BANCA D'ITALIA
EUROSISTEMA

Annual report on sustainable investments and climate-related risks

May 2025

Year 2024

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CONTENTS

SYMBOLS AND CONVENTIONS

Unless otherwise specified, Banca d'Italia calculations; for Banca d'Italia data, the source is omitted.

In the tables:

– the phenomenon does not exist;

.. the value is nil or less than half of the final digit shown;

OVERVIEW

This Report describes the results achieved by Banca d'Italia in integrating environmental, social and governance (ESG) issues into the management of its investments in 2024. Specifically, it analyses the Bank's exposure to climate-related risks, in accordance with the Eurosystem's harmonized reporting rules.

The investments covered by this Report include the financial portfolio, the foreign currency reserves and the Supplementary Pension Fund, amounting to a total value of €190.3 billion at the end of 2024. They do not include portfolios held for monetary policy purposes, as their management is shared with the Eurosystem and the related reporting is prepared directly by the European Central Bank.

In keeping with the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), the Report illustrates four key areas: governance, strategy, risk management, and metrics and targets. A chapter is devoted to each area.

The governance of investments. – The Governing Board, assisted by the Strategies and Financial Risks Committee, oversees investments and approves the strategic portfolio allocation proposals. The Climate Change and Sustainability Committee provides strategic guidance and coordination and promotes analyses that help to fine-tune the Bank's sustainable investment methodologies.

Strategy. – Banca d'Italia's strategy continues to be based on the three lines of action set out in the 'Responsible Investment Charter', i.e.: (a) encouraging firms, financial intermediaries and other financial operators to disclose information on their ESG performance; (b) publishing analyses and guides on sustainable finance and communicate ESG results regularly; and (c) integrating ESG metrics into the management of its investments and into the financial risk measurement and management systems.

In relation to these lines of action, in 2024, the Bank participated in the work of the Platform on sustainable finance promoted by the Ministry of Economy and Finance, which drafted a guide to facilitate dialogue between small and medium-sized enterprises (SMEs) and banks on ESG information. Moreover, as in previous years, the Bank contributed to research on the effects of climate-related risks on the real economy and the financial system, participated in national and international discussions, particularly within the Eurosystem and the Network for Greening the Financial System (NGFS), and carried out financial education initiatives aimed at young people, businesses and the public at large to foster a sustainable finance culture.

The Bank also continued its efforts to integrate sustainability objectives into strategic asset allocation and securities selection. These objectives focus on protecting the environment in line with national and European legislation, and on taking into consideration corporate social responsibility and the adoption of the best corporate governance standards.

Risk management. — Banca d'Italia considers both financial risks as a whole and the specific risks that could arise from climate change or other ESG issues. Sustainability risk management in the allocation phase for equity and corporate bond portfolios is conducted by favouring firms with the best ESG practices in each sector and those most committed to the climate transition (best-in-class strategy). To mitigate climate transition risk, the portfolios are constructed by considering both the emissions recorded in previous years and the decarbonization targets of each firm, taking into account the ambition, soundness and time horizon of their commitment. In fact, assessing firms – and even more so excluding them – based solely on past emissions would risk penalizing those most actively engaged in converting their production processes and would fail to encourage reconversion by firms in high-emission sectors.

Metrics and targets. – In 2024, the market value of the financial portfolio stood at €146.7 billion, i.e. €2.9 billion more than in 2023, mainly owing to the positive performance of equity markets. Foreign currency reserves amounted to €42.6 billion, up by €3.1 billion. The value of the Supplementary Pension Fund remained broadly unchanged at around €1 billion.

As regards the metrics, the main novelty of this year's Report is the addition of three new metrics, which have been agreed with the Eurosystem: (a) total Scope 3 emissions; (b) the aggregate share of sustainability, sustainability-linked and social bonds; and (c) the exposure to sectors considered to have material nature-related dependencies or impacts.

One of the boxes in this Report illustrates the many difficulties and complexities inherent in the calculation of Scope 3 emissions.

The weighted average carbon intensity of the portfolios fell significantly between 2020 and 2024. The largest changes were recorded for equity and corporate bonds in the financial portfolio (down by 59 and 58 per cent respectively). The decrease was due to the investment strategies adopted, the progress made by firms in their sustainability policies, especially in decarbonization, and inflation, which increases the nominal value of revenues (i.e. the denominator of the ratio), thereby improving this metric. Studies are under way, including within the Eurosystem, to develop metrics capable of correcting the inflation-driven bias. As regards government securities, the share of green bonds in the financial portfolio has reached 5.4 per cent over the last five years; furthermore, the share of sustainable bonds issued by international organizations and agencies amounted to 14.6 per cent in 2024.

Banca d'Italia is committed to reviewing its investment strategy regularly to help pursue, in accordance with its mandate, both the Paris Agreement goals and the European Union's target of carbon neutrality by 2050. However, the actual achievement of these goals is influenced by several factors: compliance with the commitment to climate neutrality declared by the firms and countries in whose securities the Bank invests; the commitment of financial market participants to support the climate transition; the fine-tuning of the methodologies used for estimating climate-related risks; and the impact that investment choices can have on firms' climate strategies. These factors make it difficult to set targets for reducing the carbon footprint of investments. Moreover, the Bank also considers that achieving a reduction in the carbon footprint of portfolios

in the short term, based on the current state of the art, is not necessarily the best way to pursue long-term climate objectives. Banca d'Italia has therefore chosen, for the time being, not to set short- and medium-term carbon reduction targets and to continue to study the effects of investment choices on the conduct of the issuing firms, to promote the disclosure of the information needed to tackle climate change, and to make sustainable investment choices.

1. THE GOVERNANCE OF INVESTMENTS

Banca d'Italia (the 'Bank'), like the European Central Bank (ECB) and the other national central banks (NCBs) of the Eurosystem, integrates financial objectives and sustainability considerations, particularly with regard to climate change, into the management of its non-monetary policy financial assets.[1] Many units within the Bank are involved in the governance of its investments.

The Governing Board is responsible for overseeing the investments and approves the proposals made concerning the financial assets covered by this Report, namely the Bank's financial portfolio,[2] the foreign currency reserves and the Supplementary Pension Fund.[3]

The Climate Change and Sustainability Committee, chaired by a member of the Governing Board, provides strategic guidance and coordination on ESG issues for the entire Bank. While it is not directly involved in the investment process, it promotes analyses that help to fine-tune sustainable investment methodologies. The Committee is assisted by the Climate Change and Sustainability Hub, which supports and coordinates ESG research and analysis, working with sustainability specialists from across the Bank through a permanent liaison group.

The risk management function prepares strategic asset allocation proposals and sets out portfolio composition criteria and limits. It also produces regular reports that include financial and sustainability information for the Bank's senior management and for the members and representatives of the Supplementary Pension Fund. The investment function pursues financial and sustainability objectives in managing the portfolios.

Before being approved by the Governing Board, strategic investment allocation proposals are submitted to the Strategies and Financial Risks Committee. Investment proposals for the Supplementary Pension Fund are submitted to a joint committee made up of representatives of the Bank and pension fund members for a non-binding opinion. Lastly, the Financial Investment Committee decides on the tactical allocation of the foreign currency reserves and analyses the results of its management.

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1 In keeping its commitment towards the environment as set out in the *Strategic Plan for 2023-2025*, Banca d'Italia embraces sustainability principles, not only in its investment decisions, but also in supervision, economic research, financial education and its business choices. The initiatives launched in other areas are described in the *Activity and Sustainability Report*.

2 The financial portfolio includes non-monetary policy financial assets that are not part of the official reserves, such as euro-denominated government securities and supranational bonds, corporate bonds in euros, euro and foreign-currency equities, and alternative investment funds.

3 Banca d'Italia employees hired as of 28 April 1993 can participate in an internal pension fund that pays out a supplementary allowance in addition to the pension paid by the Italian National Institute for Social Security (INPS).

2. STRATEGY

Tackling climate change-related phenomena is primarily the responsibility of national governments, whose policies can steer economic activities towards greater sustainability. However, central banks are also in a position to make a significant contribution by prompting the financial system to increase its resilience to ESG-related risks and by facilitating, within the bounds of their remit, the transition to a more sustainable economy.

Banca d'Italia has thus committed to environmental concerns, setting out two priorities as part of the objectives in its Strategic Plan for 2023-2025: (a) to bolster sustainable finance and combat climate change; and (b) to reduce its environmental footprint by means of a net zero emissions transition plan.

The Bank's investment strategy is an integral part of its commitment to the environment and involves three lines of action identified in its 'Responsible Investment Charter':

a) encourage the disclosure of information on their ESG profiles on the part of firms, financial intermediaries and other financial system operators;

b) publish analyses and guides on sustainable finance and regularly communicate ESG results to contribute to spreading the culture of sustainability within the financial system and among the general public;

c) integrate ESG metrics into the management of its investments and into the financial risk measurement and management systems.

Below are described the initiatives taken by Banca d'Italia in these three areas in 2024.

2.1 *The disclosure of information on sustainability*

Banca d'Italia promotes the disclosure of comprehensive and accurate data on sustainability, in the absence of which sustainable finance cannot develop fully. The main critical issues reside in the availability, reliability, comparability and standardization of data. On the subject of climate change, more information is also needed on the strategies enacted by firms to decarbonize.[1]

The Bank contributed to the Sustainable Finance Platform[2] in 2024, which is promoted by the Ministry of Economy and Finance (MEF). The Bank's role is to

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1 For more information, see Network for Greening the Financial System, *Final report on bridging data gaps*, July 2022.

2 The Platform is chaired by the MEF and comprises the Ministry of the Environment and Energy Security, the Ministry of Enterprises and Made in Italy, Banca d'Italia, the Italian Companies and Stock Exchange Commission (CONSOB), the Institute for the Supervision of Insurance (IVASS) and the Italian Pension Fund Supervisory Authority (COVIP). For more information, see the MEF's website: 'Sustainability Dialogue between SMEs and Banks', December 2024.

lead the working group on mapping and integrating the existing databases on the environmental and climate risks for Italian firms. The Platform's activities focused on how to support non-listed SMEs and on drafting a guide for the collection and production of information on ESG issues as required by banks (see the box 'Dialogue on sustainability between SMEs and banks').

Furthermore, over the course of the year, the Bank engaged with ESG data providers to flag areas for improvement, inconsistencies or errors.

DIALOGUE ON SUSTAINABILITY BETWEEN SMES AND BANKS

The Sustainability Dialogue between SMEs and banks is a document produced by the Sustainable Finance Platform to encourage the exchange of information on sustainability. The document was published in December 2024 and benefited from comments from a public consultation involving several stakeholders, including financial sector operators and business associations. Its aim is to foster interaction between SMEs and banks in order to facilitate the exchange of data on sustainability, to increase SMEs' awareness of the importance of these data, and to lay the groundwork for training initiatives and pilot projects aimed at improving their skills in the field of sustainability.

The document proposes a reporting model divided into five sections: (a) general information; (b) mitigation of and adaptation to climate change; (c) environment; (d) society and workforce; and (e) business conduct. The adoption of the model, which is voluntary, should be facilitated by the possibility of using it based on the size of individual SMEs.

The model responds to the growing demand for sustainability data from the banks and firms with which SMEs interact; it is based on standardization, proportionality, efficiency and cost-effectiveness criteria. The greater availability of sustainability data may have a positive effect on SMEs' access to bank credit, as well as on their integration into the value chains of large companies, which are subject to specific regulatory requirements regarding the sustainability of their suppliers and customers.

As part of its financial education programme, Banca d'Italia presented the model within the 'Small firms, big choices' project,[1] dedicated to specific SME needs when dealing with banks and other financial institutions and aimed at trainers and professional associations.

[1] For more information, see Banca d'Italia's website: 'Economics for everyone. Educational projects and school. Small firms, big choices'.

2.2 *Analysis and research*

In 2024, the Bank contributed to investigating the effects of climate-related and green transition risks on the real economy and the financial system. It produced studies on the transition risks for the Italian economy (based on NGFS climate

scenarios)[3] on the consequences of physical risks (especially those associated with firms' exposure to hydrogeological events)[4] and on the role of insurance coverage.[5] Analyses were also devoted to energy efficiency improvement measures in the real estate market and their economic effects,[6] including the role of 'green mortgages'.[7] Finally, a sizeable strain of research examined the relationship between corporate sustainability and bank lending.[8] As for matters relevant to investment activity, Banca d'Italia conducted an analysis of the environmental scores of non-financial corporations that investors use to improve the sustainability profile of their portfolios,[9] and a study of the effect of ESG scores on the default probability of non-financial corporations [10] (for a full list of the publications, see Banca d'Italia's website: 'Economic research and sustainability statistics').

Banca d'Italia cooperates with national and international entities on matters relating to the ecological transition and sustainable finance, contributing to the publication of reports and guides. It took part in the biodiversity working group organized by the Italian Sustainable Investment Forum, helping produce its reports and guides for financial operators.[11] It is part of the Sustainable Finance Working

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3 M.A. Aiello, C. Angelico, P. Cova and V. Michelangeli, 'Climate-related risks for Italy: an analysis based on the latest NGFS scenarios', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 847, 2024.

4 S. Clò, F. David and S. Segoni, 'The impact of hydrogeological events on firms: evidence from Italy', Banca d'Italia, Temi di Discussione (Working Papers), 1451, 2024; see also M. Loberto and R. Russo, 'The exposure of Italian manufacturing firms to hydrogeological risk', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 899, 2024.

5 A. Frigo and A. Venturini, 'The insurance coverage against natural risks: a preliminary analysis', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 830, 2024.

6 F. Corsello and V. Ercolani, 'The role of the Superbonus in the growth of Italian construction costs', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 903, 2024; A. Accetturo, E. Olivieri and F. Renzi, 'Incentives for dwelling renovations: evidence from a large fiscal programme', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 860, 2024; see also F. Braggiotti, N. Chiarini, G. Dondi, L. Lavecchia, V. Lionetti, J. Marcucci and R. Russo, 'Predicting buildings' EPC in Italy: a machine learning based-approach', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 850, 2024; G. de Blasio, R. Fiori, L. Lavecchia, M. Loberto, V. Michelangeli, E. Padovani, E. Pisano, M.L. Rodano, G. Roma, T. Rosolin and P. Tommasino, 'Improving the energy efficiency of homes in Italy: the state of the art and some considerations for public intervention', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 845, 2024.

7 L. Abate, V. Lionetti and V. Michelangeli, 'Is the Italian green mortgage market ready to take off?', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 868, 2024.

8 For more on this line of research, see M. Bottero and M. Cascarano, 'Green granular borrowers', Banca d'Italia, Temi di Discussione (Working Papers), 1471, 2024; M.A. Aiello, 'Climate supervisory shocks and bank lending: empirical evidence from microdata', Banca d'Italia, Temi di Discussione (Working Papers), 1465, 2024; A. Accetturo, G. Barboni, M. Cascarano, E. Garcia-Appendini and M. Tomasi, 'Credit supply and green investments', Banca d'Italia, Temi di Discussione (Working Papers), 1456, 2024; A. Bartocci, P. Cova, V. Nispi Landi, A. Papetti and M. Pisani, 'Macroeconomic and environmental effects of portfolio decarbonisation strategies', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 874, 2024; S. Nobili, M. Persico and R. Romeo, 'How important are ESG factors for banks' cost of debt? An empirical investigation', Banca d'Italia, Mercati, infrastrutture, sistemi di pagamento (Markets, Infrastructures, Payment Systems), 52, 2024.

9 E. Bernardini, M. Fanari, E. Foscolo and F. Ruggiero, 'Environmental data and scores: lost in translation', Banca d'Italia, Mercati, infrastrutture, sistemi di pagamento (Markets, Infrastructures, Payment Systems), 51, 2024.

10 F. Ferriani and M. Pericoli, 'ESG risks and corporate viability: insights from default probability term structure analysis', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 892, 2024.

11 Italian Sustainable Investment Forum, 'Sustainable Finance and Biodiversity. Sustainable Finance and Biodiversity. A guide for financial operators', June 2024 (only in Italian).

Group created within the G20 Finance track in 2021, under the Italian G20 Presidency; it is also a member of the G7 Climate Change Mitigation Working Group, and of the working groups of the Financial Stability Board (FSB), the Basel Committee and the Eurosystem. The Bank is also a participant in the NGFS groups and sub-groups, with a member of its Governing Board currently coordinating the Net-zero for central banks group, jointly with a representative of the Central Bank of New Zealand. The group has recently published a number of technical documents on sustainable investment and public disclosure on climate risks (Table 2.1). As a member of the NGFS's Steering Committee (the Network's main governing body) since 2022, the Bank has also helped define the Network's strategic line of action. It has been confirmed as a Steering Committee member until the end of 2026.

In order to foster dialogue and broaden the knowledge base on the implications of the ecological transition for the economic and financial system, the Bank hosted a number of events: G7-IEA conference on 'Ensuring an Orderly Energy Transition'; 'The many shades of climate change through the lenses of dispute settlement' (with Roma Tre – Unidroit Centre for Transnational Commercial Law and International Arbitration); 'Embedding Sustainability in Credit Risk Assessment' (in collaboration with the International Monetary Fund); and the 'Workshop on the economic implications of climate change and the transition to a low-carbon economy'. The Bank was also one of the organizers of the conference 'The macroeconomic and financial dimensions of the green transition', together with the Euro Area Business Cycle Network and the European University Institute. These events were also a platform for members of Banca d'Italia's Governing Board to give public talks on the risks and opportunities of the energy transition, on environmental controversies, on the implications of the energy transition for the real estate sector, and on the links between the ecological and the environmental transition.[12]

The Bank carries out financial education initiatives aimed at young people, firms and the general public to foster a culture of sustainable finance.[13] It has also renewed and expanded the 'environmental and social sustainability' section of its website, informing the public about the initiatives carried out by the Bank as part of its institutional functions and of its internal activities. Finally, it has created a new section on sustainable finance, which the public can access from the Bank's financial education portal 'Economics for Everyone'.

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12 'The heat is on: challenges and opportunities of the energy transition', speech by F. Panetta, Governor of Banca d'Italia, at the G7-IEA conference on 'Ensuring an orderly energy transition', Rome, 16 September 2024; 'The many shades of climate change through the lenses of dispute settlement', speech by P. Angelini, Deputy Governor of Banca d'Italia, at the conference 'The many shades of climate change through the lenses of dispute settlement', Rome, 08 November 2024; 'UN principles for Green Financing for Sustainable Real Estate, Infrastructure and Urban Transformation Projects', opening remarks by P. Angelini, Deputy Governor of Banca d'Italia, at the conference 'UN Principles for Green Financing for Sustainable Real Estate, Infrastructure and Urban Transformation Projects', Milan, 11 April 2024; 'Digital and green: twice the transformation, twice the win?', speech by C. Scotti, Deputy Governor of Banca d'Italia, at the conference 'The macroeconomic and financial dimensions of the green transition', Fiesole, 28 June 2024.

13 The Bank has created a course for upper secondary school students on the 'Financial Education for Environmental Sustainability' (only in Italian) and an online course on the 'Economics of the Green Transition', especially designed for secondary school teachers in cooperation with the Politecnico di Milano's QFinLab (only in Italian).

Table 2.1

Recent publications by the NGFS in collaboration with Banca d'Italia

- *NGFS climate scenarios for central banks and supervisors. Phase V*, November 2024
- *The green transition and the macroeconomy: a monetary policy perspective*, October 2024
- *Acute physical impacts from climate change and monetary policy*, August 2024
- *Nature-related litigation: emerging trends and lessons learned from climate-related litigation*, July 2024
- *Nature-related financial risks: a conceptual framework to guide action by central banks and supervisors*, July 2024
- *Guide on climate-related disclosure for central banks. Second edition*, June 2024
- *Sustainable and responsible investment in central banks' portfolio management. Practices and recommendations*, May 2024
- *Decarbonisation strategies for corporate portfolios of central banks*, May 2024
- *Considering climate-related risks and transition impact in the sovereign investments of central banks. Data, metrics and implementation issues*, May 2024
- *NGFS: transition plan package*, April 2024
- *Tailoring transition plans: considerations for EMDEs*, April 2024
- *Connecting transition plans: financial and non-financial firms*, April 2024
- *Credible transition plans: the micro-prudential perspective*, April 2024

2.3 *Mainstreaming sustainability in the Bank's investment strategy*

The Bank incorporates financial and sustainability goals into its investment policy. The former relate to containing financial risks and prudently seeking returns that will preserve the invested capital and contribute to covering the Bank's expenses.[14] The sustainability goals seek to contribute to environmental protection (in line with Italian and EU legislation),[15] and to promote corporate social responsibility and the adoption of best corporate governance standards.

The management of the financial portfolio and foreign currency reserves involves an initial strategic allocation phase to determine the shares of the individual asset classes, and a second phase to select the issuers and securities.

The strategic allocation is based on an integrated asset and liability management model in use since 2010 which was fine-tuned over time and has come to include

14 For the foreign currency reserves, a high degree of liquidity also needs to be ensured in view of their possible uses.

15 These include the legislation adopted to implement the EU's Green Deal provisions to achieve climate neutrality and, for Italy, Articles 9 and 41 of the Constitution. The latter explicitly reference the protection of the environment, biodiversity and ecosystems, also in the interest of future generations, and the principle that private economic initiatives must not harm public health, the environment, social utility, safety, freedom and human dignity.

sustainability considerations, among other things.[16] The outcomes of the model are supplemented by qualitative analyses in order to take account of institutional considerations.[17]

The optimization exercise has a ten-year time horizon and aims to minimize the loss of capital that could occur in the most adverse economic and financial scenarios for the Bank's balance sheet. Sustainability considerations are used as constraints: every year, investment choices must improve or at least retain the ESG score and the weighted average carbon intensity (WACI) of investments in private-sector issuers.[18] The exercise provides indications regarding the optimal portfolio allocation across the various asset classes. The Strategies and Financial Risks Committee evaluates these indications and may request modifications or further insights.

As for the financial portfolio and foreign currency reserves, the 2024 strategic allocation envisaged continuing to invest in green bonds and alternative investment funds (AIFs) that are instrumental to the climate transition. The portfolio of euro-denominated corporate bonds has also been expanded, using criteria that, among other things, take into account firms' forward-looking commitment to decarbonize and carbon intensity trends over the previous three years.

The Supplementary Pension Fund has been phasing in sustainable investment criteria since 2020,[19] mainly by selecting market indices representing the asset classes that take ESG factors into account (see Chapter 3).

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16 For further information on the model, see D. Di Zio, M. Fanari, S. Letta, T. Perez and G. Secondin, 'The strategic allocation and sustainability of central banks' investment', Banca d'Italia, Mercati, infrastrutture, sistemi di pagamento (Markets, Infrastructures, Payment Systems), 14, 2021, and A. Scalia (ed.), *Financial Risk Management and Climate Change Risk. The Experience in a Central Bank*, Springer, 2023.

17 The model takes into account Banca d'Italia's entire balance sheet and other implicit exposures that affect the Bank's financial balance in the medium and long term, for example the current value of operating costs and monetary income (see the box 'Monetary income' in 'Annual Accounts – Year 2024', 2025).

18 The optimization exercise incorporates a financial constraint determined by the risk budget (defined in terms of risk aversion) and an accounting constraint intended to avoid short-term losses, which could have reputational consequences.

19 The objective of the Supplementary Pension Fund's strategic allocation is to accumulate funds in such a measure as to provide members with a supplementary pension to that provided by the Italian National Institute for Social Security (INPS). The optimization exercise aims to maximize the real returns of the portfolio over a long-term horizon that is consistent with the demographic characteristics of the Pension Fund members.

3. RISK MANAGEMENT

Banca d'Italia has developed a risk management framework[1] for its own investments that takes account of both economic and financial risks and specific risks that may arise from climate change or from other environmental, social and governance issues. Risk management encompasses the entire investment process: strategic allocation, selection of issuers and securities, and portfolio monitoring.

3.1 *The selection of issuers and securities*

The strategic allocation phase described in Chapter 2 is followed by the selection of the issuers and of the securities in the financial portfolio and in the foreign currency reserves. During this phase, sustainability criteria are integrated in different ways depending on the asset class.

Equity and corporate bonds. – The selection is based on benchmarks that are representative of the market as a whole, excluding: (a) securities issued by the banking, insurance and financial services sectors, in light of Banca d'Italia's supervisory role; (b) limited to Italy, equities in the media sector to account for possible reputational risks; and (c) securities that do not comply with Banca d'Italia's 'Responsible Investment Charter'.

The selection phase aims to improve the ESG score and climate indicators compared with the benchmark index. Risk management favours best-in-class securities and takes into account: (a) the current carbon intensity; (b) each firm's commitment to reducing emissions, as measured by an internally calculated score that evaluates the ambition, soundness and time horizon of the commitment. Excluding firms only on the basis of their past emissions could penalize those that are most actively engaged in converting their production processes by adopting low-emission technologies.

In addition to portfolios managed against a benchmark, the Bank holds a thematic portfolio that focuses on the energy transition and invests in firms operating in the sectors of alternative energy, energy efficiency systems, electric mobility and green buildings.

Banca d'Italia also holds units of alternative investment funds (AIFs), either directly or through funds of funds, to finance Italian SMEs and infrastructure projects. The selection of AIFs also takes ESG issues into account. Since 2024, the Bank has been investing in AIFs specifically aimed at financing projects that support the climate transition.

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[1] The Eurosystem manages monetary policy portfolio risks centrally. In making its investment decisions, the Bank assesses the risks to its balance sheet deriving from its various functions, including its participation in monetary policy operations, also based on the various risk-sharing arrangements.

Government and supranational securities. – Government securities are the main financial asset in Banca d'Italia's portfolio, as is generally the case for national central banks. They are highly liquid and safe, which makes them difficult to replace with alternative instruments, especially in the management of foreign currency reserves. With regard to their sustainability profile, the ESG scores of the issuing countries fall short of fully capturing their economic and productive structure and do not reflect in a direct and timely manner the effects of the environmental policies adopted by governments. A recent IMF study has also highlighted that there is no common notion of sustainability for countries among ESG scoring providers, and that there are significant differences in their assessment of environmental factors.[2]

For these reasons, Banca d'Italia monitors ESG scores and sustainability indicators for government securities (see Chapter 4) as part of its risk control framework, though they are not factored into its investment decisions. The sustainability objectives for this type of investment are pursued through the creation and gradual expansion of portfolios of green bonds in euros and in foreign currencies.

The Supplementary Pension Fund's financial assets. – Sustainability criteria for the Fund's investments were first adopted in 2020 with the introduction of low-carbon indices for equity shares.[3] In 2024, the new strategic benchmarks for asset allocation portfolios came into effect, strengthening the overall approach to sustainable investing. For the equity investments, the benchmarks upon which the previous indices where based were replaced by the new EU Paris-Aligned Benchmarks (PABs), which have more ambitious emission reduction targets. The new benchmarks comply with the international standards for reporting and transparency of climate goals.[4] As regards corporate bonds, the Fund confirmed its investment in an undertaking for collective investment (UCI) that selects firms with the lowest current and forward-looking carbon emissions and with the highest estimated capability to adapt to climate change.

3.2 *Financial and sustainability risk control*

Financial risk control is carried out through a system of daily verified limits whereby Banca d'Italia aims to prevent its investments from being excessively exposed to individual counterparties, geographical areas, and financial instruments.

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2 E. Gratcheva and B. Gurhy, 'Sovereign environmental, social, and governance (ESG) investing: chasing elusive sustainability', IMF Working Papers, 102, 2024.

3 Low-carbon indices aim to improve the carbon profile by overweighting firms with a lower ratio of greenhouse gas emissions to total revenue, while keeping the financial characteristics and sectoral representativeness of the portfolio as consistent as possible. Furthermore, based on broader sustainability criteria, low-carbon indices exclude manufacturers of weapons banned by international treaties and those that violate human rights, workers' rights and the principles of justice and equality enshrined in the United Nations Global Compact.

4 Inclusion in the PAB indices requires compliance with stricter rules than those for low-carbon indices. For instance, the former exclude firms with revenues from oil and gas-related activities amounting to 10 per cent or more of the total, as well as those involved in controversies concerning the environmental impact of their business.

The periodic reports describe the results of the control system, analysing not only financial risk indicators but also those for climate-related and portfolio sustainability risks. These include ESG scores, weighted average carbon intensity, the implied temperature rise indicator and that on decarbonization commitments (see Chapter 4). These indicators are included in the Bank's regular investment reports, which are intended for the heads of the units dealing with investments, the relevant committees, the Governing Board and, as regards the Supplementary Pension Fund, its members.

Given the pivotal role of climate indicators in achieving both the Paris Agreement goals and the European Union's climate neutrality objectives, the risk management function conducts methodological analyses to identify new metrics to monitor. One example is the forward-looking indicator on decarbonization commitments, developed internally and complementary to the backward-looking climate metrics.

4. METRICS AND TARGETS

The sustainability metrics for the Bank's portfolios analysed here and the underlying methodologies were largely agreed with the European Central Bank (ECB) and the other euro-area national central banks, with a view to establishing a harmonized reporting framework.

This chapter also clarifies the reasons why the Bank decided not to set out short- and medium-term targets for the portfolios under review in this Report.

4.1 *Non-monetary policy investments*

At the end of 2024, the market value of Banca d'Italia's investments in relation to its financial portfolio in euros, to foreign currency reserves and to the Supplementary Pension Fund was €190.3 billion. They were mostly in government securities of euro-area countries and of countries that issue the main currencies, given their nature of safe and liquid assets.

The financial portfolio. – The financial portfolio had a market value of €146.7 billion (Figure 4.1.a). The increase of €2.9 billion compared with 2023 was essentially due to the positive performance of equity markets and, to a lesser extent, to new investments in equities, bonds and investment funds (UCITS). Government securities, mainly of the Italian Republic, account for 83 per cent of the financial portfolio; there are also government securities from other euro-area countries and from supranational issuers comparable to public ones. Investment in shares of listed euro-area companies[1] and in UCITS denominated in foreign currencies accounts for 15 per cent; the latter track the equity indices for the US and Japanese markets. A smaller part is allocated to euro-denominated corporate bonds. The Bank also invests in alternative funds specializing in unlisted small and medium-sized enterprises, mostly Italian ones, and in infrastructure or climate transition projects.

Foreign currency reserves. – The total value of the foreign currency reserves managed by the Bank[2] was roughly €42.6 billion at end-2024, up on the previous year.[3] In 2024, the share held in the form of government securities and supranational and corporate bonds increased by €3.1 billion (Figure 4.1.b).

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1 These investments include the thematic equity portfolio, which was worth around €260 million at the end of 2024.

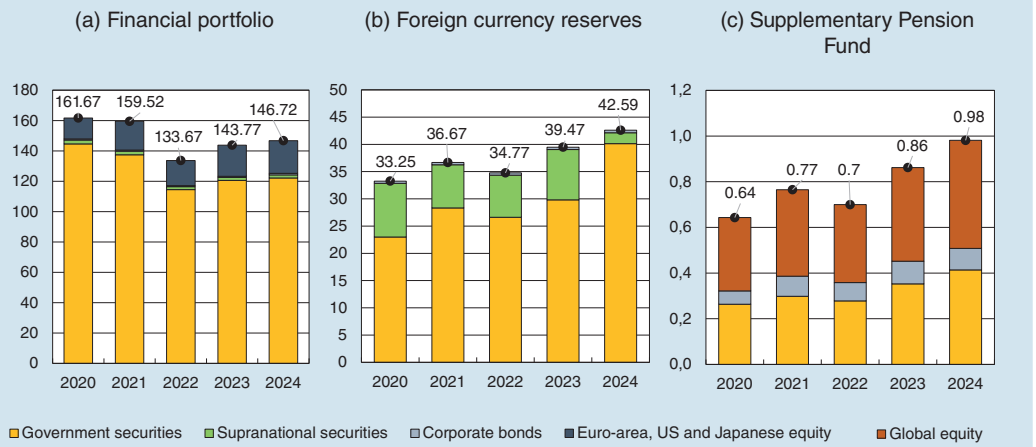
2 Foreign currency reserves are an integral part of the Eurosystem's reserves: they help bolster the credibility of the European System of Central Banks (ESCB) and can be used for FX market interventions to support currency stability. The Bank also uses foreign currency reserves to settle payments on public debt in foreign currency on behalf of the Treasury, thus avoiding potential market distortion effects, and to fulfil its commitments to international organizations such as the IMF. Foreign currency investments are mainly denominated in US dollars, as well as in the yen, the pound, Canadian and Australian dollars, the renminbi and the South Korean won.

3 The values are calculated at market prices excluding net claims on the IMF, cash and bank deposits, regardless of the valuation criteria used to prepare the Bank's financial statements; alternatively, estimates are used.

The Supplementary Pension Fund. – At the end of 2024, the total market value of the pension plans managed by the Fund was €1 billion, invested in a diversified set of assets (Figure 4.1.c).

Figure 4.1

Market value of investments (1)
(end-of-period data; billions of euros)



(1) The foreign currency reserves portfolio excludes net claims on the IMF, cash, and bank deposits. The Supplementary Pension Fund excludes investments in commodities, cash and hedging instruments.

4.2 *Climate and sustainability metrics*

The following are illustrated below: (a) backward-looking climate metrics; (b) forward-looking metrics; and (c) metrics for other elements of sustainability. In accordance with the common reporting framework agreed with the Eurosystem, this year's Report includes three new metrics:

– total Scope 3 emissions (see the box 'Scope 3 emissions');

– the aggregate share of sustainability, sustainability-linked and social bonds (in short, sustainable bonds);

– the share of exposure to sectors considered to have material nature-related dependencies and impacts (see the box 'Nature degradation and biodiversity loss risks').

The reliability and materiality of the climate metrics are closely linked to the quality of issuers' reporting. The greenhouse gas emissions data used here are partly reported by bond issuers and partly estimated by data providers. Scope 3 emissions data are still affected by quality issues that limit their reliability and comparability over time. These issues include (i) considerable estimation uncertainty, (ii) diverging estimates across different data providers, and (iii) methodological refinements that are still under way. Despite these shortcomings, Banca d'Italia and the Eurosystem report Scope 3 emissions to encourage issuers and data providers to improve their accuracy over time.

See the Methodological Notes in the Appendix for details on how the metrics are calculated.

SCOPE 3 EMISSIONS

Scope 3 greenhouse gas emissions are those produced along a firm's value chain but which are not directly controlled by it because they are generated by external entities, such as suppliers and customers. The Greenhouse Gas Protocol (GHG Protocol) – the main global initiative for drawing up corporate GHG accounting standards – divides Scope 3 emissions into 15 categories corresponding to an equal number of activities, such as the production of raw materials used by a firm, the use of sold products, and their end-of-life treatment.[1]

Scope 3 emissions far exceed scope 1 and scope 2 emissions in various business sectors; in the automotive and oil industries, for example, emissions are largely the result of the use of motor vehicles and the combustion of fossil fuels respectively. Scope 3 emissions also account for the largest share of emissions of financial intermediaries and central banks, as they include emissions from the firms or institutions to which they lend or whose securities they hold (Category 15, 'Investments').

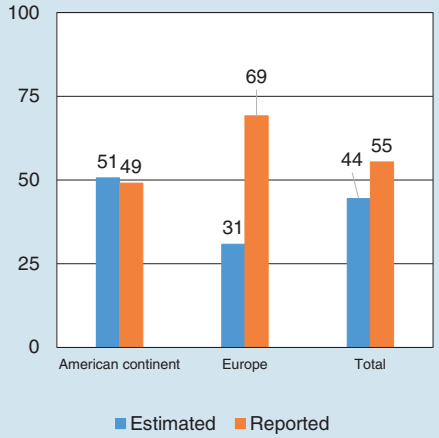
Firms cannot control these emissions directly, but they can take initiatives to promote their reduction, such as raising awareness among suppliers and producing goods that use less energy throughout their life cycle. Financial institutions, for their part, can adopt portfolio decarbonization strategies.

Even though there is a growing awareness of the importance of Scope 3 emissions, many firms do not disclose such data, given that in many jurisdictions there is no legal requirement to do so and that they are difficult to measure. With reference to the MSCI World Index, only 55 per cent of firms publish data on Scope 3 emissions. Europe is the area where reporting is most common, at close to or exceeding 70 per cent of firms across nearly all sectors (see the figure).

The research on Scope 3 emissions has highlighted four critical issues:

Figure

Scope 3 emissions: estimated and reported (1)
(data as at 31 December 2024; per cent)



Source: Based on Institutional Shareholder Services (ISS) data.
(1) The figure shows the percentage of firms in the MSCI World Index that report Scope 3 emissions and the percentage of firms for which ISS provides an estimate of Scope 3 emissions.

[1] Greenhouse Gas Protocol, Corporate value chain (Scope 3) accounting and reporting standard, 2011.

a) *Heterogeneity across the categories included in the measurement*. The guidelines require firms to include the categories of Scope 3 emissions in the calculation that they consider material based on their activity. Such discretion leads to significant heterogeneity among the categories reported, including for same-sector firms, and leaves room for opportunistic choices aimed at underestimating Scope 3 emissions.[2]

b) *Prevalence of estimated data*. Firms tend to replace primary data with their own estimates because of the difficulties in, or the impossibility of, collecting data on suppliers' carbon emissions. However, these estimates are based on heterogeneous methodologies, assumptions and emission factors that are not always suitable for monitoring the real increases or decreases in the value chain's carbon footprint.[3]

c) *Double counting*. If the investment portfolio includes firms that are linked by supplier relationships, a firm's Scope 3 emissions will include a share of the Scope 1 and 2 emissions from its suppliers; part of the emissions will therefore be double-counted;

d) *Poor comparability of data providers' estimates.* To estimate corporate Scope 3 emissions, data providers have developed some models to address non-reporting and to replace unreliable reported emissions data. However, some analyses suggest that the estimates obtained from these models differ widely because of methodological differences and the large number of assumptions and variables needed to calculate them.[4]

It is therefore necessary to pay particular attention to data quality when measuring the Scope 3 emissions of portfolios. To this end, many providers also offer a data quality score based on the metrics recommended by the Partnership for Carbon Accounting Financials (PCAF).[5] The score takes into account the reliability of the emissions data on a scale from 1 (highest quality, corresponding to emissions reported by the firm and audited externally) to 5 (lowest quality, corresponding to emissions estimated based on the sector's average revenues and emission intensity).

The PCAF also recommends not adding Scope 1 and 2 emissions to Scope 3 emissions, but disclosing them separately to avoid double counting.

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2 Q. Nguyen, I. Diaz-Rainey, A. Kitto, B.I. McNeil, N.A. Pittman and Z. Renzhu, 'Scope 3 emissions: data quality and machine learning prediction accuracy', *PLOS Climate*, 15, 2023.

3 L. Canal Vieira, M. Longo and M. Mura, 'Impact pathways: the hidden challenges of Scope 3 emissions measurement and management', *International Journal of Operations & Production Management*, 44, 13, 2024, pp. 326-334.

4 L. Swinkels and T. Markwat, 'Corporate carbon emissions data for equity and bond portfolios', *Managerial Finance*, 50, 1, 2024, pp. 118-139.

5 The PCAF is a global partnership of financial institutions that work together to develop a harmonized approach to assess and disclose the greenhouse gas emissions associated with their loans and investments. See PCAF, *The global GHG accounting and reporting standard part A: financed emissions. Second edition*, 2022.

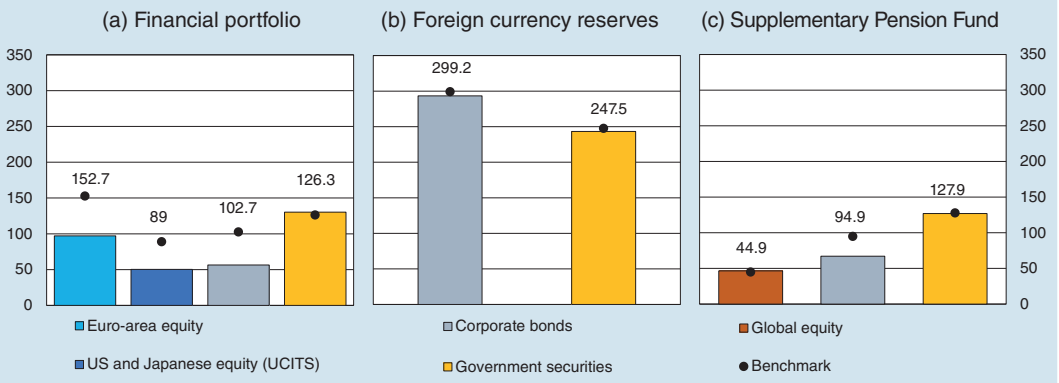
4.2.1 *Backward-looking climate metrics*

The backward-looking climate metrics discussed below refer to the portfolio situation at the end of 2024. In line with the Eurosystem's methodological guidelines, the most up-to-date data were used.[4]

The financial portfolio. – At the end of 2024, the weighted average carbon intensity (WACI) for government bonds in the financial portfolio was 130.2 tonnes of CO_2 equivalent (tCO_2eq) per million euros of GDP, based on the method of emissions linked to each country's output (Table 4.1). This value is lower (123.8 tCO_2eq) when the effects of land use, land-use change and forestry are taken into account. In both cases it is close to that of the benchmark index for the reference market (Figure 4.2.a)[5] and lower than in 2020 (Figure 4.3.a), mainly due to real GDP growth and, to a lesser extent, to inflation.

Figure 4.2

WACI for portfolios and benchmarks as at 31 December 2024 (1)
(tCO_2eq per million euros of revenue or of GDP)



Source: Our calculations based on ISS data.
(1) For government securities, the WACI referring to emissions linked to production excluding land use, land-use change and forestry is reported. For equities and bonds, the WACI is calculated on Scope 1 and 2 emissions.

The WACI for the equity portfolio in euros was 97 tCO_2eq per million euros of revenue, 36 per cent lower than for the benchmark (Figure 4.2.a)[6] and 59 per cent lower than in 2020, the first year that sustainability criteria were fully applied to portfolio management (Figure 4.3.a).[7] The WACI remains on a downward trend as a

4 The latest information on greenhouse gas emissions is for 2022 for countries and 2023 for firms. The GDP, population and government spending data used in the calculation of sovereign bond metrics refer to 2023. The portfolios for 2022 and 2023 shown in the Appendix were also recalculated; the metrics are therefore not comparable with those included in previous editions of this Report.

5 The ICE index includes nominal euro-area government securities issued by countries with an average rating equal to or higher than that of the Italian Republic.

6 The benchmark index used to compare the equity portfolio in euros is the same as the one used for its management; the index for US and Japanese equity investments is formed by using the standard MSCI market indices for the United States and Japan, which do not integrate sustainability factors.

7 The portfolio WACI reflects the sectoral structure of the markets it is invested in, which have a large share of public utilities, energy and industrial firms, i.e. with high greenhouse gas emissions.

Table 4.1

Backward-looking climate metrics: financial portfolio as at 31 December 2024 (1)
(absolute values, unless otherwise specified)

Metrics	Government securities: emissions linked to production excluding land use and forestry	Government securities: : emissions linked to production including land use and forestry	Government securities: emissions linked to consumption	Government securities: emissions linked to government activities	Supranational and agency bonds	Corporate bonds	Equity in euros	Equity United States and Japan
Portfolio size *(billions of euros)*	117.9 (2)	–	–	–	2.2	1.0	17.6	3.9
Total carbon emissions *(tCO_2eq)*	15,350,190	14,591,402	19,886,119	1,582,162	25	44,283	1,122,209	65,525
Weighted average carbon intensity *(tCO_2eq / €M or per capita)*	130.2	123.8	9.1	74.2	0.3	56.5	97.0	50.2
Carbon footprint *(tCO_2eq / €M invested)*	130.2	123.8	168.7	13.4	0.01	42.4	63.9	16.6
Carbon intensity *(tCO_2eq / €M revenue or GDP)*	130.2	123.8	9.0	73.8	0.3	85.8	114.2	60.6
Total Scope 3 carbon emissions *(tCO_2eq)*	–	–	–	–	108,031	865,762	26,692,349	1,258,954
PCAF quality score (Scope 3)	–	–	–	–	4.5	2.6	2.6	3.2

Sources: Based on World Bank, Carbon4 Finance and Institutional Shareholder Services (ISS) data.
(1) For a description of the metrics, see the Methodological Notes in the Appendix. For government and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. For equities and corporate bonds, the climate metrics refer to Scope 1 and 2 emissions, unless otherwise specified. Scope 3 emissions metrics are still affected by quality issues that limit their reliability and comparability over time. – (2) Refers to all four government securities columns.

result of: (a) the Bank's gradual decarbonization strategy, which also considers forward-looking information; (b) firms' progress in decarbonizing their operations; and (c) inflation, which results in higher nominal revenues (i.e. the WACI denominator). In this regard, in-depth work on calculating the indicators is under way, including at Eurosystem level, in order to correct the inflation-driven bias.[8]

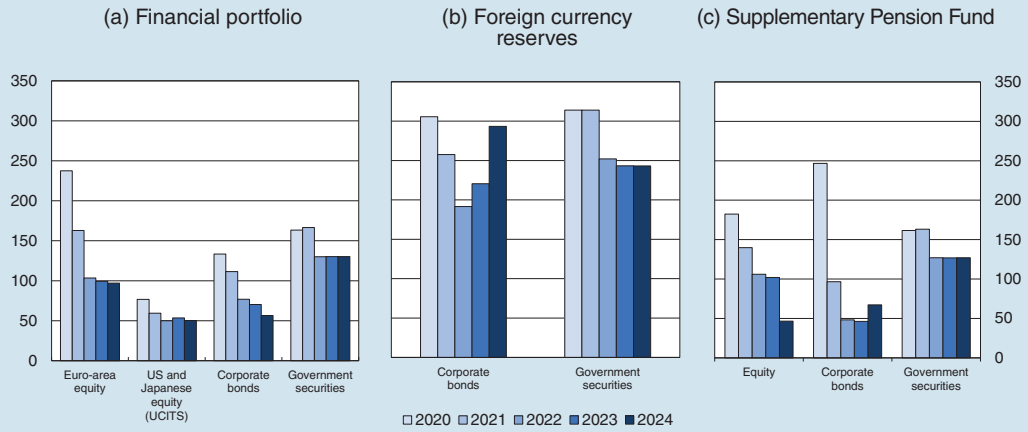
Investments in US and Japanese equity funds had a WACI of 50.2 tCO_2eq per million euros of revenue at the end of 2024, 44 per cent lower than the benchmark and 34 per cent lower than in 2020 (Figures 4.2.a and 4.3.a).

The WACI for the corporate bond portfolio stood at 56.5 tCO_2eq per million euros of revenue, 45 per cent lower than for the benchmark (Figure 4.2.a) and 58 per cent lower than in 2020, before sustainability criteria started to be integrated into this portfolio (Figure 4.3.a).

8 There is currently no international standard on the methodology for deflating the WACI.

Figure 4.3

Performance of the WACI for investments in 2020-24 (1)
(tCO_2eq per million euros of revenue or of GDP)



Source: Our calculations based on ISS data.
(1) For government securities, the WACI referring to emissions linked to production excluding land use, land-use change and forestry is reported. For equities and bonds, the WACI is calculated on Scope 1 and 2 emissions.

Total Scope 3 emissions for the financial portfolio amounted to approximately 29 million tCO_2eq, of which over 90 per cent comes from the euro-denominated equity portfolio (Table 4.1). In reading this metric, however, we should bear in mind that, as measured by the PCAF score, data quality is weak, especially for supranational and agency securities.

Foreign currency reserves. − Government securities in foreign currencies have higher climate risk metrics than those denominated in euros in the financial portfolio, owing to the low average share of renewables among the energy sources used by the issuing countries (see Table A.8 in the Appendix). The WACI estimated using the emissions linked to production was 243.2 tCO_2eq per million euros of revenue in 2024, slightly lower than that of the benchmark (Figure 4.2.b and Table 4.2);[9] it is down by around 23 per cent compared with 2020 (Figure 4.3.b; see Table A.3 in the Appendix). Similar considerations hold if the effect of land use, land-use change and forestry is included.

The WACI for foreign currency reserves invested in corporate bonds was 293.3 tCO_2eq per million euros of revenue, slightly lower than both the values for the benchmark (Table 4.2 and Figure 4.2.b) and for 2020 (Figure 4.3.b). Compared with 2023, however, the WACI rose by 33 per cent, as carbon-intensive public utilities, basic materials and industrial firms were added to the portfolio.

Total Scope 3 emissions for foreign currency reserves amounted to approximately 0.6 million tCO_2eq, of which 40 per cent relating to supranational and agency securities. In addition, the PCAF score for the latter points to very low data quality on average (Table 4.2).

9 The index is the result of aggregating several ICE indices for the foreign currency government securities held in the portfolio.

Table 4.2

Backward-looking climate metrics: foreign currency reserves as at 31 December 2024 (1)
(absolute values, unless otherwise specified)

Metrics	Government securities: emissions linked to production excluding land use and forestry	Government securities: emissions linked to production including land use and forestry	Government securities: emissions linked to consumption	Government securities: emissions linked to government activities	Supranational and agency bonds	Corporate bonds	Equity
Portfolio size *(billions of euros)*	39.5 (2)	–	–	–	2.1	0.5	–
Total carbon emissions *(tCO_2eq)*	9,594,418	8,515,286	10,515,992	1,351,485	35	41,514	–
Weighted average carbon intensity *(tCO_2eq / €M or per capita)*	243.2	215.8	18.8	237.2	0.3	293.3	–
Carbon footprint *(tCO_2eq / €M invested)*	243.2	215.8	266.6	34.3	0.0	87.0	–
Carbon intensity *(tCO_2eq / €M revenue or GDP)*	243.2	215.8	17.9	222.7	0.3	232.2	–
Total Scope 3 carbon emissions *(tCO_2eq)*	–	–	–	–	217,481	347,088	–
PCAF quality score (Scope 3)	–	–	–	–	4.7	2.4	–

Sources: Based on World Bank, Carbon4 Finance and ISS data.
(1) For a description of the metrics, see the Methodological Notes in the Appendix. For government and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. For equities and corporate bonds, the climate metrics refer to Scope 1 and 2 emissions, unless otherwise specified. Scope 3 emissions metrics are still affected by quality issues that limit their reliability and comparability over time. – (2) Refers to all four government securities columns.

The Supplementary Pension Fund. – The Fund has adopted a passive management style.[10] Its WACI and the other climate metrics are therefore essentially in line with its benchmark indices, with the exception of the corporate bond fund, which unlike its benchmark integrates sustainability factors (Figure 4.2.c and Table 4.3). At the end of 2024, the WACI was considerably lower than in 2020 in both the equity and bond segments (-73 and -74 per cent, respectively; Figure 4.3.c), as equity and corporate bond investments were shifted to PAB funds and to low-carbon funds, respectively. The Fund's total Scope 3 emissions amounted to roughly 0.2 million tCO_2eq, of which around 70 per cent in equities (Table 4.3).

4.2.2 *Forward-looking climate metrics*

Future climate risks are analysed from a long-term perspective, which reflects public policies and firms' climate neutrality strategies, whose horizons are typically set around 2050.

The Bank monitors the forward-looking climate risks for private sector securities portfolios by using specific metrics (Table 4.4).

10 The benchmark is formed by aggregating global equity indices and euro-area bond market indices.

Table 4.3

Backward-looking climate metrics: Supplementary Pension Fund as at 31 December 2024 (1)
(absolute values, unless otherwise specified)

Metrics	Government securities: emissions linked to production excluding land use and forestry	Government securities: emissions linked to production including land use and forestry	Government securities: emissions linked to consumption	Government securities: emissions linked to government activities	Supranational and agency bonds	Corporate bonds	Equity
Portfolio size *(billions of euros)*	0.4 (2)	–	–	–	–	0.1	0.5
Total carbon emissions *(tCO_2eq)*	50,910	48,533	67,545	5,169	–	3,577	9,830
Weighted average carbon intensity *(tCO_2eq / €M or per capita)*	126.9	121.0	9.5	65.9	–	67.2	46.5
Carbon footprint *(tCO_2eq / €M invested)*	126.9	121.0	168.4	12.9	–	37.2	20.8
Carbon intensity *(tCO_2eq / €M revenue or GDP)*	126.9	121.0	9.3	64.9	–	84.7	64.9
Total Scope 3 carbon emissions *(tCO_2eq)*	–	–	–	–	–	68,698	165,109
PCAF quality score (Scope 3)	–	–	–	–	–	2.9	3.2

Sources: Based on World Bank, Carbon4 Finance and ISS data.
(1) For a description of the metrics, see the Methodological Notes in the Appendix. For government and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. For equities and corporate bonds, the climate metrics refer to Scope 1 and 2 emissions, unless otherwise specified. Scope 3 emissions metrics are still affected by quality issues that limit their reliability and comparability over time. – (2) Refers to all four government securities columns.

Table 4.4

Forward-looking climate metrics: December 2024 (1)
(per cent, unless otherwise indicated)

Metrics	Corporate bonds in the financial portfolio	Equity in the financial portfolio	Corporate bonds in the foreign currency reserves	Corporate bonds in the Supplementary Pension Fund	Equity in the Supplementary Pension Fund
Implied temperature rise in 2050 (°C) - ISS	3.0	2.2	3.2	1.7	1.5
Implied temperature rise in 2050 (°C) - MSCI	2.0	2.0	2.5	2.0	2.1
Firms with SBTi commitments or targets *(per cent)*	89.5	78.3	79.8	70.4	72.5

Sources: Based on ISS, MSCI ESG Research and Moody's data.
(1) See the Methodological Notes in the Appendix for a description of the metrics.

The first metric is the global implied temperature rise (ITR) in 2050 compared with pre-industrial levels (see the Methodological Notes in the Appendix). Overall, the ITR developed by ISS and the one calculated by MSCI ESG Research indicate that the investments most vulnerable to the risk of the transition to a low-carbon economy are those in corporate bonds in the financial portfolio and in the foreign currency reserves (Table 4.4). The future emissions of the firms

that place these bonds are considered to be further from the carbon neutrality target; those firms are therefore more exposed to the regulatory, technological and market changes required by the transition. However, given the relatively low value of these portfolios, their risk is limited.

Another indicator of the future trend in corporate emissions is the share of firms with decarbonization commitments certified by the Science Based Target initiative (SBTi).[11] This share is particularly high for the financial portfolio, because of both the role of this variable in managing investments and the growth in the number of firms certified at European level.[12]

4.2.3 *Environmental, social, and governance metrics*

The analysis of sustainability factors other than climate change refers to the themes set out in Banca d'Italia's Responsible Investment Charter, namely the responsible use of natural resources, safety, equality and inclusion of workers, and using the best corporate governance practices (see Tables A.8, A.9 and A.10 in the Appendix).[13]

As regards measuring risks linked to nature and biodiversity, although there are several problems connected with the availability of data and the complexity of the analysis, an initial approximation is provided by the metric for exposure to economic sectors with a high impact on nature or whose operations are highly dependent on natural resources (see the box 'Nature degradation and biodiversity loss risks' and Tables A.9 and A.10 in the Appendix).

NATURE DEGRADATION AND BIODIVERSITY LOSS RISKS

Nature degradation and biodiversity loss can affect economic activity and threaten the stability of the financial system. Growing scientific evidence on the severity and speed of the decline of natural capital[1] stimulated negotiations on the UN Convention on Biological Diversity and led the governments of about 200 countries to endorse the Global Biodiversity Framework (GBF) at the COP15 conference in Montreal in December 2022. The framework outlines some short- and

1 Natural capital can be defined as the world's stocks of natural assets – which include geology, soil, air, water and all living things – that contribute to the production of goods and services for humans and are necessary for the survival of the environment that generates them.

11 A non-profit organization based on a partnership between the Carbon Disclosure Project (CDP), the United Nations Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF).

12 Based on SBTi data, there were 4,205 firms with SBTi-certified commitments or targets at the end of 2023. Of these, 53 per cent were based in Europe (including the United Kingdom), against 14 per cent in North America; see SBTi, *Monitoring Report 2023. Looking back at 2023 and moving forward to 2024 and beyond*, July 2024.

13 Bonds issued by supranationals and agencies are not considered in this analysis.

medium-term goals[2] and underlines the need to improve reporting on biodiversity-related issues. In July 2024, the EU Nature Restoration Regulation also entered into force, setting out rules to help restore degraded ecosystems.[3]

Nature-related financial risks, similarly to climate-related ones, can be classified as physical and transition risks. Physical risks relate to the economic and financial losses stemming from the degradation of nature and the destruction of biodiversity (e.g. due to the depletion of fresh water in agriculture); Transition risks relate to the possible losses stemming from the introduction of new environment protection policies and laws, as well as from changes in technology and demand.[4]

The Taskforce on Nature-related Financial Disclosures (TNFD) developed a set of recommendations for organizations to assess and report these risks; they are similar in structure to those of the Task Force on Climate-related Financial Disclosures (TCFD). The TNFD recommendations identity three types of metrics: (a) material to all organizations (e.g. tonnes of waste generated or water consumption); (b) sector-specific; (c) additional, to be used only if material to an organization's activities.

There are two metrics that are specific for financial institutions: the first one measures exposure to firms operating in priority sectors; the second one measures exposure to firms located in sensitive areas, e.g. in terms of biodiversity.[5]

The focus on the loss of natural capital is also underscored in the European Commission's Corporate Sustainability Reporting Directive (CSRD), which requires firms to disclose information on the impact of their activities on biodiversity and ecosystems, as well as on the actions taken to prevent or mitigate adverse effects.

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2 The main goals set by the GBF are to preserve 30 per cent of land, waters and seas by 2030 and to support environmental conservation in developing countries by mobilizing $30 billion per year. It also identifies four goals to be achieved by 2050: (a) reducing threats to biodiversity; (b) using biodiversity sustainably; (C) sharing the monetary and non-monetary benefits from the utilization of genetic resources fairly; and (d) ensuring adequate access to the tools necessary for implementing the framework (e.g. financial and scientific resources).

3 Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869.

4 NGFS, 'Biodiversity and financial stability: exploring the case for action', NGFS Occasional Papers, 2021.

5 TNFD, 'Additional guidance for financial institutions', June 2024.

Financial portfolio. – Government securities have environmental indicators that are aligned with or better than the benchmark index for the reference market; the main shortcomings concern social and governance issues (see Table A.8 in the Appendix).

Equity and corporate bond portfolios have ESG indicators that are better than or in line with the benchmarks, following the integration of sustainability into their

management. The indicators on energy and water use, and on waste management show particularly positive results (see Tables A.9 and A.10 in the Appendix).

The percentage of exposure to sectors with a high impact on nature is 49.4 per cent for equity and 44.3 per cent for corporate bonds, both of which are below the benchmarks.

The share of green bonds, the purchase of which began in 2020, grew in the three classes of bond assets and stood at 5.4 per cent in 2024 for government securities, 36.1 per cent for supranational and agency bonds and 6.2 per cent for corporate bonds (see Table 4.5, and Table A.7 in the Appendix). The overall shares of sustainable bonds for the corporate bond portfolio and for the supranational bond portfolio are 3.3 and 14.6 per cent respectively (Table 4.5).

Table 4.5

Share of green, sustainable and social bonds: December 2024 (1)
(per cent)

Metrics	Government securities in the financial portfolio	Supranational and agency bonds in the financial portfolio	Corporate bonds in the financial portfolio	Government securities in the foreign currency reserves	Supranational and agency bonds in the foreign currency reserves	Corporate bonds in the foreign currency reserves	Government securities in the Supplementary Pension Fund	Corporate bonds in the Supplementary Pension Fund
Share of green bonds	5.4	36.1	6.2	0.1	42.7	3.2	3.3	26.4
Share of sustainable bonds, linked to sustainability and social goals	0.0	14.6	3.3	0.0	14.7	4.4	0.0	3.7

Source: Based on Bloomberg data.
(1) For a description of the metrics, see the Methodological Notes in the Appendix.

Foreign currency reserves. – Government securities have environmental and social indicators that are mainly aligned with the benchmark, while the governance ones are better (see Table A.8 in the Appendix).

Corporate bonds have environmental and social indicators that are mainly worse than the benchmark; specifically, exposure to sectors with a high impact on nature is 45.4 per cent, against the benchmark figure of 39 per cent (see Table A.10 in the Appendix). The percentage of green bonds remained in line with that of 2023; the share of sustainable bonds in the portfolio is 4.4 per cent (Table 4.5).

The share of green bonds in the portfolio of supranational and agency bonds went from 6.7 to 42.7 per cent following the downsizing of that portfolio, which led to a higher share of green bonds (see Table A.7 in the Appendix). The share of sustainable securities is 14.7 per cent (Table 4.5).

Supplementary Pension Fund. – Because of the Fund's passive management strategy, the sustainability profile of the portfolios is aligned with the benchmarks (see Tables A.8, A.9 and A.10 in the Appendix). The share of green bonds in government securities and corporate bond portfolios was 3.3 and 26.4 per cent respectively. Sustainable bonds are only found among corporate bonds, and amount to 3.7 per cent (Table 4.5).

4.3 *The targets*

The climate change under way – as evidenced by an increase in global temperatures compared with pre-industrial levels that exceeded the 1.5 °C threshold on average in 2024 – has an impact on economic activity and potentially on the stability of the financial system. This confirms the urgency of implementing mitigation and adaptation measures to reduce net greenhouse gas emissions and to contain the impacts of climate change. Banca d'Italia is active in national and international forums in assessing the implications of climate risks for the economic and financial system (see Section 2.2) and in taking account of them in the exercise of its institutional functions, including investment activities.

In 2021, the Eurosystem agreed on a common stance for the application of sustainable and responsible investment principles to non-monetary policy portfolios, thereby creating the conditions for every central bank to be able to contribute to the transition towards a low-carbon economy, via the autonomous management of its own investments.

As regards the targets, the Bank is committed to reviewing its investment strategies regularly to help pursue, in accordance with its mandate, the Paris Agreement's goals and the European Union's target of carbon neutrality by 2050. However, the actual achievement of these targets is affected by a number of factors: (a) compliance with the commitment to climate neutrality declared by the firms and countries in whose securities the Bank invests; (b) the choice of financial market participants to support the climate transition; (c) fine-tuning the methodologies used for estimating climate risks; and (d) the ability of investment choices to influence firms' climate strategies. These factors make it difficult to set targets for reducing the carbon footprint of investments. Moreover, the Bank also considers that achieving a reduction in the carbon footprint of portfolios in the short term, based on the current state of the art, is not necessarily the best way to pursue long-term climate objectives.[14] Banca d'Italia has therefore chosen, for the time being, not to set short- and medium-term carbon reduction targets and to continue to study the effects of investment choices on the conduct of the issuing firms,[15] to promote the disclosure of the information needed to tackle climate change, and to make sustainable investment choices.

14 A. Bartocci, P. Cova, V. Nispi Landi, A. Papetti and M. Pisani, 2024, op. cit.

15 F. Columba, A. Fabiani, R. Gallo and G. Meucci, 'Sustainable Finance Regulation, Funds' Portfolio Reallocation and Real Effects', Banca d'Italia, mimeo, 2025.

APPENDIX

CONTENTS

METHODOLOGICAL NOTES

TABLES

METHODOLOGICAL NOTES

The climate metrics agreed upon by the European Central Bank and the national central banks in the Eurosystem are as follows:[1]

- the **weighted average carbon intensity** (WACI) indicator measures the exposure of a portfolio to issuers with high levels of greenhouse gas emissions relative to their volume of activity. For corporate issuers, activity is measured in terms of turnover; for sovereign countries, by gross domestic product (GDP), population, or central government consumption (Table MN.3). The WACI of a portfolio is calculated by weighting the carbon intensity of each issuer in proportion to its weight in the portfolio. The TCFD recommends using the WACI because it is easy to understand and can be used to compare portfolios of different sizes and compositions;

- the **total carbon emissions** (or financed emissions) indicator measures the amount of greenhouse gas emissions that can be attributed to a given portfolio (Table MN.2). As recommended by the Partnership for Carbon Accounting Financials (PCAF), the attribution is made by weighting the greenhouse gas emissions of each company by the share of the company's value held by the investor; this measure, known as enterprise value including cash (EVIC), is equal to the sum of capital, debt issued and liquidity. For government securities, the attribution is based on GDP (Table MN.4). Considering that total carbon emissions do not take portfolio size into account, this indicator is not suitable for comparing portfolios of different sizes or for analysing the same portfolio over time;

- the **carbon footprint** indicator measures the total greenhouse gas emissions of the portfolio, as a share of the market value of the portfolio itself. It can be used to compare different portfolios, although it is affected by the volatility of the market prices of the securities in each portfolio. To partially overcome this limitation, the carbon footprint data for the bonds examined in this report are calculated using their face value and not their market value, which is instead used to calculate the carbon footprint of equity (Table MN.1);

- the **carbon intensity** indicator measures the average carbon efficiency of the firms in the portfolio in terms of greenhouse gas emissions. It differs from the WACI indicator in the method used for calculating the carbon intensity of the issuers, which in this case is based on the share of value held by the investor (Table MN.1);

- the **percentage share of green bonds** is calculated by comparing the nominal value of green bonds compliant with the guidelines issued by the International Capital Market Association (ICMA) with the total nominal value of the bonds in the portfolio;

- the **percentage share of sustainability, sustainability-linked and social bonds** in the portfolio is calculated by comparing the nominal value of bonds compliant with the guidelines issued by ICMA with the total nominal value of the bonds in the portfolio;

- the **percentage share of exposure to sectors with material nature-related dependencies and impacts** measures the weight in the portfolio of companies belonging to the sectors listed in Appendix 1 of the *Additional guidance for financial institutions* issued by the Task Force on Nature-related Financial Disclosures (TNFD).

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1 The use of these metrics is recommended by the Task Force on Climate-related Financial Disclosures (TCFD) and the Partnership for Carbon Accounting Financials (PCAF). For more information, see the ECB website: 'Climate-related financial disclosures'.

The government securities portfolio metrics are calculated using three different methods based on different systems for calculating a country's emissions (Table MN.2):

production-based emissions are the emissions generated within a country to produce goods and services for both domestic consumption and exports. They are expressed to GDP (Table NM.3) and calculated in two ways: one takes into account the effects of land use, land-use changes and forestry (LULUCF), whereas the other does not. When the LULUCF factors are computed, the effects on emissions can be positive (as with deforestation, which leads to a decrease in CO_2 absorption capacity) or negative (as with reforestation);

consumption-based emissions include emissions generated within the country to meet national demand and those associated with imported products, excluding domestic emissions relating to exports; because they are based on consumption, these emissions are calculated in relation to population. This method corrects the distortion due to carbon leakage, when production that is responsible for high greenhouse gas emissions is transferred from countries with stricter climate policies to countries with less stringent ones;

government emissions are the direct and indirect emissions by a country's central government, expressed in relation to the monetary value of central government consumption.

As of this year, the Report also provides details on the total Scope 3 carbon emissions of private issuers, supranational organizations and agencies. However, because these data are unreliable and not comparable over time, a quality score calculated using the methodology recommended by the Partnership for Carbon Accounting Financials (PCAF) is also used to monitor their robustness. The score is assigned by the data providers and is based on a scale of 1 (highest quality, corresponding to emissions reported by the firm and audited externally) to 5 (lowest quality, corresponding to emissions estimated based on the firm's revenue and the sector's average emission intensity). The PCAF quality score of the portfolios is calculated as the weighted average of the Scope 3 emission quality scores of the individual securities, the weights of which are the face value for bonds and the market value for equity.

In line with the guidelines for the Eurosystem's common reporting framework, the most recent available data were used: 2022 data for the greenhouse gas emissions of individual countries and 2023 data for firms. Portfolio holdings refer to end-2024. GDP, population and government expenditure data refer to 2023, as does companies' revenues and enterprise value including cash (EVIC). The historical climate data in the report have been recalculated for the entire time series, to ensure that the data on greenhouse gas emissions and economic and financial data are as aligned as possible, and to take into account any revisions to the data by providers. The updating means that the indicators in this report are not fully comparable with those in previous reports (Table MN.5).

The variations for the last two years are solely due to changes in portfolio allocation and in the amounts invested, since the most recent information available on greenhouse gas emissions and on the macroeconomic and financial data is the same.

In addition to the metrics based on historical emissions, two forward-looking climate metrics are analysed:

the **implied temperature rise** (source: ISS and MSCI ESG Research) expresses the increase in global temperature in degrees Celsius (°C) that would occur within a given time horizon if the economy as a whole performed in the same way as the company being analysed in terms of over- or undershooting the carbon budget necessary to keep the global temperature increase below 1.5 °C. The global emissions budget is divided among countries and economic sectors and, within the sectors, among individual companies on the basis of their revenues;

companies' **decarbonization commitments** (source: MSCI ESG Research) are represented by the weight in the portfolio of companies that have made a commitment with the SBTi to draw up a decarbonization plan, or which already have decarbonization targets approved by the SBTi;

Tables MN.6 and MN.7 report the ESG metrics.

Table NM.1

Backward-looking climate metrics – formulas

Indicator	Formula
Weighted average carbon intensity - WACI (1)	$= \sum_n^i \left(\frac{\text{current value of investment}_i}{\text{current value of the portfolio}} \right) * \left(\frac{\text{issuer's carbon emissions}_i}{\text{revenue, PPP GDP, population or government spending of the issuer}_i} \right)$
Total emissions (1)	$= \sum_n^i \left(\frac{\text{current value of investment}_i}{\text{EVIC or PPP GDP}_i} * \text{issuer's carbon emissions}_i \right)$
Carbon footprint (1)	$= \frac{\sum_n^i \left(\frac{\text{current value of investment}_i}{\text{EVIC or PPP GDP}_i} * \text{issuer's carbon emissions}_i \right)}{\text{current value of the portfolio}}$
Carbon intensity	$= \frac{\sum_n^i \left(\frac{\text{current value of investment}_i}{\text{EVIC or PPP GDP}_i} \right) * \text{issuer's carbon emissions}_i}{\sum_n^i \left(\frac{\text{current value of investment}_i}{\text{EVIC or PPP GDP}_i} * \text{revenue, PPP GDP, population or government spending of the issuer}_i \right)}$

(1) Climate metrics agreed with the Eurosystem.

Table NM.2

Type of greenhouse gas emissions by issuer category

Issuer	Type of emissions	Notes	Source
Corporate	Scope 1, 2 and 3 emissions (tCO_2eq)	Scope 1 emissions are direct greenhouse gas emissions from controlled or owned sources of the organization (e.g. emissions from boiler, furnace and vehicle combustion). Scope 2 includes indirect greenhouse gas emissions from the purchase of electricity, steam, heat or cooling. Scope 3 emissions include all other indirect emissions that occur along the organization's value chain.	ISS
Supra and agency			
Sovereign	Production emissions (tCO_2eq)	Emissions produced within the country, including emissions from domestic consumption and those associated with exports. This definition corresponds to the one used by the territorial emissions approach adopted by the Secretariat of the United Nations Framework Convention of Climate Change (UNFCCC). Two calculations are made for these emissions: one includes the positive or negative quantitative effects resulting from LULUCF factors, the other does not take them into account.	ISS
	Consumption-based emissions (tCO_2eq)	Emissions generated within the country to meet national demand and those generated by imported products, excluding domestic emissions associated with exports. This calculation method provides a broader picture of a country's emissions and corrects the distortion attributable to carbon leakage, i.e. when production that is responsible for high greenhouse gas emissions is transferred from countries with stricter climate policies to countries with less stringent ones.	Carbon4 Finance
	Government emissions (tCO_2eq)	Direct emissions (e.g. from buildings and vehicles) and indirect emissions (e.g. associated with energy consumption, but also with government spending, state subsidies and public investment) by a country's central government.	ISS

Table NM.3

Backward-looking climate metrics – normalization factors

Issuer	Factor	Notes	Source
Corporate	Revenue in millions of euros (for Scope 1 & 2 emissions)	Total revenue generated by the sale of goods and services as part of the firm's core business.	ISS
Supra & Agency			
Government	PPP GDP in millions of euros (for production-based emissions)	GDP is the sum of the gross value added of all resident producers, plus any taxes on products and minus any subsidies not included in the value of products. The Purchasing Power Parity (PPP) conversion factor is a spatial price deflator and currency converter that offsets the impact of differences in price levels across countries.	World Bank
	Population (for consumption-based emissions)	Total population of a country.	World Bank
	Government spending in millions of euros (for government emissions)	General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most national defence and security expenditure, but excludes military capital expenditure.	World Bank

Table NM.4

Backward-looking climate metrics – attribution factors

Asset class	Factor	Notes	Source
Government securities	PPP GDP in millions of euros (for production-based emissions)	GDP is the sum of the gross value added of all resident producers, plus any taxes on products and minus any subsidies not included in the value of products. The Purchasing Power Parity (PPP) conversion factor is a spatial price deflator and currency converter that offsets the impact of differences in price levels across countries.	World Bank
Equity	Enterprise Value Including Cash (EVIC)	The sum of the market capitalization of ordinary shares, the market capitalization of preferred shares, and the book values of total debt and minority interests at fiscal year-end, without deducting cash or cash equivalents.	ISS and Bloomberg
Supra & Agency bonds			
Corporate bonds			
Covered bonds			

Table NM.5

Backward-looking climate metrics – year of data availability (1)

Year of updating of portfolio data	Government securities				Corporate			
	2025 issue		2024 issue		2025 issue		2024 issue	
	Year for which climate data are available	Year for which economic and financial data are available	Year for which climate data are available	Year for which economic and financial data are available	Year for which climate data are available	Year for which economic and financial data are available	Year for which climate data are available	Year for which economic and financial data are available
2024	2022	2023	–	–	2023	2023	–	–
2023	2022	2023	2021	2022	2023	2023	2022	2022
2022	2022	2022	2021	2022	2022	2022	2022	2022
2021	2021	2021	2021	2021	2021	2021	2021	2021
2020	2020	2020	2020	2020	2020	2020	2020	2020

(1) The table shows, for each issue of the *Annual report on sustainable investments and climate-related risks* published by Banca d'Italia, the years to which backward-looking climate metrics refer for the relevant portfolios held by the Bank.

Table NM.6

ESG metrics for private sector issuers (1)

Indicator	Description	Source
ESG score	Evaluates companies' management of risks and opportunities associated with environmental, social and governance (ESG) factors. It can range between 0 and 10; the higher the score, the better the ESG profile.	MSCI ESG Research
Environmental metrics		
Energy intensity *(GJ per €K revenue)*	Energy intensity is the ratio of energy consumption in gigajoules to revenue in thousands of euros.	LSEG
Weighted average water intensity *(thousands of m^3 per €M revenue)*	Water intensity is the ratio of the volume of water used by the company, in thousands of m^3, to revenue in millions of euros. The calculation is based on water drawn from any source, either directly by the company or acquired from public utilities.	LSEG
Weighted average waste intensity *(tonnes per €M revenue)*	Waste intensity is the ratio of the tonnes of solid waste produced by the company to turnover in millions of euros. Hazardous and non-hazardous waste are both included. Liquid waste is only included if expressed in tonnes. For utilities and for the energy and mining sectors, waste materials, such as waste rocks and ashes, are also considered waste.	LSEG
Waste recycling ratio *(%)*	Percentage ratio of the amount of recycled waste to the amount of total waste. Recycled waste also includes waste to be employed for waste-to-energy and waste used for composting.	LSEG
Estimated revenue from environmentally sustainable activities aligned with the EU Taxonomy *(%)*	Percentage of the revenue that firms in the portfolio/index generate from activities aligned with the EU Taxonomy of sustainable activities.	MSCI ESG Research
Exposure to sectors with material nature-related dependencies and impacts *(%)*	Percentage of exposure to economic sectors with a high impact on nature and that are highly dependent on natural resources.	ISS
Social metrics		
Women in management positions *(%)*	Percentage of female managers out of the total number of company managers. If the company provides the data broken down by managerial category, only the category of middle managers is considered.	LSEG
Average training hours *(hours per year)*	Average annual training hours per employee.	LSEG
Companies with flexible working hours *(%)*	Percentage of companies that offer flexible working hours, including formulas such as remote working, job-sharing and part-time work.	LSEG
Trade union representation	Percentage of workers represented by independent trade unions or covered by collective bargaining agreements. When both union representation and collective bargaining data are available, the latter is used to calculate the indicator.	LSEG
Injury rate	Number of injuries and deaths, including injuries that do not lead to absences from work, as a share of the total number of hours worked per year. The ratio is multiplied by the scale factor of one million. If the company does not report the hours worked, the figure is approximated as the number of workers multiplied by 2,000.	LSEG
Governance metrics		
UN Global Compact signatories	Share of companies that have signed the United Nations Global Compact.	MSCI ESG Research
Board members' independence	Percentage of independent directors on the Board. For companies with a two-tier system, the figure only refers to Supervisory Board members.	MSCI ESG Research
Combined CEO/Chair	Percentage of companies in which the roles of Chief Executive Officer and Chair of the Board of Directors are assigned to the same person.	MSCI ESG Research
Women on Boards of Directors	Percentage of women on Boards of Directors. In the two-tier system, the calculation is based solely on the members of the Supervisory Board.	MSCI ESG Research
Pay linked to sustainability targets	Share of companies that have introduced reference to sustainability targets in determining the variable components of the Board's remuneration.	MSCI ESG Research
Anti-corruption policies	Share of companies that have anti-corruption policies.	MSCI ESG Research

(1) For all the indicators in this table, the portfolio figure is calculated as a weighted average using the market weight of each issuer in the portfolio.

Table NM.7

ESG metrics for sovereign issuers (1)

Indicator	Description	Source
ESG score	Evaluates the country's exposure to environmental, social and governance factors and their management. It can range between 0 and 10; the higher the score, the better the ESG profile.	MSCI ESG Research
Environmental metrics		
Energy intensity *(MJ per one $ of GDP)*	Ratio of primary energy demand expressed in megajoules (MJ) to 2017 PPP GDP in dollars.	BP and World Bank
Forest cover *(%)*	Percentage of forest area.	FAO
Share of renewable sources in primary energy demand *(%)*	Share of renewable energy sources in the total energy supply needed by the country in a given year.	IEA
Social metrics		
Gini index	Level of concentration of income distribution in a population. The index ranges between 0 (maximum equi-distribution) and 100 (maximum concentration).	OECD and World Bank
Investment in R&D *(%)*	Percentage of GDP invested in Research and Development.	OECD
Female participation in the labour market *(%)*	Female participation in the labour market compared with male participation.	ILOSTAT
Governance metrics		
Democracy index	Examines a country's state of democracy. It focuses on five categories: electoral process and pluralism, civil liberties, functioning of government, political participation and political culture. The score ranges between 0 (authoritarian regime) and 10 (full democracy).	The Economist
Corruption perception index	Measures the perceived levels of public sector corruption by country. The index ranges between 0 (maximum corruption) and 100 (minimum corruption).	Transparency International

(1) For all the indicators in this table, the portfolio figure is calculated as a weighted average using the face value of the securities issued by each issuer in the portfolio.

TABLES

Table A1

Backward-looking climate metrics: financial portfolio 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Government securities	Other securities			
		Supra and agency bonds	Corporate bonds	Equity	
				in euros	United States and Japan
Portfolio size *(billions of euros)*					
2024	117.9	2.2	1.0	17.6	3.9
2023	118.0	2.2	0.8	17.3	3.2
2022	117.8	2.2	0.8	14.2	2.4
2021	117.3	2.1	0.7	16.1	2.8
2020	117.5	2.1	0.7	12.1	1.6

Metrics	Government securities				Other securities			
	Production emissions excluding land use and forestry	Production emissions including land use and forestry	Consumption emissions	Government emissions	Supra and agency bonds	Corporate bonds	Equity	
							in euros	United States and Japan
Total carbon emissions (Scope 1 & Scope 2) *(tCO_2eq)*								
2024	15,350,190	14,591,402	19,886,119	1,582,162	25	44,283	1,122,209	65,525
	(100)	(100)	(100)	(100)	(69)	(97)	(100)	(100)
2023	15,363,588	14,603,023	19,909,746	1,583,888	24	40,110	1,173,281	56,675
	(100)	(100)	(100)	(100)	(81)	(98)	(100)	(98)
2022	15,319,997	14,559,656	19,861,465	1,580,271	51	50,673	1,199,036	50,319
	(100)	(100)	(100)	(100)	(90)	(100)	(99)	(98)
2021	19,534,606	18,312,605	24,807,431	1,984,718	58	52,751	1,416,003	49,792
	(100)	(100)	(100)	(100)	(71)	(100)	(99)	(97)
2020	19,190,276	17,645,418	24,295,495	1,923,195	39	56,193	1,361,370	38,630
	(100)	(100)	(100)	(100)	(77)	(100)	(99)	(99)
Weighted average carbon intensity (Scope 1 & Scope 2) *(tCO_2eq per €M or per capita)*								
2024	130.2	123.8	9.1	74.2	0.3	56.5	97.0	50.2
	(100)	(100)	(100)	(100)	(69)	(100)	(100)	(100)
2023	130.2	123.7	9.1	74.2	0.2	70.3	99.3	53.5
	(100)	(100)	(100)	(100)	(81)	(100)	(100)	(98)
2022	130.1	123.6	9.1	70.3	1.2	76.8	103.5	50.0
	(100)	(100)	(100)	(100)	(99)	(100)	(100)	(98)
2021	166.5	156.1	9.0	86.9	3.3	111.4	162.9	59.4
	(100)	(100)	(100)	(100)	(89)	(100)	(99)	(97)
2020	163.4	150.2	8.2	78.7	1.0	133.5	237.5	76.6
	(100)	(100)	(100)	(100)	(77)	(100)	(99)	(99)
Carbon footprint (Scope 1 & Scope 2) *(tCO_2eq per €M invested)*								
2024	130.2	123.8	168.7	13.4	0.0	42.4	63.9	16.6
	(100)	(100)	(100)	(100)	(69)	(97)	(100)	(100)
2023	130.2	123.7	168.7	13.4	0.0	51.8	68.0	17.6
	(100)	(100)	(100)	(100)	(81)	(98)	(100)	(98)
2022	130.1	123.6	168.6	13.4	0.0	66.4	84.5	21.3
	(100)	(100)	(100)	(100)	(90)	(100)	(99)	(98)
2021	166.5	156.1	211.4	16.9	0.0	70.8	87.7	17.6
	(100)	(100)	(100)	(100)	(71)	(100)	(99)	(97)
2020	163.4	150.2	206.8	16.4	0.0	75.3	112.3	23.4
	(100)	(100)	(100)	(100)	(77)	(100)	(99)	(99)
Carbon intensity (Scope 1 & Scope 2) *(tCO_2eq per €M revenue or GDP)*								
2024	130.2	123.8	9.0	73.8	0.3	85.8	114.2	60.6
	(100)	(100)	(100)	(100)	(69)	(97)	(100)	(100)
2023	130.2	123.7	9.0	73.8	0.2	102.6	111.8	63.1
	(100)	(100)	(100)	(100)	(81)	(98)	(100)	(98)
2022	130.1	123.6	9.0	70.0	0.9	107.2	122.4	63.1
	(100)	(100)	(100)	(100)	(90)	(100)	(99)	(98)
2021	166.5	156.1	9.0	86.5	1.0	148.8	195.8	75.0
	(100)	(100)	(100)	(100)	(71)	(100)	(99)	(97)
2020	163.4	150.2	8.2	78.4	0.6	164.6	265.0	82.5
	(100)	(100)	(100)	(100)	(77)	(100)	(99)	(99)

Sources: Based on Carbon4 Finance, ISS and World Bank data.
(1) For a description of the metrics, see the Methodological notes. For government securities and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Table A2

Scope 3 emissions: financial portfolio 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Other securities			
	Supra and agency bonds	Corporate bonds	Equity	
			in euros	United States and Japan
Total carbon emissions (Scope 3) *(tCO_2eq)*				
2024	108,031 (69)	865,762 (100)	26,692,349 (100)	1,258,954 (100)
2023	128,591 (81)	676,110 (100)	21,042,445 (100)	1,066,748 (98)
2022	80,994 (90)	860,561 (100)	18,357,158 (99)	979,529 (98)
2021	19,966 (71)	684,146 (100)	14,523,984 (99)	784,703 (97)
2020	22,083 (77)	557,913 (100)	11,768,583 (99)	490,414 (99)
PCAF quality score (Scope 3)				
2024	4.5 (89)	2.6 (100)	2.6 (100)	3.2 (100)
2023	4.6 (100)	2.7 (100)	2.6 (100)	3.2 (98)
2022	5.0 (100)	2.4 (100)	2.4 (100)	2.7 (98)
2021	5.0 (100)	2.6 (100)	2.7 (100)	2.9 (97)
2020	–	–	–	–

Source: Based on ISS data.
(1) For a description of the metrics, see the Methodological notes. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Backward-looking climate metrics: foreign currency reserves 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Government securities	Other securities		
		Supra and agency bonds	Corporate bonds	Equity
Portfolio size *(billions of euros)*				
2024	39.5	2.1	0.5	–
2023	30.7	9.3	0.4	–
2022	27.5	6.9	0.4	–
2021	27.8	7.2	0.4	–
2020	22.1	10.0	0.4	–

Metrics	Government securities				Other securities		
	Production emissions excluding land use and forestry	Production emissions including land use and forestry	Consumption emissions	Government emissions	Supra and agency bonds	Corporate bonds	Equity
Total carbon emissions (Scope 1 & Scope 2) *(tCO_2eq)*							
2024	9,594,418	8,515,286	10,515,992	1,351,485	35	41,514	–
	(100)	(100)	(100)	(100)	(87)	(100)	–
2023	7,466,799	6,663,878	8,159,398	1,037,090	..	28,146	–
	(100)	(100)	(100)	(100)		(100)	–
2022	6,931,003	6,193,484	7,564,072	956,779	..	32,971	–
	(100)	(100)	(100)	(100)		(100)	–
2021	8,741,411	7,851,900	9,484,649	1,209,593	..	48,459	–
	(100)	(100)	(100)	(100)		(100)	–
2020	6,932,064	6,249,345	7,488,696	940,971	..	53,511	–
	(100)	(100)	(100)	(100)		(100)	–
Weighted average carbon intensity (Scope 1 & Scope 2) *(tCO_2eq €M or per capita)*							
2024	243.2	215.8	18.8	237.2	0.3	293.3	–
	(100)	(100)	(100)	(100)	(98)	(100)	–
2023	243.3	217.1	18.4	230.5	0.8	220.5	–
	(100)	(100)	(100)	(100)	(100)	(100)	–
2022	252.1	225.3	18.3	231.8	..	191.6	–
	(100)	(100)	(100)	(100)		(100)	–
2021	314.0	282.1	18.6	281.1	..	257.6	–
	(100)	(100)	(100)	(100)		(100)	–
2020	314.0	283.1	17.2	259.8	..	305.6	–
	(100)	(100)	(100)	(100)		(100)	–
Carbon footprint (Scope 1 & Scope 2) *(tCO_2eq per €M invested)*							
2024	243.2	215.8	266.6	34.3	0.0	87.0	–
	(100)	(100)	(100)	(100)	(87)	(100)	–
2023	243.3	217.1	265.8	33.8	..	63.6	–
	(100)	(100)	(100)	(100)		(100)	–
2022	252.1	225.3	275.2	34.8	..	74.8	–
	(100)	(100)	(100)	(100)		(100)	–
2021	314.0	282.1	340.7	43.5	..	121.8	–
	(100)	(100)	(100)	(100)		(100)	–
2020	314.0	283.1	339.3	42.6	..	145.1	–
	(100)	(100)	(100)	(100)		(100)	–
Carbon intensity (Scope 1 & Scope 2) *(tCO_2eq per €M revenue or GDP)*							
2024	243.2	215.8	17.9	222.7	0.3	232.2	–
	(100)	(100)	(100)	(100)	(87)	(100)	–
2023	243.3	217.1	17.4	214.9	..	167.3	–
	(100)	(100)	(100)	(100)		(100)	–
2022	252.1	225.3	17.2	215.7	..	173.3	–
	(100)	(100)	(100)	(100)		(100)	–
2021	314.0	282.1	17.6	263.8	..	375.8	–
	(100)	(100)	(100)	(100)		(100)	–
2020	314.0	283.1	16.3	244.5	..	419.1	–
	(100)	(100)	(100)	(100)		(100)	–

Sources: Based on Carbon4 Finance, ISS and World Bank data.
(1) For a description of the metrics, see the Methodological Notes. For government securities and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. The degree of coverage for each metric i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Table A4

Scope 3 emissions: foreign currency reserves 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Other securities		
	Supra and agency bonds	Corporate bonds	Equity
Total carbon emissions (Scope 3) *(tCO_2eq)*			
2024	217,481 (87)	347,088 (100)	–
2023	..	291,894 (100)	–
2022	..	290,894 (100)	–
2021	..	278,685 (100)	–
2020	..	255,811 (100)	–
PCAF quality score (Scope 3)			
2024	4.7 (98)	2.4 (100)	–
2023	..	2.4 (100)	–
2022	..	2.1 (100)	–
2021	..	2.4 (100)	–
2020	–	–	–

Source: Based on ISS data.
(1) For a description of the metrics, see the Methodological Notes. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Backward-looking climate metrics: Supplementary Pension Fund 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Government securities	Other securities		
		Supra and agency bonds	Corporate bonds	Equity
Portfolio size *(billions of euros)*				
2024	0.4	–	0.1	0.5
2023	0.3	–	0.1	0.4
2022	0.3	–	0.1	0.3
2021	0.3	–	0.1	0.4
2020	0.2	–	0.1	0.3

Metrics	Government securities			Other securities			
	Production emissions excluding land use and forestry	Production emissions including land use and forestry	Consumption emissions	Government emissions	Supra and agency bonds	Corporate bonds	Equity
Total carbon emissions (Scope 1 & Scope 2) *(tCO_2eq)*							
2024	50,910	48,533	67,545	5,169	–	3,577	9,830
	(100)	(100)	(100)	(100)	–	(97)	(99)
2023	44,089	42,004	58,292	4,476	–	2,516	23,626
	(100)	(100)	(100)	(100)	–	(98)	(99)
2022	36,009	34,307	47,676	3,654	–	2,688	22,025
	(100)	(100)	(100)	(100)	–	(99)	(97)
2021	41,240	38,993	53,236	4,091	–	3,636	25,905
	(100)	(100)	(100)	(100)	–	(97)	(97)
2020	36,002	33,651	45,976	3,504	–	7,136	26,558
	(100)	(100)	(100)	(100)	–	(95)	(96)
Weighted average carbon intensity (Scope 1 & Scope 2) *(tCO_2eq €M or per capita)*							
2024	126.9	121.0	9.5	65.9	–	67.2	46.5
	(100)	(100)	(100)	(100)	–	(98)	(100)
2023	126.8	120.8	9.5	65.7	–	46.2	102.0
	(100)	(100)	(100)	(100)	–	(99)	(100)
2022	127.0	121.0	9.5	63.2	–	48.1	106.1
	(100)	(100)	(100)	(100)	–	(100)	(97)
2021	163.2	154.3	9.6	77.8	–	96.6	139.8
	(100)	(100)	(100)	(100)	–	(99)	(98)
2020	161.6	151.1	8.9	72.0	–	246.7	182.3
	(100)	(100)	(100)	(100)	–	(97)	(96)
Carbon footprint (Scope 1 & Scope 2) *(tCO_2eq per €M invested)*							
2024	126.9	121.0	168.4	12.9	–	37.2	20.8
	(100)	(100)	(100)	(100)	–	(97)	(99)
2023	126.8	120.8	167.6	12.9	–	24.1	57.6
	(100)	(100)	(100)	(100)	–	(98)	(99)
2022	127.0	121.0	168.2	12.9	–	29.6	64.5
	(100)	(100)	(100)	(100)	–	(99)	(97)
2021	163.2	154.3	210.7	16.2	–	44.0	68.4
	(100)	(100)	(100)	(100)	–	(97)	(97)
2020	161.6	151.1	206.4	15.7	–	137.4	82.7
	(100)	(100)	(100)	(100)	–	(95)	(96)
Carbon intensity (Scope 1 & Scope 2) *(tCO_2eq per €M revenue or GDP)*							
2024	126.9	121.0	9.3	64.9	–	84.7	64.9
	(100)	(100)	(100)	(100)	–	(97)	(99)
2023	126.8	120.8	9.3	64.8	–	54.9	138.4
	(100)	(100)	(100)	(100)	–	(98)	(99)
2022	127.0	121.0	9.3	62.7	–	68.6	138.7
	(100)	(100)	(100)	(100)	–	(99)	(96)
2021	163.2	154.3	9.3	77.1	–	114.3	189.6
	(100)	(100)	(100)	(100)	–	(97)	(97)
2020	161.6	151.1	8.7	71.6	–	282.1	228.8
	(100)	(100)	(100)	(100)	–	(95)	(96)

Sources: Based on Carbon4 Finance, ISS and World Bank data.
(1) For a description of the metrics, see the Methodological Notes. For government securities and corporate bonds, the size of the portfolio refers to the face value of the securities, while for equity it refers to the market value. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Table A6

Scope 3 emissions: Supplementary Pension Fund 2020-24 (1)

(absolute values, unless otherwise specified)

Metrics	Other securities		
	Supra and agency bonds	Corporate bonds	Equity
Total carbon emissions (Scope 3) (tCO_2eq)			
2024	–	68,698 (97)	165,109 (99)
2023	–	71,494 (98)	249,984 (99)
2022	–	42,754 (99)	223,731 (97)
2021	–	33,799 (97)	221,193 (97)
2020	–	44,437 (95)	164,973 (96)
PCAF quality score (Scope 3)			
2024	–	2.9 (98)	3.2 (99)
2023	–	2.8 (99)	3.2 (100)
2022	–	2.9 (99)	3.0 (97)
2021	–	3.1 (100)	3.2 (98)
2020	–	–	–

Source: Based on ISS data.
(1) For a description of the metrics, see the Methodological Notes. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Table A7

Share of green bonds (1)
(per cent)

Portfolios	Government securities	Supra and agency bonds	Corporate bonds
Financial portfolio *(%)*			
2024	5.4	36.1	6.2
	(100)	(100)	(100)
2023	4.0	24.0	5.3
	(100)	(100)	(100)
2022	2.8	20.5	6.9
	(100)	(100)	(100)
2021	0.7	10.1	3.7
	(100)	(100)	(100)
2020	0.03	5.3	2.4
	(100)	(100)	(100)
Foreign currency reserves *(%)*			
2024	0.1	42.7	3.2
	(100)	(100)	(100)
2023	0.1	6.7	3.3
	(100)	(100)	(100)
2022	0.1	7.3	2.8
	(100)	(100)	(100)
2021	0.2	6.5	3.2
	(100)	(100)	(100)
2020	0.03	3.1	3.6
	(100)	(100)	(100)
Supplementary Pension Fund *(%)*			
2024	3.3	–	26.4
	(100)		(100)
2023	2.0	–	28.1
	(100)		(100)
2022	1.7	–	22.1
	(100)		(100)
2021	1.7	–	17.4
	(100)		(100)
2020	0.80	–	4.9
	(100)		(100)

Source: Based on Bloomberg data.
(1) For a description of the metrics, see the Methodological Notes. The degree of coverage for each metric, i.e. the percentage of the value of portfolio securities for which the metric is available, is given in brackets.

Table A8

Government securities: ESG metrics as at December 2024 (1)

(absolute values, unless otherwise specified)

Metrics	Financial portfolio				Foreign currency reserves				Supplementary Pension Fund			
	Coverage (2)	Portfolio (3)	Index (4)	Difference (5)	Coverage (2)	Portfolio (3)	Index (6)	Difference (5)	Coverage (2)	Portfolio (3)	Index (7)	Difference (5)
ESG score	(100)	6.5	7.0	-7.2%	(100)	6.7	6.6	1.8%	(100)	6.8	6.8	0.1%
Environmental metrics												
Energy intensity (*MJ per $ of GDP*)	(100)	1.9	2.3	-15.4%	(100)	3.7	3.7	0.4%	(100)	2.2	2.2	-0.1%
Forest cover *(%)*	(100)	32.5	32.8	-0.3	(100)	34.7	38.1	-3.4	(100)	32.5	32.7	-0.1
Share of renewable sources in total energy supply *(%)*	(100)	19.8	19.3	0.5	(99)	9.5	9.5	0.0	(100)	19.5	19.5	0.0
Social metrics												
Gini index	(100)	31.7	30.2	1.54	(100)	37.7	30.7	7.0	(100)	30.8	30.7	0.0
Investment in R&D *(%)*	(100)	1.4	2.1	-0.7	(100)	3.3	3.3	0.0	(100)	1.9	1.9	0.0
Female participation in the labour market *(%)*	(100)	71.6	82.4	-10.8	(100)	83.8	82.9	1.0	(100)	78.6	78.6	0.0
Governance metrics												
Democracy index	(100)	7.7	8.2	-5.2%	(100)	7.9	7.4	6.9%	(100)	8.0	8.0	0.1%
Corruption perception index	(100)	57.6	68.3	-15.7%	(100)	69.8	67.9	2.9%	(100)	64.7	64.4	0.4%

Sources: Based on BP, FAO, IEA, ILOSTAT, MSCI ESG Research, OECD, World Bank, The Economist and Transparency International.
(1) Higher scores indicate a better ESG profile, except for the Gini index. For a description of the metrics, see the Methodological Notes. – (2) Coverage means the percentage of the face value of the securities in the portfolio for which the indicator is available. – (3) The indicators marked in green are those for which the portfolio has a sustainability profile that is equal to or better than that of the index; those marked in red have a worse sustainability profile than the index. – (4) Based on an ICE index that includes euro-area government securities with an average rating of at least BBB. – (5) The difference is expressed as an absolute value or, where specified, as a percentage. – (6) The index is obtained by aggregating several ICE indices relating to government securities denominated in the currencies held in the portfolio. – (7) The index is obtained by aggregating several indices relating to euro-area government securities (provided by ICE) and to inflation-linked Italian government securities (provided by Bloomberg).

Table A9

Equity: ESG metrics as at December 2024 (1)
(absolute values, unless otherwise specified)

Metrics	Financial portfolio								Supplementary Pension Fund			
	Equity in euros				US and Japanese equity funds				Equity			
	Coverage (2)	Portfolio (3)	Index (4)	Difference (5)	Coverage (2)	Portfolio (3)	Index (6)	Difference (5)	Coverage (2)	Portfolio (3)	Index (7)	Difference (5)
ESG score	(100)	7.6	7.2	5.1%	(100)	7.3	6.6	10.4%	(99)	7.2	7.2	-0.3%
Environmental metrics												
Weighted average energy intensity *(GJ per €K revenue)*	(97)	1.5	1.8	-17.1%	(87)	0.6	0.9	-33.0%	(85)	7.0	7.4	-5.3%
Weighted average water intensity *(thousands of m^3 per €M revenue)*	(94)	10.3	12.8	-19.5%	(81)	2.2	6.2	-64.6%	(78)	2.9	2.0	46.1%
Weighted average waste intensity *(tonnes per €M revenue)*	(91)	19.5	24.2	-19.2%	(75)	168.3	137.9	22.1%	(75)	254.2	258.3	-1.6%
Waste recycling ratio *(%)*	(87)	76.0	74.4	1.6	(66)	67.7	66.5	1.2	(65)	70.1	69.8	0.3
Revenue from environmentally sustainable activities from the EU Taxonomy *(%)*	(100)	9.3	8.3	1.1	(100)	14.0	10.4	3.6	(100)	14.0	14.1	-0.1
Share of exposure to sectors with material nature-related dependencies and impacts *(%)*	(100)	49.4	50.8	-1.4	(100)	27.1	27.1	0.0	(100)	30.7	30.6	0.1
Social metrics												
Women in management positions *(%)*	(94)	30.9	30.3	0.5	(90)	31.6	31.4	0.2	(87)	31.7	31.9	-0.2
Average training hours *(hours per year)*	(89)	31.9	31.1	2.6%	(45)	24.5	24.1	1.6%	(63)	30.7	30.6	0.4%
Companies with flexible working hours *(%)*	(100)	87.5	85.8	1.7	(100)	79.5	74.5	5.0	(100)	76.8	76.6	0.2
Trade union representation *(%)*	(83)	67.9	68.4	-0.5	(42)	17.8	19.3	-1.5	(46)	43.7	43.1	0.7
Injury rate *(number of injuries per million employee-hours worked)*	(70)	3.1	3.0	1.5%	(39)	4.1	3.8	8.2%	(50)	3.5	3.4	1.9%
Governance metrics												
UN Global Compact signatories *(%)*	(100)	86.6	85.3	1.3	(100)	45.8	37.3	8.4	(100)	48.7	48.8	-0.1
Companies with an anti-corruption policy *(%)*	(100)	91.2	91.3	-0.2	(100)	96.6	96.2	0.4	(100)	82.4	82.5	-0.1
Combined CEO/Chair *(%)*	(100)	13.5	14.3	-0.8	(100)	40.3	40.8	-0.5	(100)	23.7	23.4	0.3
Board members' independence *(%)*	(100)	83.0	82.0	1.0	(100)	81.0	80.2	0.8	(99)	78.8	79.2	-0.4
Women on Boards of Directors *(%)*	(100)	41.5	41.3	0.2	(100)	34.6	34.5	0.1	(99)	36.1	36.0	0.1
Pay linked to sustainability targets *(%)*	(100)	4.2	3.9	0.3	(100)	35.7	38.2	-2.5	(100)	28.5	28.8	-0.2

Sources: Based on LSEG and MSCI ESG Research data.
(1) For a description of the metrics, see the Methodological Notes. – (2) Coverage means the percentage of the market value of the securities in the portfolio for which the indicator is available. – (3) The indicators marked in green are those for which the portfolio has a sustainability profile that is equal to or better than that of the index; those marked in red have a worse sustainability profile than the index. – (4) The index is obtained by aggregating the stock market index for Italy and that for the other euro-area countries. Both exclude securities issued by financial corporations. – (5) The difference is expressed as an absolute value or, where specified, as a percentage. – (6) The index is obtained by aggregating the MSCI USA and the MSCI Japan indices. – (7) The index for the equity portfolio of the Supplementary Pension Fund is obtained by aggregating several MSCI indices relating to the different geographical areas in which the fund invests.

Table A10

Corporate bonds: ESG metrics as at December 2024 (1)

(absolute values, unless otherwise specified)

Metrics	Financial portfolio				Foreign currency reserves				Supplementary Pension Fund			
	Coverage (2)	Portfolio (3)	Index (4)	Difference (5)	Coverage (2)	Portfolio (3)	Index (6)	Difference (5)	Coverage (2)	Portfolio (3)	Index (7)	Difference (5)
ESG score	(100)	7.2	6.9	4.5%	(99)	6.9	6.2	11.3%	(97)	7.3	7.3	1.2%
Environmental metrics												
Weighted average energy intensity *(GJ per €K revenue)*	(99)	0.9	1.1	-15.6%	(80)	2.4	1.9	28.7%	(84)	1.1	1.1	-0.6%
Weighted average water intensity *(thousands of m3 per €M revenue)*	(89)	1.8	2.8	-34.4%	(81)	23.2	30.3	-23.4%	(79)	7.1	11.9	-40.2%
Weighted average waste intensity *(tonnes per €M revenue)*	(83)	174.3	94.1	85.2%	(76)	126.3	88.1	43.3%	(75)	44.6	61.7	-27.7%
Waste recycling ratio(%)	(74)	72.1	74.7	-2.6	(66)	60.7	64.2	-3.5	(65)	70.0	68.7	1.3
Revenue from environmentally sustainable activities from the EU Taxonomy *(%)*	(100)	6.9	7.7	-0.8	(99)	5.2	5.1	0.1	(99)	6.7	5.5	1.2
Share of exposure to sectors with material nature-related dependencies and impacts *(%)*	(100)	44.3	49.8	-5.5	(100)	45.4	39.0	6.4	(100)	25.6	29.1	-3.5
Social metrics												
Women in management positions *(%)*	(96)	33.3	32.3	1.1	(88)	33.8	34.6	-0.8	(88)	34.8	40.9	-6.0
Average training hours *(hours per year)*	(65)	23.5	27.4	-14.2%	(43)	29.5	33.0	-10.7%	(72)	28.7	28.9	-0.8%
Companies with flexible working hours *(%)*	(100)	0.9	83.8	-82.9	(98)	0.8	0.8	0.0	(96)	0.9	0.9	0.0
Trade union representation *(%)*	(50)	65.1	55.4	9.7	(46)	24.2	43.7	-19.5	(57)	59.9	60.9	-1.1
Injury rate *(number of injuries per million employee-hours worked)*	(52)	2.3	2.5	-7.7%	(62)	3.3	4.1	-18.9%	(47)	3.7	3.3	10.9%
Governance metrics												
UN Global Compact signatories *(%)*	(99)	0.8	0.8	0.1	(97)	0.4	0.4	0.0	(85)	0.8	0.8	0.0
Companies with an anti-corruption policy *(%)*	(99)	1.0	1.0	0.0	(97)	0.9	0.9	0.0	(85)	1.0	1.0	0.0
Combined CEO/Chair *(%)*	(100)	0.2	0.2	0.0	(99)	0.3	0.3	0.0	(98)	0.2	0.2	0.0
Board members' independence *(%)*	(95)	83.0	83.8	-0.8	(82)	85.3	81.9	3.4	(90)	83.5	83.3	0.3
Women on Boards of Directors *(%)*	(100)	39.6	39.1	0.5	(99)	34.9	33.7	1.3	(98)	40.5	40.4	0.2
Pay linked to sustainability targets *(%)*	(100)	0.1	0.1	-0.1	(99)	0.2	0.2	0.0	(98)	0.1	0.1	0.0

Sources: Based on LSEG and MSCI ESG Research data.
(1) For a description of the metrics, see the Methodological Notes. – (2) Coverage means the percentage of the market value of the securities in the portfolio for which the indicator is available. – (3) The indicators marked in green are those for which the portfolio has a sustainability profile that is equal to or better than that of the index; those marked in red have a worse sustainability profile than the index. – (4) ICE BofA AAA-A euro non-financial index. – (5) The difference is expressed as an absolute value or, where specified, as a percentage. – (6) ICE BofA 1-10 year AAA-A US corporate non-financial index. – (7) The index, provided by Bloomberg, is composed of bonds denominated in euros issued by non-financial corporations with a high credit rating.