Green Monetary Policy Measures and Central Bank Mandates: A Comparative Political Economy Analysis

Appendix 1

1. Research Methodology

This study draws on a comprehensive analysis of primary and secondary data, including central bank mandates and publications on environmental topics, information issued by other relevant national and international organisations, existing literature, news reports, and two semi-structured interviews with monetary policy experts.

1.1. Search Strategy

Legal mandates, including unofficial English translations, were obtained from central banks or Justice Laws websites. The policy objectives were further validated on the banks' monetary policy web pages. In the event of conflicting information, the text of the law prevailed. As for the remaining empirical data, searches were conducted in English using a set of seven climate-related keywords on the search engines of central bank websites, also known as the "dictionary approach" (Arseneau et al., 2022, p. 7): green, climate, sustainability, environment, weather, ESG, and NGFS. When the proposed dictionary displayed hundreds of results, the search was limited to the first one hundred entries and, within these, to those containing at least one of the keywords in the title. Results that did not contain any of the keywords but were still related to the research topic were also considered, such as low-carbon transition, net-zero transition, and responsible investments. The next step involved parsing all documents, including web reports, meeting minutes, news articles, speeches, and research papers, focusing on sections related to monetary policy.

1.1.1. Caveats

Although the examined central banks have English pages and publish in English, the search strategy may have disregarded the results of banks whose prevailing working language is not English by excluding documents produced in the local language. Moreover, the selection of keywords is conditional on the validity of the author's judgment, meaning that a different dictionary could have led to slightly different results. To address these limitations, the data search included an intensive examination of central bank web pages dedicated to climate change and sustainability, as well as the banks' annual reports from 2010 onwards. Annual reports are published in English and represent what central banks aim to make accessible to international investors and other stakeholders regarding the banks' activities. Due to public accountability, most central banks are required by law to submit their annual reports to national parliaments every year. Additional publications were also reviewed when further information was needed. These included financial stability reports, monetary policy reports, policy board meeting minutes, and accountability reports. Moreover, given that "green monetary policy" is a relatively new and uncertain topic, this study hinges on the assumption that green central banks strive to publish their progress in English to share their environmental approach with the international community. This was the view of the Bank of Japan when it translated its market functioning surveys on climate change into English. The aim was to "globally explain about trends in Japanese financial markets in tackling climate change" (Bank of Japan, 2022, p. 1). No disclosure suggests that environmental risks have not been considered, or something prevents central banks from publishing this information. Either way, silent central banks do not demonstrate an interest in being recognised as well positioned in the green transition.

1.2. Interviews

The empirical data include two individual interviews, notably with a Japanese monetary policy expert and a senior advisor to the executive board of Sveriges Riksbank. The objective of the interviews was threefold: (1) to explore additional sources of information that corroborated the documentary analysis, (2) to access potential new knowledge, and (3) to obtain a more detailed analysis of the main motives and strategies behind central bank green monetary policy arrangements. Both interview participants had several years of experience in monetary policy. The interview with the Japanese monetary policy expert was held in person in April 2024. The interview with the representative from Sveriges Riksbank was held online in May 2024. The interview questions were shared with the interviewees by email one week before the interview date so that the interviewees could prepare and provide as much information as possible on the asked questions. Each discussion lasted approximately 45 minutes and was audio-recorded with the interviewees' consent. The interview sections referred to in the paper are transcribed below. As agreed with the participant from Japan, the interview material was paraphrased to guarantee anonymity.

Interview 1 (paraphrased)

(1a) The issuance of Japan Climate Transition Bonds is very small.

(1b) Despite the measures that have been adopted, the Bank of Japan is still uncertain about the extent to which monetary policy influences the greening of the economy. Japan does not yet have a robust taxonomy for defining green and brown economic activities.

(1c) The Bank of Japan seeks to play an active role in climate change discussions to address this issue. To that end, the bank participates in various international bodies, such as the NGFS, Financial Stability Board, TCFD, G7, and G20.

(1d) With climate change and natural disasters taking place all over the world, including floods in Japan, the bank finally decided to join the NGFS. Discussions at the NGFS initiated the bank's considerations of how it could contribute to addressing climate change. The Funds-Supplying Operations to Support Financing for Climate Change Responses, established in 2021, was one of the outcomes of those discussions.

Interview 2 (clean verbatim transcription)

(2a) "Our first step was in the management of foreign exchange reserves because we had foreign exchange reserves, so that was easy to do. Whereas the other measures, in 2020 during the pandemic, we started buying even more government bonds and covered and corporate bonds. Suddenly, there was something that we could do."

(2b) "I think that the Swedish public is very well informed when it comes to climate risks. They understand fully. We have had carbon taxes for twenty years, they know. So, when the Riksbank says we are doing A, B and C, it is not misunderstood as being that the central bank is in charge of climate policy … we are the second or third line of defence."

(2c) "I think the NGFS has been extremely important. I think it is a very successful organisation … There is nothing that is, let us call it, legally binding, but it has been extremely important … we designed the overall sustainability strategy of the Riksbank … [but] we did not invent things from scratch … we are very fortunate that we have been able to talk to other central banks and participate in this global network, which is the NGFS."

2. Classification of Monetary Policy Instruments

Drawing on the green monetary policy arrangements implemented or announced up to January 2024, each policy decision has been identified and categorised according to one of the following four monetary policy instruments: asset purchase programmes, collateral, credit operations, and foreign exchange investments. Asset purchase programmes stand for the outright purchase of assets under different programmes, standard or temporary, with a monetary policy purpose. The greening of these programmes is related to the exclusion of assets from firms with a higher carbon footprint or the tilting of asset purchases towards entities with better environmental performance. The greening of collateral implies altering the eligibility criteria of the assets that central banks accept as counterparts to loans. These assets must either comply with environmental principles or be subject to higher value reductions, also known as haircuts. Credit operations refer to lending solutions that offer favourable conditions to projects linked to environmental targets, such as lower interest rates or extended credit limits vis-à-vis conventional loans. Foreign exchange investments consist of including green elements in the selection of assets or counterparties in operations involving foreign currencies. The analysis excluded technical details related to how central banks conduct their operations.

3. Green Monetary Policy Index (GMPI)

The empirical evidence suggests a heterogeneous picture in terms of the green monetary policy measures adopted. For example, one option is to accept green bonds as collateral; another is to reformulate the collateral framework so that it only accepts green bonds as collateral. Although the deployed instrument is theoretically the same, the sort of adjustment undertaken varies significantly in its ability to catalyse green investments. With a view to making the adopted policy measures more comparable and enabling a more precise identification of deviant cases, this study introduces a Green Monetary Policy Index (GMPI). Under the GMPI framework, each monetary policy decision has been qualitatively assessed and graded on a scale of 0 to 5 according to one of the following six categories:

1. Not observed – identifies central banks that have not publicly mentioned the possibility of adopting green criteria in their monetary policy frameworks. They were assigned an index equal to zero (GMPI = 0).

2. Under consideration – identifies central banks broadly considering introducing green monetary policy measures without committing to an implementation date. They were assigned an index equal to one (GMPI = 1). Multiple measures stated in a single communication are scored individually.

3. On the agenda – includes green monetary policy measures publicly announced together with an approximate timeline of implementation. The exact implementation date often depends on the observation of specific preconditions. They were assigned an index equal to two (GMPI = 2).

4. Facultative – comprises flexible monetary policy arrangements that are decided upon, implemented, or have an implementation date within a short period from the policy decision (usually one to three months). They add new green criteria to existing instruments, however, with no binding force or along with other eligibility criteria that can lessen the weight of environmental factors. For instance, the voluntary purchase of green bonds, the acceptance of green bonds as collateral, and the incorporation of green elements into collateral assessments or in credit facilities designed for multiple purposes. Regarding the latter, even if such schemes offer favourable terms for environmental sectors or projects, they often encompass other business activities that can neutralise the effect of promoting green investments, such as non-green industries. Given that these instruments are not exclusive to environmental projects, they were assigned an index equal to three (GMPI = 3).

5. Risk control – encompasses mandatory environmental criteria that are decided upon, implemented, or have an implementation date within a short period from the policy decision (usually one to three months). Under this category, existing instruments are deliberately amended with enduring green parameters with a view to minimise environmental risks and protect central bank assets and operations from these risks. These policy decisions are often based on the premise that lending to or purchasing from carbon-intensive firms increases the bank's own financial risks. This may include not purchasing assets from specific polluting activities or economic sectors, requiring asset issuers to disclose climate-related risks, and favouring asset issuers with better environmental performance. Compared to the previous "facultative" category, green considerations are given substantial weight in relation to other risk metrics, implying a more explicit shift in funds from brown to green firms. They were assigned an index equal to four (GMPI = 4). It should be noted that some of these measures can (temporarily) be discontinued due to economic development and monetary policy needs. For example, the envelopes for asset purchase programmes are larger during periods of monetary policy expansion and can be stopped due to monetary policy tightening (European Central Bank, 2024; Sveriges Riksbank, 2020). Even though these measures can be suspended, they are still relevant to understanding the institutional conditions under which environmental considerations were introduced and why they were withdrawn. Furthermore, these criteria are likely to be reintroduced in future asset purchases and provide an example of how to green an asset portfolio.

6. Targeted – corresponds to monetary policy instruments exclusively created to expand the flow of financial funds towards firms and investments that consider or improve the quality of the environment. Compared to the previous "risk control" category, there is a change of narrative and approach from one focused on shielding central banks from environmental risks to another that significantly emphasises environmental targets and the promotion of green growth. Bespoke credit lines appear to be the most compelling exemplification of green-targeted monetary policy tools to date, as they can substantially lower the borrowing costs for green projects, enhancing their uptake. For their part, the purchase of corporate bonds and foreign exchange investments is normally constrained by other eligibility criteria to protect the price stability goal and the financial situation of central banks. Moreover, corporate bonds are usually a very small part of central bank asset purchases, which mainly comprise government bonds (see Bank of Canada, 2023; Bank of England, 2023; Flodén, 2019; Norges Bank, 2021; Schnabel, 2022; Sveriges Riksbank, 2019). Hence, the impact of purchasing green corporate bonds or engaging in green foreign exchange operations appears to be more limited than that of green lending facilities. Targeted monetary policy measures were assigned an index equal to five (GMPI = 5). This category also includes discontinued credit solutions launched in response to temporary needs. Even if such commitments did not

persist, they allowed the differentiation of central banks that joined efforts to pursue green objectives from those that did not take any action.

4. Description of the Dataset in Appendix 2

A new dataset was prepared to facilitate the analysis of how the 20 central banks in this study have supported the transition to a greener economy via their monetary policy frameworks. It comprises central bank mandates and the green monetary policy responses implemented or announced up to January 2024. It is possible to find a number of public databases and studies that combine central bank mandates and environmental strategies. Some are run by international organisations, while others are managed by independent research institutes or social groups. The objective of this new dataset, based on primary sources, was to avoid the shortcomings of existing material, such as inaccurate information, outdated data, or the use of different indicators. The dataset started in September 2022 and was continuously updated until January 2024. It provides the following information for each of the 20 central banks:

- Country
- Economic group (AE/EMDE)
- Central bank
- Mandate
- Monetary policy objectives according to the bank's website
- Positioning of the economic policies in the overall mandate of the bank: first, secondary, or not mentioned[1]
- Title of the legal document
- Checked version date
- Link to mandate
- Link to monetary policy objectives on the bank's website
- Implemented green monetary policy measures
- Year of implementation[2]
- Planned green monetary policy measures
- Instrument category: asset purchase programmes, collateral, credit operations and foreign exchange investments
- GMPI score per policy measure
- Reference links

[1]The dataset distinguishes between central banks whose primary monetary policy objectives include price and/or financial stability, along with (a) other economic variables as the first objective (first), (b) economic variables, support for government policies, or other wider purposes as the secondary objective (secondary), and (c) no explicit support for economic-related policies (not mentioned). When the text of the law does not clearly rank the positioning of economic variables or support for government policies vis-à-vis the central banks' main goals, and should central banks emphasise price stability as the primary monetary policy goal on their websites, the support for the real economy appears as a secondary objective.

[2]The date assigned to each implemented green monetary policy measure corresponds to the year a bank publicly placed an environmental emphasis on the adopted decision. This means that although a central bank may have already invested in green assets before a specific date, such operations were likely guided by principles related to market neutrality and portfolio risk management. Even though the growing purchase of green bonds tends to decrease green bond yields and encourage their issuance by firms, regardless of the purchase motive (De Santis et al., 2018; Lautenschläger, 2018), this study only considered investments that entail an explicit environmental concern.

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