

ISSUE BRIEF

Financing the Future: Measuring and Reporting Climate-Related Risks

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INTRODUCTION

he climate transition has arrived in the global economy. The transition is technical, and often subtle. It will have at least as large an impact on the structure of economic activity during the twenty-first century as the physical shifts in weather patterns.

On the surface, the public policy dialogue in economic and financial regulatory circles focuses on technical issues regarding mandatory disclosures by corporate issuers, sovereign issuers, and regulated financial institutions. Demands for increased precision and comparability drive efforts to define common terms, common mandatory disclosure fields, and a common approach to measuring exposure to climate-related risks.

Assessing exposure to climate-related risks is an important but substantially different exercise from measuring climate change—which makes many uncomfortable. Some question whether a risk-measurement framework creates appropriate incentives. Others debate the appropriate way to measure risk exposures regarding potential future outcomes that are not yet certain, because actions to reduce emissions today can shift the severity of the physical risks associated with climate change.

Economic actors—markets, investors, sovereigns, central banks—do not have the luxury of waiting for risk professionals and regulators to find consensus on the risk-measurement and disclosure issues. Their actions will impact the shape of supply-and-demand functions across the economy globally, as well as domestically. For example,

 increased demand for green bonds creates increased financing for green initiatives;

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- shifts in central-bank collateral policy and asset-purchase programs (which operate at scale, compliments of the pandemic) have a material impact on both green-bond liquidity and traditional-bond liquidity, creating positive incentives for accelerated attention to climate-friendly corporate policies if executed well; and
- dramatic shifts in economic activity that respond to natural disasters or increased taxes (or both), can impact price stability as well as financial stability, requiring central banks to adopt or emphasize climate-related issues when formulating monetary policy. Analysts assessing interestrate policy based solely on traditional economic data may find their monetary policy projections are increasingly inaccurate as a consequence.

The transition to a climate-focused approach to economic and financial policy continues to gain momentum during 2021. Assessing the shape of the policy reaction function requires assessing how traditional economic activity and financial regulation will adjust. The discussion goes far beyond aspirational emissions-reduction targets. It embeds a climate focus into the underpinnings of modern economic activity at a level traditionally only addressed by technical experts.

The initiatives under discussion also raise important questions about the role that central banks can, or should, play in accelerating economic transitions—both at home and in cooperation with others. Like the underlying climate-change issues that drive this shift, cross-border cooperation will be key to facilitating a responsible transition. Successfully navigating these issues may help provide a foundation for a reinvigorated Bretton Woods system that creates positive economic incentives for cross-border cooperation and coordination.

EXECUTIVE SUMMARY

Section I describes the substantial initiatives currently under way globally to expand the mandatory-disclosure framework in a way that provides meaningful perspective on exposures to climate-related risks. Many of the public policy shifts have been under way for years, particularly in Europe. The policy process achieved critical mass globally in January 2020, and is not likely to peak before 2023.

Section II assesses the state of the debate concerning risk measurement in the climate-change context. Real and difficult issues exist for corporations and financial institutions. The stakes here are high. Mismeasurement can create material adverse consequences for economic activity. It is much too soon to know what the "right" answer might be, or even if a "right" answer can be identified. Section II, therefore, merely outlines the key issues for purposes of facilitating fact-based discussions.

Section III assesses the range of monetary policy challenges associated with expanded central-bank engagement to support climate-related initiatives.

The key findings and recommendations cover a wide range of issues.

- 1. Taxonomies and Disclosure Policy (Securities and Accounting Regulators): Regulators and standard setters should accelerate their efforts to define concrete, comparable mechanisms for measuring and disclosing exposures to climate-related risks so that investors can exert market discipline on issuers.
- 2. Scenario Analysis (Financial Regulators): Financial regulators (including central banks) should intensify their use of climate-scenario analysis to explore potential exposures—and potential measurement mechanisms— within financial firms.
- **3. Regulatory Capital (Banking Regulators):** Banking regulators should identify how climate-related risks are already incorporated into either the operational-risk paradigm or the credit-risk paradigm.
- 4. Financial Stability (Macroprudential Regulators): Policymakers should provide more clarity regarding whether and how climate-related risks generate financialstability issues that require official-sector engagement.
- **5. Green-Bond Holdings (Central Banks):** Central banks should provide clear disclosures regarding the scale, scope, and standards they use to purchase green bonds.
- 6. Green-Collateral Policy (Central Banks): Central banks should provide clarity concerning whether and to what extent green bonds will be accepted to meet collateral requirements for overnight liquidity operations.

Policymakers around the world are beginning to take steps in many of these directions. The recommendations in this paper



Climate change activists take part in protests in front of the New York Stock Exchange on Wall Street during Extinction Rebellion protests in New York City, New York, U.S., October 7, 2019. Source: REUTERS/Shannon Stapleton

seek simply to encourage policymakers to intensify their engagement and provide clarity. Capital markets and climate advocates will require decisive action from policymakers faster than the traditional international consensus-building process typically allows. Clarity concerning direction, priorities, taxonomies, and standards in the near term can help mitigate financial-stability risks driven by uncertainty.

I: DISCLOSURE

Background: Entities that issue securities (equities, fixed income) seek investments from strangers. Mandatory disclosures articulated by financial regulators seek to ensure that all investors receive the same information at the same time, in order to avoid favoritism and unfair advantages. Securities-disclosure regimes, thus, focus on quantitative data that provide meaningful information on an issuer's current and recent financial performance. All companies deliver the same specific data points, so that investors can compare companies and make informed decisions about the net present value

of an issuer's offering. Verbal components within mandatory disclosures ("management discussion and analysis") are more subjective, but provide perspective on risks and trends that can impact assessment of the financials.

While the technical details can differ at the margins across countries, the core components and policy priorities underpinning the disclosure regime remain the same. Sovereigns issuing fixed income to capital-markets investors must provide the same quantitative data as private-sector issuers.

Very real adverse consequences arise for issuers that deliver materially misleading or incorrect information to investors. From an honest mistake to a deliberate attempt to mislead, the sanctions associated with delivering incorrect data to the markets seek to ensure the integrity of the investment decision.

The last ten years have seen a growing number of investors demanding more information from corporate and sovereign issuers regarding a broad range of climate-related matters. The shift delivers a positive feedback loop, with more capital flowing toward issuers that demonstrate through disclosures that they are serious about addressing climaterelated issues.

Demands for more information regarding climate-related issues no longer emanate from a relatively small, niche field of "impact investors," as

- large institutional asset managers increasingly also require this information from all companies;
- some central banks, in their capacity as large purchasers of corporate and sovereign assets in response to the pandemic, also require certain disclosures in order to determine whether or not an instrument qualifies for their green-purchase allocations;
- climate-change activists seek disclosures regarding carbon footprints, emissions, and other sustainability initiatives; and
- rating agencies seek a broad range of disclosures in order to verify whether a proposed securities issue is indeed "green."

However, the market dynamic also creates challenges. In order to make good decisions, investors must be able to compare investment opportunities using the same metrics. The rapid evolution in the markets has generated the opposite outcome. Issuers use different language to describe their activities. No agreement on metrics exists.

The range of disclosures has become exceedingly broad. Some issuers provide verbal descriptions of their recycling commitments; others provide emissions data. Some issuers provide no information at all. Lack of consistency concerning use of the term "green" to describe activities or specific securities creates concerns that the term will soon become meaningless, or will inappropriately reward companies that fail to act.

Not all measurement mechanisms are appropriate or meaningful across all industries. In addition, companies

are increasingly exposed to climate-related risks related to increased costs from taxes, from increased insurance premiums (which reflect exposure to physical climate risks), and from decreased access to capital for non-green activities.

Policy activity has occurred in fits and starts over the last decade. The pandemic, the US election, and US civil strife during 2020 combined to obscure the full scale and scope of regulatory activity as policymakers pivoted hard and fast toward accelerating the creation of concrete, and potentially more consistent, cross-border disclosure requirements. The synopsis of major developments between 2010 to 2021 below illustrates two points. The initial years (2010–2017) provided periodic incrementalism against a growing market movement with higher ambition. A brief reflection period (2018–2019) was followed by an intense period of policymaking that started in January 2020.

Periodic Incrementalism (2010–2017): The first major policymaker to recognize the importance of climate-related disclosures was the Securities and Exchange Commission (SEC). In 2010, the SEC issued guidance that climate -related disclosures should be included within Regulation S-K disclosures, if they were material to the issuer's financial prospects.¹

The expected disclosures are limited and focus on defensive, rather than proactive, actions taken by issuers regarding climate-related issues. Specifically, issuers must provide disclosures regarding material costs associated with complying with environmental regulations (Item 101) and material litigation involving environmental issues (Item 103). No quantitative disclosures were required from issuers regarding emissions, energy efficiency, or other climate-related activities—much less incidental risks. The SEC did request public comment in 2016 on whether investors should be required to provide specific disclosures regarding sustainability, but no regulatory requirements were ever issued.

The international community worked in parallel with these national initiatives. In 2015, the Financial Stability Board created a Task Force on Climate-related Disclosures (TFCD) to explore how increased standardization and data integrity could address climate-related issues.² Eighteen months

^{1 &}quot;Commission Guidance Regarding Disclosures Related to Climate Change," Securities and Exchange Commission, 2010, https://www.sec.gov/rules/ interp/2010/33-9106.pdf.

² The Financial Stability Board is an international ministerial body that promotes cross-border risk assessments and standards alignment for the financial sector. Its members comprise national finance ministers, central-bank governors, financial regulators from the Group of Twenty (G20) countries plus the European Commission, and various informal international standard-setting bodies for the banking (Basel Committee on Banking Supervision), securities (International Organization of Securities Commissions), insurance (International Association of Insurance Supervisors), payments (Committee on Payments and Markets Infrastructures), and central banks (Committee on the Global Financial System). "About the FSB," Financial Stability Board, https://www.fsb.org/about.



A man sorts out recyclable parts from electrical and electronic equipment at Quan Do village in Bac Ninh province, Vietnam, July 1, 2020. Picture taken July 1, 2020. Source: REUTERS/Kham

later, in June 2017, the TFCD released what has become the lodestar and international minimum standard for climate-related disclosures. Yet, many found it disappointing.

The "Recommendations of the Task Force on Climate-related Disclosures" provided comprehensive initial guidance, across seventy-four pages, on how issuers should approach disclosures regarding climate issues, grouped across four main headings: Governance, Strategy, Risk Management, and Metrics/Targets.³ It was always designed as a first initiative, not a final set of standards.

The TFCD report merely established a broad qualitative baseline for how to approach disclosures. As an informal group reporting to another informal group, it had no authority to make decisions or issue binding regulatory requirements for issuers. The scoping exercise initiated an international discussion, but did not deliver details. The quantitative metrics/targets left many dissatisfied. The TFCD recommended that companies disclose what kinds of metrics and targets they use to address climate-related risks. They did not, however, identify specific metrics—with one exception. The TFCD recommended that companies provide emissions disclosures in line with the Global Greenhouse Gas (GHG) Protocol. But, not all companies follow this protocol.

The TFCD report also provided a broad range of potential quantitative elements that could be used to disclose climaterelated targets, but the list effectively and unintentionally underscored the size of the disclosure challenge. The report recommended that issuers could choose from national regulatory requirements, as well as internal efficiency targets, net-revenue targets, financial-loss targets, and key performance indicators across preferred internal time horizons. The TFCD report, therefore, made no attempt to constrain

^{3 &}quot;Recommendations of the Task Force on Climate-related Financial Disclosures," Task Force on Climate-related Financial Disclosures, June 2017, https://assets. bbhub.io/company/sites/60/2020/10/FINAL-2017-TCFD-Report-11052018.pdf.

heterogeneity in climate-related disclosures. It merely sought to increase the scale and scope of those disclosures.

A technical supplement ("The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities") attempted to address these shortcomings by providing detailed guidance on how firms could begin measuring their potential exposure to climate-related risks by using specific kinds of scenario analysis.⁴ Scenario options included transition risks, as well as specific physical risks.

These reports created the foundation upon which all subsequent regulatory activity has been built, but not without some controversy. It seems clear in 2021 that the TFCD activities sparked serious momentum and thinking within the financial and economic policy communities about how to meet and manage demand for increased information on, and attention to, climate-related risks. But, climate-change activists resisted a focus on transition-related risks and ancillary financial costs, concerned that it would detract from the broader effort to address physical risks.

Finally, in December 2017, eight central banks (those of China, France, Germany, Mexico, the Netherlands, Singapore, Sweden, and the United Kingdom) created a "network for greening the financial system" at the Paris Climate Summit.⁵ This informal network operates separately from the Bank for International Settlements (which is a treaty-based organization), on a voluntary basis. It has a singular, shared mission:

"The Network's purpose is to help strengthening the global response required to meet the goals of the Paris agreement and to enhance the role of the financial system to manage risks and to mobilize capital for green and low-carbon investments in the broader context of environmentally sustainable development. To this end, the Network defines and promotes best practices to be implemented within and outside of the Membership of the NGFS and conducts or commissions analytical work on green finance."⁶

By releasing research and sponsoring conversations focused on core central-banking topics, this network seeks to advance thinking concerning the monetary policy and financial-system implications associated with the climate transition, without engaging in standard setting at the global level. It now has ninety members and fourteen observers from five continents, including the US Federal Reserve.

The Reflection Period (2018–2019): The policy process then entered a reflection period, during which a great deal of activity occurred effectively in the background. During this period, the most significant work occurred in Europe.

The European Commission established a Technical Expert Group on Sustainable Finance in 2018 to provide guidance regarding

- standard terms (a "taxonomy") for referring to environmentally sustainable economic activity;
- standards for issuers to use when floating "green" bonds;
- standards for climate benchmarks to be used in disclosures; and
- disclosure guidance.⁷

An intensive period of consultations, discussions, and forums followed in Europe.

The Europeans were not alone. The Hong Kong Monetary Authority (HKMA) issued a banking circular to implement sustainability priorities into its banking-supervision process.⁸ "Phase I" launched immediately, with an initiative to develop a framework to identify a "Greenness Baseline" as part of its banking-supervision process. The goal was to create concrete sustainability deliverables (Phase II) and incorporate those deliverables into ongoing banking supervision (Phase III). In parallel, the HKMA pledged to increase the rigor of its sustainability-review process for purposes of asset purchases and credit reviews.

^{4 &}quot;The Use of Scenario Analysis in Disclosure of Climate-related Risks and Opportunities," Task Force on Climate-related Financial Disclosures, June 2017, https:// assets.bbhub.io/company/sites/60/2021/03/FINAL-TCFD-Technical-Supplement-062917.pdf.

^{5 &}quot;Joint Statement by the Founding Members of the Central Banks and Supervisors Network for Greening the Financial System—One Planet Summit," Banque de France, press release, December 12, 2017, https://www.banque-france.fr/en/communique-de-presse/joint-statement-founding-members-central-banks-and-supervisors-network-greening-financial-system-one.

^{6 &}quot;Origin and Purpose," Network for Greening the Financial System, https://www.ngfs.net/en/about-us/governance/origin-and-purpose.

^{7 &}quot;Technical Expert Group on Sustainable Finance (TEG)," European Commission, June 13, 2018, https://ec.europa.eu/info/publications/sustainable-finance-technical-expert-group_en.

^{8 &}quot;Phase-one Measures to Promote Green and Sustainable Banking," Hong Kong Monetary Authority, June 28, 2019, https://www.hkma.gov.hk/media/eng/doc/ key-information/guidelines-and-circular/2019/20190628e4.pdf.





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Many saw the policy process in the United States enter a retrograde period, with a government in office that was actively hostile to climate-change issues.

Active Policymaking (2020–present): January 2020 arrived with a major announcement from the Bank for International Settlements (BIS) signaling a global intention to ramp up climate-related policymaking considerably. Clearly reflecting the culmination of research and discussions over the previous two years, the BIS, together with the Banque de France, published "The Green Swan: Central Banking and Financial Stability in the Age of Climate Change."⁹

Quoting Victor Hugo ("There is nothing more powerful than an idea whose time has come"), the paper issued a rallying cry for central banks to become agents of change by integrating climate considerations into both monetary policy and banking supervision. It strongly endorsed increased disclosure and robust scenario analysis as mechanisms to achieve these goals. It also underscored the need to develop new analytical tools

^{9 &}quot;The Green Swan: Central Banking and Financial Stability in the Age of Climate Change," BIS, January 20, 2020, https://www.bis.org/publ/othp31.htm.



Environmental activists stage protest in support of the Paris climate accord during the One Planet Summit in Paris, France, December 12, 2017. Source: REUTERS/Charles Platiau

and quantification mechanisms to support nimble monetary policy formation amid anticipated economic dislocations from climate disasters.

If COVID-19 had not begun its global rampage a few weeks later, 2020 would have been seen as the year that climatechange policy changed the financial system. It is, in fact, impressive that so many financial policymakers managed to make major moves during 2020 despite the pandemic. It did not generate many headlines, but the time series below illustrates the scale of the initiatives while everyone worked from home.

Whether one looked at climate-related disclosures or the broader environment, social, and governance (ESG) issues, the result was the same: sustained activity in the first half of 2020, followed by dramatic escalation during the second half of 2020 in global official-sector action regarding climate-related financial policy.

Significant upticks in the second half of 2020 corresponded with the annual meetings for the Group of Twenty (G20), the

Financial Stability Board (FSB), and other policy groups. Other notable developments included initiatives launched by the International Organization of Securities Commissions (IOSCO), which hosts its own network focused on sustainability policy, and the International Accounting Standards Board to review sustainability reporting.¹⁰

The European Union (EU) went further. In mid-2020, while the pandemic was raging globally, EU policymakers reached agreement and published the EU Taxonomy Regulation.11 It broadly seeks to cover six specific environmental objectives related to climate change (mitigation, adaptation, sustainability, a circular economy, pollution, and biodiversity protection). The purpose is to decrease or eliminate the risk that companies use positive climate terms inappropriately. Climate activists refer to this initiative as decreasing the risk of issuers overstating their climate-mitigation bona fides ("greenwashing") even as those firms continue to pollute.

The move was significant, but incomplete. The regulation left for another day the definition of specific environmentally sustainable activities that would qualify for use of the terms in

^{10 &}quot;Sustainable Finance and the Role of Securities Regulators," Board of the International Organization of Securities Commissions, April 2020, https://www.iosco. org/library/pubdocs/pdf/IOSCOPD652.pdf; "IASB Chair's Keynote at the IFRS Foundation Virtual Conference," IFRS, September 2020, https://www.ifrs.org/newsand-events/news/2020/09/speech-iasb-chairs-keynote/.

¹¹ Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment, Official Journal L192/13, (June 22, 2020).

the taxonomy. The European Commission completed Part I of this process (not without controversy) in April 2021. Part II is expected to be published in 2022.

It is widely expected that the EU Commission will articulate additional policies in the second half of 2021 regarding verbal or descriptive corporate disclosures that will be required under the Non-Financial Reporting Directive regarding corporate alignment with the sustainability priorities. The first draft of this regulatory policy was released on May 7, 2021.

Not all initiatives from the official sector have promoted climate priorities. In October 2020, the Trump administration issued a regulatory standard requiring investment-sector fiduciaries advising retirement plans to make investment recommendations regarding only quantitative financial issues.¹² The rule prohibits retirement-fund advisers from making investment recommendations based on "non-pecuniary" considerations. ESG factors were specifically singled out as prohibited. The Joe Biden administration has announced it will not enforce this rule, at least during 2021.¹³

More action is expected during 2021. In March 2021, acting SEC Chair Alison Herron Lee initiated a broad review of existing disclosure requirements.¹⁴ She also initiated an informal consultation process by publicly announcing an email address to receive comments. A parallel internal directive regarding corporate filings was announced in February 2021, without a request for public comment.¹⁵

In sum, as of this writing, no concrete climate-related disclosure obligations exist for issuers. This is a temporary situation, and the direction of travel is clear. Policymakers seek to increase the availability of climate-related information to investors. The demand for this information is clear as major institutions begin to prioritize green-capital allocation. Why aren't policymakers moving forward faster? Because measuring exposure to climate-related risks is much harder than targeting a planet-wide restriction on carbon-dioxide (CO2) emissions. Agreement on a taxonomy is a necessary, but not sufficient, condition for a functioning disclosure system.

II: MEASUREMENT

Climate-change advocates will find the measurement challenge baffling. For them, the only data point that matters is CO2 emissions, and the only trend that matters is reducing CO2 emissions. Ancillary activities and related data associated with the "circular economy" (e.g., recycling, reuse, and reduction) represent nice, but not mission-critical, data points.

The financial world is very different. A functioning marketdiscipline process requires data points that are comparable across companies, so that investors can compare performance at any moment in time, not decades into the future. Even while investors seek to allocate capital in order to support a moral commitment to "do the right thing," they also seek to achieve a specified return on a nearer-term time horizon, measured in terms of years rather than decades.

An investor can rationally choose to prioritize high performance on climate commitments over market price, but the investor needs to be able to justify such a decision by indicating objectively that one company is making more concrete progress than another. The incentivizing power of allocating capital based on positive incentives cannot function without concrete, uniform data regarding near-term objectives and related risks.

Data points regarding climate-related exposures (or mitigation initiatives) do not easily translate into time horizons that match investment time horizons. An investor may be glad to see that

^{12 &}quot;U.S. Department of Labor Announces Final Rule to Protect Americans' Retirement Investments," US Department of Labor, press release, October 30, 2020, https://www.dol.gov/newsroom/releases/ebsa/ebsa/ebsa/20201030; "Financial Factors in Selecting Plan Investments," 85 FR 72846, November 13, 2020, https://www. federalregister.gov/documents/2020/11/13/2020-24515/financial-factors-in-selecting-plan-investments.

^{13 &}quot;U.S. Department of Labor Statement Regarding Enforcement of its Final Rules on ESG Investments and Proxy Voting by Employee Benefit Plans," US Department of Labor, March 10, 2021, https://www.dol.gov/sites/dolgov/files/ebsa/laws-and-regulations/laws/erisa/statement-on-enforcement-of-final-rules-onesg-investments-and-proxy-voting.pdf.

^{14 &}quot;Public Statement: Public Input Welcomed on Climate Change Disclosures," US Securities and Exchange Commission, March 15, 2021, https://www.sec.gov/ news/public-statement/lee-climate-change-disclosures.

^{15 &}quot;Public Statement: Statement on the Review of Climate-Related Disclosure," US Securities and Exchange Commission, February 24, 2021, https://www.sec.gov/ news/public-statement/lee-statement-review-climate-related-disclosure.

Company A is doing all the right things so that the planet does not disintegrate in 2060, but that same investor also knows that retirement looms in 2030. These mismatches in time horizons between investors and climate advocates complicate the measurement challenge.

Investment professionals representing retail investors face an additional challenge: they are often legally prohibited from recommending investments that may not deliver a return for the investor on their preferred time horizon. Investment professionals also face a range of restrictions prohibiting investments that could jeopardize an individual's retirement savings.

If policymakers seek to create positive incentives by making it easier for capital markets to reward good performance regarding not only emissions, but also responsible corporate risk-mitigation strategies during the climate transition—more granular and comparable data are needed. The time has come to measure climate-related risks. It won't be easy.

Choosing Metrics. At a certain level, measuring CO2 emissions and energy efficiency is easy. The increments are well known. So is the goal: to decrease emissions and increase efficiency. But, in the financial context, the question is: at what cost?

Ardent advocates make the case that the cost does not matter. They argue that climate externalities have been inappropriately priced in the past, if they have been priced at all. They assert that remedial action is needed immediately in order to price in all climate externalities, without regard to financial stability or economic instability, because the moral imperative justifies dramatic action. Most policymakers shun dramatic action that can create rapid shifts in prices, particularly during a pandemic.

Enter the International Monetary Fund (IMF). During 2021, the IMF launched a "Climate Change Dashboard" to help investors identify risk exposures more closely affiliated with climate issues.¹⁶ The dashboard provides a range of interesting and informative aggregates regarding key issues (e.g., environmental taxes, government expenditures on environmental protection, loans adjusted for carbon footprint, trade, and direct investment). But, the data only display national-level aggregates. The dashboard's utility to investors outside the sovereign-fixed-income and, perhaps, foreign-exchange contexts is debatable.

A shift toward prioritizing climate-related indicators at the IMF could generate other externalities. The IMF's moral suasion during Article IV reviews could, over time, help shift policy trajectories toward more climate-friendly policies, if domestic political dynamics support such a shift. The IMF's lending policies could generate a more immediate impact if they were to prioritize environmental factors when granting emergency lending.

IMF Managing Director Kristalina Georgieva has been eloquent on this point. She has actively and consistently advocated for nations to prioritize green (as well as digital) solutions when they plan for a post-pandemic future. But, the reality is that emergency liquidity assistance from the IMF does not currently, and does not seem likely to, prioritize climate issues relative to immediate economic pressures.

Even if the IMF or other entities were to prioritize climate issues for emergency lending purposes, the appropriate metrics for measuring climate-related risks remain unclear. As noted, institutional and individual investors seek more granular firmspecific data beyond country allocations. Options include

- risk of loss due to loss of property from extreme weather events;
- emissions levels;
- energy-efficiency gains;
- expenses related to environmental compliance;
- taxes paid (e.g., carbon taxes);
- carbon credits (acquired through trading or other exchange mechanisms);
- plastics credits (acquired through recycling initiatives); and
- portfolio allocations (how much of a portfolio is invested in carbon; average emissions and/or energy-efficiency ratings for portfolio companies).

No consensus yet exists regarding these metrics at the national or international level. Climate-change advocates may bristle at the notion of providing companies with credits for

^{16 &}quot;Climate Change Indicators Dashboard," International Monetary Fund, https://climatedata.imf.org/.



Heavy rain and hail falls in front of the New York Stock Exchange (NYSE) as a severe weather system passes through the area in the Manhattan borough of New York City, New York, U.S., April 21, 2021. Source: REUTERS/Andrew Kelly

energy efficiency or taxes paid, because they focus instead on aggregate global carbon emissions, regardless of the cost. Investors seeking to maximize profits, or at least safeguard their retirement savings, may legitimately choose to allocate capital based on other indicators with differing time horizons.

Time-Horizon Mismatches. Daily capital-market prices represent the net present value of an issuer's prospects based on all available information. But, investment decisions require an additional, crucial parameter: time. Even if an investor were to prioritize decreased CO2 emissions, their commitment of capital to support this initiative may include an investment time horizon that does not align with the time that it takes to achieve climate remediation.

For example, an investor seeking to achieve gains over a relatively short time horizon might prioritize one data point, while an investor taking a sizeable position and seeking to acquire a board seat to influence decisions might choose a different data point.

Another time-horizon issue complicates the measurement process. Issuers (including governments) may be exposed to

global macro climate-change risks in the long term (20–50 years), but they are also crucially exposed to significant risks during the near-term (1–20 years) climate transition.

Measuring transition risks over the next two decades is crucially important for the vast majority of investors. Yet, it is a minefield.

Transition risks are not fixed; policy and corporate choices today can materially impact the direction of environmental evolution. Smart decisions today can position some firms and sovereigns to navigate environmental evolution better than others. Disclosure enhancements can facilitate capital allocations that reward smart decisions. But, much thought and analysis are required before the appropriate vectors can be identified. Federal Reserve Governor Lael Brainard recently articulated the measurement challenges:

"Unlike episodic or transitory shocks, climate change is an ongoing, cumulative process, which is expected to produce a series of shocks. Over time, these shocks can change the statistical time-series properties of economic variables, making forecasting based on

historical experience more difficult and less reliable... Quantifying the risks and implications of potentially catastrophic climate-related tipping points for the economy and financial system is extremely difficult... substantial uncertainty about the nature and timing of the policy, behavioral, and technological changes that will occur during the transition to a sustainable economy...could create significant challenges for financial stability...even well-informed investors could underestimate the likelihood of large shocks related to climate change, resulting in systematic mispricing of risk...Finally, vulnerabilities could result if climate risks in the aggregate are systematically correlated across participants in the economy and financial system. These correlated aggregate exposures could be missed by risk models and difficult or impossible to mitigate fully."17

These important challenges must be considered carefully when crafting a disclosure and risk-measurement framework, particularly since issuers face real legal consequences for mistaken or misleading disclosures. Issuers delivering securities to capital markets before these issues have been fully assessed risk incurring potential legal liability in the future if the policy landscape shifts quickly.

Pricing climate-transition risks over the near term is also important for financial institutions and insurance companies in their underwriting businesses. Financial firms hold vast portfolios of loans—particularly property loans—due to mature in the near term (e.g., 1–5 years). Some of those loans may be uniquely exposed to dramatic deterioration from physical risks related to climate change. The most obvious examples include riverfront and seafront homes and businesses. Insurance companies are particularly exposed to near-term transition risks in their property and casualty portfolios. For these firms, it is imperative to be able to price the near-term risks associated with shifts in the physical environment.

Pretending the transition risks do not exist only increases the amount of embedded, nontransparent climate exposures. Requiring firms to immediately price the risks of these embedded exposures alongside all new underwriting could create a short-term price shock within economies that may still be recovering from the pandemic.

The financial-stability risks are real. In May, the Biden administration formally determined that the "failure of financial institutions to appropriately and adequately account for and measure physical and transition risks" create financial stability vulnerabilities that jeopardize "the life savings and pensions of U.S. workers and families, and the ability of U.S. financial institutions to serve communities."¹⁸ The president has directed the Department of the Treasury to convene the Financial Stability Oversight Council for the purpose of identifying concrete vulnerabilities as well as to accelerate the development of appropriate disclosure standards within one hundred and eighty days. The Treasury Department immediately pledged to take action accordingly.¹⁹

On the same day, the ECB published its Financial Stability Review declaring that climate-transition risks create financial risks for firms and financial-stability risks for the economy.²⁰ The analysis provides the most concrete statistics to date estimating the proportion of European bank lending with direct (loans) and indirect (collateral) exposure to firms with elevated risks related to physical risks in addition to firms that are viewed as high carbon emitters. The ECB specifically estimates that European bank securities holdings include a high (30% concentration) in instruments issued by high emitters.

^{17 &}quot;Financial Instability Implications of Climate Change," Board of Governors of the Federal Reserve System, March 23, 2021, https://www.federalreserve.gov/ newsevents/speech/brainard20210323a.htm.

^{18 &}quot;Executive Order on Climate-related Financial Risk," Executive Office of the President of the United States, May 20, 2021, https://www.whitehouse.gov/briefingroom/presidential-actions/2021/05/20/executive-order-on-climate-related-financial-risk/.

^{19 &}quot;Remarks by Secretary of the Treasury Janet L. Yellen on the Executive Order on Climate-Related Financial Risks," US Department of the Treasury, May 20, 2021, https://home.treasury.gov/news/press-releases/jy0190.

^{20 &}quot;A potential concentration of climate-related physical risks among a few, more vulnerable banks could have implications for financial stability. While physical risks are not new for the assessment of credit and market risks, more frequent, more severe and more strongly correlated physical hazards may place additional strains on the banking system, especially for banks with lending in limited geographical areas. Furthermore, medium and long-term forward-looking scenario-based analysis can be used to assess the interaction of these risks with transition risks across sectors (see Box A). To limit losses to the financial system, it will be essential to support an orderly transition to a sustainable economy, limit the impact from physical hazards by means of climate change adaptation measures and diversify risks among financial institutions using loss-absorbing capacity, financial instruments or insurance coverage. In addition, further investment in granular, forward-looking data collections and risk quantification methodologies is needed to underpin comprehensive, forward-looking analyses."

Separately, central banks have been taking action. In March 2021, the European Central Bank (ECB) announced a radically different kind of stress test would be applied to the European banking system.²¹ The ECB is requiring all banks to assess their exposure to climate risks over an unprecedented thirty-year time horizon. The move supplements a November 2020 announcement that the ECB would begin applying specific expectations and requirements regarding climate-change preparedness as part of its regular bank-supervision process.²²

The Federal Reserve has been more cautious. Although the Federal Reserve recently created a Supervision Climate Committee, recent research indicates that policymakers in Washington have concluded that "although we believe that climate change increases financial stability risks, more research and analysis is needed to incorporate these risks fully into financial stability monitoring, including substantial improvements in data and models."²³ Governor Brainard has made clear that the purpose of the new committee is to assemble a robust set of data and an analytical framework for assessing risks related to that data before the Federal Reserve begins making changes to its financial-oversight policy.²⁴

Some advocates fear that measuring transition risks can create the potential for distraction. A capital-market or central-bank focus on incremental transition shifts can decrease the urgency of more drastic short-term actions to address risks that lie decades in the future. Some climate advocates would prefer to price in all cataclysmic impacts today for the purpose of safeguarding the future, but the cost of such a move could be astronomical, particularly if the fulltime horizon to 2050 or beyond is used to estimate the price of climate risk. Disclosure policy could, thus, take some time to define as experts attempt to balance the time-horizon and financial-stability issues. Policymakers have other options for taking action beyond disclosure.

An indirect, but potentially powerful, incentive mechanism exists through the bank-regulation channel. If financial

regulators—particularly in the banking sector—prioritize data points around carbon footprints associated with each loan in a bank portfolio, banks will soon begin to prioritize and incentivize loans with positive green characteristics.

The technical challenges raised by such a policy shift are far from small. Policymakers must first determine whether climate-related risks are properly characterized as operational risks or credit risks. The difference is that operational risks mostly involve exogenous elements over which a bank may have limited control. Credit risks, by contrast, effectively evaluate the behavioral choices made by a borrower. A regulatory capital framework creates an explicit price for climate risks through the operational-risk channel would effectively imply that the exposure is beyond control, except at the margins. Incorporating climate considerations into the credit-risk capital framework implicitly imposes a moral judgment on decisions made by the obligor; it also approaches the boundary between appropriate pricing for credit risks and government-mandated credit allocation, which market economies traditionally have shunned.

Finally, direct capital requirements tend to be assessed regarding concrete, identifiable risks likely to have an impact on bank liquidity and solvency over a relatively short period of time. Because climate-related risks currently present an unclear impact trajectory given that the impact of various climate policies is unclear, hasty decisions regarding regulatory capital changes regarding climate-related risks could increase or decrease incentives for banks to assess and support the climate transition.

For example, regulatory-capital decisions made with an assumption that all climate-mitigation strategies will fail to generate a shift in behavior will generate overly harsh standards that could exacerbate financial-stability concerns. Aligning regulatory-capital requirements with overly broad emissions goals may also create disincentives for financial institutions to address climate-related risks with appropriate rigor.

²¹ Luis de Guindos, "Shining a Light on Climate Risks: The ECB's Economy-wide Climate Stress Test," European Central Bank, March 18, 2021, https://www.ecb. europa.eu/press/blog/date/2021/html/ecb.blog210318~3bbc68ffc5.en.html.

^{22 &}quot;Guide on Climate-related and Environmental Risks: Supervisory Expectations Related to Risk Management and Disclosure," European Central Bank, November 2020, https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-related and environmentalrisks" 58213f6564.en.pdf.

²³ Celso Brunetti, et al., "Climate Change and Financial Stability," Board of Governors of the Federal Reserve System, March 19, 2021, https://www.federalreserve. gov/econres/notes/feds-notes/climate-change-and-financial-stability-20210319.htm.

²⁴ Governor Lael Brainard, "The Role of Financial Institutions in Tackling the Challenges of Climate Change," Board of Governors of the Federal Reserve System, February 18, 2021, https://www.federalreserve.gov/newsevents/speech/brainard20210218a.htm; Governor Lael Brainard, "Financial Stability Implications of Climate Change," Board of Governors of the Federal Reserve System, March 23, 2021, https://www.federalreserve.gov/newsevents/speech/brainard20210323a. htm.

The measurement issues for disclosure and risk-measurement purposes are, thus, far more nuanced than merely measuring CO2 emissions. They require careful consideration before implementation, in order to avoid injecting needless volatility into the economy.

Fiscal Policy Complications. Fiscal policy further complicates measurement issues. Risk assessments premised on the current policy mix implicitly assume no change in tax policy. Finance ministries and legislators are not likely to wait for financial regulators to start pricing climate risks indirectly through regulatory-capital and disclosure requirements. Immediately imposing carbon taxes or creating incentives (tax rebates and subsidies) for renewable-energy manufacturers, immediately shifts the credit-risk profile and the market-risk profile for every company either directly, because they are a beneficiary/ target, or indirectly, because they are bystanders.

Fiscal policy can be a tempting solution for advocates seeking an immediate path toward pricing in climate externalities that may have previously been ignored or underappreciated by investors. But, the economic and market consequences associated with such broad policy initiatives can include severe economic dislocation and market volatility. Few who experienced the economic dislocations during the 2008 financial crisis or the 2020 pandemic would affirmatively seek to trigger similar economic and financial-market dynamics.

Two less-draconian fiscal policy options exist. First, pandemicrelated fiscal spending can prioritize funding for climatefriendly projects. The expenditure of public resources creates considerable incentives for companies to shift toward climatefriendly solutions. It also creates the necessity to accelerate progress regarding measurement and disclosure, since recipients of public funding typically must provide reports to the official sector on the use of funds and on the impact that government funding.

Second, the creation of tradeable pollution permits should gently increase prices while simultaneously expanding disclosures. However, emissions-trading projects, to date, have had a lackluster track record.

Emissions-trading systems originated in 2005 with the EU Emissions Trading System.²⁵ While it remains the largest such trading system, its scope is limited to three substances (CO2, nitrous oxide (N2O), and perfluorocarbons) generated from industrial processes. Following its exit from the EU, the United Kingdom will launch its own emissions-trading system in May 2021.²⁶ The US Environmental Protection Agency (EPA) indicates that successful trading frameworks decrease emissions and



^{25 &}quot;EU Emissions Trading System," European Commission, https://ec.europa.eu/clima/policies/ets_en.

^{26 &}quot;Participating in the UK Emissions Trading Scheme (UK ETS)," Government of the United Kingdom, https://www.gov.uk/government/publications/participating-inthe-uk-ets.

increase disclosures when three conditions exist: a large geographical area is impacted, a "significant number of sources are responsible for the pollution problem," and the emissions can be measured consistently and accurately.²⁷

A number of emissions-trading systems exist at both the federal and state levels in the United States, in addition to most regions of the world. Yet, climate-change advocates indicate the systems are taking too long to generate a positive downward impact on emissions. Urgency propels advocates and likeminded policymakers to seek out additional mechanisms that will accelerate the transition to a net-zero-carbon economy. Starting in 2020, a critical mass of such policymakers emerged globally among central banks. Monetary policy will never be the same again.

III: MONETARY POLICY

Central banks bear responsibility for safeguarding economic and financial stability. Their swift and effective response to the Great Financial Crisis in 2008–2010, the EuroArea sovereigndebt crisis in 2010–2012, and the pandemic in 2020 has attracted the attention of climate activists seeking quick action beyond the political arena.

Consider the creativity and quick action during the 2020 pandemic. The pandemic required policymakers globally to create a massive economic-support structure over a relatively short 6–8-week period, followed by extensions of those policies as the pandemic dragged on. The increase in initiatives at certain points was exponential.



^{27 &}quot;What is Emissions Trading?" US Environmental Protection Agency, https://www.epa.gov/emissions-trading-resources/what-emissions-trading.

Fiscal policy and legislative action attract the majority of credit for ensuring that economies managed to achieve a measure of resilience during the pandemic. The unsung heroes of pandemic stabilization, however, reside at central banks that used the full arsenal of unconventional monetary policy to purchase a broad range of financial assets within traded markets. As noted below, the four largest central banks increased their balance sheets by roughly 50 percent in 2020 by allocating \$7.8 trillion to financial-stability operations. Most of those asset-purchase programs remain in place to this day.

Central banks now dominate many markets by serving as the largest buyers of traded assets.

This role now makes it possible for central banks to serve as countervailing weights to fiscal or regulatory policies seeking to accelerate the pricing climate-related risks. Conventional wisdom holds that a well-functioning central bank could be a valued partner in minimizing financial-stability risks associated with rapid recognition of climate-related risks. It can also serve as a valuable ally in deploying positive market pressure by providing liquidity to green-bond issuances.

Amid the expanding pandemic-era purchasing programs, a number of central banks simultaneously sought to expand their purchases of green bonds. Where lack of supply or internal asset-allocation requirements prohibited more purchases, certain central banks (notably, the ECB) began accepting green bonds as collateral to support overnight and other lending operations.

These early successes have attracted the attention of climate advocates and likeminded legislators in Europe to increase political pressure on the Bank of England, the ECB and national central banks to become more proactive in creating incentives that accelerate the climate transition through their collateral policies and their asset purchases.²⁸ Additional pressure points include increasing transparency regarding their own climate exposures through their balance-sheet holdings and adjusting monetary policy. These initiatives raise real questions about whether and how central banks should become more responsive to public sentiment. Because these issues are complicated, it is also important to ensure that public debate provides clarity regarding the various policy tools and their implications. Five key aspects of central bank operations merit attention in this context: price stability, collateral policy, asset purchases, reserves management, and central-bank disclosures.

Price Stability: It remains an open question whether (or not) climate change will generate short-term adverse impacts on price stability, which is so core to monetary policy. Recent experience with the pandemic provides mixed signals regarding this issue.

The pandemic created a sudden and immediate impact on both economic activity and prices—both directly (due to increased demand for household goods and decreased demand for inperson services) and indirectly (due to decreased demand for certain energy products). Inflation is clearly visible in most advanced economies regarding food and other staples.²⁹ Yet, extreme price movements have (mostly) not materialized. Global trade volumes have now surpassed pre-pandemic levels, registering increases from expanded consumer spending at home.³⁰

Even with idiosyncratic shifts in weather patterns, it remains highly likely that the price impact of climate change will be far more gradual than that of the pandemic. Stress points appearing over a period of months or years provide time and space for economic actors to adapt, and for price impacts to become gradual over time. The pandemic experience also suggests strongly that the pricing function is far more resilient than many previously expected.

Government policy, however, can immediately impact price stability through two mechanisms: carbon taxes and centralbank policies regarding collateral or asset-purchase priorities. Because central banks have no influence over the decision to impose carbon taxes, or their administration, the authors leave this issue for a different paper.

²⁸ Chloé Farand, "Parliament Urges ECB to Put Climate at Heart of Strategy Review," Euractiv, February 13, 2020, https://www.euractiv.com/section/energyenvironment/news/parliament-urges-ecb-to-put-climate-at-heart-of-strategy-review/.

^{29 &}quot;Consumer Prices, OECD," Organisation for Economic Co-operation and Development," last updated May 5, 2021, https://www.oecd.org/newsroom/consumerprices-oecd-updated-5-may-2021.htm.

^{30 &}quot;Global Trade's Recovery from COVID-19 Crisis Hits Record High," United Nations Conference on Trade and Development, May 19, 2021, https://unctad.org/ news/global-trades-recovery-covid-19-crisis-hits-record-high.

Central banks are grappling with the price stability issues right now. In a recent speech, the Bank of England's Andrew Hauser observed:

"...carbon producers do not for the most part yet bear the full costs that their emissions impose on the wider economy. A key part of the transition to net zero is to internalise those costs, driving a significant increase in the so-called 'shadow carbon price' (Chart 6). As that happens, it will put downward pressure on the prices of assets issued by companies who have been least successful in transitioning away from high-emissions activities, increasing their cost of finance... The question is not whether the shadow carbon price has to rise—the question is when. To the extent that markets are assuming an unrealistically low or distant pickup and it seems increasingly clear that they are—financial assets today may be mispriced."³¹

Every fiscal, financial-regulatory, and even monetary policy shift designed to accelerate the transition toward a net-zerocarbon economy creates additional price-stability risks that will demand a central-bank response. Central banks apparently seek to get ahead of this policy momentum by taking proactive action to smooth the transition using other monetary policy tools, particularly collateral policy and reserves management.

Collateral Policy: Central banks provide economic agents with overnight liquidity, but not for free—except in the most extreme situations. Central-bank lending instead occurs on a collateralized basis. Central-bank policies regarding which instruments will be accepted as collateral for overnight lending create significant incentives for financial firms to acquire and hold those assets in their portfolios. Central-bank collateral policy, therefore, creates positive liquidity for certain tradeable assets, even if the central bank does not directly purchase those assets.

For example, both the European Central Bank and the People's Bank of China have recently accepted green bonds as collateral for central-bank lending. Recent research from the Banque de France indicates that, at least in a command economy, the impact from this policy shift is immediate (within three weeks, with maximum impact after three months) and persistent (lasting longer than six months).³²

It is not yet clear whether the ECB policy will have a similar impact—in part, because the initial pool of eligible instruments is very small. Few instruments currently qualify for inclusion because their coupons do not link to either the EU's Taxonomy Regulation (which was only published last year, and whose details were only finalized in the spring of 2021) or the UN's Sustainable Development Goals.

Asset Purchases: As noted above, the pandemic has made central banks massive purchasers of private and sovereign securities. The role is expected to remain in place for the foreseeable future. Adding ESG or climate conditions as a prerequisite for central-bank purchases creates incentives for issuers to generate additional supplies of green bonds that are eligible for such purchases. These policies amplify and support a positive feedback loop that works with the grain of the markets, so long as official-sector buyers do not crowd out private buyers.³³

Because central banks are under political pressure to increase their support of green initiatives, markets could rationally conclude that adjusting their operations to suit asset-purchase-program requirements regarding sustainability conditions would be well worth the investment, because the central bank will be a ready buyer of those assets. This is not a hypothetical scenario. The Bank of England in May 2021 initiated a consultative process to explore how to "tilt" its asset purchases toward good climate performers and away from laggards.³⁴ It has not yet, however, identified the metrics and indicators it will

³¹ Andrew Hauser, "Speech: It's Not Easy Being Green—But that Shouldn't Stop Us: How Central Banks Can Use Their Monetary Policy Portfolio to Support Orderly Transition to Net Zero," Bank of England, May 21, 2021, https://www.bankofengland.co.uk/-/media/boe/files/speech/2021/may/its-not-easy-being-green-but-thatshouldnt-stop-us-speech-by-andrew-hauser.pdf?la=en&hash=6859472C053CB4130189220C3141648C0AADF5C2.

³² Macaire Camille, "Greening Monetary Policy: Evidence From the Peoples' Bank of China," Banque de France, May 2021, https://publications.banque-france.fr/en/ greening-monetary-policy-evidence-peoples-bank-china.

^{33 &}quot;...the financial sector has a tremendously important role to play, simply because it provides money through loans or through financing, for investments, or through insurance. This can shape behaviour. We've seen tremendous growth in the issuance of green and sustainable bonds and loans in the first three quarters of this year, right through the pandemic...The challenge here in Asia is for transition financing—how can we move corporates and other entities towards cleaner and greener forms of energy and activities..." "The thrue of Finance is Green'—Transcript of Fireside Chat with Mr Ravi Menon, Managing Director, Monetary Authority of Singapore, and Mr Mark Carney, Secretary-General's Special Envoy for Climate Action and Finance, United Nations, moderated by Dr James Crabtree, Associate Professor in Practice at the Singapore FinTech Festival," Monetary Authority of Singapore, December 9, 2020, https://www.mas.gov. sg/news/speeches/2020/the-future-of-finance-is-green.

^{34 &}quot;Options for Greening the Bank of England's Corporate Bond Purchase Scheme," Bank of England, May 21, 2021, https://www.bankofengland.co.uk/paper/2021/ options-for-greening-the-bank-of-englands-corporate-bond-purchase-scheme.



A police officer stands outside the Bank of England building which has been sprayed with black liquid during a protest by Extinction Rebellion activists, a global environmental movement, in London, Britain, April 1, 2021. Source: REUTERS/Henry Nicholls

use to determine which companies are better than others at managing and mitigating their carbon footprints.

Reserves Management: Beyond emergency asset-purchase programs, central banks routinely purchase a range of sovereign and high-quality private-sector corporate paper as part of their ongoing reserves-management activities. Dedicating even a small proportion of reserves-management funds for green-bond purchases should, in theory, create additional liquidity—as well as incentives for increased issuance that creates a positive market-feedback mechanism. Firms that perceive a faster path toward market funding by complying with green criteria will make smart choices.

This theory has apparently motived global central banks to create their own funding program to subsidize green-bond purchases by central banks globally. In 2019, the BIS launched the first such fund focused on dollar-denominated securities.

In January 2020, the fund was expanded in two ways.³⁵ First, it would comprise \$2 billion in total funding capacity. Second, it would incorporate euro-denominated assets. The move was understandable given that the European Commission is likely to begin issuing green bonds during the second half of 2020 to help fund its pandemic-recovery program.

But, the positive impact associated with these initiatives should not be overstated. First, the aggregate amounts of funding eligible for redirection to green trading assets are relatively small. Second, BIS research in 2020 indicated that the positive impact regarding climate change may be minimal because green bonds, at present, are predominantly issued to support specific projects rather than reflect corporate-wide initiatives.³⁶ Faster progress on measurement and disclosures could, thus, accelerate green-bond market depth of issuance by providing generalized and comparable statistics at the corporate level.

^{35 &}quot;BIS Launches Second Green Bond Fund for Central Banks," BIS, press release, January 25, 2021, https://www.bis.org/press/p210125.htm.

³⁶ Torsten Ehlers, Benoit Mojon, and Frank Packer, "Green Bonds and Carbon Emissions: Exploring the Case for a Rating System at the Firm Level," *BIS Quarterly Review*, September 2020, https://www.bis.org/publ/qtrpdf/r_qt2009c.htm.

Central-Bank Disclosures: Significant expansion of centralbank activities as managers and purchases of green assets is attracting attention. Unsurprisingly, climate advocates seek more information, particularly regarding climaterelated risks embedded in central-bank portfolios and reserves management.

The pressure for increased disclosure is understandable. Advocates, as well as investors, clearly crave climate disclosures that are commensurate with existing disclosures regarding foreign-exchange holdings, duration, and other key quantitative-risk attributes. The immediate challenge, as noted in Section II, is that no consensus has yet emerged regarding the appropriate quantitative components that can be used to measure climate-related risks—in part, because no agreement exists on whether the appropriate time horizon for such an assessment is near term or long term.

Increased political pressure from legislators as well as grassroots advocates creates additional challenges for central banks. Central banks were created precisely to insulate monetary policy decisions from transitory political sentiment. Appointments, terms of office, and other institutional-architecture decisions all currently serve to insulate central banks from political influence. Many of the green policy shifts at central banks are executed through mechanisms that sit firmly within the monetary policy toolkit (e.g., asset purchases, collateral policy). Even when they want to provide more information, the perception that central banks have caved to political pressure potentially propels central banks down a slippery slope that invites more engagement in monetary policy decisions than traditional economics would find comfortable.

CONCLUSION

The economic and financial consequences of the climate transition are potentially as disruptive as climate change itself. Finding ways to define, measure, and manage the risks raises deep questions about the role of private markets and the official sector in those markets. If increased disclosures and related investments do not generate the hoped-for shifts in behavior, advocates may soon question more loudly the utility of private markets and the profit-maximization priority in those markets.

Defining climate-change policies creates particular additional risks for central banks. Proactive engagement can create challenges for monetary policy independence.

Finally, the proliferation of initiatives creates the real risk of conflicting rules that undermine progress. Many will welcome parallel engagements by central banks, securities regulators, insurance regulators, and accounting standard setters. But, overlapping initiatives paired with different sectoral priorities generate the potential for more noise than consensus and clear direction.

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