

Network for Greening the Financial System
Technical document

A sustainable and responsible investment guide for central banks' portfolio management

October 2019



NGFS

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Climate change is having significant effects on our economies, on our communities and on our lives. In 2018, nearly 900 natural disasters were recorded, leading to overall losses of around USD 180 billion. Only 45% of these losses were insured. The majority of losses were covered by private households, enterprises or public authorities.¹

It is quite evident that for all parties climate change is a source of financial risk that is becoming more urgent since the frequency and severity of catastrophic events shows a growing trend. To address these challenges, international concerted efforts and collective leadership are required. That's exactly what we at the Network for Greening the Financial System (NGFS) are trying to achieve.

We believe that the financial community must play a key role in tackling climate change. In April 2019, the NGFS called for collective action to address climate-related risks in the financial system, publishing a set of recommendations aimed at central banks, supervisors, policymakers and financial institutions.

One of the recommendations is that NGFS members would lead by example. As a first step, we conducted a comprehensive portfolio-management survey among our members on how they integrate sustainability factors. The results are presented in this guide – the first of its kind. They are encouraging: many NGFS members already incorporate sustainability in their portfolio management while others are reviewing their operations.

The present guide targets all central banks, NGFS members as well as non-members. It offers valuable insight into Sustainable and Responsible Investment (SRI), presenting potential SRI approaches and ways to implement them. We are confident that our guide will inspire others to follow suit and integrate SRI into their own operations.

But we won't stop here, as we will continue to do what we can to generate the necessary change towards a low-emissions future.

Finally, we would like to thank all NGFS members who contributed to this report as well as the NGFS Secretariat for their tireless efforts to make this guide possible. We need the support of each and every one of you to tackle this great challenge to humankind: climate change.

¹ Cf. Munich Re NatCatSERVICE.

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Executive summary

The members of the Network for Greening the Financial System (NGFS) acknowledge climate change as a source of financial risk. The NGFS encourages central banks and supervisors across the globe to lead by example and include sustainability considerations in their portfolio management, without prejudice to their primary mandates.

The NGFS believes that the adoption of Sustainable and Responsible Investment (SRI)¹ practices by central banks is important and can help to demonstrate this approach to other investors and mitigate material ESG risks as well as reputational risks. As public institutions, central banks are subject to public scrutiny if they fail to address stakeholders' concerns related to climate change. This is especially true if a central bank calls upon the financial sector to take account of climate-related risks, but fails to appropriately address these risks in its own operations.

Central banks manage a large number of assets in different portfolios. However, they are not comparable to other institutional investors as their investment practices are (to a large extent) dictated by the respective policy objectives. Consequently, central banks face specific challenges in the pursuit of SRI:

- 1) **Sticking to the legal policy mandate.** The vast majority of holdings are dictated by a policy objective. It is up to each central bank to determine whether an SRI objective could be adopted without prejudice to its mandate.
- 2) **Investing responsibly while preserving liquidity.** Central banks' balance sheets largely consist of supranational and high-grade sovereign debt with short duration. The adoption of SRI is less straightforward for these asset classes.
- 3) **Safeguarding independence and preventing conflicts of interest.** Since central banks act as independent agents, any conflicts of interest arising from their investment practices should be prevented.
- 4) **Striking a balance between transparency and confidentiality.** Transparency is key to any SRI approach. Nevertheless, central banks may not be able to disclose everything about all of their investment practices as this could undermine the primary policy objective.

This NGFS guide – the first of its kind – outlines a hands-on approach aimed at central banks wishing to adopt SRI in their portfolio management. It does not offer a one-size-fits-all solution, but discusses potential SRI approaches and ways to implement them, allowing central banks to accommodate their own specific challenges.

There is a growing commitment to SRI strategies among central banks. A unique SRI portfolio management survey among NGFS members shows that 25 out of the 27 respondents have already adopted SRI principles in their investment approaches, or are planning to do so. These principles range from broad environmental, social, and governance (ESG) considerations (60% of the survey respondents) to climate-specific focuses (16%).

Central banks may choose to adopt SRI to mitigate sustainability risks in their portfolio, or to create a positive impact on the environment and society alongside financial returns. These objectives can be translated into different SRI strategies. Among the five SRI strategies identified in this guide, the most prominent are green bond investments and negative screening for equity and corporate bond holdings.

This guide concludes with case studies of first-hand experiences by NGFS members that already incorporate SRI principles in their portfolio management. While work is still needed with regard to critical elements relating to the availability of data, to transparency, disclosure and a global taxonomy, progress is being made around the world. These case studies are intended to help build critical momentum and lower barriers for other central banks to follow suit, thereby speeding up the transition to a more sustainable economy.

¹ SRI comprises a broad range of sustainable investment strategies, including environmental, social and governance (ESG) criteria.

Origin of the NGFS



8 central banks and supervisors established a Network of Central Banks and Supervisors for Greening the Financial System.



Since then, the NGFS has grown to **46 Members** **9 Observers** representing 5 continents.



The NGFS is a coalition of the willing

It is a voluntary, consensus-based forum whose purpose is to share best practices, contribute to the development of climate –and environment– related risk management in the financial sector and mobilise mainstream finance to support the transition toward a sustainable economy.



The NGFS issues recommendations which are not binding but are aimed at inspiring all central banks and supervisors and relevant stakeholders to take the necessary measures to foster a greener financial system.



1. Introduction

The urgency to act on climate change is growing. According to the IPCC report 2018, temperatures are likely to increase 1.5°C above pre-industrial levels between 2030 and 2052 if emissions continue at the current rate. In order to be able to address the risks posed to natural and human systems, associated with a temperature rise of 1.5°C or beyond, a rapid and far-reaching transition is required. This transition demands significant upscaling of investments in options that help to reduce carbon emissions in all sectors (IPCC, 2018).

The Network for Greening the Financial System (NGFS) aims to contribute to the development of environment and climate risk management in the financial sector, as well as to mobilise mainstream finance to support the transition towards a sustainable economy (NGFS, 2018). In its first comprehensive report *A Call for Action*, the NGFS provided six non-binding recommendations for central banks, supervisors, policymakers and financial institutions to enhance their role in the greening of the financial system and the managing of environment and climate-related risks. In recommendation 2, the NGFS encourages central banks to lead by example in their own operations: without prejudice to their mandates and status, this includes integrating sustainability factors in the management of some of the portfolios at hand (own funds, pension funds and reserves to the extent possible). This document serves as a guide for central banks wishing to adopt Sustainable and Responsible Investment (SRI) principles in one or more of their portfolios.

The scope and limitations of SRI objectives and strategies are discussed throughout this guide. Central banks' investment practices are (to a large extent) dictated by their respective legal mandates. As such, this guide does not provide a one-size-fits all solution, but rather discusses potential SRI approaches for central banks. Throughout this document, SRI is used as an umbrella term comprising multiple strategies and investment practices. These range from specific focuses on sustainability risks to creating a positive impact, and from climate-specific to broader ESG approaches. It is up to each central bank to define the appropriate objectives and scope for SRI, in line with the mandate of its own specific portfolios.

This guide builds on the results of an SRI portfolio management survey – the first of its kind – among NGFS members. The

survey shows that most central banks have already adopted (or are considering to adopt) SRI criteria for one or more of their portfolios. The increasing prevalence of SRI in central banks' portfolio management mirrors the growing global commitments to address climate change and environmental issues. Case studies of first-hand experiences by NGFS members that have already incorporated SRI principles in their portfolio management can help build critical momentum and lower barriers for other central banks to follow suit.

This guide provides an overview of the portfolios typically managed by central banks (chapter 2) and describes the key motivations for the adoption of SRI principles (chapter 3). Chapter 4 describes five possible SRI strategies, while chapters 5 and 6 highlight the need for SRI monitoring and reporting. The document concludes with first-hand experiences by NGFS members in the form of case studies of seven selected members that have already incorporated SRI in their portfolio management (chapter 7).

2. Central bank portfolios

Central banks typically hold different portfolios with various goals, depending on their respective mandates. This guide distinguishes four types: (i) policy portfolios, (ii) own portfolios, (iii) pension portfolios, and (iv) third-party portfolios. This chapter summarises the characteristics of central bank holdings and portfolio characteristics.

2.1 Policy portfolios

Policy portfolios are at the heart of central banks' mandates, and constitute by far the largest pool of assets on the balance sheet.¹ As central banks have distinct legal mandates, the definition of policy portfolios in this guide is broad. It can include portfolios for foreign exchange intervention, the execution of an asset purchase programme or other monetary policy goals. Notwithstanding the different functions, the holdings within the policy portfolios must meet strict policy objectives, which typically require investments to meet high standards in terms of liquidity and credit quality. Consequently, these portfolios mostly

¹ The survey shows that policy portfolios on average account for over 80% of total assets under management. Note that this number is derived from portfolios for which SRI is under consideration or already implemented.

consist of supranational and high-grade sovereign debt, and may be subject to overriding principles such as market neutrality. Still, some central banks manage their policy portfolios in a different manner, which could provide some room for SRI principles. The extent to which SRI is applicable in the end depends on its compatibility with the respective policy objective of the portfolio. Box 1 shows the current state of SRI adoption for the four portfolio types.

2.2 Own portfolios

Many central banks manage own portfolios. These portfolios typically have the objective of generating returns within a certain risk tolerance level. The asset mix of these portfolios is more diverse compared to the policy portfolios, with holdings often including equities, corporate bonds and sometimes private debt.² Some central banks invest these holdings in a market-neutral manner to limit the impact on the constitution of the broader market. Adoption of SRI is relatively straightforward for central banks' own portfolios, as long as it does not interfere with the primary objective.

2.3 Pension portfolios

Pension portfolios serve as a long-term savings account for retirement and have a longer investment horizon. While the asset allocation is largely determined by the nature of the underlying pension liabilities, central banks' pension funds are generally invested in more diverse asset classes and geographic locations compared to the own portfolios and policy portfolios. The holdings are also subject to a fiduciary duty. As such, there may be room to adopt SRI as long as this is in line with the fiduciary duty (this is further discussed in chapter 3).

2.4 Third-party portfolios

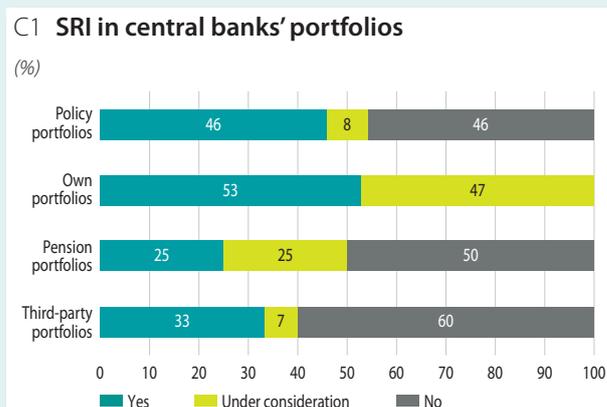
Many central banks manage portfolios on behalf of a third party. Examples include the local government's foreign reserves, or the ECB's foreign reserves which are managed by national central banks within the Eurosystem. The objectives and asset allocation of these portfolios vary, as they are determined by the third party. The extent to which SRI can be adopted in these portfolios thus depends on the client's demands.

Box 1

SRI in central banks' portfolios

The NGFS survey covers 27 central banks. In total 25 manage one or more portfolios for which SRI is already included or under consideration. Of these 25, all have adopted, or are considering adopting, SRI principles in their own portfolios. For the policy portfolios, pension portfolios and third-party portfolios, the survey results are more balanced, as roughly half of the respondents indicate that they have adopted, or are considering adopting, SRI principles in these portfolios.

These relatively high shares reflect the broad definition of "the incorporation of SRI principles", which covers varying strategies and may be applied only to specific parts (asset classes) of central banks' portfolios (see chapter 4). Moreover, as outlined in paragraph 2.1, policy portfolios can serve different functions across central banks. Most central banks that apply a form of SRI to their policy portfolio, indicate this refers to their foreign exchange portfolio.



Source: NGFS SRI portfolio management survey 2019.
Note: 27 respondents. In total, the surveyed central banks manage 68 portfolios: 24 policy portfolios, 12 pension portfolios, 15 third-party portfolios, and 17 own portfolios. Note that there are 17 own portfolios managed by 15 central banks (two respondents have 2 separate own portfolios). The survey only included pension portfolios that are part of central banks' balance sheets. This means central banks' pension portfolios managed by an independent entity are not represented.

² Over the last few years, central banks have broadened their assets under management, holding around USD 800 billion in equities (6% of total) and USD 1 trillion in return-enhancing bonds (9% of total) (OMFIF, 2019).

T1 Characteristics of typical central bank portfolios

	Policy portfolios	Own portfolios	Pension portfolios	Third-party portfolios
Dictated by	Policy goal – determined by central bank mandate.	Financial return goal – e.g. to help cover operating expenses.	Fiduciary duty – managed on behalf of beneficiaries.	Third-party mandate – managed on behalf of an external party.
Main objective	To support, implement and maintain confidence in monetary policy and currency management.	To generate returns within set risk tolerance levels. Secondary objective can be to gather market intelligence.	To provide for the retirement pension obligations of the central bank's employees.	Set by a third party. Varies, e.g. financial return, short-term liquidity provision or foreign exchange intervention.
Character	Assets meet high standards in terms of liquidity and credit quality in order to be able to absorb shocks in times of crisis or when access to borrowing is curtailed. Can be subject to market neutrality.	Subject to risk-return considerations. More freedom in investment decisions, but interference with monetary policy or currency management should be prevented.	Long term investment horizon in line with the pension liabilities. Short-term volatility is less of a concern.	Depends on main objective of funds. Cases where central bank manages foreign exchange reserves on behalf of the government.
Asset classes	Limited. Mostly (sub-) sovereigns, supranationals and agency (SSA) and some corporate/covered bonds and equity.	Diverse. Mix between SSA, corporate/covered bonds and equity, and potentially private debt.	Diverse. Mix between SSA, corporate/covered bonds, equity, and private debt.	Diverse. Mainly SSA, followed by corporate/covered bonds, and equity.
Duration	From short to medium term. From 3-6 years for majority. Less than 2 years for one-third of respondents.	Short term. Less than 2 years for majority.	Longer term. More than 6 years for two-thirds of the respondents.	Balanced. Varies from short term (0-2 years), medium term (3-6 years) and longer term (> 6 years).

Conclusion

Policy portfolios constitute the largest pool of assets managed by central banks and mainly consist of supranational and high-grade sovereign debt. These holdings are subject to a policy mandate. Some central banks also manage own portfolios, which typically provide room to adopt an SRI objective alongside the objective to generate financial returns. The remainder of central bank holdings is in pension portfolios or third-party portfolios, which are driven by beneficiaries' and clients' demands. The characteristics of the different portfolio types are summarised in Table 1.³ In general, the specific portfolio objectives and characteristics determine the extent to which SRI objectives can be adopted. Both topics are further discussed in the following chapters.

3. SRI objectives and scope

In general, two high-level SRI objectives for central bank portfolios can be identified: (i) a *financial SRI objective* which aims to address the impact of climate-related risks and/or ESG-related risks on the portfolio and (ii) an *extra-financial SRI objective* which aims to address the impact of the portfolio on the environment and society, alongside financial returns (see Figure 1).⁴ These objectives are increasingly likely to overlap as adaptation and mitigation policies evolve in response to climate change. An issuer's impact on climate change and the broader environment can translate into financially material opportunities or risks (European Commission, 2019b). Both SRI objectives can be

³ The reported data may be subject to bias, as only those portfolios are reflected for which SRI is already adopted or under consideration. The characteristics of the portfolios might, however, influence the decision to adopt SRI objectives.

⁴ These high-level objectives are closely aligned with the European Commission's double materiality perspective which distinguishes *financial materiality* (the impact of climate change on a company's development, performance and position), and *environmental and social materiality* (the impact of a company's activities on the environment and society) (European Commission, 2019b). For a climate-specific scope, the two high-level goals can be translated into a *carbon risk* objective and a *climate friendliness* objective (WRI, UNEP-FI & 2° Investing Initiative, 2015).

F1 High-level objectives for central banks' portfolio management



translated into concrete goals with either a climate-specific scope or a broader ESG scope (Box 2). The extent to which

the SRI objectives and scope may be pursued depends on the central bank portfolio under consideration.

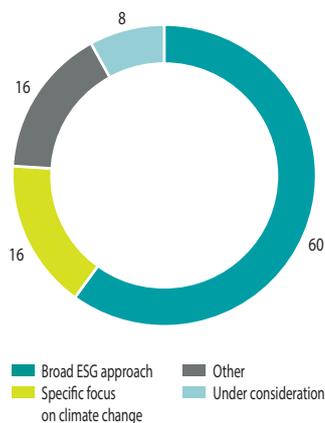
Box 2

SRI scope in central banks' portfolio management

The NGFS survey shows that 60% of the central banks have a broad ESG approach, while 16% employs a climate-specific focus. Some central banks are still deciding upon their scope.

C2 SRI scope in central banks' portfolio management

(%)



Source: NGFS SRI portfolio management survey 2019.
Note: 25 respondents.

3.1 Financial SRI objectives

An investor with a financial SRI objective does not aim to generate a positive environmental or social impact, but strives to improve the risk-return profile of the portfolio by considering financially material ESG criteria. Protecting the portfolio against climate-related risks, environmental risks, or ESG-related risks are examples of financial SRI objectives. The financial risks associated with climate change arise from two risk categories. The first category relates to physical risks due to climate-related damage from, for example, storms, hail and flooding. The second category arises from transition risks due to the shift towards a low carbon economy (NGFS, 2019). Comparable channels have been identified for other environmental and social risks, such as risks related to water stress, biodiversity loss, resource scarcity and human rights controversies (Schellekens and van Toor, 2019). The extent to which integration of these risks helps to improve an investor's risk-adjusted returns is discussed in Annex 1.

Financial SRI objectives are well aligned with central banks' SRI motivations. According to the NGFS survey results, key motivations for SRI among central banks are *protection against sustainability risks (including climate-related financial risks) and enhancement of the risk-return profile* (Box 3).⁵ These motivations are driven by the desire to protect or improve financial performance.

⁵ Similar results are found amongst asset owners and managers who feel the responsibility to address sustainability, with key motivations being downside risk protection and financial return generation (Morgan Stanley, 2018).

Box 3

Central banks' motivations for SRI

The mitigation of reputational risk, and setting a good example, are important motivations for central banks to adopt SRI. All investors face reputational risk associated with investing in controversial companies and/or countries. For central banks, this risk might be elevated in case they explicitly call for action by the financial industry to address climate-related risks or ESG-related risks, but fail to incorporate these risks in their own operations.

C3 Central banks' motivations for SRI



Source: NGFS SRI portfolio management survey 2019.

Note: The 25 respondents ranked their motivation (1-8) for each of the portfolios in which SRI plays a role (38 portfolios in total).

For own portfolios and pension portfolios, adopting a financial SRI objective is in line with the (primary) goal of generating financial returns.⁶ For policy portfolios and third-party portfolios, the extent to which this SRI objective can be adopted depends on the (policy) objective(s) of the portfolio and clients' demands.

3.2 Extra-financial SRI objectives

An investor with an extra-financial SRI objective aims to make a positive tangible impact on society by allocating capital to sustainable companies or projects, alongside generating financial returns. Actively helping to finance the Sustainable Development Goals (SDGs) or the transition (or "just transition") towards a carbon neutral economy are examples of extra-financial SRI objectives.⁷

Adoption of extra-financial SRI objectives may be less straightforward for central banks. The NGFS survey shows that motivations related to extra-financial SRI objectives, such as *compliance with international standards*

or frameworks, are mentioned less prominently (Box 3). Nevertheless, a few respondents explicitly mention *ethical considerations* and *striving for a positive impact* under "other". Where it is consistent with their mandates, there could be merit in central banks striving for a positive extra-financial impact. This could help drive the transition towards a carbon neutral economy and mitigate ESG risks to the financial sector (Schellekens & van Toor, 2019).

The extent to which an extra-financial objective suits a central bank varies per portfolio. An important consideration is whether some financial return would have to be sacrificed to generate a positive extra-financial impact. Within the own portfolios, central banks typically have flexibility to set their own targets, which provides scope for an extra-financial SRI objective. With regard to the pension portfolios, the fiduciary duty dictates that beneficiaries are consulted if an extra-financial SRI objective could impact financial returns. For the policy portfolios and third-party portfolios, the adoption of an extra-financial SRI objective is relatively complex, as this could undermine the primary policy objective or jeopardise central bank independence.

6 UNEP (UN Environmental Programme) and PRI (Principles for Responsible Investment) argue that taking ESG criteria into account in a pension portfolio can even be considered part of the fiduciary duty "as long as these criteria are shown to have a long-term effect on the financial performance of companies" (i.e. are financially material) (UNEP & PRI, 2015).

7 The 17 SDGs, adopted by all UN Member States in 2015, aim to end global poverty by 2030 while maintaining planetary stability. Governments, foundations and the private sector were explicitly called upon by the UN to mobilise more financial resources to help deliver these SDGs (OECD, 2019). A "just transition" focusses on climate action that explicitly incorporates transitional challenges from a social perspective (Grantham Research Institute on Climate Change, 2018).

T2 **Applicability of high-level SRI objectives for central banks' portfolios**

SRI Objective	Policy portfolios	Own portfolios	Pension portfolios	Third-party portfolios
Financial	Depends on portfolio objectives.	In line with portfolio's financial return objective.	In line with financial return objective (and fiduciary duty).	Depends on portfolio objectives.
Extra-financial	Depends on portfolio objectives.	Potentially room to adopt extra-financial objectives.	Depends on beneficiaries' demands.	Depends on clients' demands.

Conclusion

The room to adopt SRI objectives in central banks' portfolios, largely depends on the mandate underlying the portfolio in question. In general, two high-level SRI objectives can be considered: (i) a *financial SRI objective* and (ii) an *extra-financial SRI objective*. The first is aligned with any portfolio that aims to generate financial returns. The second can be considered, but depends on its compatibility with the portfolio's primary objective or stakeholders' demands. Table 2 summarises the applicability of the SRI objectives per portfolio.

4. Strategies

Depending on their respective SRI objective (financial or extra-financial), central banks can consider different SRI strategies. This chapter describes the most commonly used SRI strategies and – given the lack of a commonly accepted list of definitions – builds on the set of strategies presented by Eurosif and the PRI. As a result, five SRI strategies are discussed: (i) negative screening, (ii) best-in-class, (iii) ESG integration, (iv) impact investing and (v) voting and engagement ((Eurosif, 2019) and (PRI, 2018)). The discussed SRI strategies are not mutually exclusive and can be combined. Since data plays a key role for the implementation of any SRI strategy, a discussion of ESG data considerations can be found in Annex 2.

4.1 Negative screening

In the broadest sense, screening refers to restricting the investment universe on the basis of pre-selected criteria (or screens). Negative screening entails systematically excluding controversial companies, sectors or countries from the investment universe and thereby helps to address reputational risks. These exclusions can be based on global norms or values and cover companies' products and/or conduct.⁸ This strategy can be tailored to a climate-specific, environmental-specific or broader ESG approach.

Negative screening is often seen as a first step in the adoption of SRI. This strategy may be considered by central banks with an extra-financial SRI objective as disinvestment signals that some business practices are deemed unacceptable and should thus not be financed. Still, the strategy eliminates the possibility to engage with a company and strive for positive change. Moreover, excluding a large part of the investment universe (e.g. an entire sector) lowers diversification benefits and thus tends to negatively impact the risk-return profile of the portfolio (see Annex 1).

Central banks can consider exclusions on the basis of violations of widely accepted global norms or local regulation. Exclusionary screening based on values or products may be more challenging, as these considerations tend to be subjective and often vary over time. A case study by the central bank of Norway elaborates on how an independent ethics council helps to protect the bank's reputation in this respect (Section 7.1). Moreover, Box 4 summarises central banks' exclusionary screening practices.

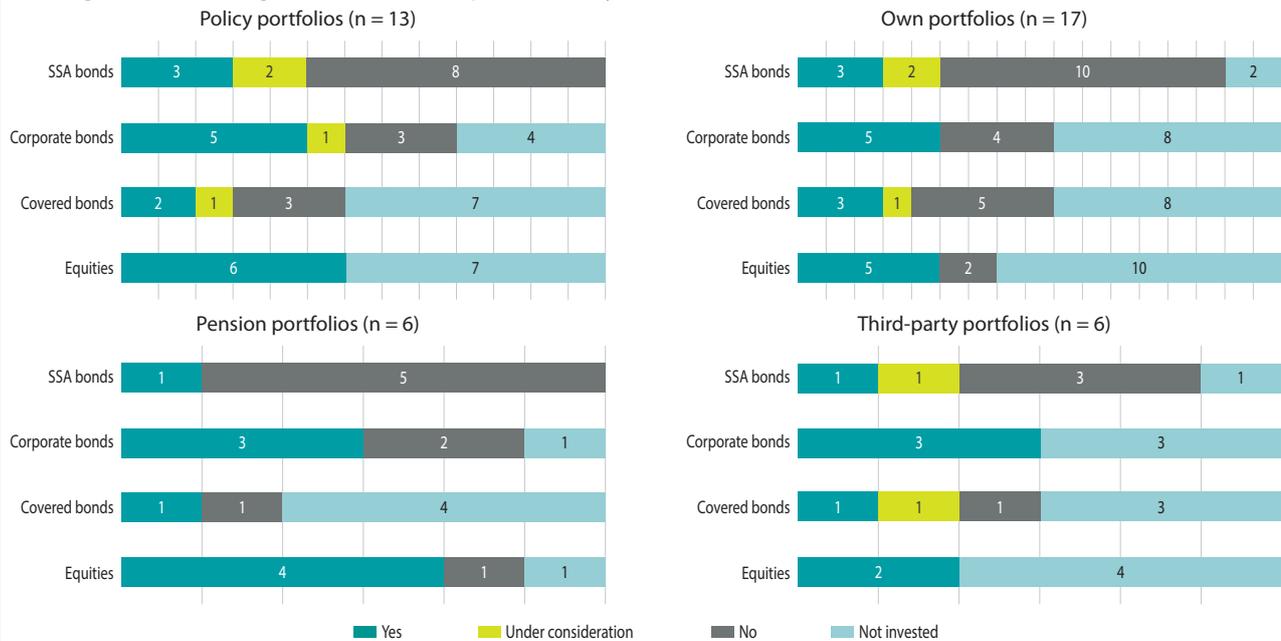
⁸ Such norms include, but are not limited to, UN Global Compact Principles, the Universal Declaration of Human Rights, International Labour Organization standards, the United Nations Convention Against Corruption and the OECD Guidelines for Multinational Enterprises.

Box 4

Negative screening in central banks' portfolios by asset class

The survey results indicate that negative screening is one of the most commonly applied SRI strategies. Most central banks that apply negative screens do so within their equity or corporate bond holdings, regardless of the portfolio under consideration.

C4 Negative screening in central banks' portfolios by asset class



Source: NGFS SRI portfolio management survey 2019.

Note: The number of respondents depends on the portfolio (see individual headings).

4.2 Best-in-class

Best-in-class is a broad strategy that involves either positive screening or index-adjusted weighting (“ESG tilting”) by comparing the ESG characteristics of a firm to those of its peers. Firms can be selected or reweighted based on (i) a best-in-sector approach (ESG leaders within the same sector), (ii) a best-in-progress approach (also referred to as “ESG momentum”), or (iii) a best-in-universe approach (only the highest-ranking firms, regardless of the sector). This strategy can be used for a financial or an extra-financial SRI objective. On the one hand, a best-in-sector approach allows for a mitigation of ESG risks without hampering sectoral diversification within the

portfolio, thus benefiting financial returns. On the other hand, lagging companies are motivated to improve their conduct, which adds to an extra-financial impact.

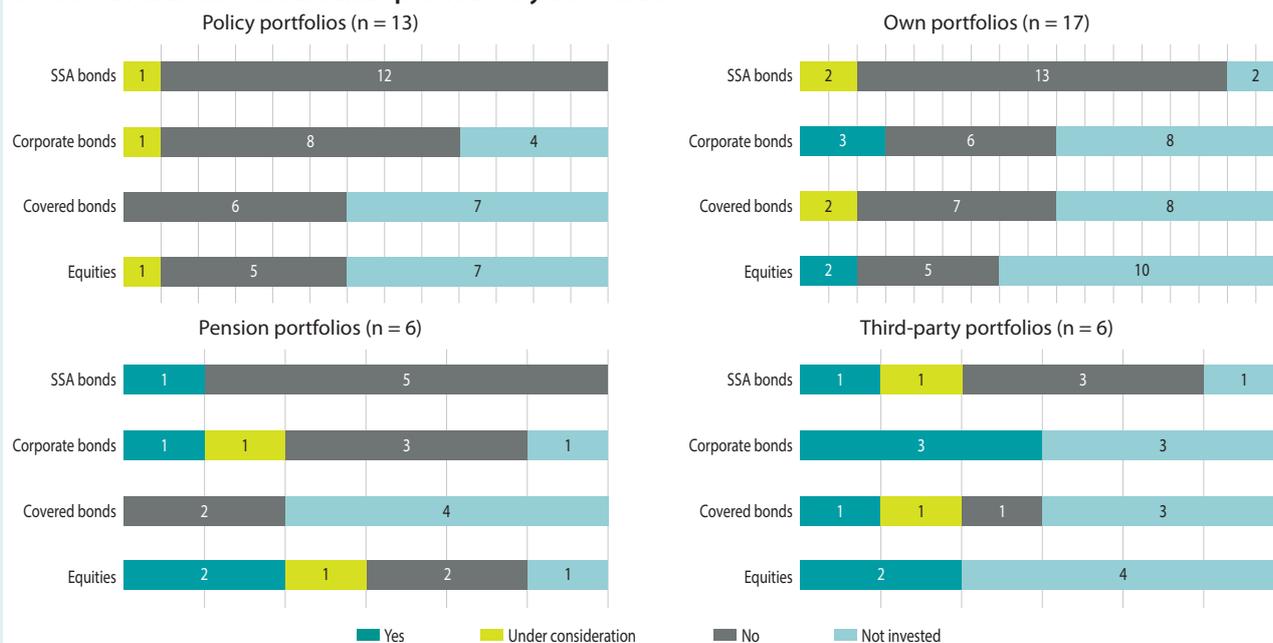
A best-in-class strategy offers a relatively easy SRI solution for central banks. Depending on the selection or reweighting criteria, the strategy can be tailored to specific goals. As such, it allows for both a climate-specific scope (e.g. a low-carbon index) as well as a broader ESG scope. In addition, a best-in-class approach may also be considered for passive investment styles. A point to consider is that the strategy is highly dependent on ESG scores or ratings. This could be a drawback as long as issues with ESG data persist (see Annex 2).

Box 5

Best-in-class in central banks' portfolios by asset class

The survey results indicate that this strategy is mostly applicable to the equity and corporate bond holdings within own portfolios, pension portfolios or third-party portfolios. None of the respondents currently follow a best-in-class strategy within the policy portfolios.

C5 Best-in-class in central banks' portfolios by asset class



Source: NGFS SRI portfolio management survey 2019.

Note: The number of respondents depends on the portfolio (see individual headings).

4.3 ESG integration

ESG integration enhances traditional financial (risk) analysis by systematically including all *financially material* ESG-criteria in the investment analysis to improve the risk-return profile of the portfolio. Identification of financially material ESG criteria is not straightforward, as these tend to vary across industries, geographical locations and over time.⁹ As a result, ESG integration requires a continuous re-assessment of the underlying criteria. This strategy is common amongst equity investors, who include ESG criteria in the quantitative analysis

to determine whether a sufficient premium is offered for underlying (ESG) risks. Within the fixed income space, however, ESG integration is still in its infancy, partly because the extent to which ESG criteria impact credit ratings is not straightforward (see Annex 3 for further discussion).

This strategy is suitable for all central bank portfolios. It explicitly accounts for ESG risks without necessarily curtailing the investment universe. The case study by the central bank of Italy provides an example of ESG integration for central banks' equity investments (Section 7.2).

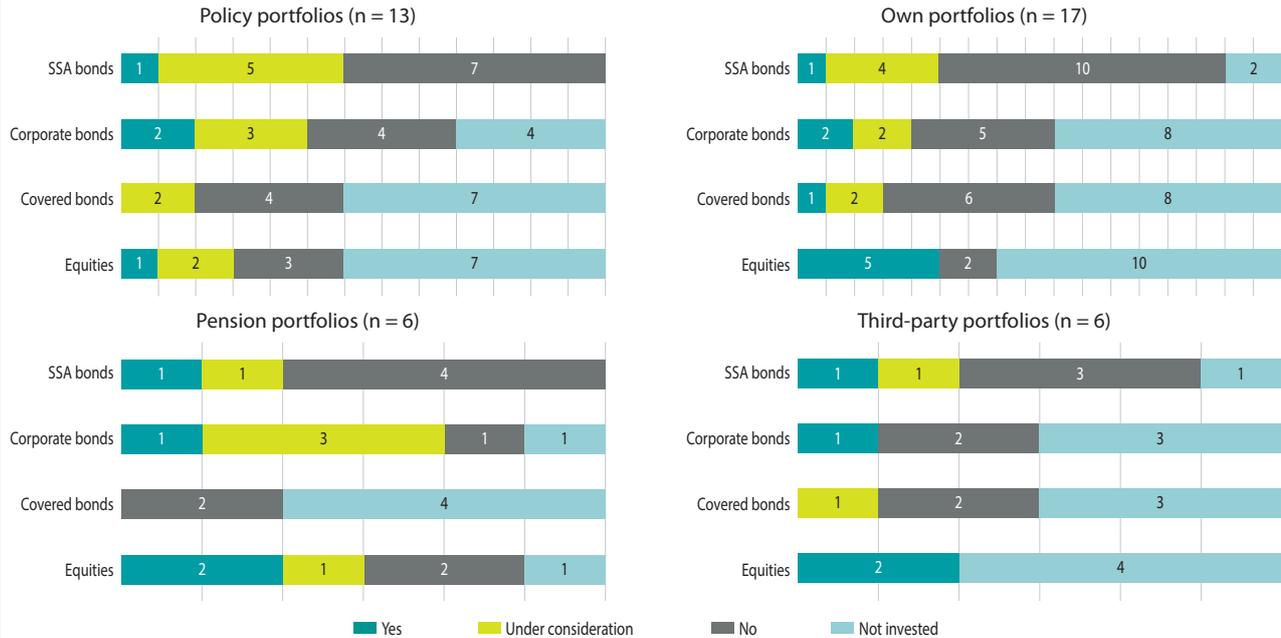
⁹ The Sustainability Accounting Standards Board has put together a framework to identify financially material issues across industries (<https://www.sasb.org/standards-overview/materiality-map/>).

Box 6

ESG integration in central banks' portfolios by asset class

The survey results indicate that ESG integration is applied across all portfolio types, mostly for equity holdings (closely followed by corporate bond holdings). It should be noted that the results in this box may be inflated due to different interpretations of what “ESG-integration” means. The concept is often used interchangeably with SRI; as an umbrella term to describe any strategy that employs ESG criteria within the investment process.

C6 ESG integration in central banks' portfolios by asset class



Source: NGFS SRI portfolio management survey 2019.

Note: The number of respondents depends on the portfolio (see individual headings).

4.4 Impact investing

Impact investing aims to generate an intentional and quantifiable positive impact alongside financial returns (GIIN, 2019). As such, this strategy is by definition aligned with an extra-financial SRI objective. Impact investing can range from “traditional” impact investments, which consist of smaller, private allocations to social

enterprises and project-type investments, to “listed” impact solutions such as equity impact funds and green bonds (see Box 7). Supranational debt instruments could also be part of an impact investing strategy, as the proceeds are often used for economic or sustainable development. Impact investors generally employ a holistic perspective in which both environmental and social objectives are targeted.¹⁰

¹⁰ The GIIN (2019) survey finds that 56% of respondents target both social and environmental objectives, while 36% target only social impact and 7% target only environmental impact.

Green bond investments

Green bonds are fixed income instruments that carry a green label. The proceeds of these bonds are explicitly used to finance or re-finance (in full or in part) new or existing green projects, such as those related to renewable energy. Apart from green bonds, ICMA (the International Capital Market Association) also recognises SDG bonds and social bonds. Multiple frameworks and labels exist to validate proper use of proceeds, with the Climate Bonds Standards (released by the Climate Bonds Initiative in 2013) and the Green Bond Principles (established by the ICMA in early 2014) most commonly known. The European Commission's Technical Expert Group recommends the European central banks and members of the NGFS consider promoting the greening of the financial system by expressing and implementing a preference for EU labelled green bonds (European Commission, 2019a).

Green bond investors aim to generate an explicit environmental impact by supporting companies with credible green investment propositions. While the green bond market is growing rapidly, total estimated market size is still small and largely concentrated in Europe (49% of total issuances). Corporates and financial institutions are well-represented in the market (Climate Bonds Initiative, 2019). Moreover, central banks may want to take into consideration that (i) the credit risk profile of the issuer remains the same (as long as the project is not ring-fenced), regardless of whether the investor is holding a green or an unlabeled bond, (ii) climate risks are not necessarily mitigated via green bonds, and (iii) the green bond market is still in its infancy which may add to potential pricing, liquidity and diversification concerns.

From a central bank perspective, the flexibility to implement an impact strategy varies across the four portfolios. Most pension portfolios have a diverse asset allocation and contain eligible holdings, such as bonds, equities and alternative investments. The own portfolios are traditionally more limited in their asset allocation, but may provide room for impact investing via green bonds or the inclusion of new asset classes. For the policy portfolios the scope is somewhat limited especially if a central bank manages these holdings in a market neutral manner. Still, as these portfolios mainly consist of fixed income instruments,

a modest allocation towards green bonds would not necessarily affect the constitution much. For third-party portfolios, the applicability of an impact investment approach depends on the function of the portfolio and clients' demand. Central banks that wish to outsource their green bond investments, can consider the Green Bond Investment Pools launched by the BIS.¹¹ Two case studies describe how the central bank of France is doing impact investment with alternative investment (Section 7.3) and how the central bank of Hungary considers green bond investments (Section 7.4).

¹¹ The BIS has launched a green bond cooperative initiative and developed two Green Bond Investment Pools accessible for central banks. This initiative is envisioned to generate a positive environmental impact and forge consensus among participating central banks on green bond principles.

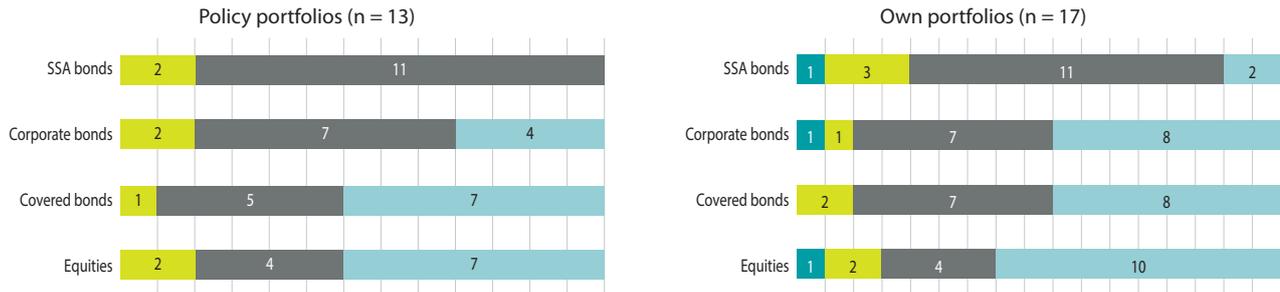
Box 8

Impact investing in central banks' portfolios by asset class

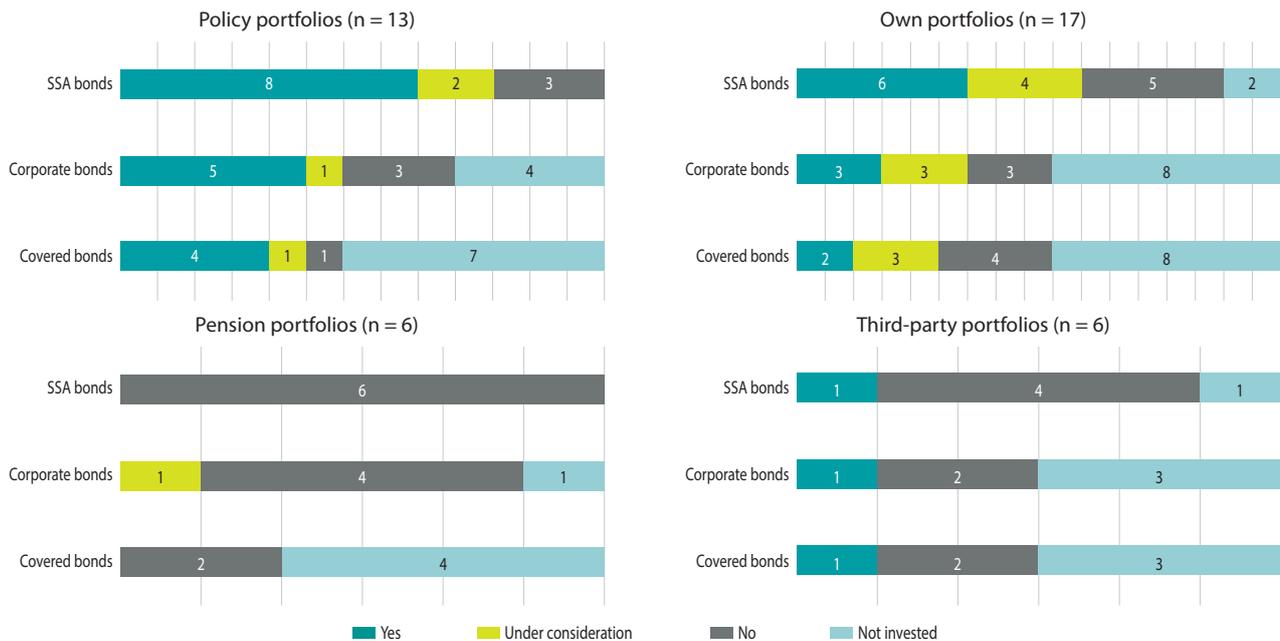
The survey results indicate that some central banks are considering impact investing (beyond green bonds) in their policy portfolios. Only one central bank has adopted this strategy within its own portfolios. In contrast, the survey shows that many central banks hold green SSA bonds, corporate bonds and covered bonds in their policy portfolios and own portfolios. Impact investing is not yet very common in pension portfolios and third-party portfolios.

C8 Impact investing in central banks' portfolios by asset class

a) Impact investing (beyond green bonds)



b) Green bonds investments



Source: NGFS SRI portfolio management survey 2019.

Note: The number of respondents depends on the portfolio (see individual headings).

4.5 Voting and engagement

This strategy involves exercising ownership rights and “voice” with the intention of changing a company’s behaviour on ESG issues. Voting and engagement is primarily focused on achieving extra-financial objectives, as investors aim to improve companies’ business conduct and thereby society at large (Robeco, 2018). At the same time, this strategy could be considered as part of a financial objective as long as the engagement mitigates specific ESG risks such as the violations of international standards and norms.

The strategy is commonly used by equity investors, as they can explicitly exercise ownership rights, and traditionally focus on governance issues. However, the strategy is also gaining traction amongst fixed income investors.

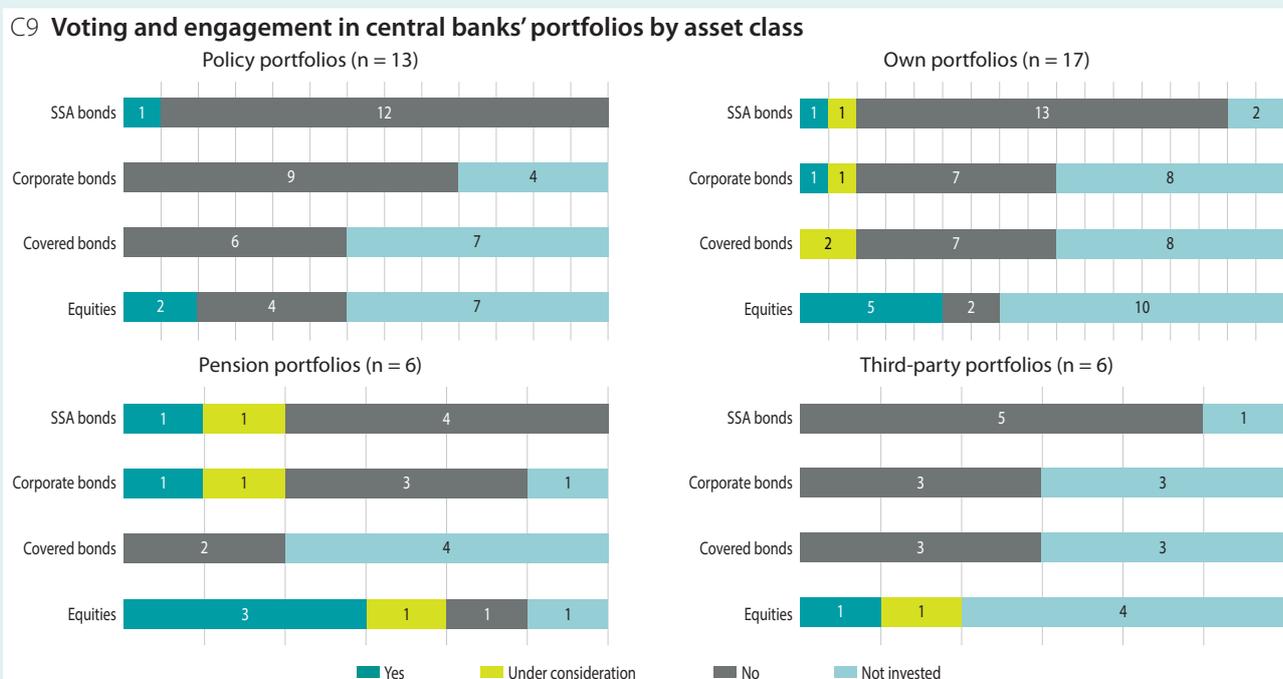
Debtholders, for instance, can challenge the use of proceeds at investor roadshows. Implementation of an engagement strategy generally requires: (i) pre-defined goals, (ii) the formulation of key performance indicators (KPIs) to monitor progress on these goals and (iii) clearly specified timelines. Moreover, rules should be put in place to determine how the outcome of the engagement process potentially impacts current positioning and future investment decisions (i.e. the need to divest, underweighting, etc.).

From a central bank perspective, a voting and engagement strategy may be feasible as long as it does not undermine the central bank’s independence or lead to a conflict of interest. This implies that engagement may generally need to be implemented anonymously (on behalf of the central bank) and at arm’s length. A case study from the central bank of Switzerland describes how a proxy voting policy can be

Box 9

Voting and engagement in central banks’ portfolios by asset class

Most survey respondents apply an engagement strategy within the equity holdings of their own portfolios or pension portfolios.



Source: NGFS SRI portfolio management survey 2019.

Note: The number of respondents depends on the portfolio (see individual headings).

T3 Potential SRI objectives and scope of SRI strategies

SRI Strategy	SRI Objective		Scope	
	Financial	Extra-financial	Climate	Broad ESG
Negative screening		✓	✓	✓
Best-in-class	✓	✓	✓	✓
ESG integration	✓			✓
Impact investing		✓	✓	✓
Voting & engagement	✓	✓	✓	✓

shaped without jeopardising central bank independence (Section 7.5). For pension portfolios, engagement could be considered less controversial as the activity is performed on behalf of the beneficiaries and does not necessarily reflect an “official central bank stance”.

Conclusion

Five strategies are identified that may help central banks to achieve their specific SRI objectives and scope (summarised in Table 3). The applicability of these strategies depends on the constitution of the portfolio under consideration. Negative screening and green bond investments are currently the most prominent strategies across central bank portfolios. Both are straightforward to implement as they do not necessarily require a significant adjustment of the asset allocation or the investment process. Some central banks take a step further and implement a best-in-class approach or integrate ESG criteria in their investment processes. These strategies are mostly applicable to equity holdings within the own portfolios. By their very nature, these strategies are highly dependent on ESG data. Only one central bank applies impact investment (beyond green bonds) within its own portfolio. Finally, several central banks follow a voting and engagement approach, mostly within their own portfolios or their pension portfolios. Considerations relating to central bank independence are relevant for the latter strategy.

5. Monitoring

Monitoring is an important step in any sustainable investment process, as it identifies the extent to which the SRI strategy contributes to the specified objectives. This chapter discusses how an SRI monitoring process can be designed, what metrics may be used, and highlights

central-bank-specific considerations for monitoring the financial and extra-financial SRI objectives.

5.1 Monitoring process

SRI monitoring can be included in the regular monitoring and governance processes of central banks. For internally managed assets, this could entail the inclusion of SRI information in portfolio management systems or on the agenda of investment committee meetings or risk committee meetings. If existing governance processes do not offer room to include SRI considerations, a dedicated SRI committee could be put in place. For externally managed assets, SRI monitoring can be integrated into regular manager monitoring processes and asset managers can be asked to provide regular sustainability reports (CFA, 2017). Depending on the chosen strategies, these SRI reports could for instance include a list of excluded companies, the ESG profile (scores) of the portfolio and engagement results.

5.2 Monitoring metrics

To monitor progress over time, the central bank’s objective(s) and scope would have to be translated into quantifiable metrics. Any chosen set of metrics should fulfil the conditions of availability, comparability and uniformity (OECD, 2019). Collecting, validating and updating a chosen set of metrics is a time-consuming process. As such, central banks can consider using third-party data providers to obtain specialised ESG data and metrics (Box 10).

5.2.1 Metrics for a financial SRI objective

Central banks that strive to improve their understanding and management of financially material ESG risks should consider the impact on the portfolios’ risk-return characteristics.

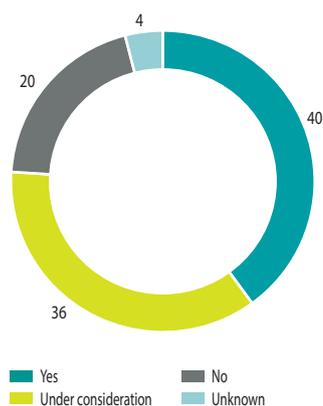
Box 10

Use of third-party (ESG) data providers by central banks

The survey indicates that most central banks use (40%), or are considering using (36%), a third-party ESG data provider.

C10 Use of third-party (ESG) data providers by central banks

(%)



Source: NGFS SRI portfolio management survey 2019.
Note: 25 respondents.

This can be monitored at different stages of the investment process, for example during model construction, the back-testing phase and portfolio management.

In each stage, multiple traditional indicators can be used to assess the risk-adjusted performance of portfolios that have been constructed on the basis of ESG criteria, such as:

- The tracking error, value at risk, the Sharpe ratio and expected shortfall, compared to the standard (non-ESG) benchmark;
- Concentration metrics, like number of constituents, effective number of stocks/bonds, weights distribution;¹²
- Cross-sectional volatility of returns for measuring the opportunity set and consequent loss stemming from reducing the investible universe for active managers as a result of applying the ESG filter.¹³

¹² The effective number of stocks is defined as the inverse of the Herfindahl-index, which is a standard measure of concentration.

¹³ The cross sectional volatility corresponds to the variation seen in daily stock returns across the universe: the greater is the cross sectional volatility, the greater the opportunities that exist for active managers to generate alpha.

5.2.2 Metrics for an extra-financial SRI objective

An extra-financial impact assessment starts with the formulation of material environmental and social issues that feed into key performance indicators (KPIs) and targets (Robeco, 2018). Metrics used to monitor progress against extra-financial targets, are often linked to broader impact categories such as industry-specific themes (e.g. energy, health, water etc.) or the SDGs (e.g. *climate action*, *gender equality*, etc.).

Over the past few years, multiple initiatives have emerged to help standardise the measurement and reporting on environmental and social impact data, including the Impact Management Project (IMP), the Impact Reporting and Investment Standards (IRIS), the Global Reporting Initiative (GRI), SASB standards and the ICMA principles. The Global Impact Investing Network (GIIN) notes that investors employ a diverse set of metric sets and frameworks (amongst proprietary methods) to measure, manage and report on extra-financial impacts. Still, nearly half of the investors in the GIIN (2019) survey uses metrics aligned to IRIS, a free catalogue of standardised metrics.

Metrics can be selected and adopted across a diverse set of themes, sectors and geographic locations, depending on the scope of the central bank:

- To assess the climate impact, metrics related to greenhouse gas emissions or fossil fuel energy dependency could be taken into account, either expressed in absolute terms or on a per-unit-of-sale basis. Central banks that want to monitor the climate impact of their portfolios could consider the list of metrics discussed in Annex 4.
- To assess the social impact, metrics related to affordable basic infrastructure (e.g. clean drinking water or sewers) and access to essential services (e.g. health and education) may be considered.
- To assess the environmental impact, a broad range of pollutants released to air, water and land could be taken into account. In this context, a distinction can be made between hazardous and non-hazardous pollutants.

Conclusion

Metrics to monitor the financial progress or the extra-financial progress can be included in the regular monitoring- and governance processes of a central bank. Depending on the SRI objective, central banks can monitor metrics that measure the impact of climate-specific risks or broader ESG risks on their portfolio, or the impact of their portfolio on the environment and society.

6. Reporting

Reporting is the final step in the sustainable investment process. Multiple frameworks have been developed for private investors over the last few years with the aim of improving the overall quality of reporting on SRI. These frameworks cover a broad range of disclosures concerning governance aspects, operational aspects and risk aspects. Some of these elements could also be considered by central banks. This chapter discusses the general case for central banks' SRI disclosures, and assesses what elements of the recommendations of the Task Force for Climate-related Financial Disclosures (TCFD) could be (partly) applicable to central banks.

6.1 The case for central banks' disclosures

In general, central banks' disclosures with regards to SRI can fulfill multiple functions. First, they help to enhance accountability, as stakeholders can challenge central banks on their SRI policies. Second, they stress the importance of SRI to other public and financial institutions, and demonstrate how central banks "practice what they preach". Third, by disclosing their practices, central banks may help to develop best practices in data collection and analysis, monitoring metrics and the development of scenarios for stress testing.¹⁴

Nevertheless, central banks will need to strike a balance between transparency and confidentiality, subject to the portfolio under consideration. SRI disclosures are likely to

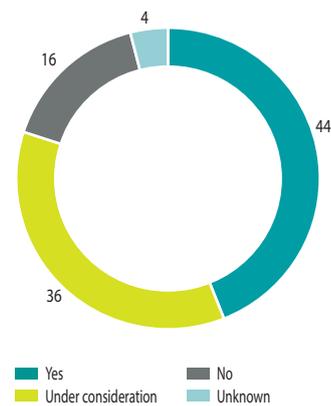
Box 11

SRI disclosures by central banks

The NGFS survey shows that 80% of central banks disclose (part of) their SRI approach or are considering doing so.

C11 SRI disclosures by central banks

(%)



Source: NGFS SRI portfolio management survey 2019.
Note: 25 respondents.

be least sensitive for central banks' own portfolios, as these assets are not held for monetary policy purposes. For pension portfolios and third-party portfolios, it is self-evident that reporting takes place vis-à-vis beneficiaries and clients. Publicly disclosing information on the third-party portfolios (with policy objectives or confidentiality issues), however, may be more sensitive. For the policy portfolios, public SRI disclosures could be considered as long as this does not interfere with the primary policy goal or lead to a breach of confidentiality.

6.2 TCFD reporting by central banks

In its first comprehensive report, the NGFS encourages "all companies issuing public debt or equity as well as financial sector institutions to disclose in line with the TCFD

¹⁴ Regarding macroeconomic modelling and stress testing exercises, see the NGFS technical supplement to the comprehensive report *Macroeconomic and financial stability implications of climate change* https://www.banque-france.fr/sites/default/files/media/2019/07/23/ngfs_report_technical_supplement_final.pdf

T4 TCFD reporting considerations, central banks can...

Governance	Strategy	Risk Management	Metrics and Targets
Set out the board's oversight of climate-related risks and opportunities. Example: the frequency that the board discusses this issue and its link to strategic objectives.	Describe the climate-related risks and opportunities identified over the short, medium, and long term across their investments. Example: reputational risks associated with investing in fossil fuels.	Set out their approach to identifying relevant climate-related risks, although there may be sensitives revealing internal risk processes. Example: use of flood risk data to identify high-risk assets.	Disclose the metrics used to assess climate-related risks and opportunities. Example: the ratio of green bonds in the portfolio and the 2 degrees alignment.
Describe management's role in assessing and managing climate-related risks and opportunities. Example: the senior manager assigned responsibility for these risks.	Describe the impact of climate-related risks and opportunities on business, strategy, and financial planning. Example: the impact of transition risks on asset values in the central banks' own portfolios. Describe the resilience of their investments under different scenarios. Example: considering an early and orderly transition to 2 degrees, a late and disorderly transition scenario, and a no transition scenario where climate targets are not met.	Set out their process for managing climate-related risks. Example: revealing details about the inclusion of climate-related considerations in scenario analysis or stress-testing. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into risk management. Example: how climate risks are incorporated into business as usual risk reports.	Disclose Scope 1, Scope 2 and Scope 3 emissions. Scope 3 emissions may be difficult to calculate for some assets such as government bonds. Set out the targets used to manage climate-related risks and performance against targets. Example: the carbon intensity or ESG score of the portfolio.

recommendations": Multiple areas of the TCFD framework may also be useful for central bank disclosures. In fact, some central banks have already voluntarily adopted (at least part of) the TCFD framework for their non-policy portfolios disclosures (Banque de France, 2019), or have committed to doing so (Bank of England, 2019).

The TCFD recommends disclosing clear, comparable and consistent information about the risks and opportunities presented by climate change (TCFD, 2017). The aim is to ensure that the effects of climate change become routinely considered in business and investment decisions. Climate disclosures should cover four main areas: (i) governance, (ii) strategy, (iii) risk management and (iv) metrics and targets. Table 4 shows how central banks can follow up on the recommended disclosures.¹⁵

While TCFD mainly focuses on climate risks, central banks may wish to disclose on a broader range of ESG issues. There are a

number of SRI reporting frameworks that can be considered, including the reporting requirements set by the Principles for Responsible Investment (PRI) and the Sustainability Reporting Standards developed by the Global Reporting Initiative (GRI).¹⁶ As none of the discussed frameworks have been developed specifically for central banks, not all elements are equally applicable. The set-up of these frameworks could still provide helpful guidance and may be used as a starting point for a tailor-made reporting framework.

Conclusion

Elements of existing SRI reporting frameworks can be adopted by central banks. As a balance needs to be found between transparency and confidentiality, not all reporting requirements are equally applicable to all central bank portfolios. The TCFD framework provides helpful guidance and could be used as a starting point for a tailor made reporting framework.

¹⁵ Though the focus of TCFD goes beyond investment practices, this guide only considers the extent to which central banks can use the recommendations to make disclosure regarding their investments.

¹⁶ Information on local initiatives can be found in an overview of the Climate Disclosure Standards Board on climate change disclosure in G20 countries (Guthrie & Blower, 2017). In addition, the European Commission has recently released new (non-binding) guidelines on climate reporting (European Commission, 2019a).

7. Implementation case studies

Multiple NGFS members have taken first steps to implement SRI considerations in some of their portfolios. Examples of practical experience gained by these central banks show that there are multiple ways to implement SRI in the investment process. An SRI policy sets out the motivation, scope and objectives. This policy document can also specify decisions related to the time horizon, investment universe, risk tolerance, constraints, and taxation (Lumboldt, 2018). Once these decisions have been made, the practical implementation details can be worked out. This chapter discusses several case studies of central banks to shed light on considerations related to the implementation of SRI. Each case study starts with a brief overview of the SRI policy in place, and then discusses specific implementation considerations.

7.1 Responsible investment at Norges Bank

Policy

Norges Bank, the central bank of Norway, is an institution with two areas of responsibility. First, based on the mandate given by Norway's central bank act, the Bank conducts central banking operations. Second, based on a separate investment mandate, Norges Bank Investment Management manages Norway's sovereign wealth fund – the Government Pension Fund Global (GPGF).

In its role as the GPGF's owner, the Norwegian Ministry of Finance specifies the investment universe, benchmark index, risk limits and requirements.¹⁷ Within these limits, the Bank works on climate risk across the GPGF's three asset classes – listed equities, listed bonds, and unlisted real estate – within a general framework of objectives.

Within the GPGF – with a total market value of NOK 9,162 billion at end-June 2019 – the Bank invests in 9,000 companies, with holdings in more than 70 countries,

to spread risk and capture global growth, benefiting from free and open markets that enable global value creation and efficient allocation of resources. The foreign exchange reserves – amounting to NOK 542 billion at end-June 2019 – are divided into a fixed-income portfolio and an equity portfolio. The strategic equity allocation of the combined portfolio is 20% and is invested in 1,500 companies worldwide. The benchmark index and the investment universe for this equity portfolio are narrower than for the GPGF, with a focus on the larger markets and currencies. Nevertheless, the equity portion of the reserves is managed according to guidelines similar to those governing the GPGF.

The objective for both portfolios is to achieve the highest possible return with acceptable risk. SRI supports this in two ways. First, it seeks to improve the long-term economic performance of the investments. Second, it seeks to reduce the financial risks associated with ESG practices of companies in the portfolio. As such, the focus is on material ESG issues that impact the fund's long-term performance. These issues are captured in three SRI pillars: (i) *establishing principles*, (ii) *long-term active ownership* and (iii) *investing sustainably*.

Implementation

1. Establishing principles

A set of international principles and standards from the UN and the OECD provides a framework for the Bank's work with companies and other stakeholders. Priorities are based on the mandate and are characterised by formulating expectations of companies, guidelines for voting, and positions on governance issues. These documents communicate the Bank's priorities and ensure predictability.

2. Active ownership

Voting at annual general meetings is the most important tool for active ownership. Through its voting, the Bank seeks to strengthen governance, improve financial performance and promote SRI practices. The voting guidelines provide a principled basis for voting decisions, but also take account of company-specific factors. In the Bank's dialogue with companies, governance and sustainability topics relevant to long-term return are raised. The largest investments

¹⁷ Based on this delegation to Norges Bank, the Executive Board gives an investment mandate to NBIM's CEO. The CEO is responsible for the actual investments, and is accountable to the Executive Board.

are prioritised, which results in regular dialogue with nearly 1,000 companies, representing around two-thirds of the total value of the equity portfolio. The Bank has a particular interest in the risks and opportunities associated with climate change and expects companies to integrate material climate risks into their strategies, risk management and reporting.

3. Investing sustainably

The Bank has been given dedicated environment-related mandates from the Ministry of Finance (clean energy, alternative fuels, and natural resource management). The aim is to identify long-term investment opportunities and reduce the fund's exposure to unacceptable risks. Companies are encouraged to evaluate their business activities and obtain a better understanding of financial risks and opportunities. To perform analyses of this kind, governance and sustainability data are needed. Thus, the Bank supports recommendations from the Task Force on Climate-related Financial Disclosures (TCFD).

Norges Bank's exclusion decisions are based on recommendations from the Council on Ethics (an independent Council appointed by the Ministry of Finance). The Bank can opt for active ownership as an alternative to observation or exclusion. The Bank itself may also decide to divest from companies that impose substantial costs on other companies and on society as a whole. In 2018, the Bank divested from 30 companies following assessments of governance and sustainability risks, and divested from 15 companies in response to climate risks.

7.2 ESG integration at the Banca d'Italia

Policy

The Banca d'Italia, the central bank of Italy, has included ESG criteria in its investment policy and started integrating ESG criteria in two equity portfolios of its own funds, consisting of Italian and other euro area companies. Together, the portfolios consist of 140 securities with a total market value of around EUR 8 billion, which represents 6% of its financial investments in euro.¹⁸

The following pillars have largely helped shape the ESG investment process:

- **Market neutrality:** As a long term investor, the Banca d'Italia does not aim to generate extra returns via active management, believing that a passive management strategy provides an efficient long-run risk-return profile.
- **Prevention of conflicts of interest and conflicts with institutional functions:** In order to avoid potential conflicts of interest, the Banca d'Italia excludes securities issued by companies from the banking, financial services, and insurance sectors.
- **Mitigation of market impact:** the Banca d'Italia's daily trading aims to avoid hampering smooth market functioning and price setting – in particular in the euro area financial markets – to prevent interference with monetary policy implementation.

With its ESG policy, the Banca d'Italia aims to promote corporate social responsibility and improve its financial and reputational risk management in the pursuit of positive outcomes related to social and environmental impact. As such, its ESG investment policy is built on two principles:

1. Exclude companies that operate in non-compliant sectors under the UN Global Compact;
2. Favor companies with the highest ESG scores according to the assessment of a carefully selected data provider.

The Banca d'Italia is actively committed to further developing its initiatives towards sustainable investment and to raising public awareness. As a result, the Banca d'Italia discloses its SRI policy by periodically publishing reports on the progress of its sustainable investments.

Implementation

The implementation of ESG criteria follows different approaches for the two equity portfolios:

- The Italian portfolio invests in all companies (full replication) of the customised benchmark. Securities are over-weighted or underweighted on the basis of their ESG score (i.e. ESG tilt or "score and weight" approach).
- The euro area portfolio applies a technique of sample replication (to reduce transaction and operational costs) of the customised benchmark, based on a factor model with

¹⁸ <https://www.bancaditalia.it/media/approfondimenti/2019/informativa-esg/index.html?com.dotmarketing.htmlpage.language=1>

the objective of minimising the tracking error. Two ESG adjustments have been introduced: a) the sampling universe excludes the securities of the benchmark with ESG scores below a percentile threshold; b) the optimisation function of the factor model has been ESG-integrated with a constraint aimed at improving the overall ESG score of the portfolio (i.e. “ESG and beta optimisation” approach).

The replication framework of the two portfolios is designed to mimic the selected indices (customised to exclude companies of the banking, financial services and insurance sectors), respecting the constraints of (i) sector exposure (accepting controlled differences by economic sector) and (ii) the concentration limit, in terms of both active portfolio weight (versus the benchmark) and shareholding of company capital.

These approaches lead to a modest increase in the tracking error of the portfolios, while the back testing exercise indicates a better relative return compared to the previous portfolios. The ESG policy is also estimated to improve the environmental footprint of the Banca d’Italia’s equity portfolios, compared to that of previous portfolios, in terms of total greenhouse gas emissions (about –23%), energy consumption (about –30%) and water consumption (about –17%).

7.3 Impact investing at the Banque de France

Policy

In March 2018, the Banque de France, the central bank of France, published its Responsible Investment Charter which applies to the assets for which the Banque de France is fully responsible. This includes the portfolios backed to own funds and to the pension liabilities, with an approximate market value of EUR 19 billion. The Banque de France considers responsible investment to be in line with its corporate social responsibility, and its fiduciary duty as a long-term investor. Furthermore, the Banque de France aims to contribute to the global response to climate change by complying with the Paris Climate Agreement. Lastly, the Banque de France has committed to publishing an annual *Responsible Investment Report* incorporating best practices.

The Banque de France follows a responsible investment strategy organised around three pillars, as outlined in its

first *Responsible Investment Report* (Banque de France, 2019):

1. Align investments with France’s climate commitments:
 - Objective 1: Get aligned with a 2°C trajectory
 - Objective 2: Contribute to financing the energy and ecological transition
2. Include ESG criteria in asset management:
 - Objective 3: Implement a filter in equity portfolios to exclude at least 20% of issuers with the lowest ESG scores
3. Exercise its right to vote and influence issuers:
 - Objective 4: Adopt a voting policy which includes provisions on non-financial transparency
 - Objective 5: Increase the general meeting attendance rate

As part of the first pillar of its strategy, the Banque de France took an impact investing approach and set the objective of contributing to financing the energy and ecological transition. As such, the Banque de France has pledged to increase its investments in green bonds and funds dedicated to the energy and ecological transition.

Implementation

The Banque de France decided that the investment in dedicated funds should be made primarily in unlisted funds, as they offer a more direct way to finance the transition. This choice implied a significant change in the Banque de France’s strategic asset allocation, which previously included only listed asset classes.

In order to identify candidate funds, besides regular financial criteria, the Banque de France took into account extra-financial criteria, such as the impact of the projects financed by the fund vis-à-vis the energy and ecological transition, the consideration of ESG risks in investments, and the quality and nature of published impact indicators. Furthermore, as it was the first time that an investment was considered with such a goal in mind, the Banque de France relied on the French public label *Greenfin* the purpose of which is to help direct investments toward assets enabling the energy and ecological transition.

So far, this process has led the Banque de France to the selection of green infrastructures funds, to which the Banque de France subscribed for a total of EUR 100 million. These funds focus on financing electricity generation infrastructures from renewable energy – solar, wind or biomass – and infrastructures dedicated to sustainable mobility, activities classified as contributing to climate change mitigation in

the taxonomy published by the European Commission's Technical Expert Group on sustainable finance. The projects financed by this type of funds are concrete and their impacts on the transition are easily measurable, thus representing an ideal asset class for an investor wishing to finance the energy and ecological transition. The process launched by the Banque de France is an ongoing and iterative process, and new funds will be selected in the future.

7.4 Green bond investments at the Magyar Nemzeti Bank

Policy

The Magyar Nemzeti Bank (MNB), the central bank of Hungary, manages foreign exchange reserves in six currencies (EUR, USD, JPY, GBP, AUD, CNY) in a variety of portfolios. The (risk-free) euro portfolio represents the backbone of its foreign exchange reserves and is restricted to highly-rated government securities, state-guaranteed securities, and supranational debt instruments. In the (euro) investment portfolio, the MNB also holds highly rated corporate bonds and bank bonds, in addition to covered bonds. From the end of 2012 – in the form of a mandate given to an external asset manager and custodian – US agency mortgage-backed securities (MBS) also form part of the MNB's investment strategy.

In accordance with global trends, the MNB launched its Green Program in early 2019. As part of this programme, the Monetary Council decided to set up a dedicated green bond portfolio. The main motivations behind the creation of the green bond portfolio are to encourage the development of this market segment, to be consistent with any potential future recommendations issued by the NGFS and to signal the MNB's commitment to international cooperation.

The ultimate goal of green finance and green bonds is to significantly improve the capital allocation process, which could lead to both financially and environmentally sustainable growth. Although green bonds aim to generate positive environmental impact through mitigation and adaptation, it remains a market-driven approach based on traditional risk-return considerations.

The MNB takes a holistic approach in its green bond strategy, which looks not only at the green bond itself (the

label and the second-party and third-party opinions), but also assesses the issuer from a sustainability perspective (ESG-like screening as a first-order filter). With regard to the required standards, only some simple rules in determining "the greenness" of the given bond are applied. Alignment with GBP, a positive second-party opinion, and the Bloomberg label are the starting point. In addition, managing a green bond portfolio requires continuous analysis and monitoring due to the changing green bond standards and taxonomies, ESG approaches, and ongoing development of green technologies.

Implementation

As the green bond market is not yet mature and is continuously evolving, the planned initial allocation towards green bonds is relatively small. Nevertheless, a dedicated green bond investor could expect somewhat preferential treatment and potentially better allocation in primary issuance. This aspect is considered very important due to the general scarcity of green bonds and the changing landscape of the investment universe.

The management style of the portfolio is envisioned to be semi-passive and aims to minimise the tracking error against the selected benchmark. The benchmark itself is a broader green bond index filtered to reflect the MNB's risk guidelines. The target duration of the green bond portfolio is somewhat longer than the average duration of the foreign exchange reserve as a whole (supported by the long-term perspective of sustainable finance). Overall, the risk-return characteristics of the green bond portfolio are not materially different from similar types of investments in the foreign exchange reserves. Therefore, given its structure and size, it does not have a significant effect on financial performance.

The semi-passive, quasi-buy-and-hold approach reflects the intention of avoiding active trading of green securities on an opportunistic basis. However, flexibility is retained through analysing and choosing which green securities are bought and also through having the option to selling securities before they mature. The main reasons for selling would be a "green default", where a bond that was green at the time of purchase is no longer green, or, similarly, if the issuer abandons or waters down its sustainability policies, which could be considered "green washing". Another more technical reason to sell could be a rating downgrade below the threshold.

7.5 Exercising voting rights at the Swiss National Bank

Policy

The SNB's balance sheet has grown in the years following the financial crisis, and today amounts to over CHF 800 billion. The asset side consists mainly of foreign currency assets, gold, and, to a lesser extent, financial assets in CHF. The present level of its currency reserves is largely dictated by the implementation of monetary policy. Their composition is determined by the established monetary order and the requirements of monetary policy. The currency reserves must ensure that the SNB has room for manoeuvre in its monetary policy at all times. They serve to build confidence, and to prevent and overcome potential crises.

Management of the currency reserves is governed by the primacy of monetary policy. In applying its investment policy, the SNB has two main objectives. First, it aims to ensure that the balance sheet can be used for monetary policy purposes at any time. In particular, the SNB must be able to expand or shrink the balance sheet if necessary. Second, the Bank aims to preserve the value of the currency reserves in the long term. As such, the investment policy is guided by the principles of liquidity, safety, and return. A substantial portion of the currency reserves is invested in highly liquid foreign government bonds. Safety is accounted for by broad diversification of currencies. Additionally, in order to improve the long-term risk-return profile, other asset classes such as corporate bonds and equities supplement government bond holdings in the major currencies.

The share of equities in the foreign exchange reserves has increased since the first allocation in 2005. At the end of 2018, roughly 20% of the reserves, or CHF 150 billion, was invested in global equities. The equity portfolios consist of mid-cap and large-cap companies in advanced economies and emerging markets as well as small-cap companies in advanced economies. The SNB passively

manages the equity portfolios on the basis of a strategic benchmark consisting of equity indices in various markets and currencies. This results in a globally well-diversified equity portfolio of around 6,700 individual shares. To prevent any negative repercussions on monetary policy arising from investment decisions, the SNB follows a market-neutral approach. No strategic or structural objectives are pursued with respect to companies or sectors. The principle of index replication ensures that the SNB operates as neutrally as possible in the individual stock markets.

In 2015, the SNB decided to start exercising its voting rights at annual and extraordinary general meetings. The decision was influenced, amongst others, by global developments regarding shareholder responsibility and transparency.¹⁹ In exercising its voting rights, the SNB focuses on agenda items relating to aspects of good corporate governance at companies. This element helps companies – and hence the SNB's investments – to perform favourably in the long term. However, as a central bank, the SNB refrains from actively engaging with companies to influence business developments or from submitting shareholder proposals.

Implementation

The SNB decided to draw up its own proxy voting guidelines, which define the general stance on agenda items at general meetings. Corporate governance-focused guidelines typically cover the following themes: financial reporting, distribution of profits, composition of the board of directors, change of capital structure, compensation, appointment of auditors, and auditor fees. Different proxy voting guidelines may be necessary for different jurisdictions, as local best practice standards can vary. To date, the SNB has defined voting guidelines and cast votes for mid-cap and large-cap companies in Europe.

Voting requires a structured process and a rigorous analysis of management and shareholder proposals. For the SNB, there is a clear advantage in cooperating

¹⁹ In recent years, expectations regarding shareholder responsibility and transparency have gained importance. These developments are reflected, for example, in the G20/OECD Principles of Corporate Governance. Institutional investors have been encouraged to exercise their shareholder rights and increase transparency with respect to their voting behaviour. In Switzerland, a federal popular initiative was approved in 2013 that required Swiss pension funds, in the context of their fiduciary duty, to exercise their voting rights for Swiss-domiciled companies and to inform their members about the votes cast.

with an external proxy voting agent, as this limits the administrative burden and implements a lean process. Proxy voting agents analyse the agenda items for a company's general meeting, issue voting recommendations based on their own or – as in the case of the SNB – the client's voting guidelines, and ultimately cast the votes. Proxy voting agents are, however, sometimes accused of wearing two hats and being prone to conflicts of interest if they sell consulting services to companies at the same time as analysing them and casting votes at general meetings. By applying its own proxy voting guidelines, the SNB mitigates these conflicts of interest and ensures that the votes are cast in line with the SNB's own objectives.

Once the voting approach has been defined, an operational structure has to be put in place. The SNB collaborates closely with its custodian and the proxy voting agent, as the definition of a clear proxy voting process is crucial. Cooperation between the proxy voting agent and the custodian is essential for gaining an insight into the regulations and formal requirements that have to be fulfilled when casting votes as these may vary from one jurisdiction to the next. Examples of this include the obligation to register the beneficial owner of the shares or the requirement to be physically present at general meetings. Knowledge of the exact requirements is important not only for successful voting, but also for the management of the portfolio.

The SNB's custodian operates a proxy voting platform that stores all of the information on upcoming general meetings, agenda items, deadlines and its clients' equity holdings. The proxy voting agent uses this platform to identify the relevant upcoming general meetings, screen the agenda items, complete the ballots based on the predefined voting guidelines, and cast the votes. The custodian sends the voting instructions out to its local custodian network. The correct interpretation of the proxy voting guidelines is monitored ex post by analysing voting behaviour based on the statistics provided by the proxy voting agent. This allows the SNB to identify any misunderstandings and resolve them with the agent.

7.6 External manager selection at De Nederlandsche Bank

Policy

In March 2019, De Nederlandsche Bank (DNB), the Dutch central bank, signed the Principles of Responsible Investment (PRI) for its own portfolios and foreign exchange reserves. These portfolios, amounting to over EUR 19 billion (year-end 2018), consist primarily of very high-grade bonds issued by governments, supnationals, and agencies. In addition, part of the portfolio is invested in external funds containing equities, investment-grade corporate credits, and high-yield corporate credits.

By signing the PRI, DNB has publicly committed itself to investing its portfolios in a responsible manner. This commitment is part of DNB's Corporate Social Responsibility strategy that focuses on sustainable economic growth with no harmful effects on the environment as well as an inclusive financial and economic system. Furthermore, the commitment is in line with DNB's statements as a supervisor, stressing the importance of the management of sustainability risks by financial institutions.

DNB published a Responsible Investment (RI) Charter, which outlines the principles for its RI policy (DNB, 2019). With its policy, DNB strives to generate an adequate return while minimising the environmental, social and governance (ESG) risks, alongside the financial risks, of its assets in the long term. The Charter consists of five pillars:

- DNB will screen the investment universe and its potential counterparties with regard to ESG criteria;
- DNB will integrate ESG criteria in its investment processes;
- DNB will promote green finance and responsible investing;
- DNB will report on its responsible investment approach;
- DNB will further develop its responsible investment approach.

In its policy, DNB translated the first two pillars into four key SRI strategies for its reserves: exclusion of controversial weapons, screening on the basis of

the UN Global Compact Principles, ESG integration in investment decisions, and voting and engagement.²⁰

Implementation

For the implementation of the RI Charter and policy, DNB created an action list for 2019 and 2020. One of the first actions on the list was to replace the investment-grade corporate bonds that did not adhere to the RI policy. Together with an investment consultant, DNB selected two investment managers that integrate all of the aforementioned SRI strategies.

To this end, DNB followed six process steps:

1. *Defining objectives*: The investment objectives are primarily a result of the strategic asset allocation process and relate to the investment philosophy, fund characteristics, performance, and risk management. For RI, these objectives directly relate to the strategies outlined in the previous paragraph.
2. *Creating a work list*: The investment consultant identified 85 potential asset managers, of which 23 managers seemed to fulfil the criteria as defined under the objectives.
3. *Request for information (Rfi)*: All 23 managers received an Rfi, in which high-level information regarding the (responsible) investment objectives of the strategies was surveyed, as well as information regarding corporate social responsibility practices (incl. signing of PRIs and PRI scores assigned to the strategies under management). Based on the responses, DNB marked eight managers as “Request for proposal-eligible”.
4. *Request for proposal (RfP)*: The objectives as defined under (1) were integrated into a scorecard used to assess all RfPs. Based on this exercise, three potential external managers were found to be most suitable.
5. *Due diligence*: DNB performed a full-day due diligence check at each of the potential asset managers. The due diligence check consisted of two tracks, focusing on (i) the investment process (incl. RI practices) and (ii) risk management. On these days, DNB spoke with senior management, portfolio managers, analysts, RI teams, and (operational) risk and compliance teams.

6. *Investment decision*: Based on the RfP and due diligence visits, DNB selected two asset managers. These asset managers were then presented to DNB’s investment committee for consultation.

In February 2019, DNB completed the onboarding of its new investment grade credit managers. As a next step, DNB is enhancing the SRI monitoring process for all its external managers.

7.7 SRI at the Banco de México

Policy

Although the Banco de México, the central bank of México, does not have an explicit SRI policy, it strongly believes that SRI objectives are aligned with the central bank’s values. These are to promote social interests, transparency, caring of the environment, and ethical commitment. As such, the central bank has incorporated SRI considerations within the fixed-income holdings in its own portfolios, including debt issued by supranational organisations, government-sponsored entities, and corporations. The Banco de México believes that implementing SRI does not mean sacrificing financial returns, as responsible and ethical firms are less likely to experience unforeseen losses and are more likely to outperform non-SRI securities in the long run. As such, SRI criteria can assist in identifying risks in a different dimension while offering long-term value.

As part of its SRI strategy, the Banco de México considers environmental elements, as well as elements related to social development and corporate governance (ESG criteria), as part its investment decisions. The Banco de México also conducts negative screening on its investments to exclude securities that are not consistent with its core beliefs of promoting development, prosperity, and ethical behaviour. Furthermore, the Banco de México will promote high responsible investment standards with its counterparties.

20 A negative screen on controversial weapons is applied to ensure compliance with the following international weapon conventions and treaties: Oslo convention on cluster munitions (2008) and the Dutch Market Abuse Regulation (*Besluit Marktmissbruik*), Ottawa Treaty on anti-personnel mines (1997), Chemical Weapons Convention (1997), Biological Weapons Convention (1975), and the Treaty on Non-Proliferation of Nuclear Weapons (1968).

Implementation

The Banco de México began its path to sustainable and responsible investments by buying bonds issued by supranational organisations that have projects related to economic growth and development. In 2016, the central bank expanded its scope in responsible investments by participating for the first time in the green bond market, and by incorporating such instruments into its universe of eligible assets for the investment of its international reserve portfolio.

The Banco de México identifies some challenges with regard to SRI and ESG criteria, including low secondary market liquidity of green, sustainable, social, or impact bonds; limited ESG government debt issuance; heterogeneity of ESG criteria; lack of ESG ratings for a wide spectrum of securities; different reporting standards and performance measures, amongst others. As such, the Banco de México has not yet established an explicit ESG threshold for its investment portfolio, as it could significantly limit the universe of eligible assets, leading to an unintended concentration of its investments.

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Annex 1 Risk-return characteristics of SRI

The ex-ante impact of including ESG criteria in the investment process is not evident, especially where it results in a large restriction of the investment universe. Schroders (2017), however, assesses a broad range of exclusions and argues that the magnitude of the effect depends on the excluded benchmark share, the volatility of the excluded securities and the applied investment strategy. This implies that an ESG-investor could compensate for the loss of diversification by investing in financial instruments with attributes similar to the excluded part of the investment universe.

Classical finance theory assumes that risk and return go hand in hand. The efficient frontier represents investment portfolios for which the trade-off between expected return and risk (measured as the standard deviation of returns) is optimized (Markowitz, 1952). Fama (1976) argues that company specific risks can be diversified away. The returns of the diversified portfolios are hence driven by systemic (market) risks. According to these theories, the application of non-financial criteria (e.g. ESG criteria) lowers diversification benefits and thereby negatively impacts the risk-return profile of the portfolio.

Other theories argue that the benefits of including ESG criteria largely compensate for the loss of diversification. From a stakeholder perspective, for instance, a more sustainable business conduct enhances productivity and company profits (Freeman, Wicks and Parmar, 2004). Friede et al. (2015) assess more than 2,000 papers and find evidence for a positive correlation between ESG criteria and financial performance. Still, the empirical evidence for a positive relation remains somewhat ambiguous, partly due to the large heterogeneity of underlying SRI strategies. To further shed light on the impact of different SRI strategies, recent literature on exclusionary and best-in-class screening is discussed in more detail below.

Excluding large parts (full sectors) of the investment universe could negatively impact risk-adjusted returns. Cornell (2015) finds that large fossil-fuel exclusions negatively affect risk-adjusted returns of the portfolio – at least in the short term. Trinks and Scholtens (2015) argue that divesting from controversial stocks reduces financial performance. Their analysis of 1,600 stocks and 14 sectors shows that investing in controversial stocks adds to the portfolio's risk-adjusted returns and their exclusion reduces that return. Blitz and Fabozzi (2017) describe abnormal returns in “sin” stocks as a “reputation risk premium”. As long as sin stocks have positive exposures to Fama-French factors and their raw return is greater than that of the market, excluding these stocks will negatively impact expected portfolio returns. Still, investors can compensate for the loss that results from excluding sin stocks (e.g. tobacco) by investing more in non-sin stocks which are characterized by exposures to the same style factors that drive sin stock returns (Blitz and Fabozzi, 2017).

Best-in-class screening impacts risk-adjusted returns less as sectoral diversification is maintained. Hoepner (2016) breaks portfolio diversification up into: (i) number of selected stocks, (ii) correlation between selected stocks, and (iii) average specific risk of selected stocks. While best-in-class screening decreases the number of stocks (first component) and increases correlation (second component), stocks with higher ESG scores exhibit lower specific risk (third component) and could positively impact risk-adjusted returns. Verheyden et al. (2016) decompose risk into specific and systematic risks, and calculate a measure of “net selectivity” – the difference between alpha and the required return. They find that best-in-class screening has a net positive impact on portfolio diversification, as the amount of specific risk was justified by a large enough increase in alpha. Giese et al. (2016) treat the ESG score as a factor and assess the relationship with traditional risk factors. They find that ESG scores exhibit statistically significant positive correlations with quality and low volatility factors, and no or negative correlation with factors such as value, momentum and size.

Thus, in the process of designing an ESG portfolio, an investor may assess the impact on the risk factor exposure and compensate for this to keep the same level of exposure, and the same expected risk-adjusted returns.

Annex 2 ESG data considerations

ESG data is key for the implementation (and monitoring) of SRI strategies. Generally three types of ESG data exist, covering issuers' (i) involvement in controversial products and/or conduct (relevant for negative screening), (ii) ESG risks exposures (relevant for best-in-class or ESG integration), and (iii) impact on society (primarily relevant for impact investing).

ESG scores reflect issuers' exposure to ESG risks and their capacity to manage and mitigate these risks. While there are no widely accepted standards for these scores, data providers typically assess E, S and G pillars separately and divide these into material topics and specific issues for analysis. The materiality analysis based on in-house or existing frameworks (e.g. the SASB materiality map, or UN PRI and the CFA Institute) assesses the effect of each issue on companies' financial values (earnings, operating costs and margins, profits, etc.).

Scoring and weighting methodologies differ between data providers. These processes often takes quantitative and qualitative indicators into account, such as the exposure of companies or countries to ESG issues, the performance in managing the ESG risks, the adoption of risk mitigation systems, the degree of disclosure etc. Sources range from issuers' public disclosure (annual reports, sustainability reports, etc.), private disclosure (survey or direct interaction between ESG providers and companies) and external data (official statistics, public or private databases, NGOs, reports, news, etc.). The final ESG scores are weighted to reflect the materiality.

Central banks that start tender procedures for the selection of a third-party data provider may look into the following points (based on (CFA, 2017)):

- Coverage of asset classes and regions, which is especially relevant for central banks with large SSA allocations (an asset class for which coverage can be lacking);
- Methodology and data collection processes (compatible with the central bank's own understanding of ESG, the objectives and scope?);
- Quality and type of ESG data and research provided (e.g. scores/rating, availability of underlying metrics, and biases in ESG data);¹
- Accessibility of data and research (e.g. via database, platform, etc.);
- Comparability with other data providers, which may be limited due to a lack of uniformity in methodologies;
- Research capacity and update frequency of the provided data;
- Costs (fixed- or volume-based pricing structure, price level).

¹ Several ESG data biases have been identified (Doyle, 2018): large companies tend to have higher ESG ratings compared to mid-sized and small companies, as they generally have more financial means to implement best practices (company size bias). Reporting requirements vary across jurisdictions leading to higher ESG scores for companies domiciled in areas with more disclosure requirements (geographical reporting bias). Company specific risks and differences in business models are not captured in industry ratings (industry sector bias).

Annex 3 ESG and credit ratings

Assessing a bond issuing entity based on its ESG performance is different from assessing the impact of ESG criteria on credit risk. The academic debate on the relationship between ESG and credit risk is somewhat fragmented. The World Bank for instance notes that studies that try to establish an empirical link between ESG and financial indicators of fixed-income instruments employ multiple approaches, methodologies, time frames, and datasets, which makes comparison difficult (Inderst and Stewart, 2019).

A review of methodologies and recent rating actions by the three largest global credit rating agencies suggests that they consider ESG criteria to be largely part of their assessments. The degree of disclosure on how ESG criteria impact credit ratings varies, which hampers thorough assessment. Still, over the last couple of years credit rating agencies have taken steps to improve consistency and enhance transparency around whether ESG factors were a key driver of the credit rating actions. Fitch, for instance, launched an integrated scoring system to show how ESG factors impact individual credit rating decisions (Fitch, 2019).

The extent to which ESG criteria feed into the rating decision can vary over time and depends on the materiality of these criteria from a credit perspective. Kiesel and Lücke (2019) examine rating reports published by credit rating agencies over the period 2004 to 2015 and find a small but present consideration of ESG in rating decisions. Notably, corporate governance issues account for the major part of considered aspects in ESG. Moody's found that ESG risks have become more significant for insurers in recent years due to evolving regulations and policy measures, climate change and shifting demographics (Moody's, 2019).

In practice, ESG criteria are often analysed by the rating agencies as part of business/industry risk considerations or as part of management/institutional considerations. ESG criteria identified as having a direct impact on an entity's business or financial profile often feed into the rating assessment. For example, S&P recently reported that over the period from 2015 to 2017, 225 corporate credit rating actions were influenced by ESG criteria. In addition, ESG issues were referenced as analytical considerations in 1,325 rating reports (S&P Global Ratings, 2019).

The lack of consistent disclosure on ESG criteria is partly due to the complexity in disentangling ESG criteria from fundamental risk considerations. When ESG risks evolve into key business or financial risks, the latter can contribute to the rating action. As such, integrating ESG criteria into credit ratings is not straightforward. Practical constraints include:

- Credit ratings are a measure of relative likelihood of default: ratings are forward-looking opinions regarding the creditworthiness of a specific issuer with a focus on debt repayment ability and the criteria that may affect it. A carbon-intensive entity that scores poorly on ESG criteria can still have a strong credit rating owing to its financial profile or that of its guarantor.
- Not all ESG criteria are material from a credit perspective: for example, while workforce diversity is a desirable governance consideration, the lack thereof may not necessarily affect the credit strength of a bond issuing entity.
- Estimation challenges owing to different time horizons: estimating the financial impact of ESG criteria on credit worthiness is complicated. The timing and magnitude of the impact on a given entity is rather uncertain, and difficult to estimate accurately to ascertain the impact on probability of default.
- Availability and quality of standardised ESG data: the shortage of standardised ESG metrics constrains peer analysis. The wide range of ESG criteria means that even when relevant, it can be difficult to measure their relative impact on the performance of an investment.

Annex 4 Examples of climate-related metrics

T1 Monitoring metrics for corporates

Corporate bonds and equity		
Metric	Description	Details
Greenhouse gas emissions (Scope 1/2/3)	GHG emissions is calculated as metric tons of greenhouse gases emitted from (in)direct operations.	Scope 1 GHG include direct energy production on-site or other industrial activity. Scope 2 GHG include energy purchased off-site. Scope 3 GHG include energy throughout the supply-chain.
Greenhouse gas intensity (Scope 1/2/3)	GHG emissions (scope 1/2/3) relative to (i) million of sales revenue or (ii) EBITDA.	Allows for comparisons at sector and company level.
Green/Brown share	% of green/brown activities in the revenue of a company.	Classification of green/brown – depends on the taxonomy chosen.
Physical risk exposure	Scoring of physical climate risk exposure of the company given its assets geographical position, its supply chain risk and market risk.	Evaluation of overall long-term and short-term potential exposure to physical risks resulting from changes to the climate system.
Environmental score	Underlying E of the ESG score.	

T2 Monitoring metrics for governments bonds

Government bonds		
Metric	Description	Details
Greenhouse gas emissions (absolute)	GHG emissions is calculated as metric tons of greenhouse gases emitted.	Production based = emissions associated with production within national territory. Consumption based = emissions associated with consumption by country's population. Economic activity = emissions associated with national production and consumption, including imports.
Greenhouse gas emissions (relative)	GHG emissions is calculated as metric tons of greenhouse gases emitted.	Per capita Per GDP
Power generation mix	% total power generation mix.	Describes sources of power generation mix and compares with global targets.
Renewable energy	% of renewable energy in the total energy consumption.	Describes sources of power generation mix and compares with global targets.
Physical risk exposure	Provides insight into physical risk vulnerability of a country resulting from e.g. sea level rise, storms, thermic stress, etc.	Evaluation of overall long-term and short-term potential exposure to physical risks resulting from changes to the climate system.
Environmental score	Underlying E of the ESG score.	

Glossary

Best-in-class	An SRI strategy that involves either positive screening or index-adjusted weighting (“ESG tilting”) by comparing the ESG characteristics of a firm to its peers.
ESG	Environmental, Social, and Governance.
ESG integration	An SRI strategy that aims at enhancing traditional financial (risk) analysis by systematically including ESG criteria in the investment analysis to enhance risk-adjusted returns.
Green bonds	Bonds for which the proceeds should be used exclusively for (predefined) green projects.
Impact investing	An SRI strategy that aims to achieve a quantifiable positive impact alongside financial returns.
KPI	Key Performance Indicator.
Negative screening	An SRI strategy that systematically excludes companies, sectors or countries from the investment universe.
Own funds	Any portfolio of a central bank that is not related to a formally mandated (policy) goal, but that is held, for example, to make up for operating expenses or for gathering market intelligence. For Eurosystem central banks this includes the ANFA portfolios.
Pension funds	Portfolios managed by central banks that serve as long-term savings account for retirement and have a longer investment horizon.
Policy portfolios	Any portfolio which has been formally mandated to the central bank, e.g. for monetary policy purposes, foreign exchange interventions, etc.
RI	Responsible Investment.
SDG	Sustainable Development Goals – seventeen goals adopted by all UN Member States in 2015 with the aim of ending global poverty by 2030 while maintaining global stability.
SRI	Sustainable and Responsible Investment – used throughout the guide as an umbrella term under which multiple strategies and investment practices can be placed that explicitly take climate or broader Environmental, Social and Governance (ESG) criteria into account.
SSA	(Sub-)sovereigns, Supranationals and Agencies.
Third-party assets	Assets that a central bank manages on behalf of a third party.
Voting and engagement	An SRI strategy that involves exercising ownership rights and “voice” with the intention of changing a company’s behaviour with regards to ESG issues, such as the violation of international standards and norms.



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