

B.6 Sustainable Finance: Integrating Measures of Climate Change Risk into External Sector Statistics

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Leveraging from the existing international initiatives that aim to improve the availability of information on sustainable finance and climate change as well as the inputs provided by the IMF's Committee on Balance of Payments Statistics (the Committee) members, this Guidance Note (GN) recommends² introducing an updatable appendix to the revised Balance of Payments Manual (BPM) on Balance of Payments and International Investment Position (IIP) measures and indicators relevant for climate change-related financial risks. The appendix initially would include related description on geographical and industrial sector breakdowns of direct investment as well as an "of which" category to identify green bonds in the balance of payments/IIP along with information on the analytical uses and limitations of the indicators. The appendix would be updatable in the future as the work in the area of sustainable finance and understanding of data needs for addressing climate change evolves. Future indicators initially would include developing physical and transition risk measures for portfolio investment and making cross-border transactions in CO₂ emissions permits visible in the accounts.

SECTION I: THE ISSUE

BACKGROUND

1. Climate change not only affects our natural environment, but also poses increasingly significant financial risks. For example, extreme weather events such as floods or hurricanes may result in larger claims for insurance companies, and more structural factors such as rising temperatures and potential water scarcity may affect the risk profile of (commercial and residential) mortgage portfolios with real estate located in the affected areas. The business model of non-financial companies in a variety of industrial sectors, including amongst others agriculture, food and beverages, may be affected as land productivity is affected by the changing weather patterns. Such so-called "physical risks" are complemented with "transition risks", which reflect the financial implications of the move (transition) towards a greener economy. For example, more stringent environmental legislation may result in increased credit risk or large changes in asset values. Higher environmental standards may have implications (though not necessarily negative) for the operational costs of doing business of non-financial companies: on the one hand, energy prices may rise, potentially up to the point where certain assets may become stranded³ (assets that are prematurely written down, devalued or converted to liabilities). However, on the other hand, new opportunities may occur, or more efficient production methods can be used. Also, technological innovations or changes in consumer or investor preferences may impact the business of various economic actors as well as financial institutions.⁴

¹ Prepared by Fabienne Fortanier (Netherlands), Maria Borga and Evrim Bese Goksu (IMF).

² The recommendations outlined in this GN were approved by the Committee in the October 2021 meeting.

³ Stranded assets are defined as assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (Caldecott, Howarth, and McSharry, 2013).

⁴ While financial institutions can take measures to reduce their exposure to climate change risk, climate-related financial risks can also be offset through counterparty measures to adapt to, or mitigate the effects of, climate change (Basel Committee on Banking Supervision, April 2021, "Climate-Related Financial Risks – Measurement Methodologies").

2. Such physical and transition risks are not limited to individual (financial) companies but may affect entire industries and geographical regions and countries.⁵ Hence, climate change may have important implications for financial and systemic stability. It is therefore appropriate that the balance of payments/IIP includes, where possible, measures and indicators that allow a better assessment of such climate change related risks.

3. Clearly, this is easier said than done: while demand for data on (the financial-economic implications of) climate change is growing exponentially, the statistical development on this subject is still in its infancy. It is likely that the field will evolve significantly as experimental indicators are developed further and more methodological research is done. At the same time, by combining insights from the System of Environmental Economic Accounting (SEEA)⁶ and from ongoing research in the financial sector and at international organizations⁷ on this subject, this Guidance Note (GN) recommends inclusion of several supplementary⁸ indicators, which may be extended upon and improved at later stages. This GN recommends including these indicators in an appendix to the revised Balance of Payments Manual, which should also include the explicit references to the System of National Accounts (SNA) and SEEA. The appendix should also include background on the analytical usefulness of the indicators as well as their limitations. A draft appendix is not provided at this stage as work is underway to better understand how these indicators will fit within the larger macroeconomic framework. This appendix could be updated, under the supervision of the Committee, to reflect advances in methodology and data availability.

4. In doing so, it is acknowledged that by focusing on “climate change”, many other dimensions of the concept of “sustainability” or “sustainable finance” are, for now, not addressed (e.g., other environmental aspects or social and governance considerations). While future editions of the BPM may potentially include more detailed indicators to such dimensions, the focus for now on climate change (as broadly covered by the two environmental objectives: climate change mitigation and adaptation) is justified in light of the size of the risks as well as the large demand by users for more data in this area.

5. While there are a wide variety of approaches worldwide to the issue of climate change, it is commonly agreed that the problem is global in nature and that handling it requires global coordination. To this end and to set a strong foundation for developing guidance to be included in the updated *BPM6*, this GN leverages several international initiatives that aim to improve the availability of information on sustainable finance and climate change as well as the useful inputs provided by the members of the Committee to the stocktaking exercise (Annex I).

⁵ Even if not all geographical areas within a single country are equally affected, physical and transition risks may still have national implications, e.g., if they result in higher government expenditures.

⁶ The SEEA currently does not set out guidance for climate change statistics and climate change adaptation remains outside its scope.

⁷ Such as the 2020 FSB Report on the “Implications of Climate Change for Financial Stability” (FSB 2020) and the 2019 Network for Greening the Financial System (NGFS) paper on “Macroeconomic and Financial Stability Implications of Climate Change: NGFS Technical Supplement”.

⁸ Compilation and dissemination of these items is encouraged, but voluntary.

BALANCE OF PAYMENTS STATISTICS ON FINANCIAL RISKS RELATED TO CLIMATE CHANGE

6. Balance of payments statistics that provide insights on the financial risks arising from climate change should, like all balance of payments statistics, be relevant at the *national* (or at most, institutional sector level) level, and contain a clear resident-non-resident dimension. They would examine the risks (exposures to) of a decrease in the value of financial assets due to physical risks related to climate change as well as those due to the transitional risks that relate to the adjustment towards a low-carbon economy. Both the physical and transition risks have a market risk and credit risk component. The former relates to the changes in the value of financial assets due to price movements stemming from, for example, extreme weather events whereas the latter relate to loan losses that may arise due to the worsening of the repayment capacity of their borrowers. Financing both adaptation to climate change as well as the transition to a low-carbon economy is a huge challenge and will require cross-border capital flows, especially to low-income countries. Tracking green financing instruments across borders would shed light on the extent that green financing has been globalized.

7. While a wide range of indicators may be useful to facilitate exploring financial risks from a cross-border perspective, this GN recommends including the two indicators below in the appendix to the revised BPM as the most feasible in the short term. The Committee also suggested that the drafters of the appendix consider the feasibility of including data on international cooperation grants to low-income countries for mitigating climate change.

Physical Location and Sector Classification of Direct Investments⁹

8. Direct investments in certain economies/regions may be more exposed to physical risks related to losses due to extreme weather events. In addition, transition risks¹⁰ may also have an important geographical component, as, for example, policy changes typically occur nationally. Sovereign credit risk could also increase in those economies with carbon¹¹ intensive industries (FSB 2020). To that end, information on the physical location of investments, in combination with information on the physical risks associated with that location, would shed light on both the physical and transitional risks to which a country's cross-border investments are exposed, both at a bilateral level but also, for example, as a weighted average across countries. National level data would be particularly useful for transition risks, since policies supporting the transition are likely at the national level. For physical risks, such calculations are ideally made at a more detailed geographical level in combination with other statistics on investments at various level of aggregation (such as city or postal code area) due to regional variation of climate change risks within countries. Nevertheless, national data would still be relevant, as the macro-stability implications may still extend to the national level, as mentioned above. Importantly, data sources on

⁹ Information by country would be provided by the supplemental presentation proposed in GN D.6 "Ultimate investing Economy, Ultimate Host Economy, and Identifying Pass-Through". Supplemental information by economic activity of FDI could provide information on risks in specific sectors/industries.

¹⁰ Transition risks are the financial risks associated with the move to a lower-carbon society, resulting from, for example, changing regulation or consumer preferences. Carbon taxation or restrictions on products or components thereof may negatively affect business models or the value of capital goods (stranded assets).

¹¹ While the GN mainly refers to CO₂ emissions given its prominence in total green-house gas (GHG) emissions, it does not preclude the inclusion of other GHG emissions.

physical risks by such detailed geographical area are readily available for use,¹² and their use in combination with existing data collections on investments at various levels of aggregation (country, city) are being explored to develop indicators of physical risks. In addition, efforts at the national level to develop detailed geographical data for DI (e.g., at a city level) by utilizing existing data collection framework together with other statistics would be encouraged.

9. In addition, ***sectoral information on Direct Investment*** would be valuable to assess the climate change related risks that nonfinancial corporations are directly exposed to through their direct investments though investments in specific sectors, such as agriculture or real estate (for physical risks) or transition risks (carbon-intensive sectors). Financial corporations are also subject to such risks indirectly through the lending portfolios of their subsidiaries abroad. The sector classification should, to the extent possible, align with other statistics (e.g., with the International Standard Industrial Classification (ISIC) revision).

10. While similar arguments could be made for breakdowns by country and sector for portfolio investments—and indeed much research in the climate change implications for the financial sector focuses on the transition and physical risks of securities (and loans) portfolios of financial institutions (e.g., CO₂ footprints)—it is far more methodologically challenging to introduce these into the BPM framework. This is because the physical location of the asset (or the sector of activities) may be distinct from the location where the financial instruments are held. Only with very detailed data (instrument-by-instrument information combined with the emissions or physical risk profile of the security issuer), could such indicators be constructed. Work is ongoing though in a range of platforms, including the NGFS, the ECB, and others, to develop such indicators on the physical and transition risks of portfolios, which may ultimately, when broken down into resident-non-resident and resident-resident indicators, provide indicators that could be included in the balance of payments framework as well. As such work advances, information on the locational and sector exposures of portfolio investments (and perhaps other functional categories) could be envisioned.

Type of Investments

11. The type or the nature of investments (e.g., green bonds) would be useful to understand the extent to which financial institutions are contributing to financing the investments that would mitigate transitional risks. Green bonds are a key example, which are typically defined as those bonds for which the proceeds are used exclusively allocated to green or climate-related expenditures and investments. Clearly, the definition of “green” depends on the availability of a consistent taxonomy for green vs. other assets, which are currently under development (e.g., the recently published EU Taxonomy). While each jurisdiction may have different taxonomies in terms of the definition of “green assets” vs. others, work is ongoing in the international fora (e.g., G-20 DGI) to bridge existing taxonomies to facilitate their use for statistical purposes. Green bonds would cover other financial instruments beyond those related to climate-change. However, this GN does not recommend narrowing its coverage to climate related green bonds only until a clear distinction between climate change-related green bonds and others in the existing

¹² Examples include the data published by the World Resources Institute or the EU Risk Data Hub.

data. While there has been considerable focus on green bonds,¹³ both lending, including intercompany debt, and equity would also be of interest. In addition to transactions and positions in these instruments, there would also be interest in the returns earned on them. In each of these instruments, supplementary “of which: ‘green’” categories may eventually be included to provide further information.

12. The appendix should also include a section providing information on the analytical usefulness and limitations of the indicators. This section could include information on how data from the balance of payments could be used in conjunction with other data to shed light on important cross-border aspects of climate change, such as emissions embodied in trade and the link with “offshoring” of emissions.

13. Other indicators that could be considered for the future updates of the appendix include:

- **Other information that could help in capturing financial risks** related to climate change, such as:
 - **Source of Funding (Location of Borrowers).** Exposure of the sources of financing (e.g., energy exporting jurisdictions) to climate change related physical or transitional risks may affect the funding levels of financial and nonfinancial institutions. Information on the lender would be helpful for an assessment of such risks.
 - **Climate-Related Financial Derivatives.** Financial derivatives are an important tool for managing risks. Therefore, institutions’ holding of financial derivatives related to sustainable investments or climate-related risks, including across borders, would help us understand how they hedge against such risks. Weather-related financial derivatives are being developed to deal with weather-related events. Derivatives tied to specific commodities, such as oil, specific agricultural commodities, or tons of CO₂ emissions, could also be of interest.
- **Making purchases and trade in CO₂ emission permits visible:** Based on the *BPM6* (paragraph 13.14), according to general principles, various arrangements involving emissions permits can be classified in the balance of payments in different ways, including that if a nonresident enterprise purchases an emission permit from a resident government the payment is classified as a cross-border tax on production in most circumstances. However, if the payment is part of the cost of establishing a direct investment enterprise in the resident economy, it is rerouted as a resident-to-resident transaction, with the payment by the nonresident enterprise recorded as an equity investment in its direct investment enterprise (see paragraph 4.47). Also, if the issuing government provides extensive services for the purchaser, the payment is instead classified in services (see paragraphs 10.180–10.181). If the permit is tradable (as most are), then it is an economic asset. A resale of this asset by a resident to a nonresident enterprise is recorded under contracts, leases, and licenses in the capital account. These differing treatments make it hard to paint a complete picture of cross-border transactions in CO₂ emissions permits.
- **Presenting cross-border transactions for waste treatment and depollution services:** Based on *BPM6* (paragraph 10.152), waste treatment and depollution services include waste collection and disposal, remediation, sanitation, and other environmental protection services. They also include

¹³ For example, the Bank for International Settlements has developed a “Sustainable Bonds Database”, aggregates from which are provided to members of the Network for Greening the Financial System members. The CID will include indicators for green bonds, including green bonds by type of issuer and sovereign green bonds as a share of total sovereign debt.

environmental services, such as production of carbon offsets or carbon sequestration, that are not classified under any more specific category. Other technical services include agricultural, mining, and veterinary services.

- **Showing total insurance claims, including those resulting from climate change related natural catastrophes:** Based on *BPM6* (paragraph 13.24), nonlife insurance claims are normally classified as current transfers. For exceptionally large claims, such as those following a catastrophe, some part of the claims may be recorded as capital transfers rather than as normal current transfers. It may be difficult for the parties to identify these events consistently, so, as a simplifying convention, all cross-border nonlife insurance claims are classified as current transfers, unless it is necessary to record a capital transfer to be consistent with the national accounts. To allow comparability with partner data, a supplementary item should be provided for insurance claims included in capital transfers.

SECTION II: OUTCOMES

14. This GN recommends including an updatable appendix to the revised BPM on measures and balance of payments/IIP indicators related to climate change-related financial risks. Considering the rapidly evolving nature of the topic, this would allow for addressing the new developments in the needs and availability of cross-border indicators of climate change. The appendix would initially include indicators on the physical location and sector of DI and type of investments. The appendix would also provide a suitable background on the analytical usefulness of the indicators as well as their limitations.

15. The GN recommends for the future to:

- continue to invest in utilizing detailed geographical and industrial sector breakdowns of direct investment, to allow for better linking with geographic and sector-specific risk data, including numerical examples; and
- add a supplementary “of which” category, to identify green bonds in the balance of payments and IIP.¹⁴

¹⁴ The definition of “green” financial instruments will be based on the international standards such as the those that are published by the International Capital Markets Association (ICMA).

Annex I. Summary of Responses to the Sustainable Finance Stocktaking Survey

16. At the October 2020 Balance of Payments Committee (the Committee) meeting, the Committee agreed to fill out a stocktaking survey on climate related statistics, in collaboration with relevant agencies in their countries to serve as inputs to developing guidance for the updated *BPM6*. The stocktaking questionnaire is the same as the one developed by the ECB Statistics Committee's Expert Group on Climate Change and Statistics (ECB EG CCS), chaired by the De Nederlandsche Bank (DNB), whose work is intended to serve as an input to discussions on how the European System of Central Banks (ESCB) Statistical Function could support the wider debate on climate change and the global financial system with data and statistics. The survey requested information on national efforts to assess climate change related risks, on a variety of data sources that are available and planned, and users' needs to identify priorities for the ECB Statistical Work Program.¹⁵ Therefore, the request to the Committee was targeted to Committee members that had not already responded to the ECB EG CCS stocktaking questionnaire, with a goal to complement the findings of their survey with a more geographically diverse set of respondents. However, only a few members (Canada, Indonesia and China) filled out the survey providing information about the climate related databases as well as existing and ongoing studies on climate change.

17. Statistics Canada maintains three databases: (i) physical flow account for greenhouse gas emissions (GHG) that included GHG emissions by province by industry and by households; (ii) direct plus indirect energy and GHG emissions intensity, by industry; and (iii) physical flows of GHG emissions by final demand category. These databases provide annual data back to 2009 that follow SEEA/SNA and could be linked to other relevant databases. In addition, they are planning to release, by December 2021, an environmental protection tax accounts database which will include data on transfers paid per tax types per each industry and household for Canada and sub-national geography. All databases are or will be publicly available.

18. Indonesia has pursued analytical work in a number of areas, including on the risks of climate change, including in marine climates; the role of sustainable finance in the insurance industry; and economic modelling to support the transition to a low carbon economy. Indonesia's annual survey of large and medium manufacturing firms (SIBS) supports analyses of the circular economy by collecting data on non-financial corporations' use of waste materials from other firms as inputs into their production. This information was used by the Bank Indonesia (BI) in a working paper examining the dynamics and the importance of circular economy variables on firm's productivity. Other studies of the BI focused on using parameters from other studies to build economic models that enable the estimation of environmental risk premiums and the assessment of central bank policies from a green and sustainable growth perspective. The Financial Services Authority of Indonesia has studied the implications of climate change on the insurance sector (disaster insurance). Finally, Low Carbon Development Indonesia has studied the costs and benefits of transforming Indonesia's economic growth model to a low carbon economy.

19. China's Wind Economic Database provides a tool to pair (monthly, quarterly and annual) macroeconomic and industrial time series data with graphics and data analysis; it includes information on carbon dioxide emissions and particulate matter 2.5 microns or less in width at the national level by

¹⁵ The outcomes of the stocktaking survey conducted by the ECB EG CCS are summarized in the "Towards Statistics on Climate Change Relevant for Central Bank Activities", October 2020, an internal ESCB report.

industry going back to 2009.¹⁶ A key study by the People's Bank of China focuses on financial risks of climate change and evaluates various regulatory responses that the central bank could take to address these risks using various methodologies and tools. China's 2018 and 2019 Green Finance Progress Reports are useful publications that provide summaries of China's progress on green finance focusing on various aspects of general policies, financial instruments, markets, innovative measures and global cooperation. In addition, the China Council for International Cooperation on Environment and Development (CCICED)'s 2018 research report on "Environmental Information Disclosure System of Listed Companies" discusses environmental information disclosures of listed companies.

¹⁶ Based on responses from the People's Bank of China and China's State Administration for Foreign Exchange responded to the stocktaking questionnaire.