



Beyond market neutrality? Central banks and the problem of climate change



Matthias Thiemann

Sciences Po, France

Tim Büttner

Independent researcher, Germany

Oliver Kessler

University of Erfurt, Germany

Abstract

Starting with a landmark speech by Mark Carney on the 'Tragedy of the Horizon' in 2015, climate change entered central banking discourse, causing some of its key convictions to come under new scrutiny. This article traces how initially climate change was firmly embedded in a conventional framework of 'market completion' that would allow financial markets to price in negative externality. Yet, over the course of the last seven years, central banks have repositioned their role regarding this problem, taking on a much more active stance, which calls into question the notion of 'market neutrality'. To trace these discursive changes, this article identifies three discursive layers formed around market-based mechanisms, responsible investment and monetary policy. We show that in the unfolding of the debate, the issue of climate change has altered the self-understanding of central bankers and driven them towards a more active stance where they acknowledge that central bankers shape and make, and not only 'mirror', market forces.

Keywords

Climate change, central banks, market neutrality, discourse

Corresponding author:

Matthias Thiemann, Sciences Po Centre des Etudes Européennes, 27 rue Saint-Guillaume, 75006 Paris, France.
Email: matthias.thiemann@sciencespo.fr

Introduction

A 'market' in the transition to a 2-degree world can be built. It has the potential to pull forward adjustment, but only if information is available and crucially if the policy responses of governments and the technological breakthroughs of the private sector are credible ... With better information as a foundation, we can build a virtuous circle of a better understanding of tomorrow's risks, better pricing for investors, better decisions by policymakers, and a smoother transition to a lower-carbon economy. (Carney, 2015: 12)

Prevailing and deep-seated market failures continue to prevent the transition towards a carbon-neutral economy at the pace that is required to ward-off the exceptional, and partly irreversible risks that climate change poses to society. In many cases, climate change is still seen as a reputational risk rather than a financial or existential risk. Central banks cannot ignore these risks. Nor should their actions reinforce market failures that threaten to slow down the decarbonization objectives of the global community. (Schnabel, 2020: 5)

When the then Governor of the Bank of England (BoE) and Chair of the Financial Stability Board (FSB), Mark Carney, addressed the audience at Lloyds on September 29, 2015, he may not have been aware that he was about to start a debate that was set to change the position and self-understanding of central banks. When Carney stood behind the lectern, the Paris Treaty on climate change was soon to be agreed upon and the topic was high on the agenda of global institutions. At the same time, Carney had just received a request from the G20 to discuss the role of climate change from a finance perspective within the FSB.¹ Carney's speech to the insurance industry, the very industry that already had to deal with the consequences of climate change, was the first at this senior level to connect the question of financial stability with climate change.

While the topic was new, his analysis was neither revolutionary nor overly dramatic. As the title of his talk, 'Beyond the Tragedy of the Horizon' indicates, the key problem is quite well understood in economic theory: due to a short-term orientation of financial market participants, they fail to properly price in long-term risks (Carney, 2015). The answer to this problem, according to Carney, was to be sought in the rightful disclosure of those risks so that the market as an information processing device could price in these risks, leading to the right decisions being made. Hence, while the market might have contributed to climate change, the market was also the solution. Carney, as our first quote indicates, was convinced that a market-based transition towards a low carbon economy was feasible. But the primary task was to find an adequate pace for that transition. Too low a pace will push the globe on a path of a plus 3 if not a plus 4-degree scenario where many financial assets are expected to become worthless. Too speedy a transition, however, poses a transition risk where the loss of financial assets could unsettle financial stability.

Five years later, however, as the quote by Member of the Executive Board of the ECB Isabel Schnabel indicates, the discursive framing of the problem has shifted, and the role of the market is approached in far more sceptical terms. While today there seems to be a consensus that climate risks threaten long-term financial stability, there is great uncertainty about what needs to be done to solve the problem. Central bankers are still unclear about whether it is within central banks' mandates to assume responsibility to deliver on climate outcomes, i.e., pushing the world towards a below-2-degrees scenario. Equally, there is great uncertainty on what tools central banks should use and how these tools will allow mitigating climate risks.

This article traces the evolution of this central bankers' discourse on climate change.² We ask whether central bankers treat global warming as business as usual, employing the

traditional set of concepts and categories, or whether we might see a more fundamental discursive shift regarding bankers' practices and self-understanding, transcending the traditional mode of problem-solving. We are very explicit here: we are convinced that it is not yet determined whether we are seeing merely a shift in the discourse or in fact a complete rupture, including in central banks' practices.³ Yet, we are convinced, and seek to show in this article, that central bankers have parted with the classic market-based problematization. Given the central position that central banks assume today, we expect that this could be felt in the wider fabric of global finance, leading to potentially significant changes in economic practices. To make visible the potential and the significance of these changes, this article identifies three discursive layers that we reconstruct from speeches and central bank publications of selected European central banks over the last six years.⁴ They can be imagined as layers of an onion, with each layer peeled off over time leading to a further problematization of what it means to 'be' a central bank for central bankers in the context of climate change.

The first layer holds on to the traditional status quo in central banking discourse, focusing on a problem that can be framed as an informational market failure, requiring limited intervention to allow the proper pricing of externalities (Kessler and Wilhelm, 2013). As the problem of climate change is discussed within these terms, a well-known policy framework is adjusted to fit the problem. Mark Carney's (2015) original problematization of climate change is a case in point: the solution, according to him, lies in the adequate disclosure of risks and hence the development of adequate standards which are to allow for the proper pricing of risk. This framing of the policy problem of climate change as a financial stability risk concomitantly introduced a solution to the problem in line with a neoliberal understanding of financial markets as a solution to social problems.

A second layer becomes visible when central banks start to apply these market techniques to their own portfolios, starting with their non-monetary portfolios. Here the focus is no longer on how to push financial markets to integrate climate-related risks, but on how and to what extent central banks should intervene in existing market structures and actively shape the economy through adjustments of their asset portfolio. A third layer then expands this critical stance and targets the very mandate and mission of central banks. Here, central banks begin self-observation about their interventions in financial markets and how these might have to be adjusted to face the problem of climate change. The question of market neutrality becomes problematic, as central banks can no longer rely on just mirroring existing market structures due to perceived market failures.

Proposing these three layers as an interpretation of the changes, we argue that we have already left a neoliberal order characterized by an unfettered belief in the market as a solution to social problems. To make this argument, the article proceeds as follows: the first section outlines our understanding of central banks and their role in contemporary capitalism. The second section outlines our methods and data. Based on interviews and qualitative interpretation of central bank reports and speeches from 2015 to 2021, the third section reconstructs the contours of central banks' discourse, detailing the discursive changes which developed over the six year period. Section four summarizes the key points.

The inevitable repoliticization of central banking

There is a growing consensus that in the aftermath of the 2008 crisis, central banks have moved to the center-stage of global finance (Bowman et al., 2013). With the infamous 'whatever it takes' speech by then European Central Bank (ECB) President Mario Draghi and the spread of Quantitative Easing (QE), a new configuration of finance has emerged which

requires central banks' persistent interventions to keep financial markets and with it, capital accumulation, functioning. In engaging in these activities, central banks have become financial market actors with the largest balance sheets of all existing and historic financial institutions (Black, 2021). Because of this ever-larger presence in financial markets and the *de facto* backstop function for financial markets and governments, central banks today find themselves confronted with diverse expectations. As such, they have moved away from the 'one function' institution they had become over the course of the 1980s, focusing solely on monetary policy. Instead, central banks, due to their newly gained centrality in financialized capitalism, see themselves subject to a persistent politicization (Van 't Klooster and Fontan, 2020), where many new and different audiences formulate requests upon their action (Braun und Downey, 2020).

This repoliticization has disrupted the established discursive order which had successfully neutered the political dimension of central banking, granting them the status of technocratic experts. Prior to the Transatlantic Financial Crisis, central banks had successfully achieved this status, as they successfully cloaked themselves in apolitical scientific discourse (Kirshner, 2003; McNamara, 1998; Pixley, 2018) and highlighted the 'market neutrality' of their interventions (Van 't Klooster and Fontan, 2020). Central banks today find themselves in a fundamentally different situation, as their repoliticized status forces central banks to care about their legitimacy in the eyes of different publics in order to maintain their independence. Their repoliticized status forces central banks to engage these audiences and to shape their expectations, highlighting the legitimacy of central bank policies to maintain their independence (Braun, 2016; Coombs and Thiemann, 2022; Thiemann, 2022).

At the same time that central banks engage these different publics, they filter these legitimacy demands in the context of what is seen to lie within their mandate (Lokdam, 2019), and in the context of their scientific discourse, engage in sometimes creative reinterpretations of external demands. An important new prism for interpreting these demands is the financial stability mandate central banks acquired immediately after the financial crisis of 2007-2008 (McPhilemy and Moschella, 2019; Thiemann, 2019). Through this shift in their mandate, central banks were suddenly charged with monitoring financial stability risks in the financial system and were encouraged to develop mitigating and adaptive tools for these issues (Thiemann et al., 2021). In this context, a new network of change agents emerged around macroprudential regulation, which was to become an important mediating factor in transforming societal demands on climate change into central bank policy (see Siderius, 2022).

Both these internal and external reconfigurations shape the way central banks address the question of climate change. Regarding external reconfigurations, central banks must address the topic of climate change to manage increasing societal expectations.⁵ While external conditions are important and need to be considered to understand the evolution of this aspect of central bank discourse and action, these societal pressures need to be translated into the technocratic discourse of central bankers in order to make a difference (Schmidt, 2008). As we will see, the internal rise of financial stability provided such a translation, allowing central bankers to make sense of climate change. This article can hence be understood as an attempt to reconstruct the discursive dynamics characteristic of the internal position of central banks regarding this societal topic over the last six years. We seek to reconstruct how, filtered through the lens of technocratic discourse, central bankers sought to respond to their new environment.

Method and empirical material

The last section has outlined the central position of central banks in the financialized capitalism of the last decade. We have shown that central banks today maneuver a diverse set of expectations and have departed from being institutions solely focused on monetary policies. We are convinced that the management of these diverse expectations, undertaken by central banks to retain their independence and evade political pressure, made it possible for the topic of climate change to enter and remain within central bank discourse. Yet, at the same time, the work of central banks on climate change goes beyond the mere management of expectations by civil society and instead should be analyzed as a translation of external demands into an internal, coordinative discourse of technocrats. In this section, we briefly discuss the nature of this discourse, explicating our method and how we trace these discursive shifts.

To do so, we base ourselves on a Foucauldian intuition regarding discourse analysis (Foucault, 1972; 1977). The reason why Foucault is interesting for us at this point is that he offers a distinction between the visible and the sayable: discourses are not just texts that need to be studied (the sayable), but also come with their particular institutionalization (the visible).⁶ Foucault's approach thus allows us to analyze how institutions problematize issues and produce the very objects in which they then intervene (Deleuze, 2006: 47-69). At the same time, the visible and the sayable are never coextensive but, as Foucault showed, institutions which produce their own way of knowing, that is to be found not in great theoretical treaties, but in manuals, handbooks and reports. We propose that central banks can be seen as the visible of an economic discourse, producing their own practical knowledge, and hence engage in a specific mode of problematization linked to their discursive practices.⁷

By reconstructing how central banks problematize climate change, we can trace possible discursive changes, including changes in the relationship of the visible and the sayable, and hence see whether and how central banks intervene in the field. To explore that intuition, we employ a qualitative discourse analysis (Fairclough, 1992; Fairclough and Fairclough, 2013), accompanied by semi-structured interviews with central bankers. In terms of discourse analysis, we analyze the implicit and explicit speaker position regarding the problem at hand (that is, the assumed responsibility, the capacities and limitations of central banks regarding the problem of climate change), as well as changing views with respect to financial markets as a solution to climate change. In terms of empirical material, we focus on the most active European central banks in this discourse (the Bank of England, the Banque de France, the Dutch Central Bank DNB, the Bundesbank, the ECB, as well as linked organizations such as the ESRB and the Network for the Greening of the Financial System), of which we read all the published speeches by policymakers and policy documents on the topic of central banks and climate change from 2015 to June 2021, making for a total of 55 policy documents and 62 speeches drawn from the websites of the respective institutions. The qualitative interviews with three central bank representatives from the Network of the Greening of the Financial System helped to validate our narrative.

The reasons for this selection of central banks resides, on the one hand, in the fact that European central banks, jointly with the Peoples Bank of China as well as the Mexican Central Bank, have been prominent forerunners in the discourse of central banks on climate change. We then chose to focus on the European members of this discursive 'avant-garde' because of language barriers as well as our attempt to somewhat keep the political economy context of the analyzed central banks constant, allowing us to assume that the discursive developments we observe stem from 'independent' central banks. As such, their discourse is structured both

by the prevalent technocratic expertise Western central banks have acquired since the 1990s when the process of ‘scientization’ took full force (Marcussen, 2009; Mudge and Vauchez, 2016), as well as by their concerns for legitimacy in the context of such independence. Since our goal is to reconstruct the logic of central bank discourse rather than offer a causal explanation of this change, this case study deliberately focuses on internal dynamics. The assembled texts were subjected to a coding exercise based on grounded theory. Two coders entered the analysis with certain assumptions as to what might be relevant for understanding central banks’ engagements with this topic, but remained open to integrating new insights gained throughout the process. Through this reading, we reconstruct three layers of the discourse to which we will now turn.

Three layers of climate change discourse

The last section outlined our approach and showed how we assembled our material. In this section, we provide a qualitative interpretation and identify three layers. This model of layers however should not be understood as a phase model which is marked by clear endings of the first phase, followed by a second phase. Neither should it be understood that these layers imply that all central banks move in lockstep or that certain central banks are always in the vanguard. Instead, certain central banks might be characterized by a more conservative attitude (e.g. the Bundesbank), and other central banks, which have been at the forefront of establishing a certain layer, such as the Bank of England in establishing climate change as a financial stability risk (Layer 1), might be laggards in addressing these risks themselves (Layers 2 and 3). Instead of signifying phases, these ‘layers’ refer to the emergence and consolidation of new discursive constellations, which at the same time do not obliterate prior discourses, but instead open a new dimension and a new limit to what can be legitimately said.

Layer 1: Climate change as a financial stability risk (2015 onward)

The beginning of this phase needs to be placed in the context of COP 21 in Paris in 2015 and the ratification of the Paris agreement, which aimed to set a 2-degree limit to global warming. In this context, Mark Carney, both as the President of the Bank of England and the President of the Financial Stability Board, was asked by the G20 to deal with the problem from a financial stability point of view.⁸ In his groundbreaking speech in September 2015 at Lloyd’s annual gathering, Carney uses the metaphor of the ‘tragedy of the horizon’ to link the potent metaphor of the ‘tragedy of the commons’ to the problem of the insufficiently long time horizons of financial market actors. Because of these short-term horizons, the threat of climate change in the decades to come leads to the accumulation of unassigned and unmitigated climate change risks that are now being framed as financial risks. This produces an inadequate mitigative reaction.

In his speech, Carney highlights that the translation of climate change into questions of financial stability occurs in three distinct ways: firstly, there are physical risks linked to the physical effects of climate change, such as damages from extreme weather incidents. Secondly, there are liability risks due to potential legal challenges to achieve compensation for climate-related loss or damage. Thirdly, transition risks revolve around the risk of too quick a transition, leading to a transformation of currently exploitable resources, such as fossil fuels, into ‘stranded assets’, with a massive devaluation and destabilizing effect. Having established

this conceptual grid, Carney intends to outline how to internalize these externalities: “Any efficient market reaction to climate change risks as well as the technologies and policies to address them must be founded on transparency of information” (Carney, 2015: 8). The market, yet to be built, functions here as a mechanism which can help policy makers to achieve their goals, as the quote already presented in the introduction demonstrates: “A ‘market’ in the transition to a 2-degree world can be built. It has the potential to pull forward adjustment – but only if information is available and crucially if the policy responses of governments and the technological breakthroughs of the private sector are credible” (Carney, 2015: 8).

The primary policy solution that Carney, quite successfully, implemented was based on the disclosure of those unaccounted risks. Carney pushed the FSB to support “an industry-led group, a Climate Disclosure Task Force, to design and deliver a voluntary standard for disclosure by those companies that produce or emit carbon” (Carney, 2015: 10) – the Task Force for Climate-Related Financial Disclosures (TCFD), which, under the leadership of Michael Bloomberg, began its work on climate-related disclosures in 2016. According to Carney, this increased and improved information could then feed into stress tests of private market agents, shining a light on climate risks currently in the shadows (Carney, 2015: 11). Until 2018, this conviction was pursued with full force. Central banks in alliance with private actors worked hard to build this envisioned market for a 2-degree transition (BoE, 2017; TCFD, 2017; Scott et al., 2017). The TCFD considered this development complete and successful, with most financial actors now adhering to these new requirements.

In essence, the cultivation of markets for a 2-degree transition consists in upgrading the risk management of the financial system to make sure it can deal with climate change. Much in line with the attempt by Banking Regulators to educate banks on risk management systems in the vein of Basel II (Baud and Chiapello, 2014; Young, 2012), public authorities’ role is to set up the institutional framework and educate private actors to do the right thing. How could these frameworks help? Here, Carney espouses doxa which explicitly assign to financial markets and the market mechanism the role of addressing climate change, a mechanism based on being fed with sufficient information. As in other domains, such as the role of central banks as market-makers of last resort (Birk and Thiemann, 2020), Carney is pursuing a project of cultivating markets by supplying them the information they need to internalize the externality of climate change.

The position of central banks was firmly in line with the standard convictions of the day: central banks were not to be seen as the front-runners of the process. As Carney puts it, “financial policymakers will not drive the transition to a low-carbon economy. It is not for a central banker to advocate for one policy response over another. That is for governments to decide” (Carney, 2015: 8). Instead, central bankers should act as facilitators for such processes. “More properly our role can be in developing the frameworks that help the market itself to adjust efficiently” (Carney, 2015: 9). The role of central banks is thus to undertake an engagement for developing “consistent, comparable, reliable and clear disclosure around the carbon intensity of different assets” (Carney, 2015: 9). This envisioned role relies upon the almost magical thinking that once such a market for information disclosure is built, it will subsequently allow financial markets to deal with the problem of climate change by internalizing the associated long-term costs. This has been accompanied by investigations into how risks arising from climate change can be translated into prudential regulation, with a focus on spreading models and scenario analysis in banks that take these risks into account.

To summarize, the key idea is that financial markets can be aligned with climate change, if they can be supplied with the right information disclosures, risk metrics and the risk

management practices that were seen as missing. The role of central banks is to facilitate the exchange and spread of those standards, enabling market participants to internalize climate risks. This approach proved helpful for anchoring the issue within central bank discourse, albeit in a yet unambitious form. In fact, by the end of 2018 and the beginning of 2019, we witnessed a broad international consensus (NGFS, 2018; 2019a; Banque de France, 2019) that climate risks are material and therefore should be acted on by central banks as part of their mandate to protect financial stability. The main belief is that by a combination of better risk management, disclosures, and green finance, financial stability risks can be reduced at the same time that funds to finance the green transition can be mobilized (Elderson, 2021: 1).

Layer 2: Central banks as responsible investors (2017 onward)

While this first layer continues, we can identify significant departures from this analysis from the end of 2017 onwards. These departures are firstly based on the recognition that central banks own portfolios themselves, requiring them to integrate climate-related risks in line with supervision and regulatory initiatives (phase II), and secondly on the incremental realization that financial disclosures alone will not be able to green financial markets (phase III). This decisive discursive shift is linked to the founding of Network of Greening the Financial System (NGFS) in December 2017, a self-dubbed ‘Coalition of the Willing’, which, on the initiative of the Banque de France, is committing itself to support the goals of the COP 21 (NGFS, 2018: 1). The network was initially founded by eight central banks and regulators, including the Bank of England, the Dutch Central Bank DNB, the French Central Bank Banque de France as well as the Bundesbank. This body not only assembled different initiatives on supervision, scenario analysis as well as support for scaling up green financing, but also laid focus on leading by example by adjusting their own portfolios (NGFS, 2019b). It is within this new discursive space that a heterogeneous discussion ensued on what central banks should do beyond monitoring and work on better measurement, metrics, data, methodologies, and scenario analysis.⁹ Newly arising debates focused on the need to green the balance sheets of central banks and their collateral requirements, and on whether climate risk mitigation measures should be applied to the existing Asset Purchasing Programs while transforming them in the process (NGFS, 2019b; 2020).

The extent to which the points requiring action by central banks is considered within this forum varied widely and was initially not consistent. Yet the NGFS managed to shift the discursive boundaries within the four years of its existence. A crucial element in this respect was the 2019 NGFS document, *Call to Action* (NGFS, 2019a), which outlined a work program for six different work-streams, the most contentious of which were the asset investment activities by central banks as well as monetary policy. Over the course of the next two years, the NGFS would engage in transforming these high-level goals into workable proposals. Central banks would engage with these topics. At the same time, they would gather data on existing practices, thereby creating awareness of already existing implementation. In the process, they would shift the boundaries of both practices and discourses.

For us, the key difference to the constellation of the first layer is that central banks become much more reflexive in their analyses. While in the first layer, central banks cherish their passive stance as facilitators and information providers, central banks should now act as responsible investors. This shift is linked to two dynamics at play. The first is based on the role of central banks as market participants. Since central banks own portfolios, the new market environment implies that they themselves should apply these new risk management practices. Because the ambition of greening the financial industry also applies to public funds, there is

no reason not to adjust their practices in line with other market participants, such as pension funds. Central banks are thus directly affected by increased regulatory and public pressure to introduce ESG (Environmental, Social and Governance) analysis to portfolio management. Due to their public status, they are also under increased reputational pressure to enact the policies they themselves are asking financial market participants to follow. In this vein, among central bankers surveyed by NGFS, more than 60% of participants responded that the main reason why they change their behavior is reputational risk, including pressure by politicians and non-governmental organizations (NGOs) (NGFS, 2019b).

The second dynamic is that adapting non-monetary portfolios is considered a contribution towards the global effort to mitigate climate change. Adjusting their own portfolios was increasingly seen as an ambition to “lead by example” (NGFS, 2019a: 3; see also Mauderer, 2019; Mauderer and Goulard, 2019), which may reinforce market dynamics by serving as a role model to other market participants. This was completely in line with the ambition of central banks to green financial markets in order to mitigate climate risks. As one interview confirmed, adapting central banks’ own portfolios was considered low-hanging fruit within the NGFS; that is, a measure that could be adopted rather quickly and without much counter-pressure. The argument of leading by example refers notably to non-monetary portfolios (e.g., pension funds of central banks). However, at this point, it is important to note that it is arguably difficult to distinguish these funds from the portfolios that central banks have amassed in the context of monetary policy (QE), and the same argument was later applied to monetary portfolios (Knot, 2021).

To summarize, the second layer includes a much stronger focus on central bankers’ own investment policies. Based on this inclusion, we observe a normative claim towards central banks which asks them to reflexively incorporate their considerations on climate change into their own portfolios and actively work towards the political aim of reducing global warming. While Layer 1 emphasized market mechanisms and demanded from central banks that they ‘build’ markets for a low carbon economy, Layer 2 pushes central banks to the center. Rather than focusing on the integration of climate risk into practices of (other) market participants, central banks move to adjusting their own policies, resulting in a more active stance of portfolio management with regards to climate risk. Yet, it is only when a discussion on monetary policy arises that the full scope of central banks’ policies comes under scrutiny.

Layer 3: A change of monetary policy (2018 onward)

While the nexus between financial stability and climate change is the dominant strand in the central bank discourse until 2019, the topic of monetary policy is notably absent in central bank debates on climate change. There is however a notable exception, which occurred during a speech on monetary policy delivered by Benoît Cœuré, Member of the Executive Board of the ECB, at a conference in November 2018 organized by the NGFS, the Bundesbank, and the Council on Economic Policies. Introducing climate change into the discourse on monetary policy, Cœuré (2018) made a first move, establishing the object as non-circumventable. In this vein, he argued that:

climate change can be expected to affect monetary policy one way or the other. That is, if left unchecked, it may further complicate the correct identification of shocks relevant for the medium-term inflation outlook, it may increase the likelihood of extreme [financial] events and hence erode central banks’ conventional policy space more often, and it may raise the number of occasions on which central banks face a trade-off forcing them to prioritize stable prices over output. (Cœuré, 2018: 1)

On this basis, he continues:

the ECB, acting within its mandate, can – and should – actively support the transition to a low carbon economy, in two main ways: first, by helping to define the rules of the game and, second, by acting accordingly, without prejudice to price stability. (Cœuré, 2018: 5)

While defining the ‘rules of the game’ refers to participating in shaping the finance agenda of the European Commission, ‘acting accordingly’ refers to how the different ECB portfolios should be adapted to mitigate climate risks. Hence, this intervention suggested that central banks not only set the rules but also apply them, so long as this does not jeopardize price stability. With this intervention, Coeuré (2018) expanded the discursive boundaries of the problem. While giving a negative answer to calls that the ECB should integrate climate risks in its monetary policy portfolio, he set the stage for a discussion about the effects of climate change on price stability that would begin to emerge more prominently in 2019.

Starting from this rather defensive analysis regarding monetary policy and the role of central banks in mitigating climate change, we can observe a significant shift in central bank positions from 2020 on, at least for the case of the ECB, the DNB, and the Banque de France, and, most importantly, in documents published under the sponsorship of the NGFS. In June 2020, the NGFS published a report on monetary policy (NGFS, 2020a), and a second one in December 2020, which amasses survey data on current practices. These two documents portray a tentative approach towards a topic, which initially was completely opposed by several within the NGFS community. The work undertaken by the NGFS (for example, its comparisons across countries), created a very first awareness of existing practices on a comparative level. Furthermore, it cemented the conviction that central banks under no circumstances should ignore the link between monetary policy and climate change, whereas beforehand several experts challenged that claim. These two reports were followed up in March 2021 by a second report by the NGFS (2021), outlining how central banks could adapt their monetary policy by weighing the different options.

This final report, called *Monetary Policy: An Operational Framework* (NGFS, 2021), is already very developed in terms of different options proposed. The document by the NGFS does not prescribe what central banks should do because they acknowledge that the latter are constrained by their mandate and social expectations. Yet, hinting at the example of QE and the issue of market neutrality, they point out that expectations are changing all the time, and hence that no options shall be ruled out. When weighing how central banks should tackle climate risks, the report (NGFS, 2021: 27-30) embraces forward-looking stress tests, while noting that these are not yet sufficiently developed. Other options, such as normative criteria for reacting to climate change are helpful but deemed not very operational. And yet, the report also contains very important and fully operational proposals, such as a portfolio hedging approach, which, according to ESG data, would allow central banks to adjust their portfolio to ensure that central banks are not overly exposed to these risks (see also BdF, 2020). In this way, the report proposes practically feasible measures that allow climate change to become incorporated in the execution of monetary policy, the core of modern central banking.

Faith in markets and the self-understanding of central banks

The last section offered three layers to show the complex discursive constellation that exists today when it comes to how central banks problematize climate change. The section was predominantly the product of a close reading of what central bankers say and write. In this

section, we offer our own interpretation of some of the key issues involved, showing why the issue of climate change is of interest beyond the mere ‘empirical’ discussion. We point to the re-positioning of markets as a possible solution and the changed self-understanding of central bankers.

If our analysis is correct, the discourses described as Layers 2 and 3 go beyond traditional central bank practices because central banks have started to re-evaluate their own position in the economy. This goes even so far as to include climate change in the very mandate of central banks. As the introduction outlined, while we want to leave open whether Layers 2 and 3 already constitute a definitive discursive rupture, we do believe that a point of no-return has been passed: a ‘Pandora’s box’ has been opened and discursive forces are now unfolding from within the various networks. If that is correct, then the issue of climate change may spurn a deliberate repositioning of central bankers, eventually ending the unfettered belief in markets. In this section, let us return to these two layers to dissect how they challenge the hegemonic belief in financial markets.

Markets as problems, markets as solutions?

Back in 2015, Carney’s policy initiatives were carried out with the conviction that financial markets compatible with the Paris Agreement could be built by raising market standards and leaving market forces to do the job. This optimism made way for a more skeptical analysis by central bankers. A report by the ECB and the European Systemic Risk Board (ESRB) published in June 2020 abandoned the previous faith in markets in favour of a more nuanced finding. Investigating whether financial markets are pricing in climate-related shocks, the report finds that “contrary to the shocks to the global financial system with potentially sizeable economic effects, the financial market pricing of climate risks appears heterogeneous at best and absent at worst. This might not only reflect allocative market failures associated with the pricing of externalities, but also the potential for informational market failures” (ECB and ESRB, 2020: 14). Much of this stems from underlying issues relating to data disclosure, “which remain insufficient, incomplete, and inconsistent... Addressing all three issues could, in turn, allow financial markets to do what they tend to do best, namely efficiently allocate financial flows” (ECB and ESRB, 2020: 14).

The report not only remains visibly sceptical of the current pricing of markets, but also the effectiveness of current measures. It concludes that:

Given the lack of any internationally or regionally consistent system-wide action such as a carbon pricing scheme, the returns in carbon-intensive sectors are likely to be overestimated. Conversely, the lack of sufficiently encompassing and rigorous scenario analysis and the time inconsistency in investment decisions (longer/medium-term risks versus shorter-term financial exposures), may lead to the underestimation of climate risk and suboptimal capital allocation. (ECB and ESRB, 2020: 14)

In the same direction, the report cautions that:

the limited evidence that financial institutions are actively reducing the carbon content of their financial portfolios supports the conclusion that market discipline is still not effective in curbing transition risks. In this context, raising awareness about the potential effects of climate risks should remain an important task for supervisory authorities. (ECB and ESRB, 2020: 17)

Without market discipline curbing transition risks, the outcome of market action alone regarding this problem cannot be deemed sufficient or satisfactory.

The tension surrounding the role of market participants as a solution to climate change reached the central bank top level in a landmark speech by ECB Executive Board member, Isabel Schnabel, on September 28, 2020, who offered surprisingly harsh criticism of the current market pricing of climate change risk: “In the absence of an, ideally global, price for CO2 emissions, financial markets will continue to overestimate the returns of carbon-intensive assets and hence allocate capital sub-optimally” (Schnabel, 2020: 3). After discussing EU carbon pricing initiatives, which according to her, lack ambition, Schnabel continues: “The implication is that current market prices are unlikely to yield the needed transition towards a carbon-neutral economy at the pace required to stimulate investment and innovation and safeguard a sustainable growth path with stable prices” (Schnabel, 2020: 3). It is hence not responsible to place one’s hope as a central bank policymaker on financial markets. In this vein, Schnabel concludes:

Prevailing and deep-seated market failures continue to prevent the transition towards a carbon-neutral economy at the pace that is required to ward-off the exceptional, and partly irreversible, risks that climate change poses to society. In many cases, climate change is still seen as a reputational risk rather than a financial or existential risk. Central banks cannot ignore these risks. Nor should their actions reinforce market failures that threaten to slow down the decarbonization objectives of the global community. (Schnabel, 2020: 3)

This paradigmatic example leads us to the first potential discursive rupture we can identify in the central bank discourse. Whereas Layer 1 assumes that more efficient market infrastructures (data, standards, risk management tools) and prudential regulation can nudge financial actors to bring about greener financial markets and thereby solve the problems identified, this solution has increasingly been cast into doubt. This depoliticized solution to the problem of climate change, which is at the core of the first layer of discursive engagement with the topic by central banks, affords market participants a central role. However, if they fail to price in climate risks and continue to build up transition and physical risks, this threatens the proposed route to financial stability via better disclosures, updated risk management tools, scenario analysis, and sustainable finance.

This allows us to draw attention to the evolving relationship between market failures and financial stability on the one hand, and climate change and central bank discourse on the other hand. The concept of market failures, that is, the under-pricing of transition risks, in this perspective, is almost entirely detached from the issue of financial stability, and instead applied directly in the context of limiting climate change itself and the associated risks. The ‘informational market failure’ identified by the ECB and ESRB report and reiterated by Schnabel (2020), linked to the incapacity of politicians to install binding carbon prices, is the first potential discursive rupture, challenging the conviction that the ‘market neutrality’ stemming from Corporate Sector Asset Purchases is the best way forward to deal with climate risks in an age of central bank independence.

Should central banks deviate from market pricing?

We argue that it is precisely this criticism of markets that opens a discursive space with far-reaching repercussions: the ECB, first in the already-mentioned speech by Schnabel (2020), then iterated by Lagarde (as reported by Look, 2020), announces that it will investigate the market neutrality principle in the upcoming monetary policy review. This shift from Coeuré (2018) is significant since monetary policy now comes under scrutiny from a climate change

perspective. Whereas Coeuré built on the hope of greening markets through green monetary policy, the speeches by Schnabel (2020, 2021) and the intervention by Lagarde (as reported by Look, 2020; Arnold, 2020) as well as the ECB and ESRB (2020) report seem less optimistic that attempts at greening markets alone will be sufficient for green monetary policy. The implications for monetary policy, notably the corporate asset purchase programs, that are evoked in the same speech seem to imply that central banks should deviate from a representative market portfolio and hence from the notion of market neutrality. These conclusions were also hinted at in the monetary policy strategy review of the ECB, published on July 8, 2021 (ECB, 2021), despite evading any concrete measures and only pointing at future studies instead.

In a speech from June 2021, Schnabel supported replacing the market neutrality principle with a principle of market efficiency, arguing that “if the market misprices the risks associated with climate change, adhering to the market neutrality principle may instead support a market structure that hampers an efficient allocation of resources” (Schnabel, 2021: 1). In her eyes, this would “explicitly recognize that a supposedly ‘neutral’ market allocation may be suboptimal in the presence of externalities. It would allow us to acknowledge that market failures may drive a wedge between market prices on the one hand and efficient asset values that internalize externalities on the other” (Schnabel, 2021: 4).

We can identify a double movement here. On one hand, the acknowledgement by central banks that a decisive re-pricing of climate risks and a transition towards greener financial markets are important to fulfil their mandate in the long-term. On the other hand, central banks increasingly admit that market pricing is dysfunctional despite the increased development of market standards, including disclosures, risk management tools, and new financial instruments. The more weight that is put on market pricing of climate risks to guarantee the long-term efficiency of central bank policies (not only regarding financial stability, but also price stability), the less appropriate it turns out to be in this regard.

This directly touches upon the core of neoliberal central banking and the independent and technocratic nature of central banks. Given the incapacity of financial markets to properly price associated risks, this is disrupting the assumption that monetary policy operations may simply mirror financial markets in order to support a green transition. This leads to a clash of two normative principles. On one hand, central banks maintain that monetary policy operations should be as neutral as possible, relying on the principle of market neutrality. This normative stance to protect their independence becomes particularly important in the current conjuncture, because, given the size of these operations, they clearly have the power to shape markets. Central banks adhering to market neutrality, however, are at the same time reinforcing current market pricing. Once this market pricing comes under scrutiny, the aspired technocratic solution to fulfil their mandates in the face of climate change becomes debatable, as underlined by the criticism of Schnabel and other central bank officials, such as the president of the Banque de France, Villeroy de Galhau (BdF, 2019; Galhau, 2021). Additionally, central banks increasingly risk becoming responsible in the eyes of the public for contributing to the market failures they have identified due to their role as powerful market participants.

We may link this to the development described as Layer 2, in which central banks have established themselves as responsible investors, increasingly fearing a loss of reputation in the case of non-action (NGFS, 2019b). This insight implies that central banks might have to extend their application of climate-related risk measurement from their non-monetary portfolios to the portfolios they build up in the context of QE. As with the non-monetary portfolios, these monetary portfolios are equally exposed to climate risks, which may

undermine central bank independence in the future. Furthermore, these monetary portfolios have an environmental impact, which may be expressed in terms of a carbon footprint. Due to the important role of central banks in financial markets, it becomes increasingly difficult to disentangle central bank action and market behaviour. Again, the critique of central banks regarding financial markets may lead to a critique of central banks themselves. The obvious but hidden link between markets and central banks comes to the front: since central banks have assumed an active role in financial markets, it is no longer possible (or at least more difficult) to assess markets independently from central bank action (van 't Klooster and Fontan, 2020). Hence, the critical perspective central banks have adopted regarding financial markets' incapacity to price in climate change risks threatens the normative principles established for central banks to act in a depoliticized manner.

We want to highlight the intrinsic discursive links between the proposed transition towards a market efficiency principle, as envisaged by Schnabel (2021), and the previous discursive changes identified as Layer 1 and Layer 2. Whereas Layer 1 established the need for central banks to facilitate the integration of climate risks into market pricing and risk management of regulated entities, the discursive changes summarized as Layer 2 call upon central banks to become responsible investors. We may interpret Layer 3, the transition from a market neutrality principle guiding the ECB's asset purchases towards a principle of market efficiency, as a combination of these two layers. Whereas Layer 1 established a consensus that correct pricing of climate risks is crucial to maintaining the long-term functioning of central banks, Layer 2 highlighted the environmental impact of central bank assets and called for adaptation. While firstly limited to non-monetary portfolios, this opens up the debate towards discussing the environmental impact of the much larger monetary portfolios on an equal footing.

Conclusion

Over the course of the last six years, central bank discourse on climate change has changed in outlook and in ambition. Drawing upon an analysis of the central bank discourse around climate change from 2015 onwards, we detected the evolution of the central banking discourse in three layers. These layers are not homogenous silos, nor do they unfold in a linear order. Instead, they are understood as distinct problematizations of climate change with the consequence that the range of the sayable, the limits of the discourse, is being pushed and changed. These three layers co-exist and eventually co-evolve. Yet, we use them to highlight differences analytically and hopefully to allow for a better understanding of their internal dynamics.

The first layer, finding its strongest development in the phase between 2015-18, is marked discursively by the acknowledgment that climate-related risks constitute significant financial stability risks. This stance is linked to an attempt to support market participants' work of integrating and pricing climate risks in their investment decisions. The second layer, evolving in the phase between 2017-20, sees central banks increasingly acknowledge the fact that they are asset-owners themselves, seeking to apply the management tools and market standards they helped develop to their own pension portfolios, establishing the role of central banks as responsible investors. In the third layer, which develops from the end of 2018 onwards, we observe a shift in focus toward the most important and sensible part of central banking, namely monetary policy. This layer problematizes the portfolios of central banks accumulated through monetary policies, accompanied by a discursive acknowledgment of the incapacity of private financial market agents to integrate climate risks. Hence, it confronts

central bankers with the question of whether central banks should deviate from replicating the market portfolio in their corporate asset purchases, instead recommending criteria more suitable to integrate climate change risks.

We outlined two issues that stand out and which – if our analysis is correct – point to a deeper reconfiguration of central bank practices, one relating to the attributed role of the market and one relating to the self-understanding of central banks. With regards to the first, the question is whether financial markets, identified to be part of the problem, can play a role as part of the solution. Here, the initial neoliberal promise that what gets measured gets managed (by the market) showed itself to be misleading, with the installed infrastructure of information provision showing little to no effect in terms of a change in behavior (ECB and ESRB, 2020: 14ff). The evidence thereby sows doubt among the expert community that such measures alone would bring about sufficient results to mitigate climate related financial stability risks. To the extent that market pricing of climate risks remains incompatible with a below 2-degree-scenario and a reduction of long-term financial risks, this not only creates risks of a late, but sudden, transition with uncertain cascade effects, but also threatens the depoliticized, largely technical solution based on disclosures of climate-related financial risks and risk management.

As we have shown, the discursive contradiction is transformed into what may turn out to be a full-fledged discursive rupture, challenging the market-driven approach to integrating climate-related risks in the discourses and practices of central banking. At the same time, this discursive engagement of central banks, encouraging data creation and metrics was not without any effect. Instead, the developed frames and data sets that were endorsed by central banks were subsequently applied to benchmark the central banks' own policies, most notably with regards to monetary policy. This is where a second indication of a deeper change in central banking comes into sight, namely the shifting self-understanding of central banks as political-economic institutions. The discourse on climate change creates an inherent tension in this regard: on the one hand, central bankers have often made clear that it is not their task, but that of the government's, to steer the economy towards a below-2-degree-scenario (Mersch, 2018; Weidmann, 2020; 2021; Carney, 2015; Knot, 2021; Bank of England, 2019). On the other hand, an increasing number of reports have made it clear that global warming above a certain threshold will create serious risks, making effective central bank policies difficult to maintain (NGFS, 2020a; 2020b; 2021; BIS 2020). Thereby, climate-related risks are established as a source of long-term financial risk that fall within the mandate of central banks.

This obligation, acknowledged by central bankers, to actively tackle climate change creates an inherent tension with their other roles, as can be most clearly observed in their interventions in monetary policy and its impact on asset pricing. As a bureaucracy seeking to minimize the impact it has on markets, the institution is required to accept market prices unless substantial reasons are provided against it. However, as an institution that needs to – within its scope of action – actively stir markets towards a below-2-degree-scenario, central banks cannot accept market pricing that will lead to a build-up of long-term risks since this will seriously challenge the effectiveness of monetary policy as well as pose difficulties for maintaining a sound financial system in the future. This understanding calls for more active intervention on behalf of central banks and a diversion away from the exclusive pursuit of market outcomes.

We would like to caution, however, that there is limited evidence supporting the second discursive rupture. While preliminary findings hint that the discursive rupture with 'market neutrality' is substantial, creating pressure on central banks to deliver on climate outcomes,

we may need to wait for further research substantiating these results. This relates also to the drivers of policy change that need further investigating in upcoming research. While these discursive contradictions, leading to discursive ruptures, may be important elements for explaining the shift towards a more active role of central banks, other dynamics, such as the increasing politicization of central banking, might also play a role. The growing politicization of central banking is not only influenced by the G20 supporting the foundation of the TCFD, but also by the role of the European Commission's sustainable finance agenda on European central banks since 2018. Additionally, several instances in the discourse point to the role of NGOs and civil society in pushing for change, such as the fact that the biggest reason given by central banks for engaging in the alignment of their investment policies with green criteria is reputational risk.¹⁰

Further research could use different methods, such as expert interviews with central bankers and civil society actors, to carefully weigh these different drivers of change within central bank discourse. In addition, discourse analysis that considers other actors, such as important reports by civil society actors (such as van 't Klooster and van Tilburg, 2020), could seek to decipher how far these discursive pressures have pushed central banks to shift course.¹¹

Acknowledgments

We would like to thank two anonymous reviewers and Nathan Coombs for guiding this article to completion.

Notes

1. That does not exclude previous debates in NGO, academic, or other contexts. Yet it seems to us that the relevant demand came from the G20 rather than NGOs.
2. By 'discourse' we mean a historically contingent set of statements that produce knowledge, meaning, and bring 'objects' into being. As Foucault (1972: 42-43) explains: "It would be quite wrong to see discourse as a place where previously established objects are laid one after another like words on a page. But the above enumeration is inadequate for a second reason. It has located, one after another, several planes of differentiation in which the objects of discourse may appear".
3. A *shift* in the discourse for us means that key terms and concepts (like market neutrality) are about to be redefined in the light of global warming, allowing for a readjustment of practices and policies. A *rupture* means that we witness the advent of a new set of concepts and categories such that the very way central banks talk about finance and climate is open to change.
4. The term 'reconstruction' is important to us. Reconstructive methods do not assume causal claims nor seek to develop adequate categories from the empirical material at hand. Reconstruction is to be separated from subsumption where categories (and variables) exist prior to the engagement with the material and adequacy is then subjected to tests and confidence intervals. Reconstruction thus does not engage in causal analysis.
5. For instance, environmental NGOs, which otherwise tend to ignore central banks and their practices, have started lobbying central banks on the issue of climate change and have campaigned publicly to increase societal pressure on central banks to act.
6. As Foucault's (1977) analysis suggested, the prison cannot be detached from the discourse of punishment, the hospital cannot be disconnected from the medical discourse, and the asylum

cannot be disconnected from the discourse on madness. Discourses fix the gaze and formulate the conditions of possibility for statements to emerge, circulate, and have effects. Yet, at the same time, Foucault showed that these institutions produce their own way of knowing on how to treat, order, and move around those bodies subject to discourse.

7. The performativity literature has highlighted how economics – as a scientific discipline and profession – is not merely a neutral observer, but its way of knowing are constitutive for both economic practices and their regulations.
8. As he put it in September 2015, “Earlier this year, G20 Finance Ministers asked the Financial Stability Board to consider how the financial sector could take account of the risks climate change poses to our financial system. As Chair of the FSB I hosted a meeting last week where the private and public sectors discussed the current and prospective financial stability risks from climate change and what might be done to mitigate them” (Carney, 2015: 3).
9. Throughout this article, we use the word ‘normative’ to highlight an evaluative stance. In contrast to a mere description of some fact, a normative claim evaluates a fact in terms of good/bad or better/worse. We thereby highlight how the ECB moves from a neutral observation of market forces to an evaluation of these forces in light of the 2-degree goal.
10. As we showed above, the sustainable finance ambitions of the European Commission as well as demands of wider society pressured the ECB as a particularly exposed public institution to adapt to the new rules in parts of their portfolios. This step taken by the central bank, however, extended only to pensions and their own portfolios, excluding monetary policy. While this may be understandable from the viewpoint of an institution seeking to remain depoliticized as far as possible, there have been frequent demands by NGOs, as well as the European Parliaments, to investigate how monetary policy may be used to the same ends (van ‘t Klooster and van Tilburg, 2020; Dafermos et al., 2021).
11. First interviews have confirmed that sizeable political pressure is exerted by NGOs, media reports, and elected politicians on central banks. What remains unclear is to what extent this pressure influences actual policy decisions, given the importance of expert communities, and the conservative nature of formally independent institutions. Our argument here would be that only if the technocratic battle within central bank discourse is won will we see such action.

References

- Arnold, M. (2020) ECB to consider using climate risk to steer bond purchases, says Lagarde. *Financial Times*, 14 October. Available at: <<https://www.ft.com/content/f5f34021-795f-47a2-aade-72eb5f455e09>>. Accessed 23 September 2022.
- Aykut, S.C. (2020) *Climatiser le Monde*. Versailles: Éditions Quae.
- Bank of England (2017) *Annual Report and Accounts 1 March 2016 to 28 February 2017*. Available at: <<https://www.bankofengland.co.uk/-/media/boe/files/annual-report/2017/boe-2017.pdf?la=en&hash=32D14F11EF6AA4E3D708C168819F112FAC1D3681>>. Accessed 22 September 2022.
- Bank of England (2019) *Future of Finance: Review on the Outlook for the UK Financial System: What it Means for the Bank of England*. Available at: <<https://www.bankofengland.co.uk/-/media/boe/files/report/2019/future-of-finance-report.pdf?la=en&hash=59CEFAEF01C71AA551E7182262E933A699E952FC>>. Accessed 22 September 2022.
- Banque de France (2019) *Greening the Financial System: The New Frontier*. Available at: <https://publications.banque-france.fr/sites/default/files/media/2019/08/27/financial_stability_review_23.pdf>. Accessed 22 September 2022.

- Banque de France (2021a) *Politique d'investissement responsable: renforcement des exclusions en matière d'énergies fossiles*. Available at: <https://www.banque-france.fr/sites/default/files/medias/documents/cp_politique_dinvestissement_responsable.pdf>. Accessed 22 September 2022.
- Banque de France (2021b) L'investissement responsable: un enjeu croissant pour la Banque de France et la communauté des banques Centrales. *Bulletin de la Banque de France*, 234(4). Available at: <https://publications.banque-france.fr/sites/default/files/medias/documents/bulletin-234-4_investissement_responsable.pdf>. Accessed 22 September 2022.
- Baud, C. and Chiapello, E. (2014) Disciplining the neoliberal bank: Credit risk regulation and the financialization of loan management. *SSRN Working Papers*. Available at: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2417396>. Accessed 22 September 2022.
- Birk, M. and Thiemann, M. (2020) Open for business: Entrepreneurial central banks and the cultivation of market liquidity. *New Political Economy*, 25(2): 267-83.
- Black, J. (2021) Central banks face new balancing act with their huge asset piles. *Bloomberg*, 26 May. Available at: <<https://www.bloomberg.com/news/articles/2021-05-26/Central-Banks-face-new-balancing-act-with-their-huge-asset-piles>>. Accessed 22 September 2022.
- Bolton, P., Després, M., Pereira da Silva, L., Samama, F. and Svartzman, R. (2020) *The Green Swan: Central Banking and Financial Stability in the Age of Climate Change*. Basel: Bank for International Settlements. Available at: <<https://www.bis.org/publ/othp31.pdf>>. Accessed 13 September 2022.
- Bowman, A., Erturk, I., Froud, J., Johal, S., Leaver, A., Moran, M. and Williams, K. (2013) Central bank-led capitalism? *Seattle University Law Review*, 36(2): 455-88.
- Braun, B. (2016) Speaking to the people? Money, trust, and central bank legitimacy in the age of quantitative easing. *Review of International Political Economy*, 23(6): 1064-92.
- Braun, B. (2018) Central bank planning? Unconventional monetary policy and the price of bending the yield curve. In: Beckert, J. and Bronk, R. (eds.) *Uncertain Futures: Imaginaries, Narratives, and Calculation in the Economy*. Oxford: Oxford University Press, 194-218.
- Braun, B. and Downey, L. (2020) Against amnesia: Re-imagining central banking. *Council on Economic Policies*, Discussion Notes. Available at: <<https://www.cepweb.org/against-amnesia-re-imagining-Central-Banking/>>. Accessed 22 September 2022.
- Carney, M. (2015) Breaking the tragedy of the horizon: Climate change and financial stability. Speech given to Lloyd's of London, London, 29 September. Available at: <<https://www.bis.org/review/r151009a.pdf>>. Accessed 22 September 2022.
- Carney, M. (2019) A new horizon. Speech given at the European Commission Conference, London, 21 March. Available at: <<https://www.bankofengland.co.uk/-/media/boe/files/speech/2019/a-new-horizon-speech-by-mark-carney.pdf?la=en&hash=F63F8064E0408F038CABB1F29C58FB1A0CD0FE25>>. Accessed 22 September 2022.
- Coeuré, B. (2018) Monetary policy and climate change. Speech given at the Scaling-Up Green Finance Conference, Berlin, 8 November. Available at: <<https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181108.en.html>>. Accessed 22 September 2022.
- Coombs, N. and Thiemann, M. (2022) Recentering central banks: Theorizing state-economy boundaries as central bank effects. *Economy and Society*, 51(4): 1-24.
- Dafermos, Y., Gabor, D., Nikolaidi, M., Pawloff, A. and van Lerven, F. (2021) *Greening the Eurosystem Collateral Framework: How to Decarbonise ECB's Monetary Policy*. London: New Economics Foundation. Available at: <<https://neweconomics.org/uploads/files/Collateral-Framework.pdf>>. Accessed 22 September 2022.
- De Haas, R. and Popov, A.A. (2019) Finance and carbon emissions. *ECB Working Paper Series*, 2318. Available at: <<https://ssrn.com/abstract=3459987>>. Accessed 22 September 2022.

- Deleuze, G. (2006) *Foucault*. London: Bloomsbury.
- European Central Bank (ECB) (2019) *Financial Stability Review*. Available at: <<https://www.ecb.europa.eu/pub/pdf/fsr/ecb.fsr201905~266e856634.en.pdf>>. Accessed 22 September 2022
- European Central Bank (ECB) (2021) The ECB's monetary policy strategy statement. Available at: <https://www.ecb.europa.eu/home/search/review/pdf/ecb.strategyreview_monpol_strategy_statement.en.pdf>. Accessed 22 September 2022.
- European Central Bank and European Systemic Risk Board (2020) *Positively Green: Measuring Climate Change Risks to Financial Stability*. Available at: <https://www.esrb.europa.eu/pub/pdf/reports/esrb.report200608_on_Positively_green_-_Measuring_Climate_Change_risks_to_financial_stability~d903a83690.en.pdf?c5d033aa3c648ca0623f5a2306931e26>. Accessed 22 September 2022.
- Elderson, F. (2021) All the way to zero: Guiding banks towards a carbon-neutral Europe. Speech given at The Role of Banks in Greening Our Economies Conference, Frankfurt, 29 April. Available at: <<https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210429~3f8606edca.en.html>>. Accessed 22 September 2022.
- Fairclough, N. (1992) Discourse and text: Linguistic and intertextual analysis within discourse analysis. *Discourse & Society*, 3(2): 193-217.
- Fairclough, I. and Fairclough, N. (2013) *Political Discourse Analysis: A Method for Advanced Students*. New York: Routledge.
- Foucault, M. (1972) *Archaeology of Knowledge*. New York: Pantheon Books.
- Foucault, M. (1977) *Discipline and Punish: The Birth of the Prison*. New York: Random House.
- Kessler, O. and Wilhelm, B. (2013) Financialization and the three utopias of shadow banking. *Competition & Change*, 17(3): 248-64.
- Kirshner, J. (2003) The inescapable politics of money. In: Kirshner, J. (eds.) *Monetary Orders: Ambiguous Economics, Ubiquitous Politics*. Ithaca, NY: Cornell University Press, 3-24.
- Knot, K. (2021) A green monetary policy for Europe? Speech given to the Centre for European Policy Studies, Brussels, 20 May. Available at: <<https://www.dnb.nl/publicaties/publicaties-dnb/speeches/speech-klaas-knot-a-green-monetary-policy-for-europe/>>. Accessed 22 September 2022.
- Lagarde, C. (2021) Climate change and central banking. Speech given at the ILF Conference on Green Banking and Green Central Banking, Frankfurt am Main, 25 January. Available at: <<https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210125~f87e826ca5.en.html>>. Accessed 22 September 2022.
- Lokdam, H.C. (2019) Banking on sovereignty: A genealogy of the European Central Bank's independence. Doctoral thesis (PhD), London School of Economics and Political Science (LSE). Available at: <<http://etheses.lse.ac.uk/4112/>>.
- Look, C. (2020) Lagarde says ECB needs to question market neutrality on climate. *Bloomberg*, 14 October. Available at: <<https://www.bloomberg.com/news/articles/2020-10-14/lagarde-says-ecb-needs-to-question-market-neutrality-on-climate>>. Accessed 22 September 2022.
- Marcussen, M. (2009) Scientization of central banking: The politics of a-politicization. In: Dyson, K. and Marcussen, M. (eds.) *Central Banks in the Age of Euro: Europeanization, Convergence and Power*. Oxford: Oxford University Press, 373-390.
- Mauderer, S. (2019) Central banks – a crisis manager for the climate? Speech given at the Deutsche Bundesbank's Second Financial Markets Conference, Frankfurt am Main, 29 October. Available at: <<https://www.bis.org/review/r191029b.pdf>>. Accessed 22 September 2022.
- Mauderer, S. and Goulard, S. (2019) Setting a good example – central banks put climate change and its impact higher on the agenda. Bundes Bank Press Release. Available at: <<https://>

- www.bundesbank.de/en/press/contributions/setting-a-good-example-Central-Banks-put-Climate-Change-and-its-impact-higher-on-the-agenda-800872>. Accessed 22 September 2022.
- McNamara, K. (1998) *The Currency of Ideas: Monetary Politics in the European Union*. Ithaca, NY: Cornell University Press.
- McPhilemy, S. and Moschella, M. (2019) Central banks under stress: Reputation, accountability and regulatory coherence. *Public Administration*, 97(3): 489-98.
- Mersch, Y. (2018) Climate change and central banking. Speech given at the European Central Bank workshop discussion Sustainability is Becoming Mainstream, Frankfurt am Main, 27 November. <<https://www.bis.org/review/r181128b.pdf>>. Accessed 22 September 2022.
- Moschella, M. and Tsingou, E. (eds.) (2013) *Great Expectations, Slow Transformations: Incremental Change in Post-Crisis Regulation*. Colchester: ECPR Press.
- Mudge, S.L. and Vauchez, A. (2016) Fielding supranationalism: The European Central Bank as a field effect. *The Sociological Review*, 64(2): 146-69.
- Network for the Greening of the Financial System (NGFS) (2018) *First Progress Report: October 2018*. Available at: <<https://www.ngfs.net/sites/default/files/medias/documents/818366-ngfs-first-progress-report-20181011.pdf>>. Accessed 22 September 2022.
- Network for the Greening of the Financial System (NGFS) (2019a) *A Call for Action: Climate Change as a Source of Financial Risk*. Available at: <https://www.ngfs.net/sites/default/files/medias/documents/ngfs_first_comprehensive_report_-_17042019_0.pdf>. Accessed 22 September 2022.
- Network for the Greening of the Financial System (NGFS) (2019b) *A Sustainable and Responsible Investment Guide for Central Banks' Portfolio Management. October 2019*. Available at: <<https://www.ngfs.net/sites/default/files/medias/documents/ngfs-a-sustainable-and-responsible-investment-guide.pdf>>. Accessed 22 September 2022.
- Network for the Greening of the Financial System (NGFS) (2020a) *Climate Change and Monetary Policy: Initial Takeaways. June 2020*. Available at: <https://www.ngfs.net/sites/default/files/medias/documents/climate_change_and_monetary_policy.pdf>. Accessed 22 September 2022.
- Network for the Greening of the Financial System (NGFS) (2020b) *Survey on Monetary Policy Operations and Climate Change: Key Lessons*. December 2020. Available at: <https://www.ngfs.net/sites/default/files/medias/documents/survey_on_monetary_policy_operations_and_climate_change.pdf>. Accessed 22 September 2022.
- Network for the Greening of the Financial System (NGFS) (2021) *Adapting Central Bank Operations to a Hotter World: Reviewing Some Options*. March 2021. Available at: <https://www.ngfs.net/sites/default/files/media/2021/06/17/ngfs_monetary_policy_operations_final.pdf>. Accessed 22 September 2022.
- Pixley, J. (2018) *Central Banks, Democratic States and Financial Power*. Cambridge: Cambridge University Press.
- Schnabel, I. (2020) When markets fail – the need for collective action in tackling climate change. Speech given at the European Sustainable Finance Summit, Frankfurt am Main, 28 September. Available at: <https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp200928_1~268b0b672f.en.html>. Accessed 22 September 2022.
- Schnabel, I. (2021) From market neutrality to market efficiency. Speech given at the ECD DG-research symposium on Climate Change, Financial Markets and Green Growth, Frankfurt am Main, 14 June. Available at: <<https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210614~162bd7c253.en.html>>. Accessed 22 September 2022.
- Scott, M., van Huizen, J. and Jung, C. (2017) The Bank of England's response to climate change. *Bank of England Quarterly Bulletin*, 2: 97-109.

- Siderius, K. (2022) An unexpected climate activist: central banks and the politics of the climate-neutral economy. *Journal of European Public Policy*, <https://doi.org/10.1080/13501763.2022.2093948>
- Taskforce on Climate Disclosure (TCFD) (2017) *Recommendations of the Task Force on Climate-Related Financial Disclosures*. Available at: <<https://www.fsb.org/wp-content/uploads/P290617-5.pdf>>. Accessed 22 September 2022.
- Thiemann, M. (2019) Is resilience enough? The macroprudential reform agenda and the lack of smoothing of the cycle. *Public Administration*, 97(3): 561-75.
- Thiemann, M. (2022) Growth at risk: Boundary walkers, stylized facts, and the legitimacy of counter-cyclical interventions. *Economy and Society*, 51(4), in press.
- Thiemann, M., Melches, C.R. and Ibrocevic, E. (2021) Measuring and mitigating systemic risks: How the forging of new alliances between central bank and academic economists legitimizes the transnational macroprudential agenda. *Review of International Political Economy*, 28(6): 1433-58.
- Van 't Klooster, J. and Fontan, C. (2020) The myth of market neutrality: a comparative study of the European Central Bank's and the Swiss National Bank's corporate security purchases. *New Political Economy*, 25(6): 865-79.
- Van 't Klooster, J. and Van Tillburg, R. (2020) Targeting a sustainable recovery with green TLTRO's. Positive Money and Sustainable Finance Lab Working Paper. Available at <<https://doi.org/10.31235/osf.io/2bx8h>>, Accessed 22 September 2022.
- Villeroy de Galhau, F. (2021) Le rôle des Banques Centrales dans le verdissement de l'économie. Speech given at Climate and Sustainable Finance Conference, Paris, 11 February. Available at: <https://www.banque-france.fr/sites/default/files/medias/documents/2021-02-11_discours-fvg.pdf>. Accessed 22 September 2022.
- Walter, T. and Wansleben, L. (2020) How central bankers learned to love financialization: The Fed, the Bank, and the enlisting of unfettered markets in the conduct of monetary policy. *Socio-Economic Review*, 18(3): 625-53.
- Wansleben, L. (2018) How expectations became governable: Institutional change and the performative power of central banks. *Theory and Society*, 47: 773-803.
- Weidmann, J. (2017) green bond insurance and other forms of low-carbon finance. Speech given at the OMFIF Global Public Investor Symposium, Frankfurt am Main, 13 July. Available at: <<https://www.bundesBank.de/en/press/speeches/welcome-and-opening-speech-711524>>. Accessed 22 September 2022>.
- Weidmann, J. (2019) Climate change and central banks. Speech given at the Deutsche Bundesbank's Second Financial Markets Conference, Frankfurt am Main, 29 October. Available at: <<https://www.bundesBank.de/en/press/speeches/Climate-Change-and-Central-Banks-812618>>. Accessed 22 September 2022.
- Weidmann, J. (2020) Combating climate change – what central banks can and cannot do. Speech given at the European Banking Congress, Virtual Event, 20 November. Available at: <<https://www.bundesBank.de/en/press/speeches/combating-Climate-Change-what-Central-Banks-can-and-cannot-do-851528>>. Accessed 22 September 2022.
- Weidmann, J. (2021) Climate change and climate protection. Speech given at the Press Conference to Present the Annual Accounts of the Deutsche Bundesbank, Virtual Event, 3 March. Available at: <<https://www.bundesBank.de/en/press/speeches/introductory-comments-at-the-press-conference-to-present-the-annual-accounts-860192?#tar-5>>. Accessed 22 September 2022.
- Young, K.L. (2012) Transnational regulatory capture? An empirical examination of the transnational lobbying of the Basel Committee on Banking Supervision. *Review of International Political Economy*, 19(4): 663-88.