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DOI

[10.1093/jfr/fjac002](https://doi.org/10.1093/jfr/fjac002)

Publication date

2022

Document Version

Final published version

Published in

Journal of Financial Regulation

License

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[Link to publication](#)

Citation for published version (APA):

Smoleńska, A., & van 't Klooster, J. (2022). A risky bet: Climate change and the EU's microprudential framework of banks. *Journal of Financial Regulation*, 8(1), 51–74. <https://doi.org/10.1093/jfr/fjac002>

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A Risky Bet: Climate Change and the EU's Microprudential Framework for Banks

Agnieszka Smoleńska* and Jens van 't Klooster**

ABSTRACT

Banking regulation and supervision have a key role to play in realizing the EU's climate change objectives. In this article, we analyse the EU-level initiatives currently underway to decarbonize the banking system, in particular with regard to the microprudential rulebook. We document how regulators work hard to fit climate policy into the existing objectives of the microprudential framework. We also assess whether these efforts are likely to be successful by sketching two ways forward, which involve their own distinct hazards. The first is a 'Deferential Transition', which sees policymakers rely on banks and external rating providers to develop adequate internal risk management procedures while taking a largely agnostic approach as to what methodologies are appropriate. If this is the way forward, we see a number of risks: banks have a clear incentive to downplay risk, while large financial institutions gain a significant advantage and the division of responsibility between banks and supervisors becomes blurred. We also outline the scenario of a 'Guided Transition', in which regulators provide fine-grained guidance on the future that banks should anticipate. Although we broadly think this approach is the more effective route to greening EU banking, we also see challenges of an entirely different sort: regulators will unavoidably face political choices and EU lawmakers will need to consider issues of legality, legitimacy, and accountability. In this regard, we argue, the EU faces a risky bet.

KEYWORDS: sustainable finance, prudential regulation, banking supervision, taxonomy, European Banking Authority

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We would like to gratefully acknowledge helpful comments from Antonio Cabrales Goitia, Clara Isabel González, John Hogan Morris, Christos Gortsos, Kinanya Pijl, David Ramos Muñoz, Wolf-Georg Ringe, Julia Symon, Ulrich Volz and two anonymous referees. We also want to thank the participants in the Expert Group "Draft ECB Guide on climate-related and environmental risks" (September 2020), the 2021 Sustainable Finance Webinar Series of the European Banking Institute, and the 2022 "Central banking beyond price stability" workshop at the University of Amsterdam. Agnieszka Smolenska received support from the National Science Centre, Poland (UMO-2021/40/C/HSS/00134). Jens van 't Klooster received support from the Research Foundation – Flanders (FWO) under Grant 1227920N and the Dutch Research Council (NWO) under Grant 406.18.FT.014.

I. INTRODUCTION

Banking regulation and supervision have a key role to play in the EU's approach to climate change, both for adapting its economy to physical change and for transitioning to climate neutrality.¹

For one, the EU needs to adapt to the physical consequences of climate change.² Extreme weather events threaten coastal real estate and a changing climate will have a major impact on agriculture. Winemaking may no longer be viable in parts of Southern Europe while becoming increasingly attractive in the North. Investments that anticipate the physical effects of climate change help mitigate the impact, while creating new opportunities.

Financial flows will also be key for the EU's transition to climate neutrality. By 2050, the EU economy will require an estimated €30 trillion in investments in renewable sources of energy, making more efficient use of them, and transitioning the industry to new ways of producing.³ Increasingly ambitious climate objectives will require replacing carbon intensive infrastructure, even giving up whole sectors of the economy, while transforming and creating new sectors.⁴ Although public investment—including efforts by public development banks—is key, there can be no transition without the private sector. Climate neutrality will not be achieved without cutting funding for investments that damage the environment and shifting these funds to new, sustainable activities. Banks, accordingly, have a critical role to play in an effective transition.

However, to date—despite banks' vocal support for global climate targets—the facts on the ground show a rather different picture.⁵ Every day, banks issue mortgages for the construction and renovation of real estate according to efficiency standards far below those needed for a climate neutral economy. Fossil fuel companies fund exploration of new reserves with investment grade euro-denominated bonds. European banks even continue to fund new coal-based energy production.⁶ These investments continue because banks lack an adequate understanding of climate and environment related risk (C&E risk). As the European Central Bank (ECB) recently observed, 'few institutions have put in place C&E risk practices with a discernible impact on their strategy and risk profile'.⁷

How is the EU addressing these issues? Within the bewildering range of EU sustainable finance initiatives we distinguish two prongs. The first prong seeks to clarify which individual economic activities contribute to the EU's environmental objectives, including climate change

¹ On climate change and banking law, see Kern Alexander, 'Stability and Sustainability in Banking Reform: Are Environmental Risks Missing in Basel III?' (CISL & UNEP FI 2014); Kern Alexander, *Principles of Banking Regulation* (Cambridge University Press 2019); Seraina N Grünwald, 'Climate Change as a Systemic Risk—Are Macroprudential Authorities up to the Task?' EBI Working Paper 62 (European Banking Institute 2020) <<https://papers.ssrn.com/abstract=3580222>> accessed 2 September 2021; Nathan de Arriba-Sellier, 'Turning Gold into Green: Green Finance in the Mandate of European Financial Supervision' (2021) 58 *Common Market Law Review* 1097; René Smits, 'Elaborating a Climate Change-Friendly Legal Perspective for the ECB' SSRN Scholarly Paper ID 3913653 (Social Science Research Network 2021) <<https://papers.ssrn.com/abstract=3913653>> accessed 28 September 2021. This article focuses on climate change and environmental (C&E) risks, following the emerging central bank terminology. It reflects measures announced up until August 2021, and references legislative proposals and supervisory initiatives until October 2021.

² Sandra Batten, 'Climate Change and the Macro-Economy: A Critical Review' (Bank of England 2018) 706; Yannis Dafermos, Maria Nikolaidi and Giorgos Galanis, 'Climate Change, Financial Stability and Monetary Policy' (2018) 152 *Ecological Economics* 219.

³ McKinsey, 'How the European Union could achieve net-zero emissions at net-zero cost' (Report, 3 December 2020), Adam Tooze, 'Europe's de-carbonisation challenge? "Wir schaffen das"' (Social Europe, 22 March 2021).

⁴ Frederick van der Ploeg and Armon Rezai, 'Stranded Assets in the Transition to a Carbon-Free Economy' (2020) 12 *Annual Review of Resource Economics* 281; Gregor Semieniuk and others, 'Low-Carbon Transition Risks for Finance' (2021) 12 *WIREs Climate Change* 678.

⁵ See e.g. the launch of a new-zero banking alliance in anticipation of the Glasgow COP Climate Action, UNEPFI, '43 Banks Launch Net-Zero Banking Alliance' (UNEPFI, 21 April 2021) <<https://www.unepfi.org/news/industries/banking/43-banks-launch-net-zero-banking-alliance-as-key-part-of-consolidated-glasgow-cop-climate-action>> accessed 1 September 2021.

⁶ RAN, 'Banking on Climate Chaos Fossil Fuel Finance Report' (Rainforest Alliance Network 2021).

⁷ ECB, 'The state of climate and environmental risk management in the banking sector. Report on the supervisory review of banks' approaches to manage climate and environmental risks' (European Central Bank 2021) 2.

adaptation and mitigation, through the Taxonomy Regulation.⁸ These efforts seek to steer capital to products and activities that fit these objectives, while protecting investors from misleading claims ('green-washing'). The taxonomic approach is at the heart of the EU's efforts to green the financial markets, but its classificatory framework has a potentially much wider application.

The focus of our article is on the second prong, which tackles climate change using the microprudential framework for EU banks.⁹ The strict regulatory framework for banks reflects their complex financial positions and their ability to impose risk on depositors, other funders and deposit insurance schemes, as well as their systemic importance.¹⁰ This regulatory framework contains strong levers to shape bank lending by ensuring that banks accurately monitor exposures (risk management) and hold enough capital to offset potential losses (capital requirements).

To incorporate climate change into the microprudential framework, regulators conceptualize climate change as a source of financial risk.¹¹ Formally, the primary objective of these efforts is to ensure that climate change related risks are adequately covered on the banks' balance sheets, effectively providing the latter with direct incentives to green their portfolio. From the perspective of financial stability, policymakers seek to ensure that climate related risks are adequately management and disclosed. They also seek to contribute to the provision of adequate information concerning the impact of climate change on the value of investments. Despite the different objectives in play, policymakers primarily pursue them by ensuring that banks adequately manage C&E risks.

In this article, we analyse the EU-level initiatives currently under way to green the banking system by revising and strengthening the microprudential rulebook, focusing on the 2019 reform of the Credit Requirement Directive (CRD5)¹² and the Credit Requirements Regulation (CRR2).¹³ We document how regulators work hard to fit climate change concerns into the existing objectives of the microprudential framework. We also assess whether these efforts will make a meaningful contribution to mitigating climate change and adapting the EU's economy to it.

Our discussion documents the outlines of an ongoing process that can still evolve in multiple directions. In conceptualizing climate change as a source of risk, regulators have focused on the *identification* of risks, but have been more hesitant to regulate their *evaluation*.¹⁴ When it comes to identification, regulators have in various ways broadened the scope of events and features of investments that could expose a bank to losses. However, merely asking banks to identify risks

⁸ TEG, 'Taxonomy Report' (Technical Expert Group on Sustainable Finance 2020); TEG, 'Taxonomy Report: Technical Annex' (Technical Expert Group on Sustainable Finance 2020). For the Taxonomy Regulation, see n 20.

⁹ In this article we focus on microprudential regulation of banks, ie rules oriented at securing an individual institution's safety and soundness, protecting its depositors and investors. There is equally, however, a systemic dimension to climate change related risks. As such the issue has been also addressed by macroprudential authorities (eg European Systemic Risk Board). See eg Grünewald (n 1), and Pierre Schammo, 'Inaction in Macro-prudential Supervision: Assessing the EU's Response' (2019) 5 *Journal of Financial Regulation* 1.

¹⁰ Daniel K Tarullo, *Banking on Basel: The Future of International Financial Regulation* (Peterson Institute 2008) 16–29.

¹¹ Mark Carney, 'Breaking the Tragedy of the Horizon' (Speech given at Lloyd's of London, 29 September 2015) <<https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability>>\protect\$<relax>\$; NGFS, 'A Call for Action: Climate Change as a Source of Financial Risk' (Network for Greening the Financial System 2019).

¹² Directive (EU) 2019/878 of the European Parliament and of the Council of 20 May 2019 amending Directive 2013/36/EU as regards exempted entities, financial holding companies, mixed financial holding companies, remuneration, supervisory measures and powers and capital conservation measures, [2019] OJ L150/253 (henceforth 'CRD5').

¹³ Regulation (EU) 2019/876 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No 575/2013 as regards the leverage ratio, the net stable funding ratio, requirements for own funds and eligible liabilities, counterparty credit risk, market risk, exposures to central counterparties, exposures to collective investment undertakings, large exposures, reporting and disclosure requirements, and Regulation (EU) No 648/2012, [2019] OJ L150/1 (henceforth 'CRR2').

¹⁴ EBA, 'On Management and Supervision of ESG Risks for Credit Institutions and Investment Firms' (European Banking Authority 2020) 48 (henceforth 'EBA 2020 ESG Risk Discussion Paper').

will not suffice to shape the actions of EU banks.¹⁵ What is needed is for banks to change how they decide whether or not to make certain investments. Effective regulation should shape how banks evaluate their investments.

In light of this situation, what is the right way forward? A major challenge for any approach to the evaluation of risk is the issue of fundamental uncertainty. Both the physical effects of climate change and the economic consequences of the transition typically resist any straightforward quantification of possible outcomes.¹⁶ They involve the interactions of complex systems, subject to discontinuities and tipping points, while any outcome is fundamentally endogenous to regulatory action. For now, there are no widely accepted methodologies for assigning probabilities to most climate related losses, and, as we argue, there are good reasons to doubt that any obviously best methodology will emerge. From a narrow epistemic perspective, accordingly, there is often ample room for reasonable disagreement on how risky any particular investment is. In light of this predicament, we suggest that the EU faces a choice between two strategies, which involve their own distinct hazards.

The first scenario sees regulators staying within their existing approach, which leaves it up to the banks to evaluate C&E risk. We refer to this scenario as that of a 'Deferential Transition'. As part of this scenario, policymakers would continue to focus on supervising bank governance and risk management practices. Supervisors would ask banks to develop adequate internal procedures while taking a largely agnostic approach as to which methodologies are appropriate. Policymakers would continue to adhere to the existing macroprudential framework and leave it to the banks to develop their own risk management methodologies, helped in these efforts by private rating providers. A Deferential Transition would avoid the need for a root and branch reform of banking regulation, while leaving ample room for private sector initiatives to improve risk management and disclosure standards. If this is the way forward, we see a number of risks: banks have a clear incentive to downplay risk, and existing levels of uncertainty leave ample room for this. The approach would also favour large financial institutions and give rise to a blurring of the distribution of responsibility between banks and supervisors when it comes to assessing the accuracy of assumptions.

We also identify a second scenario involving more hands-on supervisory guidance, which we refer to as a 'Guided Transition'. A range of regulatory efforts today go beyond merely asking banks to manage risk effectively. Instead, we see policymakers working on fine-grained rules for how banks should deal with climate risk and how to adapt their lending. As examples of initiatives that fit this scenario, we point to the risk management methodologies proposed by the European Banking Authority (including stress testing and sensitivity analysis) and disclosure requirements linked to the Green Taxonomy.¹⁷ We also highlight pathbreaking supervisory guidance issued by the ECB on C&E risks in 2020 for the banks under its supervision. Although we broadly think that a Guided Transition is the better direction to take, we also foresee challenges of an entirely different sort: regulators and supervisors will unavoidably face political choices and EU law-makers will need to consider issues of legality, legitimacy, and accountability.

The analytic contribution of the article is to provide the reader with an overview and evaluation of the EU's current greening efforts. We also map scenarios and point to challenges that they confront policymakers with. Our aim is not to provide a blueprint for a particular set of

¹⁵ In this article we focus on how climate change considerations are included in EU banking regulation; however, the efforts to green the financial system are also evident in other market segments, eg investment firms and financial market products.

¹⁶ Patrick Bolton and others, 'The Green Swan: Central Banking and Financial Stability in the Age of Climate Change' (Bank for International Settlements 2020); Hugues Chenet, Josh Ryan-Collins and Frank van Lerven, 'Finance, Climate-Change and Radical Uncertainty: Towards a Precautionary Approach to Financial Policy' (2021) 183 *Ecological Economics* 106957; Yannis Dafermos, 'Climate Change, Central Banking and Financial Supervision: Beyond the Risk Exposure Approach' Working Paper (SOAS Department of Economics 2021) 243.

¹⁷ See n 20.

regulatory policies. We show that developments compatible with both scenarios now happen in tandem and often without clear articulation of their underlying logic. Even if the EU's strategy is likely to retain elements of both scenarios, they are clearly distinct and their relative merits should be kept in mind. In this regard we argue that the EU faces a risky bet and should make its choices accordingly.

The rest of the article is structured as follows. In section II, we outline the main features of the EU's regulatory approach to greening the financial system and highlight the conflicting aspects of it. In section III, we sketch out the potential outcomes of the EU's risky bet; we ask whether policymakers should leave the evaluation of risk to banks themselves or provide more substantive inputs into the prudential framework to specify the future that banks should anticipate. Section IV concludes.

II. THE EU'S EFFORTS TO GREEN THE BANKING SYSTEM

Starting with the 2018 Sustainable Finance Action Plan, the EU has made tentative steps to incorporate climate change-related risks into its banking regulation and soft law.¹⁸ Due to the technical nature of this task, policymakers rely heavily on specialized bodies such as the European Banking Authority (EBA) and the Platform on Sustainable Finance to formulate specific rules and advice on further proposals.¹⁹ Our account of these regulatory efforts identifies an overarching duality in the EU's approach (section II.1). In section II.2 we turn to what we take to be key aspects of microprudential regulation reform for banks. In section II.3 we describe how banks and supervisors have adapted to the rules, demonstrating the significant heterogeneity of approaches adopted in practice.

1. A two-pronged approach

The EU has no single approach to greening the banking system. Instead, a wide range of greening initiatives have appeared across the EU's regulatory framework. We distinguish two prongs in its current approach, one focused on the sustainability classification of economic activities and one focused on the microprudential framework for banks.

The first prong is a framework for identifying what investments count as sustainable, through which policymakers seek to create a common ground for determining the environmental impact of different economic activities. The main initiative to date within this prong is the Green Taxonomy, which came into force in 2020.²⁰ In order for an economic activity to count as green (be 'Taxonomy-aligned') it has to make a substantial contribution to at least one of the EU's environmental objectives, not harm any other objectives²¹ and comply with global governance standards.²² The EU's Platform on Sustainable Finance has already developed detailed

¹⁸ European Commission, 'Action Plan: Financing Sustainable Growth' (2018) (henceforth 'SFAP 2018').

¹⁹ Platform on Sustainable Finance is a permanent expert group of the European Commission established under article 20 of the Taxonomy Regulation (see n 20) in order to assist the Commission in developing its sustainable finance policies, notably the further development of the EU Taxonomy.

²⁰ See Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, [2020] OJ L198/13 (henceforth 'Green Taxonomy' or 'Taxonomy Regulation') and the delegated acts on technical screening criteria for environmental activities which substantially contribute to achieving climate change mitigation and adaptation. For comment see eg Christos Gortsos, 'The Taxonomy Regulation: More Important than Just as an Element of the Capital Markets Union' SSRN Scholarly Paper ID 3750039 (Social Science Research Network 2021) <<https://papers.ssrn.com/abstract=3750039>> accessed 22 January 2022.

²¹ The EU's environmental six objectives are: adaptation and mitigation of climate change, protection of water, air quality, and biodiversity, and promoting circular economy. In the article we focus on climate change adaptation and mitigation standards.

²² These include alignment with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the Declaration of the International Labour Organization on Fundamental Principles and Rights at Work and the International Bill of Human Rights (article 18 of the Taxonomy Regulation).

technical screening criteria for over 100 different types of activities to determine whether they contribute to climate change mitigation and adaptation.²³ These activities range from heating and manufacturing to agriculture and tourism. Specific disclosure requirements drawing on the Taxonomy and imposed on both banks and corporates serve to promote sustainable investing throughout the economy. So far, less than 2 per cent of euro area investments falling within the scope of the Taxonomy Regulation can be considered ‘green’.²⁴ Policymakers intend to develop further classification systems for activities that have no environmental impact, eg due to their size (small enterprises) and those which are not significantly harmful to the environment (a ‘yellow’ taxonomy). Although to date there is no ‘red’ taxonomy (ie for activities significantly harmful to the environment), effectively all remaining investments will be in this category. Such a traffic light system differentiates the impact on the environment of specific economic activities, on the basis of the best available knowledge. As such it is quite different from the financial risk based approach which informs the microprudential framework.

In the following section, we focus on this second prong in the EU’s approach. The microprudential prong treats environmental risks, such as climate change, as a potential source of financial risks. It seeks to ensure that banks hold sufficient capital and implement adequate risk management for exposure to climate change related losses. The microprudential prong relies on the existing framework for bank supervision and regulation. Accordingly, it follows the three pillars of the Basel Committee.²⁵ Under Pillar I, the regulatory framework sets the bank’s minimum capital requirements. Capital requirements are determined by the institution’s investments and the credit, trading and operational risks it faces. Under the Standardized Approach (SA), capital requirements are derived from regulatory risk-weights for individual asset classes, often conditional on credit ratings issued by ratings agencies. An Internal Ratings-Based approach (IRB) allows banks to use their own models, which—though approved by the supervisors—give significant leeway when deciding how to evaluate credit risk exposures. The IRB is only used by large banks, while most banks rely on the default SA approach.²⁶ So far, there is no dedicated regulatory risk-weighting treatment for a C&E risk under either approach. Pillar II establishes the supervisory framework within which public authorities assess a bank’s internal risk management and governance. Within its scope, the supervisors can require banks to hold additional capital if they determine the latter are exposed to particular risks. Policymakers are currently working to extend the EU’s Supervisory Evaluation and Review Process (SREP) to cover specifically climate change risk, including by extending the time horizon of policy action. Finally, Pillar III subjects the banks to specific disclosure requirements, which serve to create a route for market discipline exercised by investors.²⁷ In addition, new internal governance rules put in place after the financial crisis of 2007 and 2008 impose broader risk governance duties on

²³ European Commission, Delegated Regulation 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, [2021] OJ L442/1.

²⁴ Lucia Alessi, and Stefano Battiston, ‘Two sides of the same coin: Green Taxonomy alignment versus transition risk in financial portfolios’, JRC Working Paper (JRC European Commission 2021).

²⁵ In the EU, the Basel framework is implemented through the Capital Requirements Directive and Regulation, 2019 Amendment. On the architecture of EU banking oversight see Danny Busch and Guido Ferrarini, *European Banking Union* (Oxford University Press 2015), Christos Gortsos, ‘The Single Resolution Mechanism (SRM) and the Single Resolution Fund (SRF): A Comprehensive Review of the Second Main Pillar of the European Banking Union’ (SSRN Scholarly Paper ID 2668653 (Social Science Research Network 2019) <<https://papers.ssrn.com/abstract=2668653>> accessed 22 January 2022).

²⁶ Brunella Bruno, Giacomo Nocera and Andrea Resti, ‘The Credibility of European Banks’ Risk-Weighted Capital: Structural Differences or National Segmentations?’ Research Paper No 2015-9 (BAFFI CAREFIN Centre 2015).

²⁷ Michael B Gordy, Erik A Heitfield and Jason Wu, ‘Risk-Based Regulatory Capital and the Basel Accords’ in Allen N Berger, Philip Molyneux and John OS Wilson (eds), *The Oxford Handbook of Banking* (Oxford University Press 2014) 553.

the management, for example to create dedicated risk committees, with such duties acquiring a wider systemic dimension.²⁸

The differences between the two prongs do not prevent EU policymakers from combining them. For example, Pillar III disclosures are supplemented with a Green Taxonomy based Green Asset Ratio (GAR), which is the share of Taxonomy aligned investments.²⁹ Mixing environmental and financial considerations underpins the 'double materiality' perspective with which the EU policymakers would like the supervisors and the banks to assess financial exposures.³⁰ A proposed dedicated prudential treatment of C&E risks would lower the mandatory capital for sustainable investments (as a 'green supporting factor').

Despite EU policymakers switching back and forth between these two approaches, it is clear that they are fundamentally distinct. The microprudential pillars are linked by the concept of risk and specifically an assessment of the probability of various events which may materialize and have a negative impact on bank capitalization. By contrast, the Taxonomy framework is not concerned with probabilities or risks to capital or liquidity, but with the expected environmental impact of an investment. The second prong is therefore oriented at encouraging the development of truly green investment opportunities, while remaining agnostic about their financial risk. Consequently specific projects, such as some 'clean' technologies (eg carbon capture and storage, hydrogen), could be assessed positively in terms of their 'greenness', and negatively in terms of their credit or market risk. Before asking in section III about the risks that stem from pursuing such an entangled approach, we first explore the EU's greening efforts as part of the second prong in more detail.

2. Efforts to green the microprudential framework

The 2019 revision of the Capital Requirements package incorporates climate change risks within the three pillars of bank supervision. Here we highlight the unclear trajectory of existing EU sustainable finance regulation. We show that (1) policymakers have ambiguous objectives, while their approach is inconsistent, both (2) across pillars and (3) in terms of how regulators translate environmental factors into financial risks. ESG risks fit awkwardly into the microprudential framework.

First, when one moves beyond the general narrative of policymakers, and looks to the regulation itself, its rationale is often unclear. Microprudential rules generally seek to instil safety and soundness into each individual bank's operations, as well as protecting specific stakeholders such as depositors, investors, and creditors.³¹ EU legislators have on a number of occasions used banking regulations to pursue other policy objectives. A notable example here is the 'SME Supporting Factor', which was explicitly introduced to stimulate SME (small and medium-sized enterprise) financing (article 501 CRR). Likewise, the most recent amendments to the regulatory framework propose an Infrastructure Supporting Factor to incentivize lending for long-term project finance. In cases where the EU legislature introduces such incentives this is typically made clear in the recitals to the legislation. For example, the Capital Requirements

²⁸ Stefan Grundmann, 'The Banking Union Translated into (Private Law) Duties: Infrastructure and Rulebook' (2015) 16 *European Business Organization Law Review* 357.

²⁹ The GAR is calculated as the percentage of Taxonomy-aligned assets in the turnover, capital expenditure (CapEx) and operating expenditure (OpEx). EBA, 'Advice to the European Commission on Disclosures under Article 8 Taxonomy Regulation' (European Banking Authority 2021).

³⁰ European Commission, 'Strategy for Financing the Transition to a Sustainable Economy' (2021) 3 (henceforth: '2021 Sustainable Finance Strategy').

³¹ This contrasts with macroprudential oversight which concerns the system as a whole and serves to prevent the emergence of bubbles. See the work of EU's macroprudential oversight agency, the European Systemic Risk Board on climate change, eg ESRB, 'Positively green: Measuring climate change risks to financial stability' (European Systemic Risk Board 2020). Though note the specific reference to 'sustainability' of the financial markets in article 3(1) of the ESRB Regulation (Regulation (EU) No 1092/2010 of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board, [2010] OJ L331/1).

Table 1. Summary of ESG risk incorporation across pillars of EU bank supervision

Basel framework	Article	Scope	Actor responsible	Timeline
Pillar I— Regulatory capital requirements	501 CRR2	Assessment of dedicated prudential treatment of exposures related to assets or activities associated substantially with environmental and/or social objectives	EBA	By 28 June 2025 (Anticipated to 2023 by the 2021 Sustainable Finance Strategy (n 31))
Pillar II— Supervision	98(8) CRD5	ESG risk definition, proposals on ESG risk assessment methodologies, feasibility of incorporating ESG risks into SREP	EBA	Delivered on 23 June 2021
Pillar III— Disclosures	449a CRR2	Mandatory (biannual) disclosure of ESG risks following EBA Pillar III report	EBA, European Commission	EBA standards published in January 2022, application delayed to end-2023

Regulation it is explained that the ‘SME Supporting Factor’ aims to support access to finance for small businesses as these are ‘one of the pillars of the Union economy given their fundamental role in creating economic growth and providing employment’.³²

It is therefore surprising that we find no explicit rationale for the insertion of ESG risks into the microprudential framework in 2019. This absence of an explicit reference to EU’s environmental objectives contrasts with the corporate sustainability disclosure framework, which makes ample references to global commitments on climate change action and the unique role which the financial sector is to play in this context.³³ Background interviews we have conducted point to the frantic pace of work on the CRD5/CRR2 legislative file as the reason for this omission.³⁴ Articles on ESG risk were incorporated into the framework as an off-hand concession by the EU Council to the European Parliament.

a. Inconsistency in ESG risk treatment across the pillars of the microprudential framework

The ambiguous objectives of the policymakers are also evident in how the CRR2/CRD5 reform incorporates ESG risks, and therefore climate change concerns, differently for each of the three pillars we discussed in section II.1 (see Table 1).

³² Recital 44 of Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012, [2013] OJ L176/1 (henceforth ‘CRR’).

³³ See eg ‘As the Union is increasingly faced with the catastrophic and unpredictable consequences of climate change, resource depletion and other sustainability-related issues, urgent action is needed to mobilise capital not only through public policies but also by the financial services sector’, Recital 8 of Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, [2019] OJ L317/1 (henceforth ‘SRDR’).

³⁴ Interview with EU Official, June 2021.

ESG risk treatment is least concrete in Pillar I. There are no specific prudential capital requirements such as a dedicated risk-weighting for assets exposed to climate change-related risks.³⁵ Rather, article 501c CRR2 provides that the EBA should carry out an analysis of whether such treatment is warranted by June 2025. To this end, the legislators have asked specifically for: (a) a review of methodologies for the assessment of the effective riskiness of exposures of assets and activities related to environmental objectives; (b) the development of appropriate criteria for the assessment of physical risks and transition risks; and (c) the assessment of financial stability and bank lending effects of a dedicated prudential treatment of *inter alia* climate change related exposures. CRR2 requires that the European Commission come up with any legislative proposals only on the basis of the EBA's above-mentioned analysis. The European Commission anticipated the reform by committing to the delivery of the EBA's assessment by 2023 in the renewed sustainable finance strategy.³⁶

CRD5 is more concrete with regard to the inclusion of ESG risks in SREP (Pillar 2).³⁷ Article 98(8) CRD5 asks the EBA to assess whether to include ESG risks into the supervisory process. In the report presented in June 2021, the EU agency makes a number of recommendations for how to do this. First, EBA recommends defining ESG risks, including climate change-related risks, as 'risks that stem from the current or prospective impacts of ESG factors on their counterparties or invested assets'. It emphasizes that ESG risks materialize through the traditional categories of financial risk (credit risk, market risk, operational and reputational risk, etc).³⁸ The report further defines three separate approaches to managing ESG risk, namely (i) a portfolio alignment method, (ii) a risk framework (stress testing and sensitivity analysis); and (iii) an exposure method. Acknowledging the potential negative impact of ESG risks on bank balance sheets, the EBA recommends changes in banks' internal governance (adaptation of business strategies, organizational improvements, risk management framework) and supervision (assessment of business models, internal governance, risks to capital, liquidity and funding; also for the purpose of SREP capital add-ons). A key recommendation is to extend the time horizon of the supervisory process to 10 years. Building on the EBA's analysis, the European Commission made legislative proposals in October 2021.³⁹

Finally, the rules are most concrete with regard to Pillar III. Article 449a CRR2 imposes standardized mandatory risk disclosure requirements, under which large banks should disclose information on physical and transition risks by June 2022. In the second quarter of 2021 the EBA consulted market participants and stakeholders on the implementing regulation which will introduce the template for such disclosures. This template, published in January 2022, includes specific tables for qualitative and quantitative ESG risks, climate change transition risk, and climate change physical risks, as well as 'quantitative information on mitigating actions on climate-change related risks'. These technical rules combine the implementation of article 449a CRR2 with GAR disclosures under articles 3 and 9 of the Green Taxonomy.⁴⁰

The discrepancy in time horizons and scopes of ESG risk inclusion under the CRR2/CRD5 regime creates confusion and unnecessary complexity. It is unclear, for example, to what extent

³⁵ With the exception of certain environmental liabilities under Basel Pillar I, see Adrienne Coleton and others, 'Sustainable Finance—Market Practices' Staff Paper DZ-AH-19-003-EN-N 16 (European Banking Authority 2019).

³⁶ 2021 Sustainable Finance Strategy (n 31).

³⁷ Further on the impact of the reform on the mandates of EU agencies and supervisors see Arriba-Sellier (n 1).

³⁸ EBA, 'Report on Management and Supervision of ESG risks for credit institutions and investment firms' (European Banking Authority 2021) (henceforth 'EBA 2021 ESG Risk Report').

³⁹ European Commission, 'Banking Package 2021: new EU rules to strengthen banks' resilience and better prepare for the future' (27 October 2021).

⁴⁰ See the templates available on the EBA 'Pillar 3 Disclosures' (European Banking Authority 2022) <<https://www.eba.europa.eu/eba-publishes-binding-standards-pillar-3-disclosures-esg-risks>> accessed 17 March 2022.

the ESG risk approach pursued under Pillar III will find application in Pillar I. Delayed implementation of the rules, despite the fact that there is already pressure for supervisors to include such considerations into SREP (see section II.3) further risks time inconsistency in policy implementation and questioning of the legitimacy of the decisions taken by supervisors.

b. Tenuous riskification of environmental factors

A final ambiguity concerns how regulators intend to map C&E risks onto the microprudential framework.

The EBA Report on ESG risks proposes a three-step approach to determine how climate change impacts a bank's financial position.⁴¹ First, it identifies the relevant environmental factors in light of existing EU legislation. Such factors include greenhouse gas emissions, energy consumption and efficiency, and the carbon footprint of an activity. They may be both positive and negative; however, it is only the latter that are relevant for the risk assessment framework. Second, banks should assess the risks associated with the negative factor impact through specific risk drivers, namely physical change and transition actions. The latter are transmission channels which determine how specific environmental factors may bring about negative physical (eg floods, droughts) or policy (eg new tax regimes) consequences. Finally, banks should assess the resulting risks by analysing their counterparty's risk profile and credit worthiness.

However, developing a methodology for the assessment of such risks is by no means straightforward and in practice efforts are not clearly focused on financial risks. None of the three ESG risk assessment methodologies proposed by the EBA in the 2021 Report make extensive use of the framework described in the previous paragraph. The first two—portfolio alignment and exposure methods—focus on assessing whether the bank's portfolio is aligned with global commitments (eg investments contributing to climate change mitigation) or limiting particularly environmentally harmful investments (eg in coal plants). Scenario analysis and stress testing start off from an identification of risks, but rather than assigning probabilities to them, these methodologies explore what would happen to the bank's balance sheets were they to materialize. There is a discrepancy between the elaborate processes for turning environmental factors into financial risks and the selective application of methodologies.

That discrepancy is perhaps unsurprising given the difficulties in incorporating ESG factors into risk frameworks in general. As the EBA recalls, environmental considerations are not traditionally conceived of in risk terms, and have hitherto been mainly treated as negative externalities which go beyond the impact on individual banks, and more generally such factors are more sensitive to public policy changes.⁴² Meanwhile, the project of incorporating C&E risks into banking regulation is about recognizing the extent to which private capital is in fact supporting the unsustainable state of the economy, and that without the transition of the banks' balance sheets it will be nigh impossible to shift the economy as a whole. We further explore the difficulties this project creates and how they may be addressed in section III.

3. Bank greening in practice

Anticipating future mandatory requirements and responding to growing public pressure for banks to stop financing environmentally harmful activities, some banks have already begun developing their own ways of governing risks related to sustainability, eg by including environmental factors in existing risk categories (credit, market, operational risk etc). Likewise, the slow pace of the microprudential framework reform and the inconsistencies in the EU's approach have not prevented some supervisors from taking action. However, the EU banking supervisors

⁴¹ EBA 2021 ESG Risk Report (n 24) 29.

⁴² EBA 2020 ESG Risk Discussion Paper (n 14).

for now lack a coordinated and harmonized approach to incorporating climate and ESG risks into the microprudential framework.

a. Current rules defer to banks and credit rating agencies

Despite vocal claims of greening by large financial institutions, in practice a lot remains as it was. Reclaim Finance estimates that between 2016 and 2020 banks invested almost 4 trillion euro in fossil fuel projects globally.⁴³ Furthermore, though banks are increasingly concerned about climate change, especially for reputational reasons, they lack specific skills, including scientific ones, to properly assess climate related risks. A recent study carried out for the European Commission by BlackRock finds that 'the majority of interviewed banks (83%) stated that they have strategies in place for the integration of ESG into lending and investments'.⁴⁴ However, a more critical ECB study finds that the EU's largest banks 'do not have the tools to assess the impact of climate-related and environmental risks on their balance sheet' and 'only a small number of institutions have fully incorporated climate-related and environmental risks into their risk management framework'.⁴⁵ A 2020 EBA survey suggests that banks' approaches to managing climate change related exposures vary substantially. Generally, the exposure and portfolio alignment method dominate, with 38 per cent of surveyed credit institutions adopting some balance sheet targets or exposure limits adopting exclusion criteria (eg related to coal-related investments). More advanced risk-based methodologies are rarer. Only 13 per cent of banks address ESG risks within the scope of Internal Capital Adequacy Assessment Process (ICAAP) and 15 per cent include climate related risks in their risk governance in the form of stress tests or scenario analysis.⁴⁶ In such cases banks rely on climate change scenarios developed by international organizations (UNEP FI, IEA) or specialized private consultancies (eg Oliver Wyman), which suggests the absence of in-house expertise.⁴⁷

There is some evidence that large banks are taking ESG risks on board as part of internal governance arrangements. One study of large European banks finds that they all discuss ESG topics in board committee meetings and nine out of 24 have a risk committee dedicated to this topic.⁴⁸ It is difficult to say, however, how effective these measures really are. It is also doubtful whether 'dedicated climate change governance' can be easily replicated by smaller institutions.⁴⁹ In fact, the specific challenges associated with climate change risks (data, uncertainty, specialist knowledge, proportionality of requirements) are a barrier to the inclusion of such considerations into internal governance.⁵⁰ Although the situation on the ground is quickly evolving, for now banks remain stuck in 'business as usual'.

Credit rating agencies, which are indispensable for the banks' evaluation of risk exposures, have taken a similarly reactive approach. The providers of ratings used by banks have begun to include ESG considerations in their methodologies; however, their practice remains confounded by factors such as the longer time horizon of C&E risks, the different routes pursued by supervisors, and a lack of clarity as to the climate change scenarios that have been chosen

⁴³ Reclaim Finance, 'Banking on Climate Chaos' (2021) 4.

⁴⁴ BlackRock Financial Markets Advisory, 'Development of tools and mechanisms for the integration of environmental, social and governance (ESG) factors into the EU banking prudential framework and into banks' business strategies and investment policies' (May 2021).

⁴⁵ ECB, 'Guide on Climate-Related and Environmental Risks' (European Central Bank 2020) 14 (henceforth 'ECB C&E Guide'). The survey covers all Single Supervisory Mechanism (SSM) banks as well as some smaller banks to reflect 44 per cent of the sector.

⁴⁶ Coletan and others (n 36) 18.

⁴⁷ *ibid* 24.

⁴⁸ BlackRock Financial Markets Advisory (n 45)

⁴⁹ BlackRock Financial Markets Advisory (n 45) 47–48.

⁵⁰ Deloitte, 'Zmiany klimatyczne i banki. Pytania na temat ryzyka klimatycznego i ESG, jakie powinny sobie zadać rady nadzorcze' (Report, 2021) <<https://www2.deloitte.com/pl/pl/pages/zarzadzania-procesami-i-strategiczne/article/s/zmiany-klimatyczne-banki.html>> accessed 10 October 2021.

by policymakers.⁵¹ Such ratings in any case focus purely on the financial risk posed by the assessed asset, and not on the environmental impact of the investment. The growing regulatory emphasis on ESG has empowered specialized providers of ESG assessments, who offer services such as external verification of green financial products. Both the credit rating agencies and the specialized providers of sustainability analytics face the well-known problems of conflicts of interests vis-à-vis their clients. The EU has been working on regulation of sustainability ratings since 2018, when the European Commission vowed to assess the need to mandate that credit rating agencies explicitly integrate sustainability factors into their assessments.⁵² The progress on these reforms has been stalled, with only initial (non-binding) guidelines on disclosure published by European Securities Markets Agency (ESMA).⁵³ The ECB has announced a review of the credit ratings used in its collateral framework to ensure rating agencies improve their treatment of C&E risk.⁵⁴

b. Supervisors adopt different approaches

Bank supervisors lack specific guidance from the regulators as to the treatment of ESG risk in the SREP (see section II.2). Nonetheless, some are already taking action. The Basel III framework gives supervisors tools to do this. To the extent that supervisors can impose bank specific requirements, they may treat C&E risk exposures as a matter of particular concern. They can assess banks' business strategies and business processes, evaluate their internal governance and institution-wide controls, and consider climate specific risks to capital (standard categories of credit, market, operational risk). That assessment could result in additional Pillar II capital requirements. Furthermore, though supervisors cannot create generally applicable binding rules, they may issue guidance as to how they plan to assess particular regulatory requirements so as to influence banks' expectations of supervisory practice and therefore influence the latter's behaviour.⁵⁵ They can also impose individual bank requirements in light of their particular risk profile.

EU supervisors currently adopt different approaches. So far, only the Hungarian Central Bank (MNB) has introduced a preferential capital requirement treatment for sustainable investments (in this case loans to finance improvements in energy efficiency).⁵⁶ Most supervisors are focusing on improving bank governance of internal processes and building a common understanding with banks of the ESG risk exposure, in anticipation of the more stringent rules (see section II.2). C&E risks have risen to particular prominence in the Banking Union, where the ECB has taken a more comprehensive approach in order to foster convergence among the largest euro area banks, which to date have taken very different approaches.⁵⁷

An important initiative is a 2020 Guide on climate related and environmental risks that will inform SSM banking supervision of banks in the Banking Union (including in Bulgaria and

⁵¹ See eg S&P, 'ESG In Credit Ratings Newsletter' (2021).

⁵² SFAP 2018 (n 18).

⁵³ Further impact assessment of methodologies and possible regulatory action is foreseen for 2022–2023 as per 2021 Sustainable Finance Strategy (n 31). In February 2022 ESMA launched a dedicated call on ESG ratings as part of a broader sustainability strategy to ensure coherence of sustainable finance regulation, implement new EU regulations and enhance the understanding of how the sustainability turn affects various market segments. ESMA, 'Sustainable Finance Roadmap 2022–2024' (European Securities and Markets Agency 2022) <<https://www.esma.europa.eu/press-news/esma-news/esma-prioritises-fight-against-greenwashing-in-its-new-sustainable-finance>> accessed 15 February 2022.

⁵⁴ ECB, 'ECB presents action plan to include climate change considerations in its monetary policy strategy' (European Central Bank 2021) <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708_1~f104919225.en.html> accessed 15 February 2022.

⁵⁵ Alberto de Gregorio Merino, 'The ECB's Regulatory Powers, Their Scope and Their Judicial Review' in Chiara Ziloli and Karl-Philipp Wojcik (eds), *Judicial Review in the European Banking Union* (Oxford University Press 2021) 333.

⁵⁶ MNB, 'Notice on the criteria for the Preferential Green Capital Requirement Treatment for housing Loans' (4 February 2021) <<https://www.mnb.hu/letoltes/notice-preferential-green-capital-requirement.pdf>> accessed 1 September 2021.

⁵⁷ ECB, 'The state of climate and environmental risk management in the banking sector' (n 7).

Croatia, which joined in October 2020). The document outlines how the ECB—in light of the various initiatives taken at EU level in the area of climate change—intends to incorporate concern for greening the banking system in its supervisory actions. As such, it will be an important reference point for other supervisors, including the national supervisors in the Banking Union and others across the EU.

The Guide lists of 13 expectations regarding how C&E risks should be treated in a bank's business strategy, management and disclosure. By formulating expectations on these issues, the ECB tells banks how it will interpret existing legal requirements. Making C&E risk a part of the supervisory process also serves to 'enhance the industry's awareness of and preparedness for managing climate-related and environmental risks', since this is not yet the case. Such expectations touch upon the internal governance, where the ECB provides the banks with guidance as to how it expects them to address the climate change risks in their risk appetite strategies, for example through the risk committees assessing 'whether the prices of assets offered to clients take the business model and risk strategy fully into account'.⁵⁸ This suggests that the ECB may soon be taking a closer look at banks' pricing systems, and take supervisory action if it is not satisfied with the result.

On a financial system level, some supervisors are developing dedicated climate change stress tests. In the EU, the Dutch Central Bank (DNB) has been at the forefront of implementing macroprudential climate related stress tests, with one in 2018 specifically focused on energy transition risk. The French supervisory authority (ACPR) carried out a pilot exercise on climate related risks in 2020. This exercise encouraged banks to develop methodologies to assess climate related risks, build up capacity to strategically react to climate risks, and assess implications of systemic effects of climate change.⁵⁹ The ECB has already carried out a macroprudential stress test in 2020–2021 with the intent of improving its understanding of systemic risks. A microprudential exercise to stress test the resilience of individual banks with regard to C&E risks will follow in 2022.⁶⁰ These stress tests rely on climate change scenarios developed jointly by central banks through the Network for Greening the Financial System (NGFS).⁶¹

In contrast to these proactive initiatives, a number of supervisors remain on the side-lines of the greening efforts. For example, authorities in Czechia and Bulgaria are not even part of the NGFS, which organizes cooperation and exchange between monetary and macroprudential authorities across almost a hundred countries. Further, these authorities have taken no steps to incorporate ESG risk assessment into the prudential framework, which shows the scope of discretion which EU supervisors enjoy to cover—or not—C&E risks under the current microprudential rules.⁶²

III. THE WAY FORWARD: HEADS OR TAILS?

We now turn to the way forward. How should the EU address the specific challenge of the transition to a net zero economy and adaptation to climate change in revising the microprudential framework for banks?

⁵⁸ ECB C&E Guide (n 46) 37.

⁵⁹ EBA 2020 ESG Risk Discussion Paper (n 14) 66–67.

⁶⁰ ECB, 'Climate risk stress test: SSM stress test 2022' (European Central Bank 2021) <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.climate_risk_stresstest2021-a4de107198.en.pdf> accessed 24 December 2021.

⁶¹ Luis de Guindos, 'Shining a light on climate risks: the ECB's economy-wide climate stress test' (ECB Blog Post 18 March 2021) <<https://www.ecb.europa.eu/press/blog/date/2021/html/ecb.blog210318-3bbc68ffc5.en.html>> accessed 1 September 2021.

⁶² This is not to say that the local banking sector is oblivious to the coming requirements, although the lack of supervisory guidance increases uncertainty. See eg PwC Poland, 'How will ESG change the banking sector and corporate financing?' (2021) <<https://www.pwc.pl/en/publikacje/green-finance-in-poland-how-will-esg-change-the-banking-sector-and-corporate-financing.html>> accessed 1 September 2021.

As the previous section has documented, a bewildering range of initiatives are underway to incorporate climate change-related risks into banking governance. It is too soon to say where the EU's regulatory initiatives are heading; the future trajectory of the framework is itself uncertain. Rather than making any predictions about its future, we will distinguish two currently plausible scenarios. We also investigate these different scenarios to ask which is the most attractive way to align bank lending with the EU's environmental objectives.

The pivotal issue going forward, we contend, is who will decide how to deal with future events that are currently unknown. Will policymakers leave the evaluation of climate change related risk for the private sector to navigate within the existing microprudential framework? Or will regulators and supervisors provide more substantive guidance to specify the future that banks should anticipate? Because both scenarios involve clear hazards, we characterize this choice as a risky bet.

As we explain in section III.1, fundamental uncertainty precludes translating climate related exposures into accurate probabilities of losses. Hence, for now, innovation in risk modelling is unlikely to result in straight-forward prescriptions. Building on that analysis, we sketch two scenarios for how the EU's regulatory approach may play out. In section III.2, we explore a scenario where policymakers leave the decision of how to evaluate risk largely to the individual financial institutions, subject to the SREP review. We describe this scenario as a Deferential Transition because it defers to banks, credit rating agencies, and other private sector providers in deciding how to evaluate risk. If this is the way forward, we see a number of risks: banks have a clear incentive to downplay risk, for which existing levels of uncertainty leave ample room. The scenario will also favour large financial institutions and give rise to a blurred distribution of responsibility between banks and supervisors where it comes to the accuracy of assumptions.

To avoid these risks, regulators need to successfully link the EU's emerging vision of a climate neutral economy to the micro-level of the banking system. In section III.3, we therefore turn to a second scenario, which sees policymakers provide banks with fine-grained guidance on how to evaluate C&E risk and jointly develop long-term transition plans (Guided Transition). Although we broadly favour this scenario, it will involve challenges of an entirely different sort: regulators and supervisors will unavoidably face political choices and will need to consider issues of legality, legitimacy, and accountability. We summarize the two scenarios and their implications across the pillars of banking regulation in [Table 2](#).

1. Climate risk and fundamental uncertainty

The pace of industrial transformation that is needed to respond to climate change lacks any clear historical precedent. As a consequence, we do not currently know the shape that efforts to achieve climate neutrality and protect the EU economy against climate change effects will take. However, to effectively manage risk, institutions need not only to identify risk, but also to evaluate how to act on it. Institutions need to make actionable choices on whether to make certain investments in light of the associated risks.

Within the EU's current regulatory framework, the imposition of capital requirements is solely justified with reference to the financial consequences of climate related exposures (see section II.2). Similarly, the supervisory perspective is focused on evaluating risk management practices with an eye on financial exposures. A key problem that regulators and supervisors face is epistemic: banks often do not know which exposures and risks are relevant and in what way. As a consequence, they do not incorporate them into their risk management practices nor disclose the risks they face to investors.⁶³

⁶³ ECB, 'ECB Report on Institutions' Climate-Related and Environmental Risk Disclosures' (European Central Bank, 2020).

Table 2. Deferential and Guided Transition for greening banking lending

Basel framework	Deferential Approach—led by banks and external ratings providers	Guided Transition—led by regulators and supervisors
Pillar I—Regulatory capital requirements	Banks and credit rating agencies improve their capacity to assign risk-weights to C&E risk (potentially subject to new regulatory standards)	Regulators set out forward-looking prudential rules for C&E risk on the basis of EU climate neutrality strategy
Pillar II—Supervision	Banks set their strategy and risk management for C&E risk subject to <i>ex post</i> supervisory evaluation in the SREP	Supervisors issue binding guidance on how banks should ensure strategy and lending is compatible with EU climate strategy, including through new transition plans required by legislation
Pillar III—Disclosures	Banks and external providers develop metrics to disclose C&E risk and ESG compliance with limited verification of data and criteria	Regulators set binding templates for disclosure of C&E risk and ESG compliance on the basis of EU climate neutrality strategy

With regard to financial outcomes, it is common to distinguish between certainty, risk, and uncertainty.⁶⁴ An agent is certain when a specific outcome materializes in every possible future state of the world. An agent faces risk when there are different possible outcomes, but each has known financial consequences and the agent knows the probability of each outcome. Fundamental uncertainty exists when agents lack sufficient evidence to assign probabilities to each possible outcome or even distinguish all possible outcomes. As Keynes explained in a famous passage:

The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know.⁶⁵

Many climate change related losses are fundamentally uncertain today. Not only is much of the data that would be required for estimating risk not yet available, the physical changes that will occur and the transition measures that will be taken to mitigate them are still unknown.

We can consider future energy use to get a sense of the types of unknowns that are crucial to managing the risks associated with climate change. The majority of the climate transition scenarios compatible with 1.5 degrees warming involve a rapid transition to renewable energy sources

⁶⁴ Frank H Knight, *Risk, Uncertainty and Profit* (Houghton Mifflin Company 1921); John Maynard Keynes, *A Treatise on Probability* (Macmillan and Co 1921); John Maynard Keynes, 'The General Theory of Employment' (1937) 51 *The Quarterly Journal of Economics* 209; Jochen Runde, 'Keynesian Uncertainty and the Weight of Arguments' (1990) 6 *Economics & Philosophy* 275; Marc Lavoie, *Post-Keynesian Economics: New Foundations* (Edward Elgar Publishing 2014).

⁶⁵ Keynes, 'The General Theory of Employment' (n 65) 214.

combined with battery and hydrogen-based energy storage.⁶⁶ However, not everyone shares this pessimistic view of fossil fuels. Consider Royal Dutch Shell's transition strategy, which assumes a roughly constant use of fossil fuels combined with massive carbon capture efforts and newly planted forest.⁶⁷ Their vision of the future rests on a pessimistic view of the competitiveness of renewable energy, together with highly optimistic predictions of developments in reforestation and carbon capture technology—largely unproven and potentially expensive. In Shell's vision of the future, the EU will reforest 220,000 km² (about half the area of Spain) to remove 300 million tonnes of CO₂ emitted. This allows Shell to continue its present business model and even sees profitable investments in exploration for \$1.5 billion annually until 2025.

What should we make of these large unknowns? And how do they impact banking regulation? A probability distribution can be inferred from past observations when it can be assumed that the event is equally likely to occur in the future. However, for some types of financial market events, very limited evidence is available for estimating their probability. If it is not appropriate to make that inference, there is no adequate evidential basis for assigning a probability to a future event.

Following the EBA approach we introduced in section II.2, we take successfully addressing that challenge to have two epistemic preconditions: *identification* and *evaluation* of risk.⁶⁸ The identification of risk concerns the specification of exposures that banks should take into account in their internal risk management and reflect in their business strategy. Regulators have in various ways broadened the scope of events and features of their investments that could expose the bank to losses. The issue of identification logically precedes risk-weighting of assets: only once the features have been identified that need to be taken into account to determine the risk-weighting, does it become possible to determine the risk-weight.

As we saw, the current efforts to green the microprudential framework not only seek to broaden the risk categories that banks identify, but also increasingly touch on the evaluation of these risks. For now, bank internal risk models and the credit ratings that banks rely on are not suited for dealing with climate change. Both use historical default rates to estimate future potential losses. Their credit assessments represent quantitative predictions of potential losses based on financial indicators and observed default frequencies. However, such backward-looking methodologies are blind to risks that have not historically occurred; like the proverbial black swan, climate change will result in historically unprecedented green swan events.⁶⁹

Changing the evaluation of risk is essential for shaping bank credit provision. After risks have been identified, banks can still deal with them in various ways in the process of extending credit. Merely asking banks to identify risks does not suffice to prevent excessive risk-taking and ensure an efficient allocation of credit. However, although regulators have started to look at the evaluation of risk, they remain very hesitant to specify how banks should quantify exposures and adapt their business decisions in the light of potential climate related losses. Instead, supervisors have sought to incentivize banks to develop their own procedures while taking a largely agnostic approach as to what methodologies are appropriate.

For now, there are good reasons to doubt whether methodologies can be found to assign meaningful probabilities to most climate change related losses, in particular over the medium

⁶⁶ IEA, 'Net Zero by 2050: A Roadmap for the Global Energy Sector' (International Energy Agency 2021); Matthew Ives and others, 'A New Perspective on Decarbonising the Global Energy System' (Smith School of Enterprise and the Environment, University of Oxford 2021), Report 20–04.

⁶⁷ Royal Dutch Shell, 'A Climate Neutral EU by 2050' (Shell International BV 2020) <<https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/scenario-sketches/new-sketch-a-climate-neutral-eu.html>> accessed 1 September 2021.

⁶⁸ The EBA further distinguishes 'action' but our focus here is on the epistemic stages that are a precondition for action.

⁶⁹ Bolton and others (n 16).

and long-term. Rather than hoping to overcome existing limitations of risk-modelling techniques, we contend that the relevant future outcomes are typically fundamentally uncertain.⁷⁰ This has an important impact on scope for potential approaches that work within the existing microprudential framework.

Why should climate risk be different from conventional risks imposed on the banks as a consequence of market dynamics? Consider four key aspects: complexity, tipping points, time horizons, and endogeneity.⁷¹

First, complexity. Both the climate and the economy are complex interactive systems in which the outcome of a specific event depends on feedback from other parts of the system. Feedback can be positive such that an individual dynamic is strengthened by events elsewhere in the system. It can also be negative when events elsewhere serve to counteract it. The effects follow discontinuously from an increase of the cause.

Second, tipping points. Both the physical effects of climate change and the pathway of economic transition involve critical tipping points, after which change becomes irreversible. These tipping points can trigger further tipping points to cascade through the system. When it comes to the physical effects of climate change, tipping points and cascades create risks that resist quantification.⁷² More optimistically, the transition towards a green economy may involve positive feedback effects and tipping point cascades that, again, resist quantification.⁷³

Third, climate related risks play out over a much longer time horizon.⁷⁴ The Intergovernmental Panel on Climate Change (IPCC)'s representative concentration pathways focus on a time horizon that extends to the end of the twenty-first century. This contrasts markedly with the 1–3 year time horizon that is typical for existing quantitative risk management methodologies and microprudential supervision.

Finally, which risks will materialize is not exogenous to policy. A quick transition will reduce physical risks, but exacerbate transition risk. If financial regulation supports a transition focused on renewable energy, a crucial tipping point may quickly make fossil fuel based projects economically unviable even if cheaper carbon capture technologies are developed. Conversely, a transition in which fossil fuels continue to play a major role may preclude certain positive tipping point cascades of the renewable strategy from materializing. Hence, there may be no way to accurately manage risk without already assuming a specific way of regulating finance to begin with.

Uncertainty, of course, does not preclude the possibility of dealing effectively with climate change. In the face of fundamental uncertainty, however, regulators and financial institutions need to make choices on how to identify and evaluate risks. Following Michael Power, we may describe the process by which an organization agrees on a way of dealing with uncertainty as that of 'organizing' it.⁷⁵ Organizing uncertainty does not take away uncertainty, but rather puts into place practices for dealing with it. It creates assumptions regarding possible outcomes, their likeliness and what should be done to prevent adverse outcomes that allows organizations to act in the face of uncertainty. It requires identifying potential outcomes and preparing actionable evaluations to decide which of the potential outcomes financial institutions can permissibly expose themselves to. Organizing uncertainty does not require knowledge of probabilities.

⁷⁰ Bolton and others (n 16); Chenet, Ryan-Collins and van Lerven (n 16); Dafermos (n 16).

⁷¹ EBA, 'On Management and Supervision of ESG Risks for Credit Institutions and Investment Firms' (European Banking Authority 2021).

⁷² Timothy M Lenton and others, 'Climate Tipping Points—Too Risky to Bet Against' (2019) 575 *Nature* 59.

⁷³ Simon Sharpe and Timothy Lenton, 'Upward-Scaling Tipping Cascades to Meet Climate Goals: Plausible Grounds for Hope' (2021) 21 *Climate Policy* 421.

⁷⁴ ECB, 'Climate-Related Risk and Financial Stability' (European Central Bank 2021).

⁷⁵ Michael Power, *Organized Uncertainty: Designing a World of Risk Management* (Oxford University Press 2007).

2. C&E risk in a Deferential Transition

Although there is now broad agreement that banks lack adequate capacities to estimate the probabilities of climate change related losses, there are different approaches to addressing this problem. A Deferential Transition sees regulators push banks to develop better internal capacities to manage climate related risk while investors provide banks with price signals. It also involves efforts to incentivize credit rating agencies to be more attuned to C&E risks, as well as promoting private sector provision of adequate ESG metrics. The role of supervisors is limited to enforcing the rules and thereby ensuring that banks manage and disclose risk adequately. In this way, regulators seek to incentivize banks to develop better assessment frameworks that evaluate climate change related risks, while taking a largely agnostic approach to what methodologies are appropriate.

A major advantage of this scenario for policymakers is that it does not involve a major revision of the existing regulatory framework. There would be no need for a dedicated prudential treatment of C&E exposures.⁷⁶ Instead, supervisors could work within their existing mandate to ensure that these risks are properly monitored and disclosed. Although some tweaking of the regulatory framework may be required, the key objectives of supervision would not change. A second advantage is that this approach is decentralized and agnostic. Rather than setting out any specific methodology, it leaves it to banks and credit rating agencies to find the right approach. It relies on the market to experiment with different approaches and to ensure that innovations are implemented in business practices.

Despite these clear advantages, we think there are also dangers in betting on a narrow microprudential approach where it comes to the evaluation of risk. This scenario puts the onus on banks and rating agencies to assign probabilities to C&E risks, but in the face of uncertainty banks retain considerable discretion in doing so. That raises four hazards.

First, the development of private sector methodologies is subject to clear incentives to downplay risk. ‘Green-washing’—falsely marketing investments as contributing to environmental objectives—is already rampant.⁷⁷ As the lenient risk modelling practices leading up to the financial crisis of 2007 and 2008 illustrate, the short-term business incentive for banks and rating agencies is to underestimate risk and thereby keep their cost of capital low.⁷⁸ While regulation put in place since has sought to improve these risk management practices, C&E risks raise new challenges, as discussed in section III.1. Banks are once again likely to seek to formally align with rules by identifying and modelling risks, but assigning lenient risk-weights to them. The energy examples that we started with illustrate the scope for leniency well. A bank that plans to invest in Shell or other companies whose business model essentially relies on fossil fuel use could easily produce an optimistic story to justify investment in the company.

Second, a narrow focus on epistemic aspect of financial risk will often fail to align lending with the EU’s environmental objectives.⁷⁹ For physical environmental factors there are upside and downside risks, where it is both economically inefficient to over- and underprepare for future developments. By contrast, where the transition is concerned, outcomes are clearly skewed due

⁷⁶ The ‘output floor’ as introduced by the 2017 Basel accord amendment, and due to be introduced into EU legislation via the 2021 Banking Package reform, is meant to ensure that banks do not use internal ratings-based models to artificially lower their capital requirements in comparison to standardized models set down in legislation.

⁷⁷ Ellen Pei-yi Yu, Bac Van Luu and Catherine Huirong Chen, ‘Greenwashing in Environmental, Social and Governance Disclosures’ (2020) 52 *Research in International Business and Finance* 101192; Torsten Ehlers, Benoît Mojon and Frank Packer, ‘Green Bonds and Carbon Emissions: Exploring the Case for a Rating System at the Firm Level’ (2020) September 2020 BIS Quarterly Review 31.

⁷⁸ De Larosiere Report, ‘The High Level Group on Financial Supervision in the EU’ (European Commission 2009); Tamim Bayoumi, *Unfinished Business: The Unexplored Causes of the Financial Crisis and the Lessons Yet to Be Learned* (Yale University Press 2017).

⁷⁹ Ben Caldecott, ‘Climate Risk Management (CRM) and How It Relates to Achieving Alignment with Climate Outcomes (ACO)’ (2020) *Journal of Sustainable Finance & Investment* 1.

to the externalities of emissions; it would be much worse for the EU's climate neutrality objective if banks continue to underestimate C&E risks, than it would be to overestimate the risk and refrain from making investments that later turn out to be compatible with the transition scenario. A narrow focus on estimating future losses is blind to these stakes.

Third, the Deferential Transition also risks undermining the level playing field within the EU's banking sector. In light of the differences in the trajectory of transition to climate neutrality across different Member States, some discretionary scope may be necessary to allow supervisors to adapt the ESG risk framework to fit local circumstances. The post-crisis regulatory wave has significantly advanced risk harmonization in EU banking regulation, as well as supervisory practices within the Banking Union.⁸⁰ In the absence of substantive common rules on the treatment of C&E risks much of that work may have been in vain, giving rising to a new race to the bottom between national supervisors (as happened in the years leading up to the financial crisis).⁸¹ Moreover, where large banks have the capacity to formally align and 'look busy' developing new models and running stress tests, it is difficult to see smaller institutions doing so.⁸² There is a long history of large banks using hefty EU-level compliance costs to get rid of smaller domestic competitors.⁸³

Finally, the Deferential Transition leads to an unclear distribution of responsibility for the evaluation of risk. Who is ultimately responsible in this scenario for testing whether a transition scenario such as that put forward by Shell makes sense? Because it is left to the banks to model financial risk in response to supervisory expectations, the scope for corrective action which may be taken by the supervisor will be limited. Regulatory initiatives may also be contested by banks. When it is not possible to establish the facts, banks can hardly be blamed for making optimistic predictions. The short-term incentive for bank supervisors, conversely, is to state that risks are adequately managed, rather than concede major flaws in the prudential architecture that may only materialize years into the future.

In sum, a Deferential Transition that leaves it to the private sector to assign probabilities to climate risk is a risky bet when there is no clear epistemic basis for estimating those probabilities.

3. C&E risk in a Guided Transition

An alternative direction we see in the existing greening efforts is what we describe as a Guided Transition. In this scenario policymakers would not only shape the identification of risk and supervise bank risk management, but they would also actively specify what types of investments are compatible with the EU's environmental objectives.

A Guided Transition is distinct from to a Deferential Transition, in that regulators and supervisors would move beyond their narrowly defined prudential roles (see Table 2). Instead of merely asking banks to anticipate mitigation trajectories and estimate potential losses, policymakers guide bank lending through a fine-grained account of how banks should invest. It sees regulators limit bank discretion when developing internal models to assess C&E risks and provide detailed rules for external ratings providers. Regulation would also empower supervisors to issue binding guidance on how banks should ensure strategy and lending is compatible with

⁸⁰ Zdenek Kudrna, 'The varieties of banking regulation in the EU: An empirical analysis' (2020) 33 *Governance* 79; Sophia Döme and Stefan Kerbl, 'Comparability of Basel risk weights in the EU banking sector' (2017) OEBB Financial Stability Report 34; Bart Stellinga and Daniel Mügge, 'The Regulator's Conundrum. How Market Reflexivity Limits Fundamental Financial Reform' (2017) 24 *Review of International Political Economy* 393.

⁸¹ De Larosiere Report (n 79); Matthias Thiemann, 'In the Shadow of Basel: How Competitive Politics Bred the Crisis' (2014) 21 *Review of International Political Economy* 1203; Bayoumi (n 79); Emanuela Benincasa, Gazi Kabas and Steven Ongena, 'There is No Planet B', but for Banks There are "Countries B to Z": Domestic Climate Policy and Cross-Border Bank Lending' (2021) Centre for Economic Policy Research, Discussion Paper 16665.

⁸² See on the constrained use of IRB models by smaller banks, Bruno and others (n 26).

⁸³ Daniel Mügge, *Widen the Market, Narrow the Competition: Banker Interests and the Making of a European Capital Market* (ECPR Press 2010).

the EU's climate strategy. Their guidance serves to enable banks to work out a transition plan for aligning their balance sheets with climate neutrality goals over the long term.

Accordingly, policymakers would go beyond what they do under a Deferential Transition with regards to both instruments and objectives.⁸⁴ In this scenario, policy would encompass a much broader range of regulatory instruments than those specific to the supervision of bank capital and risk management. Greening would be guided by a specific vision of the future of economic policy, for which the risk-focused metrics of the Basel framework may not be the most helpful. The second feature of this scenario is that policymakers would pursue objectives that can be broader than the current prudential focus. In a Guided Transition, policymakers would seek to ensure that that credit institutions lend in accordance, and not in conflict, with the EU's environmental objectives. In this regard, policymakers would pursue the dual objectives of financial stability and greening the economy, with an emphasis on the latter.

A Guided Transition would constitute a break with the existing microprudential approach, but is not without historical precedent. Under Basel I, the specification of risk-weighting was still entirely in the hands of policymakers and subject to a range of consideration beyond narrow prudential concerns. Looking even further back, the immediate post World War II era featured strict regulation of banks, various strategies of credit guidance, and capital controls that served to mobilize domestic spending for investment.⁸⁵ Credit guidance, such as the French policy of *encadrement du crédit*, involved specific targets enforced with strict quantitative controls but also using more informal 'window guidance' to favour manufacturing and exports over services and imports.

Credit guidance was abandoned in favour of a microprudential approach during regulatory liberalization efforts from 1980s onwards.⁸⁶ Policymakers came to favour a market-based allocation, in which market risk premia were meant to guide credit to the most productive sectors. Capital requirements acquired a key role in banking regulations as regulators sought to balance the societal benefits of credit provision against the societal costs of excessive risk-taking and bank defaults. Instead of actively guiding credit, EU policymakers came to focus on enabling a competitive and integrated financial area. The SME Supporting Factor and Infrastructure Supporting Factor, which are meant to incentivize bank investment in small companies and project finance, constitute a cautious return to earlier practices.

We see a similar return to credit guidance in the EU's most recent greening efforts. Rather than focusing on the epistemic question of the probability of losses associated with individual assets, recent efforts often aim to promote certain types of lending. They thereby shape private sector risk-taking without making any assumptions about the correct pricing of risk. Instead, policy directly targets a specific allocation of credit. The examples of guidance that we give play out within the existing microprudential framework and are, accordingly, distinct in important regards from earlier practices of credit guidance.

The first shoots of an incipient guided transition can be found in the EU's green finance regulation, as discussed in section II. One example is the obligation for banks to disclose a range of ESG-relevant aspects of their investment portfolio, subject to EBA standards, using detailed Pillar 3 templates. From 2022 onwards, these disclosures will cover *inter alia* institutions' sectoral

⁸⁴ For further discussion of such a scenario, see Paola D'Orazio and Lilit Popoyan, 'Fostering Green Investments and Tackling Climate-Related Financial Risks: Which Role for Macroprudential Policies?' (2019) 160 *Ecological Economics* 25; Caldecott (n 80); Chenet, Ryan-Collins and van Lerven (n 16); Moritz Baer, Emanuele Campiglio and Jérôme Deyris, 'It Takes Two to Dance: Institutional Dynamics and Climate-Related Financial Policies' (2021) 190 *Ecological Economics* 107210.

⁸⁵ Eric Monnet, *Controlling Credit: Central Banking and the Planned Economy in Postwar France, 1948–1973* (Cambridge University Press 2018); Dirk Bezemer and others, 'Credit Policy and the "Debt Shift" in Advanced Economies' (2021) *Socio-Economic Review* <<https://doi.org/10.1093/ser/mwab041>> accessed 25 November 2021.

⁸⁶ Charles Goodhart, *The Basel Committee on Banking Supervision: A History of the Early Years 1974–1997* (Cambridge University Press 2011); Bayoumi (n 79); Monnet (n 86); Bezemer and others (n 86).

exposures to transition and physical risks (including estimated probability of default on such assets) as well as the greenhouse gas (GHG) emissions and energy efficiency of collateral in the banking book. Importantly, such disclosures are not only focused on green investments, but also on dirty exposures where risk and environmental perspectives are more strongly aligned. One of these metrics is the Green Asset Ratio (GAR), which measures the total share of bank assets that is aligned with the Green Taxonomy (section II.1). According to EBA estimates, the EU's aggregate GAR stands at only 7.9 per cent.⁸⁷ However, once banks disclose it, the GAR can be used in various ways to shape bank lending. This may happen formally by linking refinancing costs to the volume of green lending.⁸⁸ It could also be implemented by treating investments which are sustainable favourably for the purpose of calculating any additional capital requirements. It may be done more informally by making it a topic of conversation during the SREP, as we have seen the ECB intends to do (section II.3). By making the GAR a topic of consideration in the SREP and related capital guidance, supervisors would use their relationship with their financial sectors to guide bank lending. So far, however, regulation does not foresee measures to verify and facilitate comparison of such information across credit institutions, which would be warranted to prevent greenwashing and ensure compliance with supervisory expectations.

Second, somewhat less direct but no less potent, are efforts to promote specific methodologies for evaluating climate change related risks. We saw in section II.2 that the EBA has already singled out three distinct approaches: portfolio alignment, exposure limitation and stress testing / sensitivity analysis. The first two are more qualitative, whereas the latter seeks to quantify the potential impact of climate change risks materializing on the banks' balance sheets, albeit through scenario analysis. The EBA's portfolio alignment method measures the bank's portfolio against the Paris Agreement goals by looking at the emissions of the bank's clients.⁸⁹ Such a methodology does not assign probabilities to specific losses associated with investments and, hence, needs to be complemented with further systems to shape lending decisions. Exposure methods simply screen individual investments of the bank for specific particularly harmful investments. As a result, certain types of opportunities—most commonly coal industry related—are simply excluded from the bank's lending portfolio. Supervisory guidance on the use of such methodologies would indirectly shape bank lending.

Stress testing methodologies, too, involve crucial inputs that shape bank lending. Stress testing involves testing the bank's viability under adverse scenarios, which accordingly does not involve assumptions about the likelihood of future outcomes.⁹⁰ Rather, a number of different macroeconomic scenarios are tested. The time horizon is usually longer than the 1–3 years that is typical for microprudential policy, even extending to 10 years. Similarly, sensitivity analysis focuses on what happens to the bank's portfolios should certain climate related risks materialize. In contrast to a stress test, the methods do so without making assumptions about the time horizon over which risks materialize or ways in which they might be interlinked. Both approaches focus on what happens to the bank in certain future states of the world rather than asking how likely that outcome is. Stress tests carried out by the EU supervisors (section II.3)

⁸⁷ EBA 2021 ESG Risk Report (n 24) 122

⁸⁸ Jens van 't Klooster and Rens van Tilburg, 'Targeting a Sustainable Recovery with Green TLTROs' (Positive Money Europe & Sustainable Finance Lab 2020) <<http://www.positivemoney.eu/wp-content/uploads/2020/09/Green-TLTROs.pdf>> accessed 22 January 2022.

⁸⁹ See eg 2DII, 'PACTA for Banks Methodology Document' (2° Investing Initiative 2021) <https://www.transitionmonitor.com/wp-content/uploads/2021/07/PACTA-for-Banks-Methodology-document-02-07-2021_v1.2.0_v4.pdf> accessed 22 January 2022.

⁹⁰ Nathan Coombs, 'What Do Stress Tests Test? Experimentation, Demonstration, and the Sociotechnical Performance of Regulatory Science' (2020) 71 *The British Journal of Sociology* 520.

distinguish between a quick transition, a slow transition, and no transition.⁹¹ The quick transition scenario tests how exposed the bank is to sectors that would face major losses in the event of a quick transition. Conversely, the no transition scenario measures a bank's exposure to the large physical effects of climate change in the absence of policy change. Banks whose lending is out of sync with the EU's environmental objectives are unlikely to do well on such tests. So far, the supervisors have not yet used the stress testing exercise to impose additional capital requirements on banks, but they may still do so.

The most ambitious proposals to date concern mandatory transition plans for banks. Frank Elderson, ECB board member and vice-chair of the supervisory board of the ECB, proposed legally binding requirements for banks to show 'at any point in time, from now until 2050, the bank's alignment and potential divergence with the relevant policy objectives through which the EU implements the Paris Agreement'.⁹² In such transition plans, individual banks would have to outline how they plan to navigate the climate transition, not only by decarbonizing and greening, but also by embedding Paris-alignment goals horizontally across bank activities. Elderson also proposes that supervisors are empowered by law to evaluate these plans. Although transition plans can be justified as having a narrow prudential objective, they mark a significant departure from a purely risk-based supervisory model with regard to the time horizon that banks would be required to plan for.⁹³ They also constitute a powerful tool for aligning bank credit provision with the EU's climate strategy.

These regulatory and supervisory measures all go beyond merely specifying the risks that banks should consider in their risk management practices. Instead, they shift the focus onto how banks should adapt their lending and hence see policymakers co-determine what banks invest in. They can be motivated by prudential considerations, but this need not be their exclusive focus. A Guided Transition might well mean treating investments favourably which are risky from a financial perspective (think of untested green technologies). It may also involve cutting-off funding for businesses which are, at least in the short term, economically viable. Because a Guided Transition shapes the evaluation of climate exposures directly, it takes away the need for banks to navigate the present uncertainty alone. This gives regulatory guidance teeth, safeguards the level-playing field, and assigns a clear responsibility to supervisors.

A Guided Transition is compatible with the general structure of the Basel framework. The quantitative approach to risk-weightings of Basel II and III provides supervisors with a legal framework to navigate the arcane structure of bank balance sheets. That approach may need to be adapted for C&E risk. Returning to Basel I, supervisors could specify risk-weightings for classes of assets where it is either not feasible or not desirable to leave these evaluative choices to banks. Crucial work is already under way to map the Green Taxonomy onto risk-weightings.⁹⁴ However, as we saw, the Guided Transition need not rely exclusively on risk-weightings. This

⁹¹ Frank Elderson, 'All the way to zero: guiding banks towards a carbon-neutral Europe' (European Central Bank 29 April 2021) <<https://www.bankingsupervision.europa.eu/press/speeches/date/2021/html/ssm.sp210429-dd7665b2d2.en.html>> accessed 1 September 2021.

⁹² Frank Elderson, 'Overcoming the tragedy of the horizon: requiring banks to translate 2050 targets into milestones' (European Central Bank 2021) <<https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp211020-03fba70983.en.html>> accessed 24 December 2021. Mandatory transition plans are already proposed for large corporates as part of the new expanded sustainability disclosure regime (CSRD) put forward by the European Commission in April 2021. However such plans are intended to be only a matter of a general disclosure requirement, rather than substantive basis for supervisory action, as proposed by Elderson.

⁹³ Jean Pisani-Ferry, 'Climate policy is macroeconomic policy, and the implications will be significant' Policy Brief 21-20 (PIIE 2021).

⁹⁴ JRC-EBA, 'Joint JRC-EBA workshop on Banking Regulation and Sustainability, European Union (Joint Research Centre-European Banking Authority, Brussels 2020); Yannis Dafermos and Maria Nikolaidi, 'How Can Green Differentiated Capital Requirements Affect Climate Risks? A Dynamic Macroeconomic Analysis' (Post Keynesian Economics Society (PKES) 2021) 2105 <<https://ideas.repec.org/p/pke/wpaper/pkwp2105.html>> accessed 28 December 2021; Lorenzo Esposito, Giuseppe Mastromatteo and Andrea Molocchi, 'Extending "Environment-Risk Weighted Assets": EU Taxonomy and Banking Supervision' (2021) 11 *Journal of Sustainable Finance & Investment* 214.

raises its own challenges for regulators and supervisors. It will increasingly confront banking supervisors with questions of economic policy and broader political questions. Stress test scenarios for physical risks can be based on the relevant climate science, but spelling out what these require from banks is not straightforward. An even more politically sensitive factor is that scenarios for the transition require drawing on and anticipating the evolving transformation strategies on the EU and Member State level. Tackling these issues sets supervisors up to directly intervene in the allocation of capital in the European economy. Spelling out the direction and the pace of changes that banks should anticipate limits economic freedom for market participants. It will also unavoidably shape the transformations of the economy, e.g. by influencing the cost of credit for specific economic activities.

Although politically sensitive, financial regulation and supervision cannot simply wait for certainty to emerge about the EU's mitigation and transition trajectory. Environmental policy is a shared competence of the EU and the Member States, and notwithstanding the EU's commitments to climate neutrality, each Member State generally retains the right to autonomously determine 'the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply'.⁹⁵ The task of banking governance is to accommodate existing policies, not to develop environmental policy autonomously.⁹⁶ In this role, financial policy should ensure that banks and investors take these policies into account. The content of environmental policy develops over time, and absolute clarity over the regulatory transition strategy may not arrive until it is too late. To say that such clarity is required invokes an unduly narrow understanding of the supervisory role. The supervisor's task is to promote a well-functioning and stable financial system. This will unavoidably require ensuring that banks anticipate new developments.

Greening the banking system, hence, raises new questions concerning the proper mandate of supervisors and regulators and their accountability structures—we can only scratch the surface of these topics here. In the EU, greening the financial system could be justified by invoking overarching sustainability-related goals of the EU Treaties (in particular article 11 of the Treaty on European Union (TEU), which requires that environmental protection be integrated in the definition and implementation of EU policies by the Union's institutions).⁹⁷ In fact, the EU's supervisory mandate has now been 'greened' to mainstream explicit consideration of sustainability objectives.⁹⁸ This change may make it easier to hold the EU's technocrats accountable on that particular issue, because democratically elected politicians are more likely to raise issues of general concern such as climate change.⁹⁹ The key challenge will remain, however, at the level of implementation by individual supervisors—both within the Banking Union (ECB and national supervisors) and in the rest of the EU. It is often far from clear whether a given greening measure will prove to be effective. Previous attempts to introduce EU incentives to guide investment from the EU level towards SMEs have not been evenly implemented and have

⁹⁵ Article 194 of the Treaty on the Functioning of the European Union (TFEU).

⁹⁶ Grünewald (n 1); Michael Ioannidis, Sarah Jane Hlásková and Chiara Zilioli, 'The Mandate of the ECB: Legal Considerations in the ECB's Monetary Policy Strategy Review' Occasional Paper Series 276 (European Central Bank 2021).

⁹⁷ Javier Solana, 'The Power of the Eurosystem to Promote Environmental Protection' (2019) 30 *European Business Law Review* 547.

⁹⁸ De Arriba-Sellier (n 1).

⁹⁹ As opposed to technical matters on financial market operation. For a discussion of how accountability mechanisms inbuilt in financial regulation are mobilized around issues such as climate change: Agnieszka Smoleńska and Adrienne Héritier, 'Critical Infrastructures (CCPs): Political Accountability and the Policy effects of EMIR' in Adrienne Héritier and Johannes Karremans (eds) *Regulating Finance in Europe: Policy Effects and Political Accountability* (Edward Elgar Publishing 2021).

brought limited results.¹⁰⁰ Without a common and coordinated approach supervisors may still in some cases be reluctant to implement a measure, especially if they interpret their mandate as focusing only on financial stability, rather than incorporating a longer-term sustainable perspective. Supervisors from different Member States, with different transition trajectories, may also face different political trade-offs or be subject to different levels of scrutiny.

Tackling climate change will require not only rethinking the aims of the prudential framework but also the role of banking supervision. To make limited, but ultimately crucial, choices when supervising climate risk, banking supervisors need clear democratic authorization. Legislating climate change risk management, as under article 98(8) CRD5 and article 501c CRR2, is an important step in this regard, but does not imply a clear and comprehensive framework (section II.2). There are ample legislative tools within the EU's political framework to expand the supervisory mandate and enhance democratic guidance.¹⁰¹ Improved guidance on the exercise of the supervisory mandate must also be coupled with an adjustment of its *ex ante* and *ex post* accountability mechanisms. Despite the high level of confidentiality that characterizes the SREP, it is essential that supervisory decisions on C&E risk are based on publicly available information and transparent methodologies. Politically sensitive choices, such as those concerning transition scenarios, should ideally follow democratic procedures at the EU level, with appropriate stakeholder involvement.

If regulators and supervisors are to set out the future that banks should anticipate, their role will unavoidably become more political. This is the future for which they need to prepare.

IV. CONCLUSIONS

We have provided the reader with a detailed account of efforts currently underway at the EU level to green the microprudential framework for banks. We have shown that the current framework is rife with internal inconsistencies. The EU still has a lot to do to ensure that the banking sector weans itself off dirty investments and facilitates the ambitious climate agenda. Going forward, policymakers should choose between a Deferential and a Guided Transition. Continuing on the current trajectory with a Deferential Transition is initially attractive, because it does not involve any major overhaul of the regulatory framework. However, it provides banks with ample opportunities to downplay risk, potentially undermining fair competition and blurring supervisory responsibilities. A Guided Transition, in contrast, sees policymakers directly shape bank lending, which confronts them with quintessentially political choices. Since the stakes of this wager are high, it should not be left to chance. Instead, the EU's choice should be made deliberately, comparing the advantages and disadvantages of both. We hope this article contributes to making the right bet.

¹⁰⁰ Empirical studies launched by EBA—since introducing the SME Supporting Factor in the CRR—did not identify any increase in access to finance for SMEs relative to large firms following the introduction of the SME SF' and found 'no evidence that bank financing conditions on loans and credit lines (e.g. interest rates, size, maturity, and collateral required) improved to a greater extent for SMEs than for large firms after the introduction of the SME [Supporting Factor]', see EBA, 'Report on SMEs and SME Supporting Factor' (European Banking Authority 2016).

¹⁰¹ Nik de Boer and Jens van 't Klooster, 'The ECB, the Courts and the Issue of Democratic Legitimacy after Weiss' (2020) 57 *Common Market Law Review* 1689.