



Sustainability-Related Risks and Financial Stability: A Systemic View and Preliminary Conclusions

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Abstract This chapter discusses the possible impact of sustainability-related factors (such as climate change, environmental degradation, social inequality, policy and technology shifts) on financial stability. To this extent, it first identifies the areas in which an evolution of the practices

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of financial intermediaries are necessary to better manage sustainability-related risks. This refers in particular to the existing risk-management frameworks (which may not consider sustainability-related risks) and to the timespan of the risk-taking strategies (which typically underestimate the long-term nature of sustainability-related risks). Hence, the chapter discusses a set of policy actions to both mitigate and control for sustainability-related risks. In this respect, it focuses on the need of evolving the prudential supervisory approaches and on the possibility to assign a more active role to central banks.

Keywords Sustainability-related risks · Climate change-related risks · Financial stability · Risk management frameworks · Macroprudential supervision · Central banks

5.1 INTRODUCTION

Financial stability can be defined as the condition in which the financial system, comprising financial intermediaries, markets and market infrastructures, is capable of withstanding shocks and the unravelling of financial imbalances (ECB 2019). In such a condition, the likelihood of disruptions in the financial intermediation process that are systemic and severe enough to trigger a material contraction of real economic activity can be considered to be mitigated. Already before the 2007–2009 Great Crisis, literature had highlighted three key characteristics that a financial system needs to have in order to maintain financial stability (e.g. Fell and Schinasi 2005). First, it has the capacity to efficiently and smoothly facilitate the intertemporal allocation of financial resources from savers to investors. Second, it can comfortably absorb both financial and real economic shocks. Third, it foresees mechanisms and practices to ensure that financial risks are assessed, priced and managed accurately by financial intermediaries. If one or more of these characteristics is not present, then it is likely that the financial system is moving in the direction of

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becoming less stable, and at some point in time it might exhibit instability. Monitoring and ensuring financial stability implies the throughout considerations of a full range of potentially harming factors, both external and internal to the financial intermediaries, including an assessment of the systemic relevance of the potential fragilities coming from each financial actor (this latter in particular to avoid contagion effects¹).

When it comes to the possible impact of sustainability-related risks on financial stability, it is relevant to analyse the matter under the light of the possible emergence over time of new (and underestimated) financial risks. This chapter mainly focuses on this issue. To do that, it is structured as follows. First, it introduces the key features of the policy frameworks typically in place to ensure financial stability, as well the possible role of sustainability-related risks in these frameworks. This is done in Sects. 5.2 and 5.3. Second, it proposes a number of actions to be undertaken by policymakers to effectively shield financial stability from sustainability-related risks, with particular emphasis on the role of prudential supervisory authorities. This analysis is carried out in Sects. 5.4, 5.5 and 5.6. Finally, some preliminary conclusions on the relationship between sustainability-related risks and financial stability are presented in Sect. 5.7.

5.2 BRIEF OUTLINE OF THE POLICY APPROACH TO FINANCIAL STABILITY

Given its broad scope, financial stability has been traditionally pursued by policymakers worldwide through a structured mix of regulation and organisational structures. To this extent, a preventive arm of policy action aiming at limiting situation of crisis is normally accompanied by a remedial harm dealing with specific cases of financial distress. The preventive arm typically includes the definition of prudential legislation, the empowerment of authorities and agencies with specific supervisory and regulatory

¹In this respect, the Basel Committee on Banking Supervision (BCBS) published in October 2012 a principles-based framework for dealing with domestic systemically important banks (BCBS 2012). The European Union implemented this framework in the Capital Requirements Directive (CRD IV) and the European Banking Authority adopted guidelines that recommend to the national macroprudential authorities the approach to follow for the identification of systemically important banks at the domestic level. Hence, national authorities designate systemically important banks and set capital buffers for them.

competences, the public support to the establishment of a sound physical market infrastructure (and related market conventions), as well as the periodical provision of information by public authorities to the market on the most relevant economic and financial risks. On the other hand, the remedial arm usually foresees different forms of liquidity and solvency support for distressed financial entities as well as mechanisms to orderly managing deeper crises, including in case of entities' resolution.^{2,3}

Prudential supervision represents in such a context a central pillar for the safeguard of financial stability, and it is particularly relevant when it comes to the analysis of the systemic impacts of sustainability-related risks on financial risks. In broad terms, prudential supervision refers to the oversight of financial institutions to ensure that they are complying with relevant regulation and, more generally, are operating soundly and prudently in line with the principles laid down by the financial stability framework.

In the last two decades, it has been observed a tendency to assign prudential supervision of credit and insurance institutions to central

²See for example Allen and Wood (2006).

³An example of the structured mix of the regulation and organisational structure in place to ensure financial stability is the one adopted in the European Union (EU). In the EU, financial stability is first nested in the framework defined by the combination of the so-called Banking Union and Capital Markets Union. The Banking Union is mainly built around the Capital Requirements Directive and Capital Requirements Regulation (CRD IV-CRR package, derived by the Basel Accords), the Bank Recovery and Resolution Directive (BRRD) and the Deposit Guarantee Schemes Directive (DGSD). The overall aim of these pieces of legislation is to enforce financial stability through a mix of measures designed to both reduce and share banking sector risks. In this respect, the Banking Union eventually results to be based on three pillars: a single supervisory mechanism (SSM), a single resolution mechanism (SRM) with a related single resolution fund, and a European deposit insurance scheme (EDIS). However, the EU macro-prudential framework is to a significant extent implemented in a decentralised way. Authorities in the Member States identify risks and may implement macro-prudential measures within the remit of their jurisdiction. Such a decentralised set-up is mainly due to the fact that systemic risks are often local or national in scope and interrelate with specific national situations (see for example EC 2019a). To balance this decentralised implementation, the EU macro-prudential framework also comprises mechanisms to avoid excessive heterogeneity. To this extent, the European system of financial supervision (ESFS) was introduced in 2010. It

banks, as a supplementary activity to the one of definition and implementation of the monetary policy.⁴ A set of instruments is usually in the toolkit of prudential supervisory bodies to perform their tasks, with different instruments used for different purposes. As concerns the supervision of credit institutions, specific instruments are aimed at facing the cyclical systemic risks which may arise from the self-perpetuating interactions between lending, on the one hand, and the valuation of the real and financial assets used as collateral, on the other hand (the relationship between mortgages lending practices and the price of real estate is a typical example). Scenario analyses and stress testing are widely used techniques to monitor the potential magnitude of these types of risks. Other instruments look at the broad structure of the financial markets and are intended to attenuate the risks arising from the dominant positions that some institutions may acquire or can result from a high level of interdependence between financial institutions. The request of supplementary capital buffers for systemic relevant banks is a case of possible risk mitigating action in such cases (e.g. NBB 2018). Finally, other instruments exist dealing with specific risks. These are used in particular in the management of liquidity and capital positions in banking groups, or in the adjustment of the capital requirements in line with specific developments in the financial or property markets (e.g. NBB 2018).

comprises the European Systemic Risk Board (ESRB), which ensures that the objectives of financial integration at EU level and financial stability at the Member State level can be jointly pursued, and the three European supervisory authorities (ESAs), namely: the European Banking Authority (EBA), the European Securities and Markets Authority (ESMA) and the European Insurance and Occupational Pensions Authority (EIOPA). On the other hand, financial stability is also fostered through the implementation of the Capital Markets Union, the blueprint headed by the European Commission to channel financial resources to all types of companies and infrastructure projects that need it to expand and create jobs. A first specific action plan to build the Capital Market Union has been published in 2015 (see EC 2015).

⁴Central banks act to pursue specific objectives as defined by their statutory documents. For example, the main objective of the European Central Banks (ECB) is to maintain price stability, defined as a year-on-year increase in the Harmonized Index of Consumer Prices (HICP) for the euro area close but below 2%. In addition, without prejudice to the objective of price stability, the ECB may support the general economic policies in the Union. These may include, inter alia, full employment and balanced economic growth.

5.3 FINANCIAL INTERMEDIARIES AND KEY AREAS OF ATTENTION IN THE MANAGEMENT OF SUSTAINABILITY-RELATED RISKS

In point of fact, an argument can be made according to the idea that the threat to financial stability coming directly from sustainability-related risks is somewhat limited in the short-term. The likelihood of the appearance of a systemic crisis in the financial sector in the next few years stemming from factors such as climate change, environmental degradation, social inequality or policy and technology shifts is reasonably low.⁵ However, such a threat is expected to considerably increase in the future with the foreseen consolidation of sustainability-related risks, both in terms of frequency and magnitude (the severe consequences of the expected increase in temperature worldwide in the next decades are an example of this dynamic⁶). For this reason, the implementation of forward-looking mitigation actions by both supervisory entities and financial institutions in order to preserve financial stability from sustainability-related risks should not be postponed too late in the future.

In this respect, at least two (interrelated) elements featuring the approach to risk-management and risk-taking of financial intermediaries should be carefully considered in the assessment of the possible impact of sustainability-related risks on financial stability. On the one side, the reliability of the existing risk-management frameworks, which may not systematically and coherently take into account the occurrence of sustainability-related risks and their link to financial risks. On the other side, the possible timing mismatch between the risk-taking strategies of financial intermediaries, often shaped to produce results in the short or medium term, and the profile over time of the sustainability-related risks, these latter expected to have increasingly disruptive effects in the longer term (e.g. BoE 2015; ACPR 2019; BIS 2020).

The need for financial intermediaries to adjust their risk management frameworks in order to consider the possible impact of sustainability-related risks on their financial risks may progressively become material. This implies the incremental development of specific risk management

⁵For a wider analysis of the relation between sustainability-related risks and financial risks, see Chapter 1.

⁶See IPCC (2018) or BIS (2020).

methodologies⁷ and, more in general, an enrichment of the risk culture. In particular, models able to predict the development of climate and environmental variables and simulate economic impact scenarios tailored on the business of each intermediary (specifically in terms of geographic areas and economic sectors served) would need to be progressively developed. In addition, as risk-taking activities are typically decentralised at operational units, the familiarity of all the relevant levels of the organisation with the possible consequences for the business of sustainability-related factors is also expected to play an increasingly important role.

On the other hand, it would be necessary for financial actors to critically reassess the reference horizon of their risk-taking strategies, in a way to be able to fully factoring in sustainability-related risks (e.g. BoE 2015). As a matter of fact, the tendency of part of the financial industry to privilege short-termism and strategies set to produce positive returns in the space of a few years clearly goes in the opposite direction of a throughout understanding of sustainability-related risks, which in many cases spread their effects in the long-term.⁸ In this respect, it is important to underline that threats to financial stability may also arise from the possibility of disorderly adjustments of imbalances that have built up endogenously over a period of time because, for example, expectations of future returns were misperceived and therefore mispriced. This latter can be in particular the case for stranded assets and as a consequence of policy and technology changes.

5.4 THE WIDER POLICY APPROACH

In general terms, two major areas of action can indeed be highlighted for policymakers in order to shield financial stability from the expected impact of sustainability-related risks. The first concerns the set of actions to put in place with the aim of limiting the foreseen incidence of these risks. The second refers to the most effective ways to effectively dealing with the effects of the risks.

The possibility of limiting the expected incidence of sustainability-related risks on financial risks does not lay only in the field of finance. On the contrary, it implies the prior assessment of the different facets of the sustainability of human activities on the planet as well as the conception

⁷For further details, see Chapter 4.

⁸See, as concerns global warming and climate change, IPCC (2018).

and evaluation of the possible corrective measures. As a matter of fact, the possibility to trigger a trend reversal in matters such as climate change or environmental degradation depends on a multitude of factors. It can be expected that aspects regarding political engagement, effective regulation, technological improvements, scientific research and investment flows will jointly determine the feasibility and speed of the changeover (e.g. EC 2019b; Migliorelli and Dessertine 2019). For this reason, actions aiming at reducing the sustainability-related risks should indeed be nested in the wider policy initiatives having as objective the fight against climate change, the restoration and preservation of the environment, the reduction of the inequalities. On the other hand, it can be argued that policy actions aimed at specifically dealing with the financial risks stemming from sustainability-related risks (that is understanding, measuring and managing the relationship between the different types of sustainability-related risks and financial risks) can be more easily narrowed in scope, and specifically assessed in the traditional perimeter of action of prudential supervision authorities.

In such a context, Table 5.1 reports six key policy actions that jointly would likely allow to effectively limit and deal with the sustainability-related risks and, in turn, would also safeguard financial stability. In point

Table 5.1 Key policy actions to safeguard financial stability from sustainability-related risks

#	Action	Objective
1	Implementing the Paris Agreement and reaching the Sustainable Development Goals	Reducing the risk
2	Mainstreaming sustainable and green finance	Reducing the risk/dealing with the risk
3	Assessing the impact of climate policies in order to limit sideeffects	Reducing the risk
4	Fostering economic resilience to sustainability-related risks	Reducing the risk
5	Ensuring prudential supervision of the impact of all sustainability-related risks on financial markets	Dealing with the risk
6	Establishing global governance structures for the analysis of the impact of sustainability-related risks on financial markets	Dealing with the risk

Source Authors' elaboration

of fact, adopting such a set of actions would result first and foremost in the definition of a comprehensive policy programme backed by a strong commitment towards the achievement of a sustainable society.

5.4.1 *Implementing the Paris Agreement and reaching the Sustainable Development Goals*⁹

The Paris Agreement and the Sustainable Development Goals, both dated 2015, are today the cornerstones of the international community's engagement towards the fight against the climate change and the construction of a more sustainable and fair society. However, it is increasingly evident that the fortune of these deals will decisively depend on the level of political commitment during the (necessary long) implementation phase.¹⁰ Some jurisdictions, such as the European Union, have already made some concrete steps to drive the change,¹¹ while in other cases, as for the United States, a certain level of disengagement has been observed.¹² Intermittent political commitment can risk to dilute the efforts and the results reached thus far. On the contrary, a full implementation of the Paris Agreement and the achievement of the Sustainable Development Goals will allow a sensitive reduction of all the sustainability-related risks, in this way also reducing their potential impact on financial stability.

⁹For a wider dissertation on the Paris Agreement and the Sustainable Development Goals, see Chapter 1 or Berrou et al. (2019b).

¹⁰In particular for the Paris Agreement, the political commitment of the countries responsible for the largest part of the greenhouse gas emission is essential. In this respect, China counts for about 26% of the GHG emissions, the U.S. for 15%, the EU for 10%, India for 6%, Russia for 5%, Japan for 3%, Brazil for 2%. Source: World Research Institute. Data referred to 2014.

¹¹At European Union's level, it should at least be listed the issuance of the European strategic long-term vision for a prosperous, modern, competitive and climate-neutral economy (EC 2018a) and the European Green Deal (EC 2019b).

¹²In June 2017, United States President Donald Trump announced his intention to withdraw his country from the Paris Agreement. Under the agreement itself, the earliest effective date of withdrawal for the United States is November 2020.

5.4.2 *Mainstreaming Sustainable and Green Finance*

Sustainable finance may be referred to the process of taking due account of environmental and social considerations in investment decision-making, leading to increased investments in longer term and sustainable activities (EC 2018b).¹³ In this respect, green finance can be considered to be part of the wider sustainable finance landscape.¹⁴ The growth of sustainable finance market, and in particular of green finance, can be considered today robust, as increasing volumes are accompanied by sectorial diversification and a continuously widening range of products. Nevertheless, it can be argued that the actual levels of issuance of sustainable securities is still nothing more than “a drop in the ocean” when it is compared to estimated needs for an effective financing of the sustainability objectives.¹⁵ As a matter of fact, for sustainable finance to effectively contribute to mitigate the sustainability-related risks, from a promising niche it has to evolve in a mainstream way of financing. To do that, the full involvement of key policymakers is fundamental as market forces alone will most probably be ineffective to produce the necessary transition.¹⁶

5.4.3 *Assessing the Impact of Climate Policies in Order to Limit Side Effects*

Climate policies in particular are expected to trigger an unprecedented shift in the structure of the economies that will embrace the change. If effective, these policies will be also accompanied by a new stream of

¹³For more details on possible definitions of sustainable finance and green finance, see UNEP (2016) or Berrou et al. (2019a).

¹⁴See also Chapter 1.

¹⁵As an example, investments of around EUR520–575 billion annually have been estimated to be necessary in the EU in order to achieve a net-zero greenhouse gas economy in the 2050 horizon (EC 2018a). In 2018, annual emissions of labelled green bonds (the major security in the green finance market segment) in the EU can be estimated in less than EUR50 billion (authors’ elaboration on data CBI).

¹⁶Namely, to mainstream sustainable finance it would be needed that environmental and other sustainability-related risks are properly included in the investors’ decision-making processes, market demand is effectively channelled towards sustainable investments, additionality is adequately encouraged by policymakers when needed and the banking sector is fully engaged in the transition. For a more detail dissertation, see also Migliorelli and Dessertine (2019).

technology advances that will help reducing greenhouse gas emission and eventually minimise the dependency from fossil fuels. Policy and technology shifts may however produce considerable side effects as they can result in a rapid and unaffordable obsolescence of a large amount of economic assets.¹⁷ A typical case could be represented by the loss of value of oil companies in a society with 100% of electric cars and green buildings. As a matter of fact, financial stability could also be threatened by policies aiming at fostering sustainability without considering the consequent impact on traditional sectors and disrupted incumbent industries. Hence, it is necessary for climate policies to be backed by an assessment of potentially negative impacts on specific economic actors, and foresee when necessary adapted mitigating and transition measures (e.g. in the form of “transition funds”).

5.4.4 Fostering Economic Resilience to Sustainability-Related Risks

Financial stability may increasingly depend on the economic resilience to sustainability-related risks of the different economic actors. In this respect, the strengthening of the response capabilities to climate and environmental risks in particular (which can eventually translate into physical risks and other risks arising from natural catastrophes) should be considered a key policy objective in the years to come. In principle, such resilience should be endogenously built over time by economic actors, in particular by continuing assessing the potential impacts of sustainability-related risks on their businesses, and planning investments consequently. Nonetheless, the role of public actors in this area is still of the utmost relevance and should consist in at least three concrete actions. First, to raise awareness towards relevant stakeholders on the expected increasing incidence of sustainability-related risks on their business, that can be underestimated due to short-seeing approaches to risk-taking and focus on the specific phase of the business cycle. Second, to ensure that key national and international infrastructures are resilient to sustainability-related risks (and in particular to the ones linked to climate change), in order to avoid major disruptions in trade and business operations. Third, to foster market

¹⁷ Estimates of losses are large and range from USD1 trillion to USD4 trillion when considering the energy sector alone (IAE and IRENA 2017).

discipline and allow better pricing and monitoring of the exposure of businesses to sustainability-related risks, in particular by identifying and set specific disclosure requirements for these risks.¹⁸

5.4.5 *Ensuring Prudential Supervision of the Impact of All Sustainability-Related Risks on Financial Markets*

As of today, only a few authorities in charge of financial stability have started to study the possible incidence of sustainability-related risks on financial risks, by focusing on climate change-related risks and, at a lesser extent, to environmental-related risks (e.g. PRA 2018; ACPR 2019). As the potential impact of sustainability-related risks become more accepted and material, the need for a more structured approach under a prudential supervision perspective also materialises. Among the suitable actions, systematically monitoring the overall exposure and resilience of the financial system to sustainability-related risks and encouraging financial intermediaries to develop specific methodologies for handling such risks conveys particular importance. In addition, an assessment of the existing prudential requirements can also be needed. In fact, it can be argued that existing capital requirements may largely play against the full inclusion of sustainability-related risks in risk management frameworks and increase the possibility of market failures. As the Basel framework adopt a risk-weighted approach to capital consistencies, banks may need to bear increasing capital costs when fully considering sustainability-related risks. Hence, an effort to better integrate such risks into prudential supervision frameworks by verifying the suitability of the existing capital requirements may be also necessary in the mid-term.¹⁹

¹⁸ See also Chapter 4.

¹⁹ The capital requirements set out in the Pillar 1 of the Basel III framework do not consider sustainability-related risks directly (capital is explicitly required only for credit and operational risks related to borrowers that violate environmental regulations), so it can be argued that the Basel III framework is not adapted as such to promote a progressive integration of sustainability-related risks (Cambridge and UNEPFI 2014). Despite the fact it seems attractive to foster green lending by regulatory-based incentives linked to Pillar 1 (e.g. by lowering risk weights or by using other types of “green supporting factors”), the prudential regime should remain fully focused on risk management and any innovation carefully assessed. Weak material incentives (e.g. slightly lowered risk weights for sustainable assets) would probably not change the banks’ investment behaviour, whereas greater incentives may have the undesired effect to incentivise regulatory arbitrage towards exposures that absorb less regulatory capital while still bearing financial risk and existing

5.4.6 *Establishing Global Governance Structures for the Analysis of the Impact of Sustainability-Related Risks on Financial Markets*

The establishment of global structures for the fair assessment of the possible impacts of sustainability-related risks on financial markets can produce considerable benefits when it comes to the need to identify the most effective ways forward to deal with these risks. In point of fact, sustainability-related risks are often originated from the cumulative behavior of actors located in several different countries or even continents. In addition, the response to the threats coming from sustainability-related factors may not be effective if not implemented globally (the fight against the increase of temperatures due to global greenhouse gas emissions is a typical example). A global governance for the sustainability-related risks implies the creation of specific bodies or agencies empowered to discuss relevant items (such as regulation effectiveness, data gathering and sharing, methodological approaches, standards for disclosure) and formulate policy recommendations. The Network for Greening the Financial System (NGFS),²⁰ the Sustainability Accounting Standard Board (SASB)²¹ and the Task Force on Climate-related Financial Disclosures (TCFD)²² represent noteworthy initiatives in this direction, even if limited in scope.

regulatory uncertainties (e.g. related to the definition of sustainable, green or brown assets).

²⁰ Launched at the One Planet Summit in Paris in December 2017 under the initiative of the Banque de France, the NGFS is composed by more than 30 central banks, supervisory bodies and international organisations (including Banco de España, Bank of England, Bank of Finland, Banque Centrale du Luxembourg, Deutsche Bundesbank, European Banking Authority, European Central Bank, Japan FSA, National Bank of Belgium, Oesterreichische National Bank, the People's Bank of China, the Reserve Bank of Australia, Reserve Bank of New Zealand). It aims on a voluntary basis to exchange experiences and best practices, to contribute to the development of environment and climate risk management in the financial sector, and to mobilise mainstream finance to support the transition towards a sustainable economy. In 2019, the NGFS issued the first comprehensive report on climate change as source of financial risk (NGFS 2019).

²¹ The SASB (<https://www.sasb.org/>) is a non-profit organisation that sets financial reporting standards on the issue of sustainability. In this respect SASB standards have as objective to enable businesses to identify, manage and communicate financially material sustainability information to their investors.

²² The TCFD (<https://www.fsb-tcf.org/>) aims at developing voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to

5.5 SUSTAINABILITY-RELATED RISKS AND PRUDENTIAL SUPERVISION

In the last a few years only, first progress has been made by financial stability authorities in understanding how the financial system may be vulnerable to the physical risk of climate change and to risks from a slow response to the need for a transition to an economy with lower carbon emissions (ECB 2019). However, these authorities, which include in particular central banks, still face significant gaps in the availability of assessments of risk management and stress testing frameworks, as well as in the availability of comprehensive and reliable disclosures and the reporting of relevant data, such as carbon emission-related data (ECB 2019; BIS 2020).

As mentioned above, prudential supervision practices should evolve in order to take into account the novelties introduced by sustainability-related risks.²³ In this respect, the NGFS provided in 2019 a high-level roadmap for the integration of climate-related factors into prudential supervision, highlighting a possible course of action. The actions suggested refer to raising awareness and building capacity among firms, assessing climate-related risks, setting supervisory expectations, requiring

investors, lenders, insurers and other stakeholders. The TCFD in particular considers the physical, liability and transition risks associated with climate change and what constitutes effective financial disclosures across industries.

²³In April 2020 Basel Committee published the main results of a survey (BCBS 2020) on the initiatives on climate-related financial risks conduct on 27 Basel Committee members, including the European Central Bank (ECB) and the European Banking Authority (EBA). A large majority of these supervisors detected that they do not have an explicit mandate with regards to climate-related financial risks, but indicated that such risks could potentially impact the safety and soundness of individual financial institutions and could pose potential financial stability concerns for the financial system. Then, these institutions believe they can act within their existing mandate to mitigate climate-related financial risks. Even if the climate-related financial risks are not specifically designated in their regulatory and supervisory framework, most of these supervisory authorities consider these risks to fall implicitly within their existing framework, since the existing prudential framework requests banks to manage all risks of relevance, including climate-related financial risks. However, a few authorities are of the view that climate-related financial risks should be manifested or embedded into the existing risk categories (e.g. credit risk, operation risk, etc.), rather than be considered a new and standalone category of risk. Less than half of the Basel Committee members have issued dedicated supervisory guidance related to the governance, strategy and/or risk management of climate-related financial

transparency to promote market discipline, mitigating risk through financial resources. The full roadmap and related measures is reported in Table 5.2.²⁴

Such a comprehensive approach has indeed the merit to fully consider climate-related risks as elements having an impact on financial risks, and to propose a way forward to gradually put in place a structured prudential supervisory framework to the management of these risks. However, the NGFS's recommendations are not compulsory and the reach of this body is indeed not global (in particular, the United States have not taken part to this initiative). Hence, a certain level of heterogeneity in the responses to this call for action should be expected. In addition, the limitation to climate-related factors (that is, not including among others environmental, social, policy and technology factors) still makes the full management of the impact of sustainability-related risks on financial risks an objective far to be reached. In this respect, the gradual extension of prudential supervisory action to other sustainability-related risks should be encouraged.

risks by banks. The form chosen to this supervisory guidance is guidelines, action plans or supervisory statements, and they are not always legally binding rules. Rather, it is principle-based or interpretations of existing rules. In addition to supervisory guidance, some institutions are working on identifying 'best practices' to mitigate climate-related financial risks and some of these initiatives are being conducted together with private-sector participants. Most supervisors have not yet included some form of the mitigation of climate-related financial risks into the prudential capital framework. However, some institutions are still quite far from being able to quantitatively assess the climate-related financial risks in the context of capital. As such, they have no short-term plans to consider applying Pillar 1 or Pillar 2 requirements for climate-related financial risks. Regarding the potential application of Pillar 2 capital add-ons, several institutions believe that the current Pillar 2 framework offers flexibility to address climate-related financial risks. Under Pillar 2, banks are required to develop the internal capital adequacy assessment process to capture all material risks that are not sufficiently covered under Pillar 1. Such risks would also include climate-related financial risks if they are estimated to be material to the specific financial institution.

²⁴The NGFS also provided a set of six recommendations to enhance the role of central banks, supervisors, policymakers and financial institutions in the greening of the financial system and the managing of and climate change and environment-related risks (NGFS 2019). Namely: (i) integrating climate-related risks into financial stability monitoring and

Table 5.2 High-level roadmap for the integration of climate-related factors into prudential supervision

<i>Course of action</i>	<i>Possible measures by supervisors</i>
Raising awareness and building capacity among firms	<ul style="list-style-type: none"> • Raise awareness of the relevance of climate-related risks publicly and during bilateral meetings; survey firms on the impact of these risks; lay out a strategic roadmap for the handling of climate-related risks • Build capacity by convening events to progress the translation of scientific findings to financial analysis; set up working groups with firms, for example, on incorporating climate issues into risk management or scenario analysis
Assessing climate-related risks	<ul style="list-style-type: none"> • Develop analytical tools and methods for assessing physical and transition risks related to climate change both at a micro- (financial institutions) and macro-level (e.g. the financial system) • Conduct and publish an assessment of these risks at a macro- and micro-level • Analyse potential underlying risk differentials of “green” and “brown” assets. This pre-supposes that the supervisor and/or jurisdiction have agreed on definitions and classifications for “green” and “brown” activities
Setting supervisory expectations	<ul style="list-style-type: none"> • Issue guidance on the appropriate governance, strategy and risk management of climate-related risks by regulated firms • Train supervisors to assess firms’ management of these risks
Requiring transparency to promote market discipline	<ul style="list-style-type: none"> • Set out expectations for firms’ climate-related disclosures in line with the Task Force on Climate-related Financial Disclosure (TCFD) recommendations^a • Consider integrating climate-related disclosure into Pillar 3 [of the Basel framework]

(continued)

Table 5.2 (continued)

<i>Course of action</i>	<i>Possible measures by supervisors</i>
Mitigating risk through financial resources	<ul style="list-style-type: none"> • Consider applying capital measures in Pillar 2 [of the Basel framework] for firms that do not meet supervisory expectations or with concentrated exposures • Based on the risk assessment outlined above, possibly consider integrating it into capital requirements of Pillar 1 [of the Basel framework]

^aSee TCFD (2017)

Source Authors' elaboration on NGFS (2019)

5.6 A NEW ROLE FOR CENTRAL BANKS?

Central banks, in particular in Europe, are gradually emerging as critical actors in the policy action aiming at dealing with the potential financial risks coming from climate change (e.g. BoE 2015; PRA 2018; ACPR 2019), in this way paving the way for a better comprehension of the sustainability-financial risk nexus. Such dynamism has been linked to their prudential supervision mandate and it mainly results in assessing climate risks as a new source of financial risk potentially able to harm financial stability. In this vein, in the most ambitious approaches, the possibility to run “climate change stress tests” is under discussion in order to measure the resilience of financial intermediaries to different climate scenarios.

Nevertheless, when considering the possible role of central banks in ensuring that financial stability is not affected by sustainability-related risks, an additional dimension of action might be discussed. This refers to the possible extension of the central bank's mandate to formally include the support to the attainment of the sustainability objectives. Such an option presents considerable potential benefits, but also engenders some

micro-supervision; (ii) integrating sustainability factors into own-portfolio management; (iii) bridging the data gap; (iv) building awareness and intellectual capacity and encouraging technical assistance and knowledge sharing; (v) achieving robust and internationally consistent climate and environment-related disclosure; (vi) supporting the development of a taxonomy of (environmentally sustainable) economic activities. These recommendations are not binding and reflect the best practices identified by NGFS members.

concrete risks. In practice, this would probably mean to integrate sustainability considerations in the implementation of the monetary policy, by setting specific eligibility criteria for the securities object of the central bank's open market operations of assets purchase or for the banks' marginal deposit operations towards the central bank. Part of the central banks' operations (in terms of a fixed portion, a ceiling or a floor) might hence be reserved to sustainable securities. In this respect, the eligibility criteria to be fixed would eventually need to mirror industry standards as concerns the labelling of sustainable or green securities and consider, when present, existing policy actions aiming at strengthening sustainable finance.²⁵ The main benefit of such an approach would be a strong contribution to mainstreaming sustainable finance, by directing an unprecedented amount of financial resources towards specific sectors or activities (the ones considered to foster a more sustainable economy). Eventually, this will also reduce the incidence of sustainability-related risks and in turn would also shield financial sustainability. Nevertheless, some concrete risks can arise from such an approach. On the one side, underfunding dynamics and higher costs of financing could hit sectors not considered as being sustainable, again potentially triggering wide reductions in related assets values. On the other side, and maybe even more importantly, a further widening of the mandate of central banks beyond the traditional primary objective of maintaining price stability might result in a situation in which the effectiveness of the monetary policy could be

²⁵The labelling of sustainable securities, in particular if needed to drive policy making, is not a straightforward exercise and requires the implementation of a considerable preliminary infrastructure. In this respect, at least two main aspects need throughout consideration. The first concerns the analysis of sectors or activities that can be financed with "sustainable" or "green" funds. The second regards the operational standards (e.g. use of proceeds, management of proceeds, reporting requirements) that need to be followed for labelling a specific security as "sustainable" or "green". For a further dissertation, see Berrou et al. (2019a) and, for the policy activities carried over at the European level in the attempt to mainstream sustainable finance by defining, inter alia, a taxonomy of sustainable activities and correlated labelling standards, https://ec.europa.eu/info/business-economy-euro/banking-and-finance/green-finance_en.

diluted or even endangered.²⁶ For this reason, a throughout prior assessment of the policy and governance implications of such an extension of scope would be necessary.

5.7 SUSTAINABILITY-RELATED RISKS AND FINANCIAL STABILITY: SUMMARY AND PRELIMINARY CONCLUSIONS

As of today, existing evidence is not sufficient to state strong conclusions on the specific impact of sustainability-related risks on financial stability. Nevertheless, first warnings from international and national institutions have already been launched (e.g. BoE 2015; BIS 2020). Realistically, little probability exists that factors such as climate change, environmental degradation, social inequality, policy and technology shifts will cause in the near term a systemic-wise crisis in the financial system. This notwithstanding, such a possibility is expected to become more concrete in the longer term, in particular if the observed trends linked to climate change and environmental degradation will keep consolidating. In this respect, the harm for financial stability can principally derive from a generalised misinterpretation by financial intermediaries of the magnitude of the challenge ahead. For this reason, understanding the direct and indirect consequences of these new sources of risk on their businesses is an essential preliminary condition to safeguard financial stability. Such an awareness would need to be reflected in the evolution of existing risk-management frameworks and in a recalibration of risk-taking strategies in order to consider the profile over time of sustainability-related risks. On the other side, policymakers are also expected (and in some case have started) to act. In particular, a refinement of the prudential supervisory approaches, by also including instruments able to take into account the features of the different types of sustainability-related risks, is today necessary. Such intervention would be more effective if complementary to wider policy actions to be carried over out in the frameworks given by

²⁶One can say that in some jurisdictions fostering sustainability should be already considered as a secondary objective of central banks and, as such, can be treated within the existing statutory functions. For example, the main objective of the European Central Banks (ECB) is to “maintain price stability”. Nevertheless, “without prejudice to the objective of price stability, the ECB may support the general economic policies in the Union. These may include, inter alia, full employment and balanced economic growth”.

the Paris Agreement and the implementation of the Sustainable Development Goals (which, as a by-product, would also allow to reduce the incidence of the sustainability-related risks on the financial risks). In such a context, central banks could assume an unprecedented leading role, as major actors in the supervision of the financial system and potentially able to help mainstreaming sustainable finance. In particular, the integration of sustainability considerations in the execution of the monetary policy would drastically increase the flow of resources directed to finance sustainable activities. However, such possible a new role could carry some relevant drawbacks. This would be principally linked to the need for central banks to consider and integrate a wider policy context and to the possibility to dilute the effectiveness of the monetary policy action in pursuing the primary objective of preserving price stability.

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