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Climate Change and IMF Surveillance

The Need for Ambition

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ABSTRACT

The International Monetary Fund (IMF) needs to rapidly devise a climate change strategy that helps its members meet their collective climate change and development goals. This policy brief outlines the macro-critical aspects of climate change that will need to be incorporated into IMF surveillance activity and examines the extent to which climate risks have been a part of IMF surveillance in recent years. Our research shows that the IMF has paid minimal and uneven attention to climate risks in Article IV reports, and even less so in its Financial Sector Assessment Programs (FSAPs)—though in each case the IMF has experimented with analyses that can be built upon. As a result of the reviews of Article IVsurveillance and FSAPs currently underway, it is imperative that the IMF: recognize that both physical and transition risks within and across countries are macro-critical threats to financial and fiscal systems; ensure that physical and transitions risks analysis within and across countries is compulsory, systematic, and universal for all Article IV and FSAPs moving forward; and that the IMF work with staff, member states, stakeholders, the NGFS, and experts to build on its early experience and align IMF surveillance policy with ambitious climate change goals.

Keywords: International Monetary Fund, Surveillance, Climate change, Physical Risk, Transition Risk

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INTRODUCTION

The International Monetary Fund (IMF) needs to rapidly but carefully devise a climate change strategy that helps countries meet their collective climate change goals in a manner that enhances stability, equity, growth, and sustainable development. A top priority for IMF reform will be to align the IMF's core surveillance functions with climate ambition. To this end, the IMF recently pledged to incorporate climate change in its current reviews of the Article IV and Financial Sector Assessment Programs (FSAP). This policy brief outlines the macro-critical aspects of climate change that will need to be incorporated into IMF surveillance activity, examines the extent to which climate risks have been a part of IMF surveillance in recent years, and presents recommendations for mainstreaming climate risk in the reviews of Article IV and FSAP surveillance underway.

Key to preventing and mitigating the macro-critical implications of climate change are the need to consider physical and transition risks to fiscal and financial systems within and across countries. Physical risks occur when the material effects of climate change such as increased incidence of hurricanes damage physical assets, subsequently increasing credit risk and financial losses for investors. Transition risks emerge from a late and uncoordinated introduction of climate policies whose impacts cannot be fully anticipated by investors, leading to sudden adjustments of asset prices (Battiston et al. 2017). Drawing on recent and forthcoming analyses, we find very limited attention to climate risks in IMF surveillance programs to date. While the IMF has begun to pay more attention to climate physical risks in Article IV reports, this is mostly excluded from FSAPs with the exception of ground-breaking work for the IMF on transition risk in 2020. These findings are both concerning and encouraging. Concerning that the IMF has been slow to recognize the macro-critical importance to climate change. Encouraging that the IMF is beginning to adopt the necessary tools to incorporate climate risk into its surveillance activities.

It is paramount that such momentum be accelerated and mainstreamed into current surveillance reviews. As a result of the current reviews, Article IV and FSAPs need compulsory examination of physical and transition risk, as well as those transmitted through spillovers. The IMF will also need to have clear staff guidance notes and training to ensure that climate risk analysis is mainstreamed in a consistent and transparent manner across the IMF. Finally, the IMF will need to work with stakeholders, the NGFS, and experts to ensure their surveillance efforts are properly aligned with ambitious climate and development goals.

The Need for Climate Risk Analysis at the IMF

There is an emerging consensus that climate change poses serious macro-critical risks to the financial system—from the national to the global levels. A growing network of central banks and supervisors organized as the Network for Greening the Financial System (NGFS) has taken the call from the scientific community, governments, and civil society and has begun to incorporate climate change into their risk assessment toolkits. More recently, the IMF has recognized the need to introduce climate considerations in its operations (Adrian et al. 2020). As the premier multilateral institution charged with ensuring the stability of the international monetary system, the IMF stands to play a key role in supporting these national efforts from a global perspective. Earlier this year, IMF managing director Kristalina Georgieva pledged to put climate change at the heart of its work:

> *As we aim to exit the COVID-19 pandemic and the economic crisis it has triggered we must face a greater threat – that of a changing climate. It is a fundamental risk to economic and financial stability. It is also an opportunity to reinvigorate growth and create new green jobs. Our research shows that combining steadily rising carbon prices with a*

> *green infrastructure push can boost global GDP over the next 15 years by about 0.7 percent and generate work for millions of people. This is why at the IMF we embrace the transition to the new climate economy — one that is low carbon and climate resilient, that helps fight the causes of climate change and adapt to its consequences (Georgieva, 2021, np).*

In addition to providing emergency liquidity and policy advice, surveillance is a key pillar of the IMF's mission that is conducted at the global, regional, and country levels. According to the IMF, "the IMF identifies potential risks to stability and recommends appropriate policy adjustments needed to sustain economic growth and promote financial and economic stability" (IMF, 2020). The two key tools of bilateral surveillance efforts are Article IV consultations and Financial Sector Assessment Programs (FSAPs). Indeed, the Managing Director charged the IMF to incorporate climate change in the Comprehensive Surveillance Review (CSR) and the FSAPs (Georgieva, 2021).

The CSR will guide surveillance through 2030 with particular priorities of "(i) confronting risks and uncertainties; (ii) preempting and mitigating spillovers; (iii) fostering economic sustainability; and (iv) adopting a more unified approach to policy advice (IMF, 2020)". The FSAP review will incorporate climate change into its analyses of the financial stability and development aspects of member country financial and fiscal systems. In so doing the IMF will look to incorporate climate risks into analyses of banking sector resilience, in stress tests on banking systems and cross-border spillovers as well as the quality of the legal framework and institutions designed to promote stability and growth (IMF, 2019). This policy brief summarizes recent and ongoing work to help guide the IMF and stakeholders as the IMF works to incorporate climate change into its operations.

The next section of this short policy brief outlines the macro-critical aspects of physical and transition risks. Section 3 briefly assesses the extent to which the IMF has addressed these issues in the recent past. The final section summarizes main findings and outlines the contours of reform that will be needed in CSR and FSAP reviews.

Macro-Critical Aspects of Climate Risks

Over the past half decade, climate risk analysis of the financial sector has made significant developments in the scholarly literature and in central banks and is now gaining traction at the IMF. In this section we outline three key aspects of climate risk that are of seminal importance for the IMF to incorporate into its surveillance activity.

Financial risks stemming from climate change include both 'physical risks' and 'transition risks.' Physical risks (Figure 1) arise from immediate weather events as well as long-term changes in the climate. These risks are characterized by increasing severity, volatility, and frequency. They are financial risks because they impact the value of financial assets such as property, infrastructure, and beyond. Banks in turn face higher credit and underwriting risks (Batten et al, 2016; Campiglio et al, 2018; Dikau and Volz, 2019; Monasterolo, 2020a).

Physical risk can have significant macro-financial impacts on countries that are important to analyze. Picture the case of Figure 1 as a Small Island Developing State (SIDS) in the Caribbean that is highly dependent on tourism for foreign exchange, growth, and employment. It has been demonstrated that such climate vulnerable countries already have to pay a higher cost of capital for those vulnerabilities, creating problems for fiscal space and debt sustainability (Kling et al, 2021). Thus, unanticipated increases in the incidence of natural hazards such as hurricanes can translate into an acute supply shock through the destruction of hotels, roadways, and air transportation. That destruction of the capital stock can have a negative and cascading impact on levels of growth and employment, and on the balance of payments of the country. Of course, the level of production and profitability

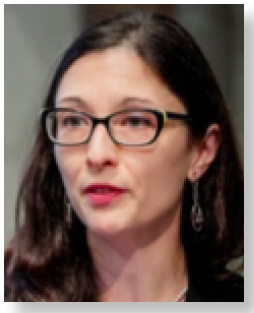

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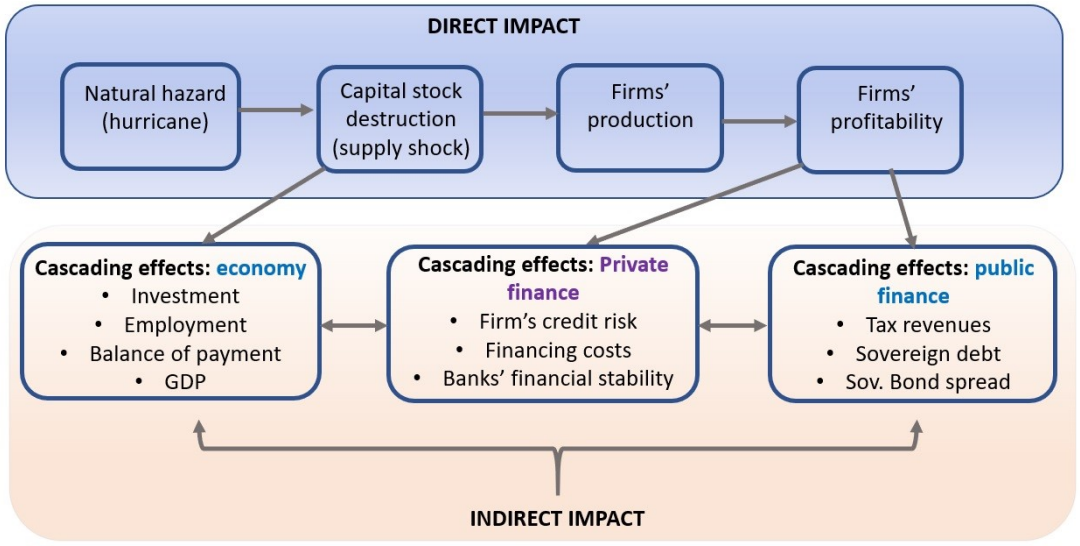
Figure 1: Macro-Critical Aspects of 'Physical Risk'

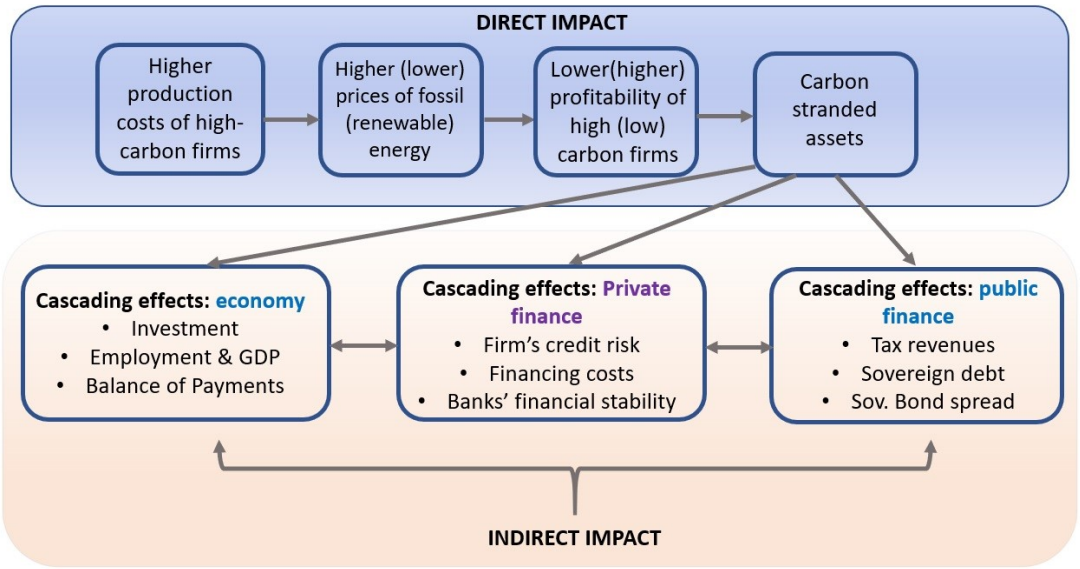


Source: Adapted from Dunz et al, 2021.

decreases in impacted firms which can have negative impacts on the financial system and of course through losses in tax revenues, bond spreads, and beyond.

Transition risks (Figure 2) are those involved with the transition process to a low-carbon economy at the national level. This entails a wide array of quantity and price-based regulations such as bans on coal-fired power plants, carbon taxes, and permitting schemes that increase the production costs and decrease the profitability of carbon intensive firms—causing some assets to be 'stranded' and others to gain and value. There is an additional liability risk, which refers to the legal risks from parties adversely affected by climate change (Ackerman, 2017; Battiston et al, 2017; Dikau and Volz, 2019; Monasterolo, 2020a).

Figure 2: Macro-Critical Aspects of National 'Transition Risk'



Source: Adapted from Monasterolo, 2020a.

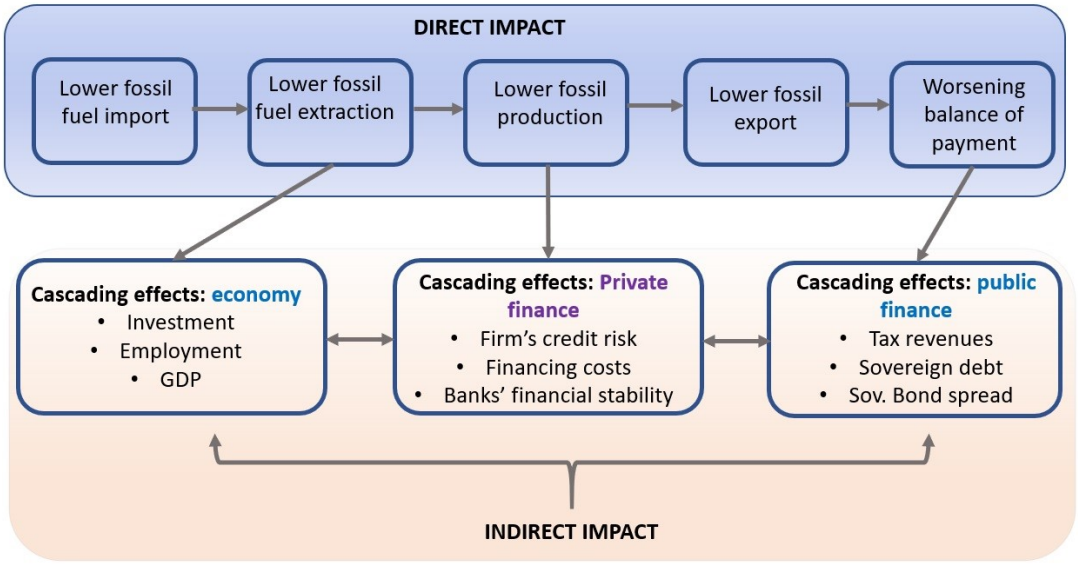
Transitioning away from coal is seen as the most important first step in carbon transitions across the world. For Figure 2, picture Poland or South Africa – two countries where the share of electricity production from coal is over 60 percent – putting in place a major carbon tax or phase out of coal-fired power plants. Such action also poses major risks to the real economy and to fiscal and financial systems. By definition a carbon-tax would raise the production costs and prices of coal-fired power plants and lower their profitability such that they would be deemed carbon stranded assets — a trend that is already cascading across the world (Caldecott, 2018; Sen and Schickfus, 2020).

Indeed, transition risks are perhaps the most macro-critical in their potential impacts on the real economy and livelihoods, financial systems, and public finance. Figure 2 outlines some of the cascading indirect effects that occur such as declines in employment and growth, balance of payments (for countries that export coal) financial stability, tax revenues, and sovereign risk. While exposure to all types of fossil fuels is becoming increasingly risky, a number of central banks see transition risks due to coal extraction and coal-fired power plants closings as the most macro-critical form of climate risk given the depth of such exposure and the consensus that coal should be the first energy source to diversify from (Vermuelen et al, 2019; Allen et al, 2020). The Bank of England estimates that a rapid carbon transition could result in equity write-downs from 40 to 65 percent in coal extraction and generation respectively (Bullard, 2019).

The early work on climate risk and financial stability was national in nature, given its origins in the central banking community. As a global institution the IMF is charged will monitoring cross-border spillovers as well. To that end, in addition to national-level transition risks, we are developing the concept of 'spillover transition risks' whereby physical or transition risk that happens in one country or region have cross-border macro-critical impacts on financial and fiscal systems (Gallagher et al, 2021; Monasterolo and Gallagher, 2021).

Picture the EU putting in place a large carbon tax with a border adjustment mechanism for Figure 3, but in this case through the perspective of a developing country that is highly dependent on oil or gas as a source of exports (either in crude form or indirectly through tourism) such as Angola, Azerbaijan, Congo, Ecuador, Mexico, Timor Leste, and developing states in the Persian Gulf. In those cases, an oil or gas price shock lowers exports and has an immediate impact on the balance of payments.

Figure 3. Macro-Critical Aspects of Spillover 'Transition Risk'



Source: Adapted from Monasterolo and Gallagher, 2021.

Indeed, it was a shock like this that led to many of the financial crises of the 1980s and continue to be unexpected and trigger instability (Baumeister et al, 2016). Climate transition spillovers will not only trigger balance of payments shocks but can also cascade to the real economy, private finance, and of course to public finance—especially for fossil fuel dependent economies.

Surveillance Efforts Lack Attention to Climate Risks

To date, the IMF has largely not been conducting its surveillance activities with attention to climate risk. In an analysis of Article IV reports and FSAPs from 2017to the present, we find that with a few promising exceptions the IMF is yet to incorporate climate risk analysis in these programs, especially in the countries that may face the largest climate risks.

Table 1: Count of Selected Terms in Articles IV and FSAPs

	Article IVs				FSAPs			
	2017	2018	2019	2020	2017	2018	2019	2020
Climate Risk	7	2	15	3	0	0	0	5
Physical Risk	0	0	0	0	0	0	0	4
Transition Risk	3	3	2	3	2	0	1	15

Source: Gallagher et al, 2021.

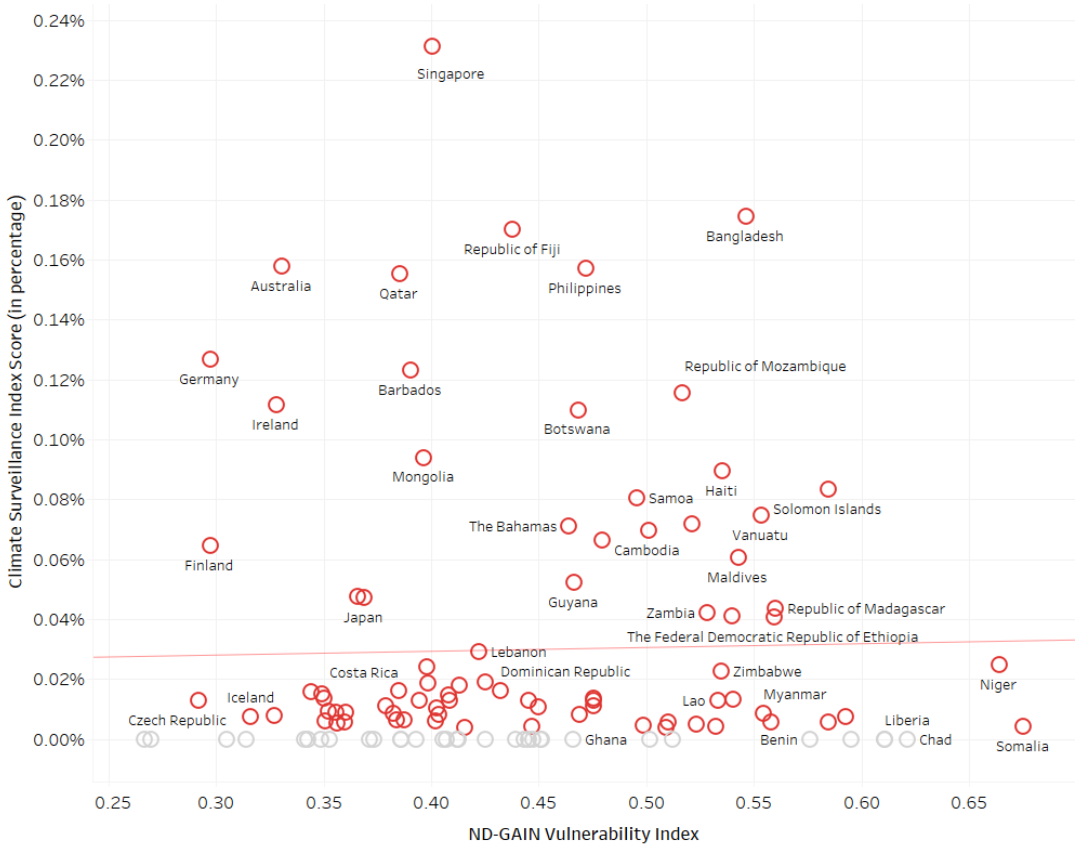
Since 2017 the IMF has conducted and published 384 Article IV reports and 66 FSAPs focused on risk assessment. As shown in Table 1, while many of these reports to discuss climate change in some detail, they are yet to conduct surveillance through the same lenses as the central banking community. The term 'climate risk' has gained some traction in Article IV reports but much less so in FSAPS. Transition risk has largely also not been on the radar in these reports, except in an encouraging pilot FSAP on Norway in 2020. There has been no mention of climate spillover risk in IMF surveillance as of yet.

While Table 1 presents a stark picture of the IMF's attention to climate risk, there is nuanced room for optimism. Building on Volz (2020) and Volz and Ahmed (2020), in a more comprehensive textual analysis of all IMF bi-lateral surveillance from 2017 through March 1 of 2021, we created a corpus of climate and climate risk related nomenclature and adopted an algorithm to scrape these documents and gauge IMF attention to climate change and related risk.

Through that exercise we created an 'IMF Climate Surveillance Index, as the ratio between the sum of search terms per group and the inverse document frequency as a percentage, from 0 to 1. Here, a higher score means more attention to climate change per publication for each member country in the sample. In that analysis, we found little attention to climate change but do find that the IMF has paid some attention to physical risk for smaller states in Article IV reports, and has piloted a promising FSAP in Norway (Gallagher et al, 2021).

IMF Article IV reports have paid little attention to physical risks in the countries that are most vulnerable to climate risk in the world economy. Otherwise, in Figure 4 we would see an upwardly sloping trendline. In Figure 4, the vertical axis depicts our climate surveillance index score (discussed above) for Article IV reports and the horizontal axis exhibits climate vulnerability in the form of physical risks such as hurricanes, droughts, etc., for countries across the world as measured by Chen et al, (2015) and referred to as the ND-Gain Vulnerability Index. The higher the index number the more attention that the IMF pays to climate change in Article IV reports. Niger, Somalia, Chad,

Figure 4: IMF Article IV Surveillance in 2019 and Physical Risk



Source: Adapted from Gallagher et al, 2021.

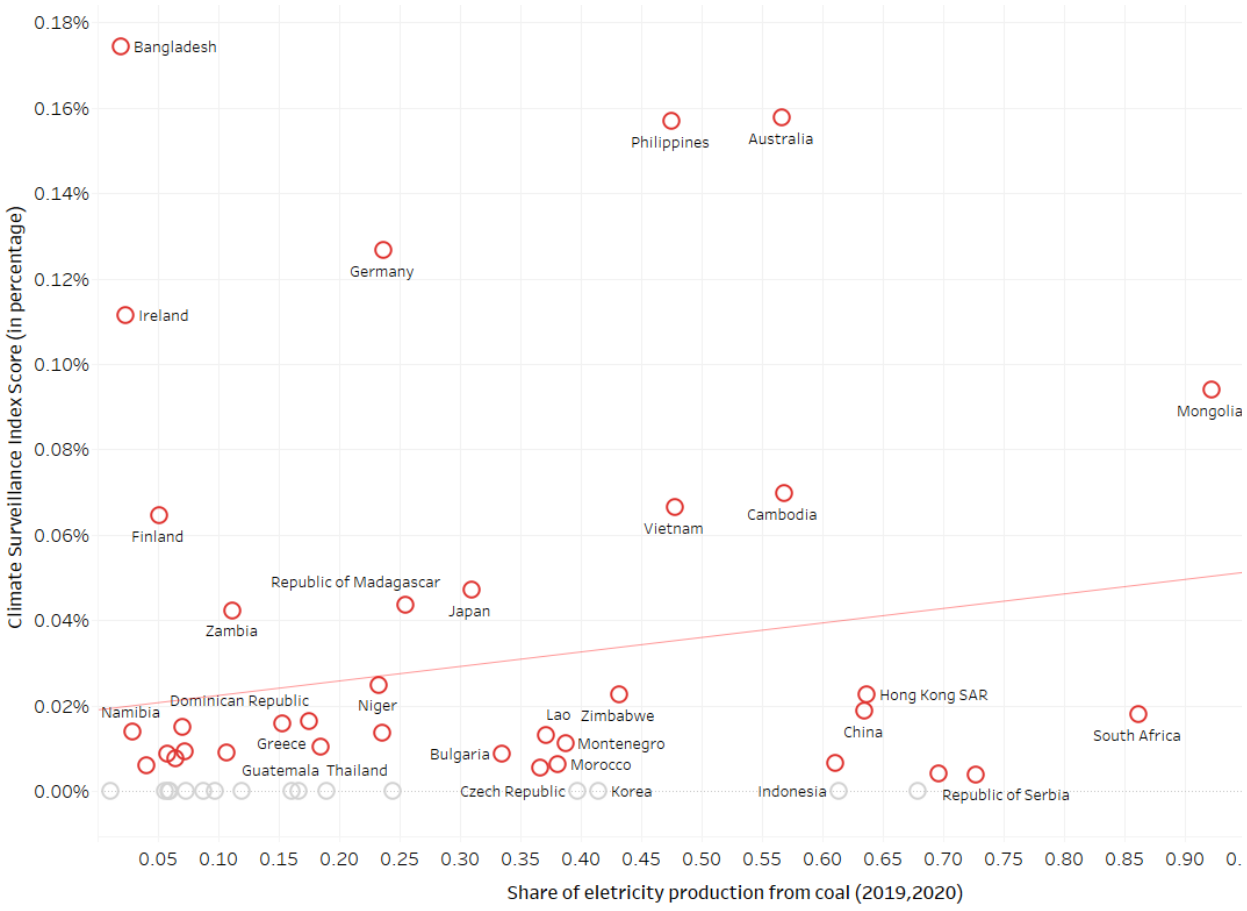
Benin, Myanmar, Liberia, Uganda are highly vulnerable countries to physical climate risk, according to the ND-Gain Vulnerability Index. However, in 2019, in the climate surveillance index they had low or zero scores, indicating low attention to physical risks in the countries that are impacted the most by climate change. In our broader analysis however, we find that 55 percent of all of the attention to climate change in Article IV reports occurs in small states across the world (Gallagher et al., 2021).

A similar story emerges for the IMF with respect to transition risks, especially in the coal sector. Figure 5 shows that in all but two countries – Mongolia and Botswana where the share of electricity from coal fired power plants is extremely high — the IMF is not considering risks related to carbon stranded assets. Related research on Mongolia, however, shows that IMF has given inconsistent advice to Mongolia in that country's Article IV consultations — on the one hand acknowledging the shortcomings of coal dependency for that country, but also encouraging Mongolia to create better investment incentives for the country's coal deposits (Recourse, 2020).

Although spillover risks are an important part of IMF surveillance activities, there is no evidence that the IMF is considering transition spillovers in its analyses to date. Figure 6 shows the IMF Climate Surveillance Index for Article IV in 2019 on the vertical axis, and fossil fuel exports as a percent of total exports on the horizontal axis. In this case the relationship is fully negative, with the IMF paying less attention to climate change the more a country is exposed to global fossil fuel markets.

In this policy brief we do not report on our papers' findings with respect to FSAPs because our research finds that there has been no attention to climate change in FSAPs except for in one case.

Figure 5: IMF Surveillance and Transition Risk: Coal



Source: Adapted from Gallagher et al., 2021.

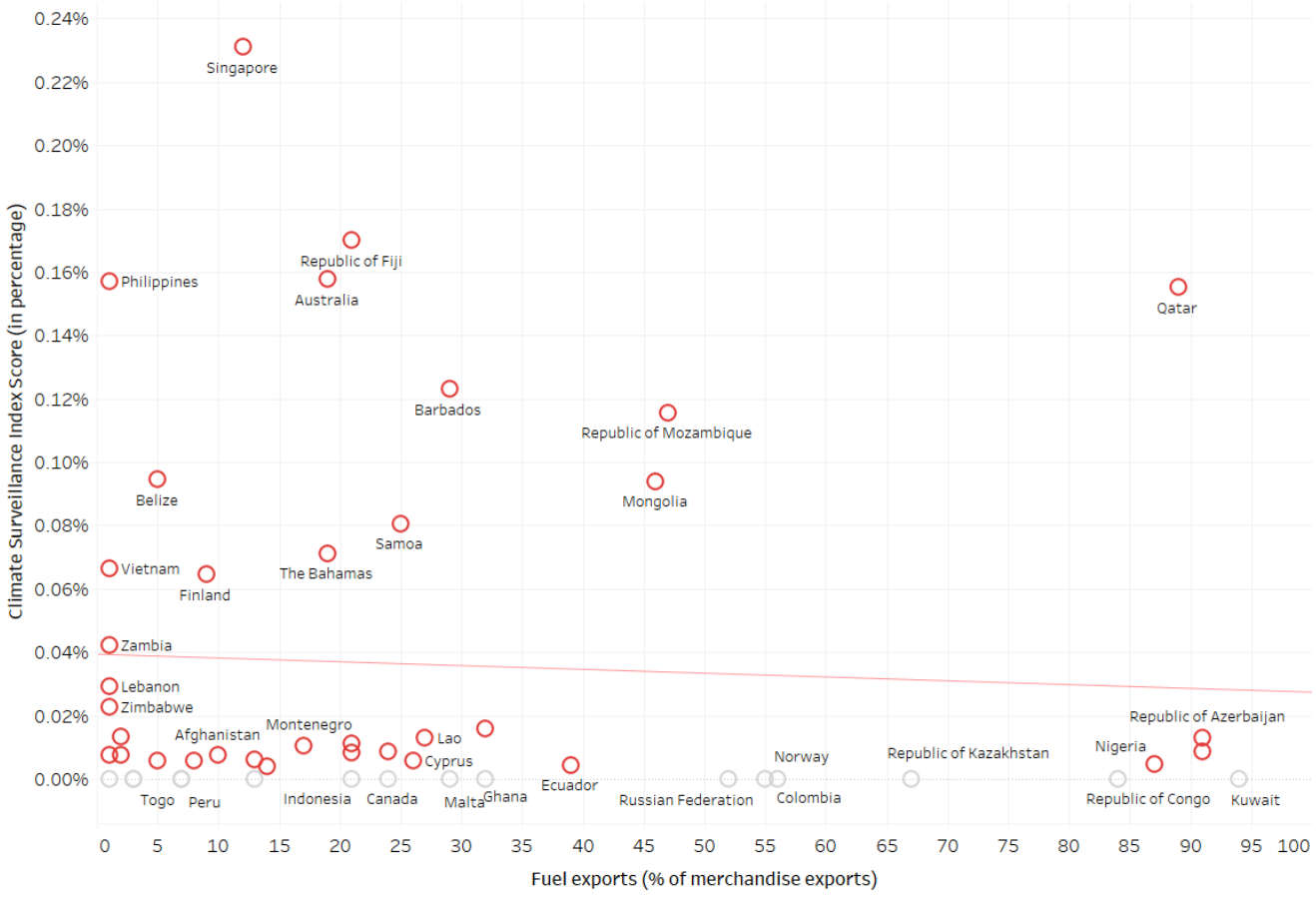
Between 2017 and 2021 there were 66 relevant FSAPs that only mentioned climate change 127 times—with 105 of those mentions were in a pioneering FSAP on Norway. As part of the Norway FSAP the IMF conducted an analysis of domestic transition risk shocks on Norwegian firms and they also model spillover transition risk channels through a scenario where there is a significant increase in global carbon prices that impact Norway through the oil sector (Grippa and Mann, 2020).

Summary and Recommendations for the CSR and FSAPs

This short policy brief summarizes the pioneering scholarship and central bank practice that has arisen to address the macro-critical aspects of climate change. Climate change is macro-critical to national economies and the world economy at large through physical and transitions risks. Importantly, we also demonstrate how some transition risk can be transmitted across borders, which we refer to as spillover transition risks.

We also summarize recent and forthcoming work on the extent to which the IMF has incorporated physical and transition risks into Article IV and FSAP surveillance activities since 2017. We find that the IMF has paid little and uneven attention to climate risks in Article IV reports, and even less in FSAPs. Indeed, we do identify promising analyses of physical risks in some small states in recent Article IV consultations, and a pilot analysis of transition risk for an FSAP in Norway.

Figure 6: IMF Surveillance and Spillover Transition Risk



Source: Adapted from Gallagher et al, 2021

It is paramount that the IMF rapidly scale this experience to align all of its functions with ambitious climate goals. The CSR and FSAP review are the first concrete opportunities to do so. Given the time lag in between surveillance reviews and the urgency of the climate problem, it is imperative that the 2021 CSR and FSAP reviews result in directives recognize that physical and transitions risks are equally macro-critical and that require:

- **Assessment of physical and transition risks** for all countries in Article IV Consultations and Financial Sector Assessment Programs in a manner that is compulsory, systematic, and universal;
- **Assessment of transition spillover risks** as part of Article IV consultations and FSAPs that are also incorporated into multinational surveillance efforts and spillover reports; and
- **Specific guidance notes** and trainings will be necessary to help surveillance staff identify macro-critical channels for both physical and transition risks and perform the necessary analysis to help member states identify and mitigate such risks.

During this crucial year it is essential that the IMF work with member states, stakeholders, NGFS and scholars to build on its early experience to ambitiously align IMF surveillance policy with climate change goals.

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