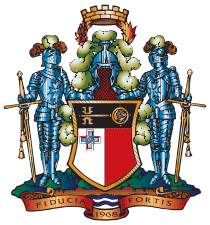

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REVIEW OF CURRENT EFFORTS FOR MITIGATING CLIMATE RISK AND RELATED SCENARIO DESIGN

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Article published in the Financial Stability Report 2021, pp. 55-57

BOX 2: REVIEW OF CURRENT EFFORTS FOR MITIGATING CLIMATE RISK AND RELATED SCENARIO DESIGN

The impact of repercussions surrounding climate change is increasingly on institutions' agenda as a source of risk for financial stability that could materialise not only in the longer-term but also in the short-to-medium term. With increasing evidence of physical effects and accelerating impacts of the effort to transition to a low-carbon economy, financial regulators are rapidly integrating climate-related and environmental risks into their supervisory frameworks.

In the 2015 United Nations Climate Change Conference (COP 21), 196 Parties adopted the **Paris Agreement** to limit global warming compared to pre-industrial levels to well-below 2°C, preferably 1.5°C, in accordance with the recommendations of the United Nations' Intergovernmental Panel on Climate Change (IPCC). The Paris Agreement entered into force on 4 November 2016, with countries aiming to achieve this long-term temperature goal by curbing greenhouse gas emissions, as soon as possible, and reach a climate neutral world by 2050. In its Sixth Assessment Report (AR6), the IPCC has warned that "it's now or never", to address these concerns "if we want to limit global warming to 1.5°C," global greenhouse emissions are required to peak before 2025 at the latest, and start a turning point at which emissions are reduced across all sectors by 43% by 2030 (IPCC, 2022). If alternatively global warming is targeted to 2°C, greenhouse gas emissions still need to peak before 2025 at the latest and be reduced by 25% by 2030.

The **Network of Central Banks and Supervisors for Greening the Financial System** (NGFS) was launched at the Paris One Planet Summit on 12 December 2017 and currently consists of circa 130 central banks and supervisors. The NGFS was established with the aim of contributing to the global response needed to achieve the Paris Agreement's goals, as well as to improve the role of the financial system in risk management and capital mobilization for green and low-carbon investments. In its first progress report of October 2018, the NGFS acknowledged that central banks and supervisors are mandated to ensure resilience of the financial system against climate-related risk (NGFS, 2018).

The NGFS considers scenario analysis as a useful tool for central banks and supervisors to determine, amidst all the uncertainty, how climate change would affect the financial system and assess the soundness of financial firms. For this reason, the NGFS is continuously investigating how scenarios can be integrated into authorities' toolkits. In July 2020, the NGFS released the first iteration of climate scenarios, now known as the Phase I scenarios, to investigate the impacts of climate change and climate policy as a common reference framework for central banks and supervisors (NGFS, 2020). In July 2021, the NGFS released the second iteration of the scenarios, referred to as the Phase II scenarios (NGFS, 2021a). The Phase II scenarios consist of six alternative pathways for global changes in policy, the energy system and climate, and differ in terms of the two key financial risks, namely physical risk and transition risk. These six long-term scenarios (with projections up to 2050) are grouped into three categories: the *orderly; disorderly*; and *hot house world* scenarios. These scenarios also vary in terms of the extent of physical risks as a consequence of environmental events such as floods; or transition risks associated with new policies and technologies. The orderly scenarios, which are the Below 2°C and the *Net Zero 2050* scenarios, assume that climate policies are enacted in a timely manner and gradually become more stringent to smoothly limit climate change to below 2°C compared to pre-industrial levels (a more ambitious target of 1.5°C under *Net Zero 2050*). In these scenarios, both physical and transition risks are kept under control. The two disorderly scenarios, consisting of the *Delayed Transition* and the *Divergent Net Zero* scenarios, include higher transition risk due to policies that are delayed or diverge across different countries and industries. Under the former scenario, carbon prices are assumed to rise quickly after a 10-year delay to allow for a fossil-fuel based economic recovery after COVID-19. The *Divergent Net Zero* scenario instead still reaches the net-zero emissions target by 2050 but with divergent policies and a faster

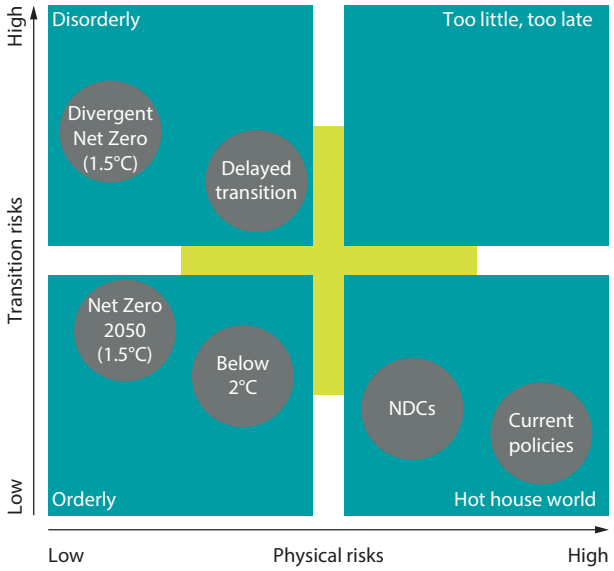
phase-out of fossil fuels. Both disorderly scenarios lead to higher transition costs compared to the orderly scenarios. Finally, the two hot house world scenarios, which are the *Current Policies* and the *Nationally Determined Contributions (NDCs)* scenarios, assume that some climate regulations are enacted in some jurisdictions, but global efforts are unsuccessful in preventing major global warming. This results in significant physical risk, such as irreversible impacts like a sea-level rise.

Figure 1 illustrates the six scenarios classified by the level of transition and physical risks, as presented by the NGFS.

Some of the major challenges encountered in climate scenario analyses include data gaps and the alignment of different data sources and models, the uncertainty driven by the climate exercise's long-time horizon contemplated, the adaptation of current stress test methodologies which typically focus on the short to medium term, and the development of adequate in-house climate-related scientific expertise. To address some of these challenges, the NGFS scenarios provide a framework for supervisors and financial institutions to engage in forward looking climate-related risk analysis. In early-2021, the ECB conducted its first economy-wide climate stress test based on the NGFS Phase I scenarios (ECB, 2021). The exercise, which relied on internal datasets and models, was conducted on almost all monetary financial institutions in the euro area to estimate how the probability of default for corporate loans would change during a 30-year horizon up to 2050. The results highlight the clear benefits of acting early to reduce the costs of physical risks to businesses which, in the absence of additional climate policies, could rise drastically, thereby increasing their probability of default.

Central banks and supervisors have also been increasingly conducting scenario analyses to identify and assess the impact of climate risk in the financial system. In the NGFS progress report on

Figure 1
CLASSIFICATION OF THE SIX NGFS SCENARIOS BY TRANSITION AND PHYSICAL RISKS



Source: NGFS (2021a, slide 7).

global supervisory and central bank climate scenario exercises, several NGFS members highlighted the work being carried out in their respective jurisdictions (NGFS, 2021b). There is an inherent diversity in terms of design choices and approaches with an even split between top-down and bottom-up. While all exercises consider the respective banking system, some also extend testing to insurers and pension funds. Depending on the number of years available in their projections and the computational capacity, some exercises consider 30-year time horizons, while others focus on shorter time-horizons of three to five years to assess the short-term implications of climate risk. The majority of the exercises consider a static balance sheet assumption due to the ease of implementation and interpretation of the results across the board. Several institutions are using the NGFS scenarios in their analyses, mostly focusing on transition risk with few also considering the impact of physical risk.

In January 2022, the ECB launched its supervisory climate stress test (ECB, 2022a). This differs from the economy-wide climate stress test carried out in 2021 as it relies on the self-assessment of banks regarding their exposure to climate change risk and their preparedness to address it, thus being more bottom-up oriented. The exercise is carried out on over 100 supervised entities, including the three domestic significant institutions, and consists of three separate modules: (i) a qualitative questionnaire assessing banks' climate stress testing capabilities, (ii) a peer benchmark analysis on the sustainability of banks' business models and their exposure level to emission-intensive firms, and (iii) a bottom-up stress test targeting transition and physical risks. Smaller banks will not be requested to give their own stress test estimates in the third module, in order to maintain the exercise's degree of proportionality. The exercise is an exploratory stress test with no direct implications on P2G, although findings may impact P2R in a qualitative way. For the third module, the ECB is considering six different scenarios: (i) a flood risk scenario, (ii) a heat and drought risk scenario, (iii) a short-term (3-year horizon) disorderly transition scenario based on the NGFS' Delayed Transition scenario and three long-term (30-years horizon) scenarios based on the NGFS' (iv) *Net Zero 2050*, (v) *Delayed Transition* and (vi) *Current Policies* scenarios which correspond to an orderly, disorderly and hot house world scenario, respectively. The exercise was concluded in July 2022, with results highlighting the need for banks to enhance their climate risk tress-testing frameworks and further address the current data gaps (ECB, 2022b).

Domestically, the Central Bank of Malta performed its first analysis of climate-related risk exposures for the Maltese financial system that may be impacted by the transition to a less polluting economy (Ciantar and Scerri, 2021). Drawing from the methodologies adopted by the EBA and ECB, the Bank developed a methodology for classifying economic sectors by carbon-emission intensity from the available data sources and thereby identifying those most vulnerable to climate transition risks.

Based on current practices and the findings for the domestic banking system, the MST will feature a climate-related adverse scenario to provide further insight on the resilience of domestic banks to climate-related shocks.

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