ESMA, 2022).

The charts below provide a few examples of how indicators can inform ESMA's climate risks assessment, based on the framework outlined above. These indicators do not by themselves provide an exhaustive picture of where climate risks currently stand, or how they might evolve. They need to be complemented by expert judgement, while our ability to correctly interpret them also depends on the accuracy of definitions, data quality and coverage. As such, they need to be interpreted with caution in light of their context and identified limitations, and that they only shed light on specific aspects of an inevitably more complex reality. Furthermore, in line with ESMA's broader approach to risk assessment, it is important to keep in mind that these indicators may not be suitable tools for risk management purposes and are strictly intended to monitor potential risks to ESMA's objectives.

While greenwashing has been identified as a core risk to ESMA's objective, the absence of a definition in EU legislation currently hampers the ability of supervisors to clearly delineate and identify greenwashing practices at this stage. The

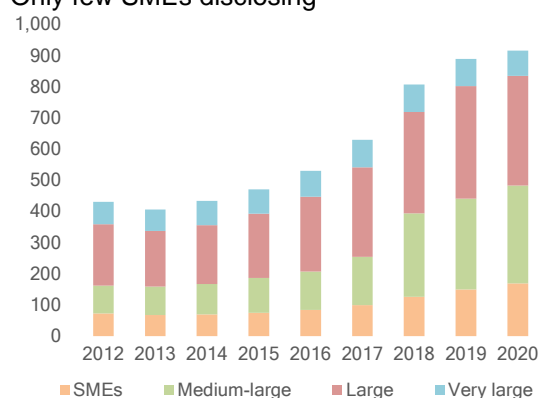
⁽¹³⁾ See Ross, V. (2021), '[Keynote Speech](#)'.

⁽¹⁴⁾ [Appendix A: Generic Criteria for DNSH to Climate Change Adaptation](#) of the EU taxonomy regulation.

EU regulatory framework has already introduced disclosure rules and safeguards to enable investors to make informed investment decisions – including possible divestments or exclusions from products or vehicles they deem to not be adapted to their preferences or objectives. Conceptual work on greenwashing-related issues in supervisory context will directly inform and feed into our risk monitoring framework in the future. Similarly, future analyses and research will help to shape public authorities' understanding of greenwashing risks and of how to address them. With this in mind, we refrain at this stage from introducing indicators to monitor potential greenwashing risks.

The lack of climate-related information in the context of company-level environmental performance is one of the issues at the core of climate risks. Part of this stems from the fact that a limited number of firms in the EU and elsewhere are disclosing climate-related metrics (TCFD, 2021). Although the number of firms disclosing Scope 1 (i.e. direct) emissions data has grown – especially after the 2015 Paris Agreement – the problem remains particularly salient within smaller firms (Chart 1): only 3 % of listed European SMEs are currently reporting this information, compared to more than 50 % of firms with a market capitalisation above EUR 2 bn.

Chart 1
Number of EEA firms disclosing Scope 1 emissions
Only few SMEs disclosing



Note: Number of EEA-domiciled firms listed in the EU disclosing Scope 1 (direct) greenhouse gas emissions, by market capitalisation bucket. SMEs=below 200mn; Medium-large=from 200mn to 2bn; Large=from 2bn to 20bn; Very large=above 20bn.
Sources: Refinitiv EIKON, FIRDS, ESMA.

Improved information availability can help reduce transition risks by limiting potential changes in market sentiment for subjective reasons, in addition to reducing information asymmetries. Indicators monitoring firms' disclosures can also

help policymakers to evaluate the level of transparency in the market and then introduce targeted measures to promote these further.

In addition to mandatory disclosures, a useful way to ensure that green finance instruments can deliver their intended objectives is through the recourse to labels. Some EU-wide labels already exist (e.g. EU Climate Benchmarks) or have been proposed (e.g. EU Green Bond Standard) and others are currently on the way (e.g. the EU Ecolabel) (Boyano, A. et al., 2021). Monitoring the relative share of labelled instruments will provide useful insight on the transparency and credibility of each market, the firms operating within these markets and the products or services they sell. Increases in labelled instruments should enhance transparency and lead to reduced information asymmetries.

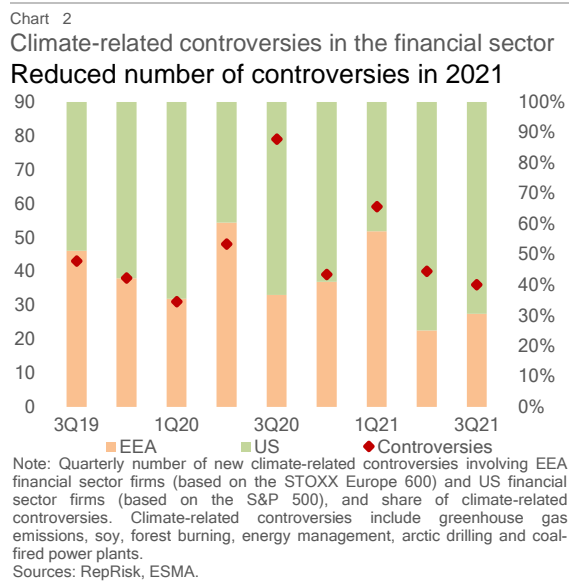
Another important consideration in the context of climate risk perceptions relates to the reputation of each firm. Considered a core intangible asset, corporate reputation is shaped by a firm's past and expected future actions and has substantial impact potential for financial performance (Gatzert, N., 2015; Pires, V. and Trez, G., 2018).. When it comes to measuring reputation, various approaches already exist. In an ESG investing context, some ESG rating providers integrate 'ESG controversies' into their methodology. ESG controversies are environmental, social or governance-related incidents (e.g. in the form of negative press, lawsuits or scandals) involving firms or governments with potential reputational implications. Monitoring ESG controversies has become increasingly relevant given their growing impact, either directly on financial metrics or indirectly through ESG ratings and public perception (for example, Winck, B., 2020). Beyond the effects on individual firms and governments, major controversies can have broader ramifications for entire sectors.

For our climate risk monitoring framework, the involvement of EU financial sector firms in climate-related controversies⁽¹⁵⁾ can provide useful insight (Chart 2). A higher count of climate-related controversies may signal higher transition risks, with e.g. investors becoming increasingly sensitive to negative news coverage of firms engaging in controversial or polluting activities. This may lead environmentally minded investors to withdraw from specific firms or entire sectors. This information is particularly relevant for financial sector firms given the link between

⁽¹⁵⁾ Climate-related controversies are separated from other environmental controversies, with a focus on climate

change, greenhouse gas emissions and global pollution.

reputation and liquidity (i.e. the willingness of counterparties to trade), which has in the past driven some banking institutions into insolvency.



The monitoring and assessment of physical risks is particularly data and resource intensive (ECB and ESRB, 2021b). With a view to monitoring potential risks stemming from weather-related hazards in EU markets, and in particular to financial market infrastructure (such as trading venues or central counterparties), ESMA will aim to develop a methodology leveraging on the work done by public authorities with greater expertise in this area.

In our semi-annual TRV risk monitoring, new indicators will complement existing ones to form the basis of our analysis in the Sustainable Finance section. They will also be reflected in a composite Environmental Risks indicator in the TRV Risk Dashboard.

Conclusion

Climate-related policies and public awareness of the climate emergency have put climate risks at the core of the agendas of many authorities and private-sector firms. The growing interest in and shift to sustainable investing confirms a public urge to consider wider ESG factors in investment decision-making. Meanwhile, the increasing visibility of climate change impacts, including on financial markets, makes it imperative to account for this new risk source in our risk monitoring and analysis.

This article underpins ESMA's work in the area of risk analysis by providing a comprehensive framework through which climate risks can be

monitored in the context of EU securities markets. In doing so, it also highlights some of the challenges that are specific to risks stemming from climate change. ESMA's objectives of financial stability, investor protection and orderly market functioning lead us to adopt a broad definition of climate risks, capturing not only physical and transition risks, but also ESG investing risks of relevance in the context of climate change. Together with the unique features of climate risk monitoring, stemming from the long-term horizon of climate change, we propose to add climate risks as a new risk category. This will focus our analytical efforts on developing climate-specific risk monitoring indicators.

The identification of three core risks (abrupt changes in market sentiment, greenwashing and weather-related hazards) further allows us to focus our monitoring efforts on those areas of most immediate importance to our remit. At the same time, the framework needs to remain flexible and adjustable to account for new developments and structural changes in EU markets moving forward. Furthermore, and while acknowledging the existing knowledge and information already available in the market or from other public authorities, the many different risk sources, events and triggers and their potential interactions, combined with existing data and methodological limitations, make monitoring climate risk a particularly challenging task. Reflecting this, ESMA's risk monitoring framework and indicators will evolve over time as public understanding of climate risks improves and operational limitations recede, while ESMA continues to contribute to the development of the EU framework in the area of sustainable finance and to promote convergence in supervisory approaches.

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