ESG REPORT 2018

For All Generations

Government Pension Investment Fund

CONTENTS

GPIF is committed to fulfilling our fiduciary duty to secure adequate retirement funds for both current and future beneficiaries.

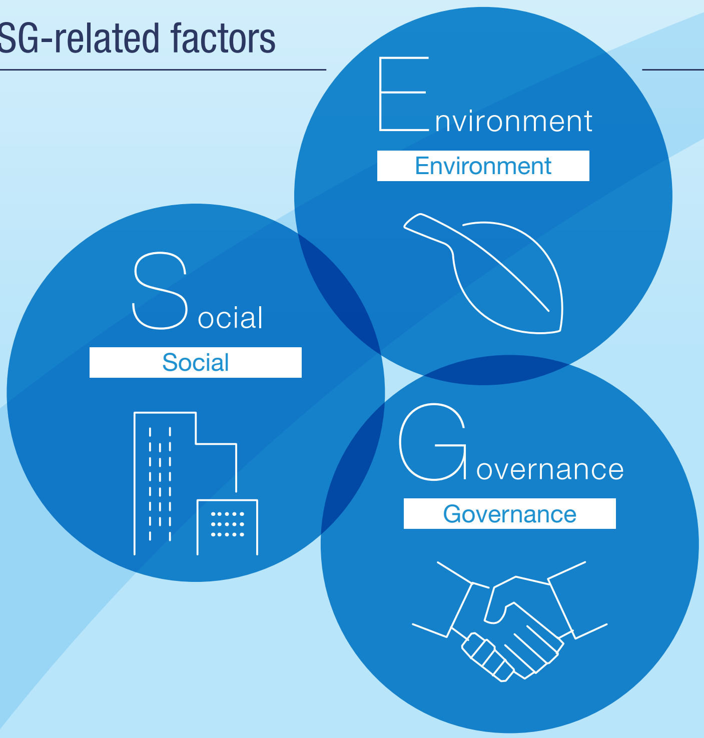
We believe that improving the governance of the companies that we invest in while minimizing negative environmental and social externalities – that is, ESG (environment, social and governance) integration – is vital in ensuring the profitability of the portfolio over the long term.

What is ESG?

ESG is the acronym for Environmental, Social, and Governance. While investors have traditionally used cash flows, profit margins and other quantitative financial data to value a company's equity or other securities, "ESG investment" also takes non-financial ESG factors into consideration.

POINT

1 Examples of ESG-related factors



Climate Change
Water resources
Biodiversity, etc.

Diversity
Supply chain, etc.

Composition of the board of directors
Protection of minority shareholders, etc.

POINT

2 GPIF as a universal owner

A "universal owner" is a long-term investor with a substantial level of assets under management that invests in securities spanning the entire capital market, which is an accurate description of GPIF. The fund is also described as a "cross-generational investor" because the pension reserve managed by GPIF will be used to lessen the burden of pension contributions made by future generations. As such, sustainable corporate value creation by each investee company and the sustainable, stable growth of the entire capital market is critical for GPIF, as a universal owner and cross-generational investor, to achieve stable returns over the long term. Furthermore, since environmental issues and social issues will inevitably impact the capital market over the long term, it is essential that we reduce the negative impact of these issues on the capital market to achieve sustainable investment returns.

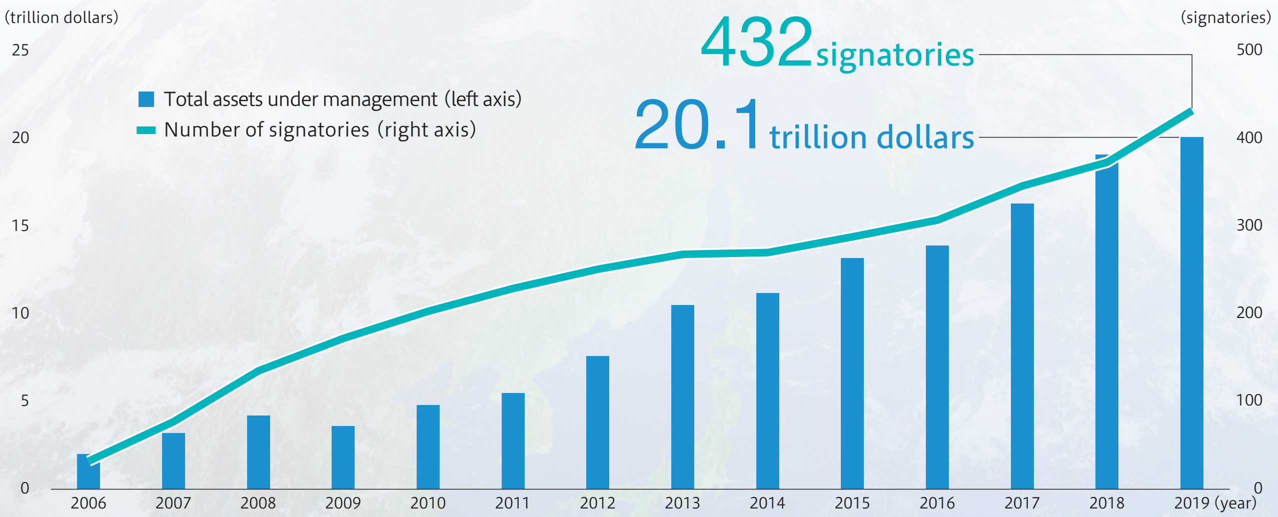
POINT

3 PRI Signatory

The term "ESG" was first popularized in 2006, when then-Secretary-General of the United Nations Kofi Annan proposed the Principles for Responsible Investment (PRI) – a new framework incorporating ESG into the investment process – to institutional investors around the globe. Criticism of the pursuit of short-term gain in capital markets has been growing in the wake of the 2008 global financial crisis, and this has been reflected in the rising number of PRI signatories. GPIF signed on to the Principles in 2015.

Integrating ESG into investment is expected to improve risk-adjusted returns over the long term. At GPIF, we are convinced that this method of investment allows us to fulfill our fiduciary duty and is in line with our investment principles, which state, "Our overarching goal should be to achieve the investment returns required for the public pension system with minimal risks, solely for the benefit of pension recipients from a long-term perspective, thereby contributing to the stability of the system."

Number and assets under management of PRI signatory asset owners



Source: PRI Data as of the end of March for each year.

Column

Divestment and GPIF

"Divestment" refers to a particular method of ESG investment in which a group of companies in a certain industry or category viewed as problematic from an ESG perspective is summarily excluded from the investment universe according to some formalistic criteria.

We do not practice divestment at GPIF. If we were to exclude a company with a significant environmental footprint from our portfolio, the value of our assets may eventually be damaged by the negative impact generated by this company in the long run. Rather, we view it as vital to encourage companies that have considerable negative ESG-related externalities to improve their business processes. The opportunity for constructive dialogue will be lost if we choose to no longer be a shareholder, and selling off our stake could result in the transfer of shareholder rights from a responsible investor to an indifferent investor, as pertaining to ESG issues.

External asset managers are responsible for investing the majority of GPIF's assets, and we proactively engage in dialogue with companies with ESG issues through these asset managers.

About GPIF

Government Pension Investment Fund (GPIF) manages and invests Japan's pension reserve fund, which is used to pay Employee Pension Insurance and National Pensions. Our goal is to contribute to the stability of the pension system by earning returns on our investments and distribute these to the government.

POINT

1 Pension system in Japan

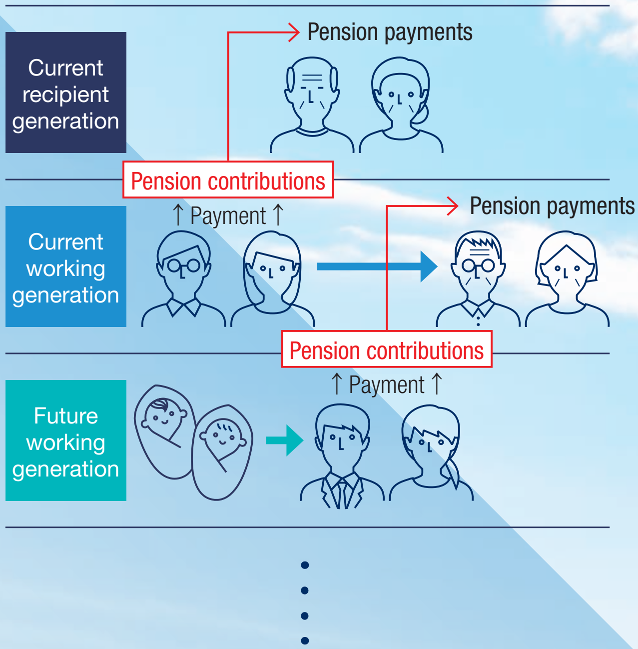
The Japanese pension system adopts the "pay-as-you-go system," in which contributions from the current working generation are used to pay the pensions of elder generations.

As the birth rate declines and the population ages at a rapid pace in Japan, in order to avoid an unduly heavy burden from being placed on future generations, pension contributions not immediately applied to payment of benefits are accumulated as pension reserves.

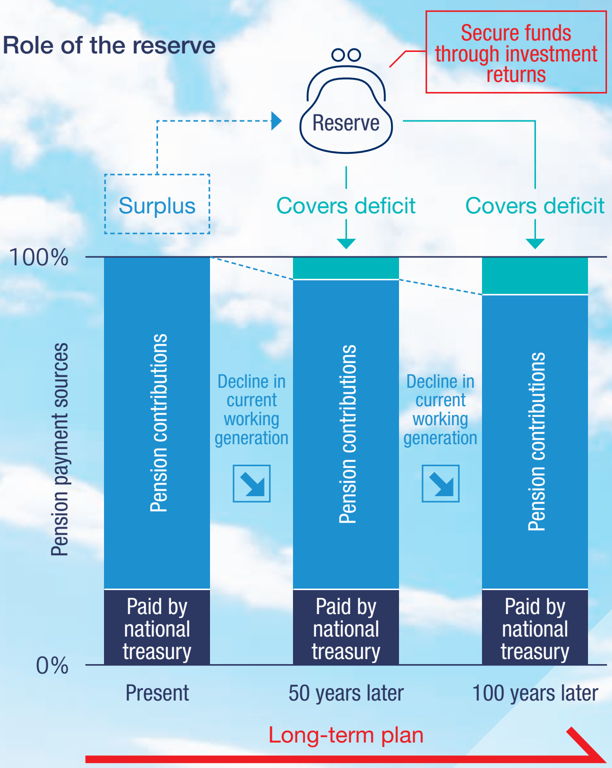
GPIF grows this reserve by investing it in capital markets in Japan and overseas. This means that we draw on growth in both the Japanese and global economies to expand the pool of funds available for future pensions. Both returns on the reserve and the reserve itself will be used to supplement pension payments to future generations as part of the 100 year pension fiscal plan. Reserves account for approximately 10% of the total resources available for pension payouts.

Pay-as-you-go system

Japan adopts a system where the current working generation supports the lives of the elderly.



Role of the reserve



Note: The above diagram is for illustrative purposes; please refer to the Ministry of Health, Labour and Welfare website for details on the public pension system.

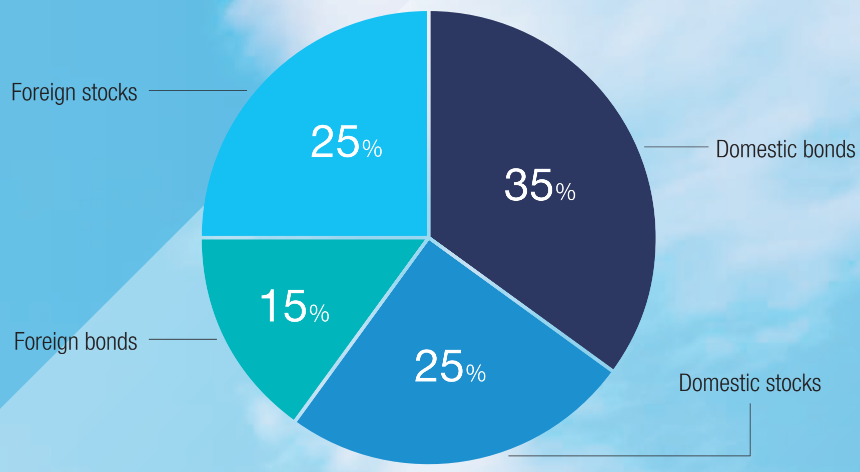
POINT

2 Long-term, diversified investment

GPIF manages the pension reserve in line with our investment principles, which state "Our primary investment strategy should be diversification by asset class, region, and timeframe. We shall achieve investment returns in a more stable and efficient manner by taking full advantage of our long-term investment horizon."

With assets under management of over 159 trillion yen as of March 31, 2019, we invest in a broad, diverse range of assets across fixed income and equities in Japan and overseas, holding 5,111 stocks and bonds from 3,457 issuers.

GPIF policy asset mix (breakdown of proportion of investment)



GPIF invests in a variety of asset classes.

GPIF in numbers

Universal owner

Assets under management

¥159 trillion

World's largest pension fund

Numbers of issuers and GPIF-owned stocks

(Stocks)

5,111 stocks

(Bonds)

3,457 issuers

+

Super long-term investor

Investment time horizon

100 years

Playing a role in pension finance with an investment time horizon of over 100 years

=

GPIF's ESG activities (investment)

Integrating ESG factors based on our Investment Principles

¥159 trillion

Assets under management tracking ESG indices

¥3.5 trillion

Rating by PRI (strategy and governance)

A+

Note: Data as of the end of March 2019. Rating by PRI is for 2018.

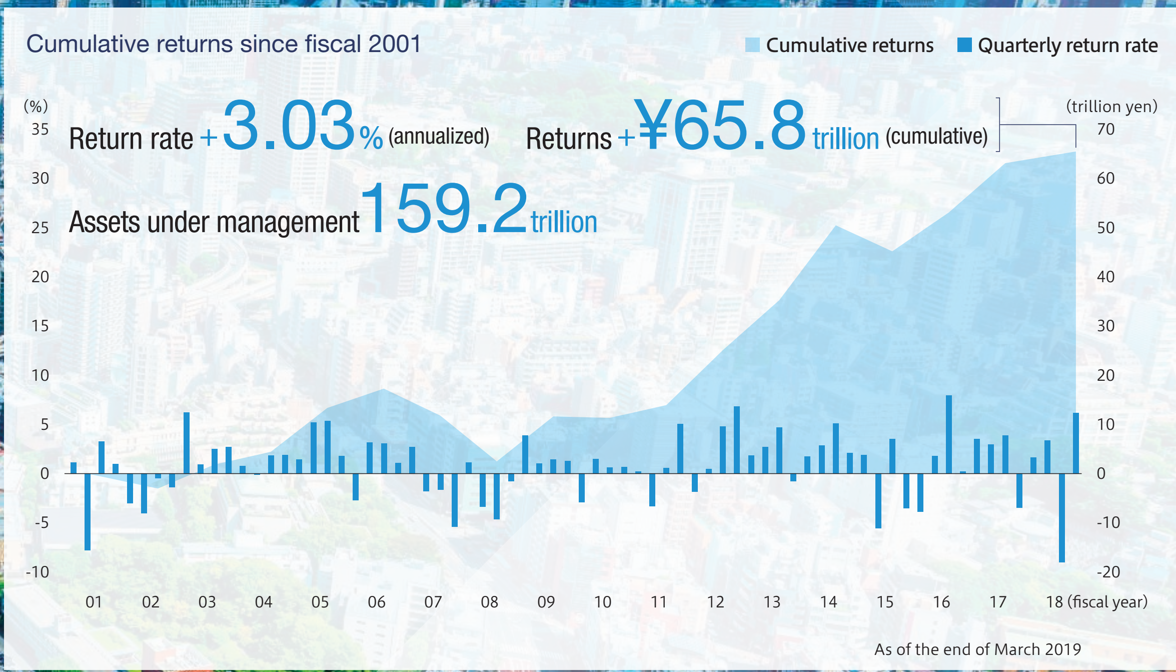
Ensuring the Stability of the Pension System

Our mission

Our mission at GPIF is to contribute to the stability of the national pension system by managing and investing the pension reserves entrusted to us by all of its beneficiaries.

We began managing assets as we are today in fiscal 2001. Since then, we've recorded a cumulative return rate of +3.03% (annualized) and total returns of 65.8 trillion yen as of the end of fiscal 2018.

Pension reserves managed by GPIF are used to prevent the burden on future generations from becoming too excessive.



Our conviction

We firmly believe that enhancing the sustainability of financial markets as a whole through ESG activities will help stabilize the pension system to the ultimate interest of all beneficiaries.

We are committed to continue promoting ESG in order to reduce the negative impact of environmental and social problems on financial markets, and thus encourage sustainable economic growth and improve returns over the long run from all the assets we manage.

We are committed to fulfilling our fiduciary duty to preserve the funds that future generations of pension beneficiaries need.

Government Pension Investment Fund, Japan

President **Norihiro Takahashi**

ESG, SDGs, and other sustainability-oriented movements gained further momentum in fiscal 2018. According to a survey by the Global Sustainable Investment Alliance (GSIA), total global assets under management classified as ESG investment hit 30.7 trillion dollars at the start of 2018, of which Japan accounted for 2 trillion dollars: 4.6 times the amount recorded during the previous survey in 2016. This makes Japan the fastest-growing country or region in ESG investment.

The shift towards ESG is happening not just among investors; but is also spreading amongst corporations. Our annual survey covering companies listed on the first section of the Tokyo Stock Exchange revealed that a steadily growing number of companies have prepared integrated reports disclosing ESG-related and other non-financial information, and showed that investors are putting these reports to better use. In addition, more companies announced that they have launched SDG-related initiatives.

Since signing on to the Principles for Responsible Investment (PRI) in 2015, we at GPIF have expanded our ESG initiatives with the goal of preserving the funds that future generations of pension beneficiaries need. In fiscal 2018, we selected and began investing with new global environmental stock indices. We also provided a clear definition of ESG integration in equity and fixed income management, and began a review of our manager evaluation criteria. In the fixed income space, we revised our investment guidelines to be able to invest in green bonds issued by international institutions. For alternative investments as well, we began to closely examine ESG initiatives during our selection of external asset managers, drew up an ESG evaluation framework, and began monitoring managers along these dimensions.

Among ESG-related issues, the damage wrought around the world from record-breaking heat waves, torrential flooding, uncontrollable forest fires and other abnormal weather conditions in FY2018 prompted an even greater focus on climate change. Current research indicates that climate change increases the frequency of heavy rain, heat waves, and other abnormal weather conditions, and the financial industry is waking up to the fact that climate change poses a material risk to both the real economy and financial markets.

In 2015, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosures (TCFD) at the request of the G20 to address how the financial sector should manage climate change risks. The TCFD published a set of recommendations in 2017, which GPIF endorsed at the end of 2018. This is our first report since announcing our support for the TCFD and is the first time that we have disclosed information in line with the TCFD's recommendations, and we don't expect to get it right on the first try. We will, however, proactively address any potential deficiency in these disclosures to incrementally improve the report year by year. We hope our efforts will provide motivation for other asset owners and asset managers to disclose TCFD information.

ESG investments take a long time to produce results. We will continue to regularly examine the impact of our activities in the ESG REPORT to confirm that we are headed in the right direction and will ultimately achieve the results that we are aiming for.

Fiscal 2018

Activity Highlights

In fiscal 2018, GPIF continued to promote ESG in new areas. Here we present the highlights of our ESG activities during the year.

Global environmental stock index selection

▶ Please refer to pages 15–16 for details.

In September 2018, GPIF announced that we will begin benchmarking approximately 1.2 trillion yen of our foreign and domestic equity portfolio to two newly-selected global environmental stock indices. These indices help significantly reduce the greenhouse gas (GHG) emissions of our portfolio by overweighting the more carbon-efficient companies within each industry, and also incorporate a mechanism to encourage better carbon disclosure by companies.

S&P/JPX Carbon Efficient Index

S&P Global Carbon Efficient Index

Endorsement of climate change-related initiatives

▶ Please refer to pages 25–26 for details.

GPIF believes that asset owners must take the initiative in tackling climate change issues.

In December 2018, GPIF endorsed the TCFD, an initiative to request companies to disclose climate change-related information.

In this report, we disclose climate-related information relevant to our portfolio in accordance with the recommendations announced by the TCFD.

In addition, in October 2018, GPIF joined Climate Action 100+, an investor-led initiative to tackle climate change issues, as a supporter.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Climate Action 100+

Green bond investment

▶ Please refer to page 18 for details.

Following up on a joint research initiative by GPIF and the World Bank Group entitled "Incorporating Environment, Social and Governance (ESG) Factors into Fixed Income Investment," the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC) – both members of the World Bank Group – drew up a new proposal to provide GPIF's external asset managers with an opportunity to invest in Green, Social and Sustainability Bonds.

ESG in external equity and fixed income management

▶ Please refer to pages 17–18 for details.

At GPIF, we invest in a broad range of equity and fixed-income assets in Japan and overseas through external asset management companies. When we conduct evaluations of these asset management companies, we look at how well they integrate ESG into their investment processes. We established a clear definition of what comprises "ESG integration" in fiscal 2018, and are further exploring setting forth specific ESG integration evaluation criteria in the future.

ESG in alternative asset management

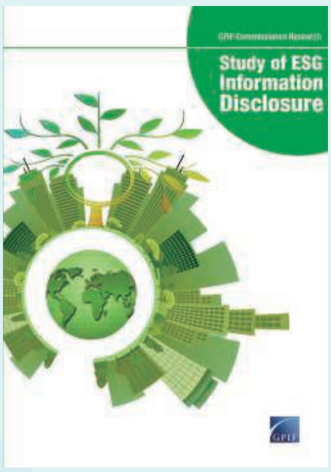
▶ Please refer to pages 23–24 for details.

At GPIF, we also take ESG factors into consideration when investing in alternative assets. We examine ESG initiatives in the process of selecting asset management companies, and monitor these managers after a mandate is awarded. In fiscal 2018, we revised ESG-related evaluation criteria for these managers based on the PRI framework and input from external consultants.

Commissioned research on ESG information disclosure

▶ Please refer to pages 29–30 for details.

Enhancing the quantity and quality of ESG-related information disclosure is critical in advancing ESG activities. In fiscal 2018, GPIF commissioned Nissay Asset Management Co., Ltd. to conduct a study of ESG information disclosure with the purpose of examining effective and efficient ESG information disclosure approaches that contribute to the sustainability of the investment chain.



ESG-Related Governance and Organizational Frameworks

The Board of Governors discusses and oversees the promotion of ESG and approaches to ESG investment at GPIF. The Executive Office promotes initiatives targeting ESG in coordination with the Investment Strategy Department, Public Market Investment Department, Private Market Investment Department, and other departments related to asset management, and reports relevant matters to the Board of Governors.

Deliberations by the Board of Governors

At GPIF, the Board of Governors, established in October 2017, makes decisions concerning important matters such as the formulation of the policy asset mix and medium-term plans by mutual consent, and oversees the execution of operations by the Executive Office.

The Board of Governors discusses and oversees the promotion of ESG and approaches to ESG investment at GPIF. In fiscal 2018, the Board of Governors met 13 times (9th to 21st meetings), and ESG-related issues were discussed at six of those meetings.

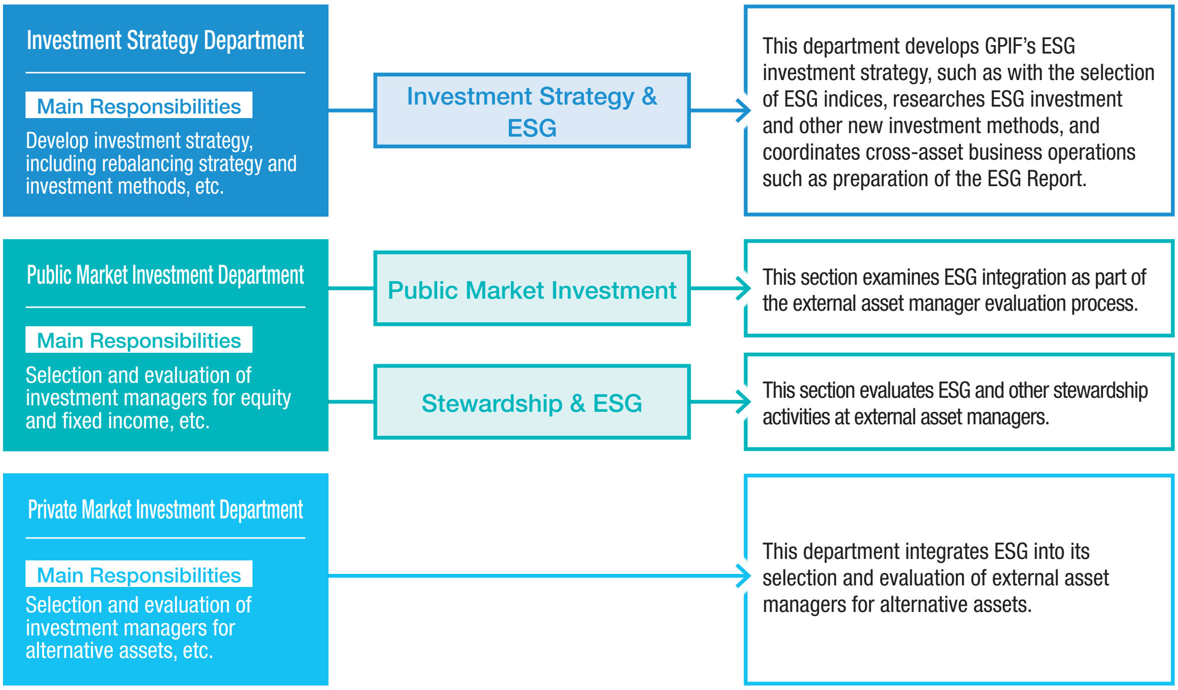
ESG-related items discussed and reported on at Board of Governor meetings

	Meeting date	Agenda item	
10th meeting	May 2018	Reported matter	Summary Report of the 3rd Survey of Listed Companies Regarding Institutional Investors' Stewardship Activities
13th meeting	July	Reported matter	ESG REPORT
		Reported matter	Global environmental stock indices
15th meeting	October	Reported matter	Participation in Climate Action 100+
17th meeting	December	Reported matter	Endorsement of TCFD
18th meeting	January 2019	Reported matter	Preparation of ESG REPORT for next fiscal year
21st meeting	March	Resolution	Plan for fiscal 2019 (draft)
		Reported matter	Report on stewardship activities in 2018

ESG-related executive structure

The Executive Office implements ESG initiatives in coordination with the Investment Strategy Department, Public Market Investment Department, Private Market Investment Department, and other asset management-related departments. The Investment Committee, chaired by the Chief Investment Officer (CIO), deliberates and makes decisions on ESG-related initiatives and other asset management-related issues, and particularly important matters are reported to the Board of Governors. Preparation of the ESG Report is also deliberated on by the Investment Committee before being reported to the Board of Governors.

Key departments responsible for ESG



Column

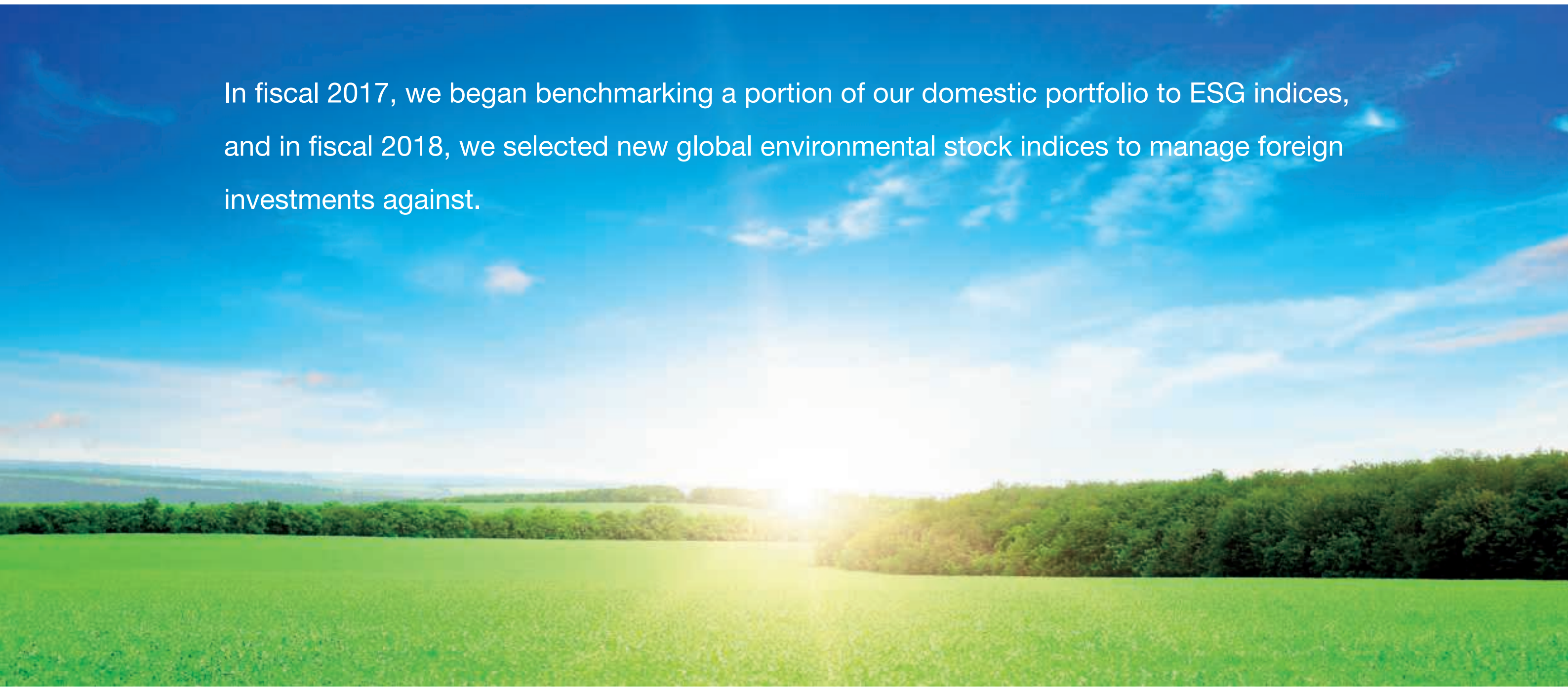
Women's participation at GPIF

GPIF understands that enhancing diversity is an important part of creating a more sustainable organization. The table on the right includes data for GPIF for the five items that companies are required to disclose under the Act on Promotion of Women's Participation and Advancement in the Workplace. These are also quantitative evaluation metrics used in the MSCI Japan Empowering Women Index (WIN). We will continue to work towards enhancing diversity, including promoting active participation by women.

(i) % women in new hires	33.3%
(ii) % women in the workforce	29.7%
(iii) Difference in years employed by the company: men vs. women*	–21.7%
(iv) % women in senior management	13.0%
(v) % women on board**	20.0%

Note: Data for **(i)** as of fiscal 2018; other data as of the end of March 2019.
Difference in years employed by the company: men vs. women* = (average years employed for women – average years employed for men) / average years employed for men. As GPIF has a small number of employees, this difference is easily affected by the status of hiring and retirement and therefore fluctuates significantly depending on the fiscal year.
At GPIF, % women on board** refers to the percentage of women on the Board of Governors, with Governors (including the President) appointed by the Minister of Health, Labour and Welfare.

Global Environmental Stock Index Selection and ESG Index-Based Asset Management



In fiscal 2017, we began benchmarking a portion of our domestic portfolio to ESG indices, and in fiscal 2018, we selected new global environmental stock indices to manage foreign investments against.

Selection of global environmental stock indices

With climate change increasingly becoming an important investment theme, GPIF announced that it was accepting applications for new global environmental stock indices in November 2017. In September 2018, we selected the S&P/JPX Carbon Efficient Index as a benchmark for domestic stocks and the S&P Global Ex-Japan LargeMid Carbon Efficient Index as a benchmark for foreign stocks – both proposed by S&P Dow Jones Indices. In tandem with this, we announced that we would begin investing approximately 1.2 trillion yen worth of domestic and foreign assets in line with these indices.

The carbon efficient indices will lead to a considerable reduction in greenhouse gas emissions coming from and mitigate climate change risk related to the portfolio. This is achieved by overweighting those companies within a given industry that are carbon-efficient (i.e. companies with low greenhouse gas emissions per unit of revenue), rather than by excluding industries with a significant environmental impact (divestment). In addition, these indices are open to relatively small listed companies that were excluded from the eligible universe for previous ESG indices. In this respect, the indices are in line with GPIF's intention to enhance and bolster the sustainability of the market as a whole. Moreover, these indices have a mechanism that overweights companies that disclose greenhouse gas emissions information, which we expect to help boost such disclosure.

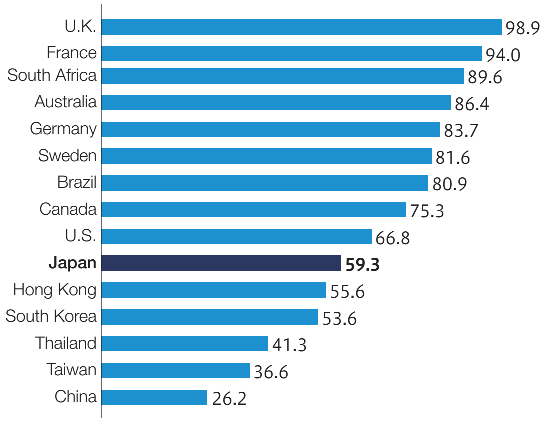
Main characteristics of the Carbon Efficient Index series

1. Within a given industry, increase exposure to carbon-efficient companies and companies that disclose information related to carbon dioxide and other greenhouse gas emissions.

2. For each industry, adjust the range of potential investment weights for item 1 above according to the extent of the environmental impact of that industry. (Industries with a larger environmental impact will have a greater incentive to improve their carbon efficiency and disclose relevant information).

3. The investible universe of the S&P/JPX Carbon Efficient Index is comprised of all companies listed on the first section of the Tokyo Stock Exchange (with certain liquidity screening requirements), which is a much broader scope than general ESG indices.

Status of disclosure related to greenhouse gas emissions (%)



Note: Constituents of S&P Global Ex-Japan LargeMid Index; data as of the end of August 2018. Whether a subject does or does not provide disclosure is based on assessment by Trucost.
Source: S&P Trucost Limited © Trucost 2019

Characteristics of ESG indices and investment status

In July 2017, GPIF announced the selection of three ESG indices for domestic stocks and began to link approximately 1 trillion yen worth of passive investment to these. In fiscal 2018, we continued expanding investment in these ESG indices in phases, and this increase coupled with a rise in stock prices resulted in total investment in global environmental and other ESG indices growing to approximately 3.5 trillion yen by the end of fiscal 2018. Please refer to "ESG Indices Performance" on pages 31–32 to see the performance of each ESG index.

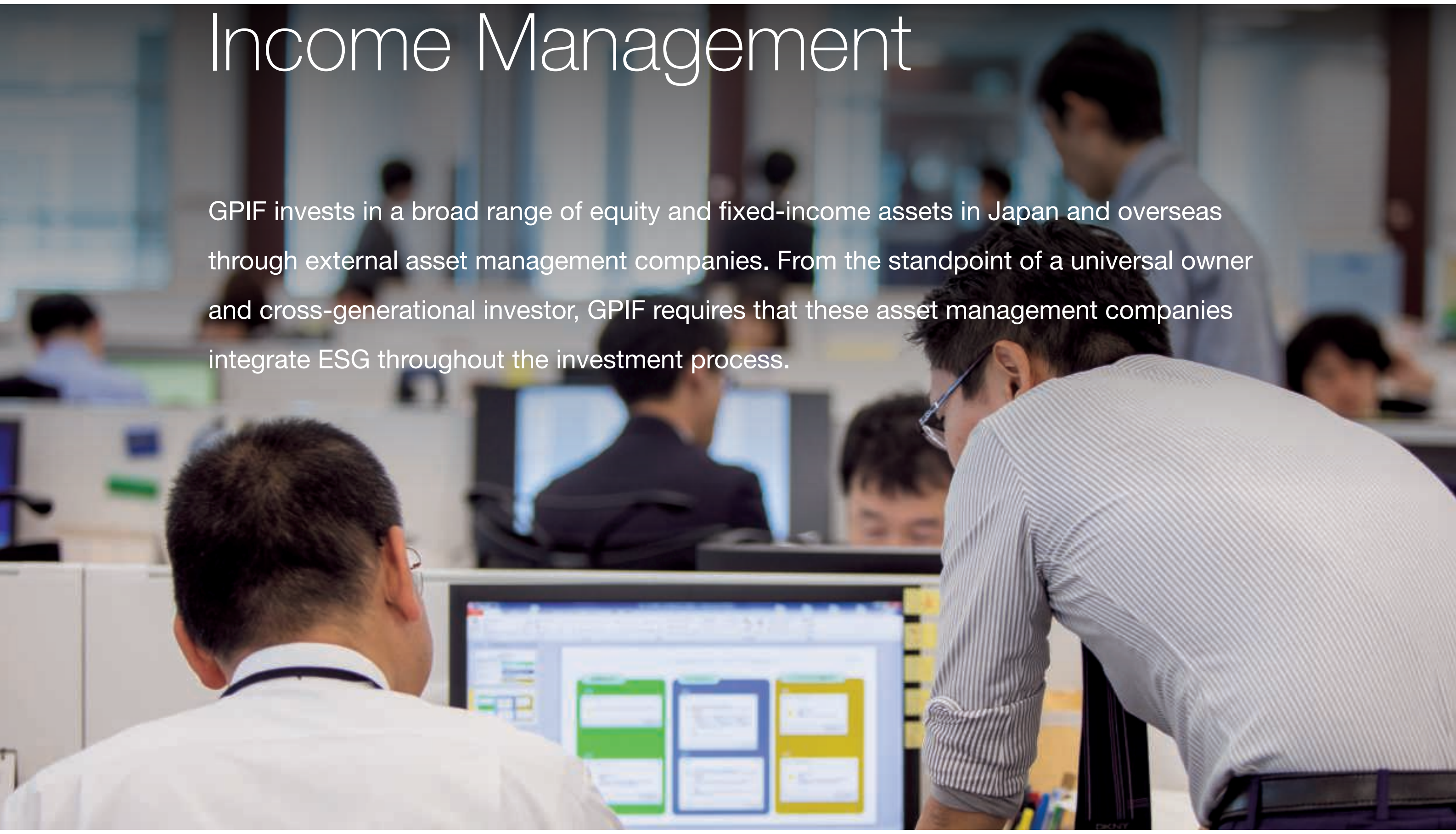
Main characteristics of ESG indices adopted by GPIF

	FTSE Blossom Japan Index	MSCI Japan ESG Select Leaders Index	MSCI Japan Empowering Women Index (WIN)	S&P/JPX Carbon Efficient Index	S&P Global Ex-Japan LargeMidCap Carbon Efficient Index
Index concept	● The index uses the ESG assessment scheme used in the FTSE4Good Japan Index Series, which has one of the longest track records globally for ESG indexes. ● The index is a broad ESG index that selects stocks with high absolute ESG scores and adjusts industry weights to neutral.	● The MSCI Japan ESG Select Leaders Index is a broad ESG index that integrates various ESG risks into today's portfolio. The index is based on MSCI ESG Research used globally by more than 1,000 clients. ● The index is comprised of stocks with relatively high ESG scores in each industry.	● MSCI calculates the gender-diversity scores based on information disclosed under "the Act on Promotion of Women's Participation and Advancement in the Workplace" and selects companies with higher gender diversity scores from each sector. ● The first index designed to cover a broad range of factors related to gender diversity.	● Based on carbon data provided by Trucost, one of the pioneers of environmental research companies. S&P Dow Jones Indices, a leading independent provider, develops the index methodologies. ● The indices are designed to increase index weights of the companies which have low Carbon to Revenue Footprints (annual greenhouse gas (GHG) emissions divided by annual revenues) and actively disclose carbon emission information.	
Subject of Investment	Domestic Equity	Domestic Equity	Domestic Equity	Domestic Equity	Foreign Equity
Parent index (number of stocks)	FTSE JAPAN INDEX (513 stocks)	MSCI JAPAN IMI TOP 700 (694 stocks)	MSCI JAPAN IMI TOP 500 (498 stocks)	TOPIX (2,124 stocks)	S&P Global ex-Japan LargeMid Index (2,556 stocks)
Number of index constituents	152	268	213	1,738	2,199
Assets under management (billion yen)	642.8	804.3	474.6	387.8	1,205.2

Note: Data as of the end of March 2019.
Source: Prepared by GPIF based on data from each index provider. FTSE Russell, data as in 2019 ©2019 MSCI ESG Research LLC. Reproduced by permission. S&P Trucost Limited © Trucost 2019

Equity and Fixed Income

ESG in External Equity and Fixed Income Management



GPIF invests in a broad range of equity and fixed-income assets in Japan and overseas through external asset management companies. From the standpoint of a universal owner and cross-generational investor, GPIF requires that these asset management companies integrate ESG throughout the investment process.

ESG integration in asset manager evaluations

GPIF invests in a broad range of assets, holding 2,380 domestic stocks, domestic bonds from 511 issuers, 2,731 foreign stocks, and foreign bonds from 2,946 issuers (Note). Most of these assets are managed externally by asset management companies in Japan and overseas, who are selected and evaluated by the Public Market Investment Department. This department evaluates managers' investment policies, asset management processes, personnel, and other business processes, and examines ESG integration as a part of this comprehensive evaluation.

As a PRI signatory, we defined ESG integration in fiscal 2018 as follows, based on the PRI definition:

> The explicit and systematic inclusion of ESG factors into investment analysis and investment decisions

A part of GPIF's evaluation criteria for asset management companies already reflects ESG factors, and we are considering establishing specific clear evaluation criteria related to ESG integration.

Note: Data as of the end of March 2019.

Evaluation of stewardship activities

As asset managers are the channel through which GPIF buys and sells stocks and exercises proxy voting rights, we promote constructive dialogue (engagement) between asset management companies and investee companies. Engagement activities are aimed at enhancing medium- to long-term corporate value, with ESG being a central theme.

In 2017, the Stewardship & ESG Section of the Public Market Investment Department formulated the GPIF's Stewardship Principles (shown on the right), and from this aspect evaluates asset manager stewardship and other engagement activities.

Passive investment accounts for approximately 90% of equity investment by GPIF. The medium- to long-term growth of the market as a whole is essential to increasing returns from this portfolio, and as such, our evaluation of passive managers is based on whether or not they contribute to improving the quality of the entire market. On the other hand, our evaluation of active managers is based on whether or not their efforts are conducive to enhancing long-term share value. Stewardship activities account for 30% of passive manager evaluation scores and 10% for active managers.

Stewardship Principles

Government Pension Investment Fund (GPIF) requires its external asset managers ("asset managers") for domestic and foreign equity investments to comply with the following principles. If an asset manager should decide not to comply with any of the principles, it is required to explain the rationale for the non-compliance to GPIF.

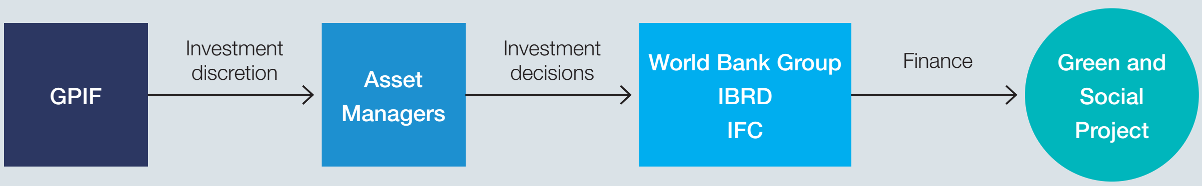
In order to fulfill its own stewardship responsibilities, GPIF continuously monitors the stewardship activities of asset managers, including the exercise of voting rights, and proactively conducts dialogue (engagement) with them.

1. Corporate governance structure of asset managers
2. Management of conflicts of interest by asset managers
3. Policy for stewardship activities, including engagement
4. ESG integration into the investment process
5. Exercise of voting rights

GPIF and World Bank Group launch new initiative to promote Green, Social and Sustainability Bonds

Government Pension Investment Fund (GPIF) and the World Bank Group have worked together to promote sustainable investment. In April 2018, they published a joint research paper entitled "Incorporating Environment, Social and Governance (ESG) Factors into Fixed Income Investment" at the 2018 World Bank Spring Meeting. Following up on this, the International Bank for Reconstruction and Development (IBRD) and the International Finance Corporation (IFC) – both members of the World Bank Group – drew up a new proposal to provide GPIF's external asset managers with an opportunity to invest in Green, Social and Sustainability Bonds. GPIF is committed to promoting ESG-based investing to limit negative environmental and social externalities and enhance the long-term return of the portfolio across all asset classes.

Investment framework



Equities and Fixed Income

Stewardship Activities and ESG Promotion

GPIF has conducted an annual survey of listed companies since 2016 in order to assess asset manager stewardship activities and understand how engagement is actually being conducted.

Survey of listed companies

Outline of the Survey Purpose and Results

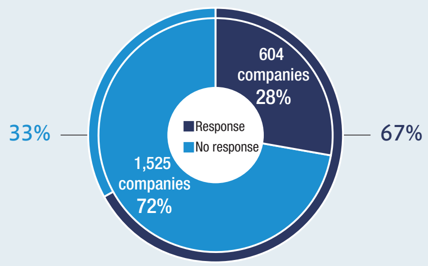
1. Purpose

- Assess asset manager stewardship activities and understand how "purposeful constructive dialogues" (engagement) are actually being conducted, while keeping updated on any changes seen over the year since the previous survey was conducted.

2. Subjects

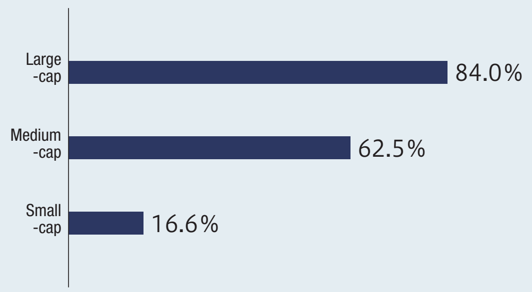
- 2,129 companies listed on the First Section of the Tokyo Stock Exchange (TSE) (as of December 20, 2018)
- Number of respondent companies: 604 (previous survey: 619) Response rate: 28.4%, Survey period: From January 10 to February 20, 2019

Response rate



(Note) Inner circle: based on number of companies
Outer circle: based on market cap

Response rate by company size



GPIF conducted the fourth survey of listed companies in 2019 from January to February. Results showed a further increase in the number of companies publishing integrated reports and holding information sessions focused on ESG issues compared with the previous year.

Among those companies that publish integrated reports, 39.4% indicated that institutional investors make better use of these reports than before – a significant jump from 17.5% in the previous survey. More companies also stated that institutional investors are highly interested in the information sessions they held on ESG issues. These results show that companies are seeing positive changes with regard to institutional investors' interest and utilization of ESG and other non-financial information.

Companies' awareness of SDGs (United Nations' Sustainable Development Goals) also continued to grow, with 96.7% indicating that they "have knowledge of SDGs," compared to just over 80% in the previous survey. The ratio of companies that have taken some type of action on SDGs was 44.7%, up substantially from 24% in the previous survey.

As for major themes in ESG activities by companies, as with the previous survey, the most cited theme was "corporate governance," with 71.2% responding that this was the most significant theme (up 3.8 percentage points from the previous year). Meanwhile, the theme with the most significant change was "climate change," with 45.5% of companies indicating this as the major theme – up 9.2 percentage points from the previous year.

Announcement of excellent integrated reports and governance reports

GPIF requested external asset managers given a mandate to manage Japanese equities to submit nominations for "excellent integrated reports," "most-improved integrated reports" and "excellent corporate governance reports." In fiscal 2018, 17 asset managers were each requested to nominate up to 10 companies for integrated reports and up to 5 companies for governance reports. A total of 67, 87 and 41 companies were selected for excellent integrated reports, most-improved integrated reports and excellent corporate governance reports, respectively.

Reports cited as excellent from multiple asset managers (among listed companies)

Excellent integrated reports

- ITOCHU Corporation Nominated by 8 companies
- MARUI GROUP CO., LTD. Nominated by 7 companies
- Daiwa House Industry Co., Ltd. Nominated by 6 companies
- Ajinomoto Co., Inc. Nominated by 6 companies
- OMRON Corporation Nominated by 5 companies
- Mitsubishi Chemical Holdings Corporation Nominated by 4 companies
- KONICA MINOLTA, INC. Nominated by 4 companies
- Recruit Holdings Co., Ltd. Nominated by 4 companies
- NSK Ltd. Nominated by 4 companies
- Mitsubishi UFJ Financial Group, Inc Nominated by 4 companies
- CAPCOM CO., LTD. Nominated by 4 companies

Most-improved integrated reports

- J. FRONT RETAILING Co., Ltd. Nominated by 4 companies
- MinebeaMitsumi Inc. Nominated by 4 companies
- SHIMADZU CORPORATION Nominated by 4 companies
- Mitsubishi UFJ Financial Group, Inc Nominated by 4 companies

Excellent corporate governance reports

- Kao Corporation Nominated by 7 companies
- Kagome Co., Ltd. Nominated by 6 companies
- EBARA CORPORATION Nominated by 6 companies
- Mizuho Financial Group, Inc Nominated by 5 companies

Material ESG issues recognized by asset managers

GPIF has identified those ESG issues that external equity asset managers consider to be material. Among passive managers, regardless of whether they managed Japanese or foreign equities, all managers listed "climate change" as a material ESG issue. Additionally, an increasing number of companies cited "climate change" as a principal theme of their ESG activities in the survey for listed companies, which means both companies and investors are attaching importance to this topic. On the active management side, managers of foreign equities also said "climate change" was a material ESG issue, while managers of Japanese equities mentioned "composition and evaluation of the board of directors." With this, we saw that active managers of Japanese equities recognize G (governance) as a material issue, and that they are focusing on a wider range of themes, such as "supply chains" and "labor standards," as compared with the previous year.

Material ESG issues listed by all asset managers under each investment management method

	Passive	Active
Domestic equities	Climate change, supply chains, misconduct	Board structure and self evaluation
Foreign equities	Climate change, diversity, water stress/water security	Climate change

Equities and Fixed Income

Engagement with Index Providers and ESG Evaluators

Index providers and ESG evaluators play an absolutely vital role in GPIF's investments. GPIF engages in dialogue with index providers and ESG evaluators to improve the sustainability of the market.

Importance of dialogue with index providers and ESG evaluators

In addition to external asset managers, index providers and ESG evaluators play an absolutely vital role in GPIF's investments. Passive investments tracking indices account for approximately 90% of our equity portfolio. Since the stocks we invest in and the weights of these investments are determined by indices calculated by index providers, these providers arguably play a critical role in determining the success or failure of our investments.

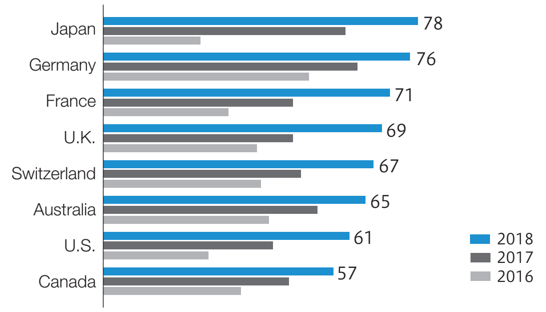
Especially in the case of ESG indices, constituent stocks and their weights vary greatly depending on ESG evaluations, so the companies that conduct these evaluations have a particularly great responsibility. As such, similar to external asset managers, GPIF conducts due diligence of index providers and ESG evaluators when selecting ESG indices by assessing their governance structures and other business processes in order to ensure the transparency and neutrality of evaluation and index selection.

We've continued to have proactive dialogues with index providers and ESG evaluators after the ESG index selection process, and also proactively participate in consultations that these companies conduct when they consider making changes to their ESG evaluation methods and/or index construction rules. Through this engagement, GPIF supports the efforts these companies make to improve ESG evaluations and the quality of indices.

Dialogues in fiscal 2018

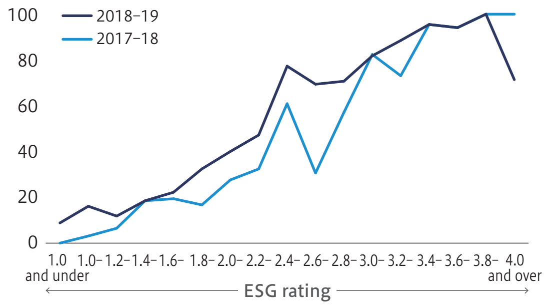
As in the previous fiscal year, in fiscal 2018, GPIF met with the ESG evaluators that it employs to discuss inquiries and opinions received from various companies. More and more firms are consulting with these evaluators when they conduct their own ESG evaluations, and according to MSCI, more Japanese firms consulted with them than any country in the world A. The percentage of companies that consult with FTSE during the ESG evaluation process is also rising B. Particularly, more companies receiving an ESG rating falling in the middle range – who may potentially be candidates for the FTSE Blossom Japan Index in the future – are consulting with FTSE. These trends may be evidence that these companies are consciously taking action to be included in ESG indices. While this is just the second year since GPIF adopted ESG indices for Japanese equities, we can already see that dialogue between the companies and index providers has become more active since the previous fiscal year.

A Percentage of companies consulting with MSCI in the ESG evaluation process (%)



Note: Only includes constituents of MSCI ACWI as of the end of 2018.
Source: ©2019 MSCI ESG Research LLC. Reproduced by permission.

B Proportion of companies that had contact with FTSE in the ESG evaluation process (%)



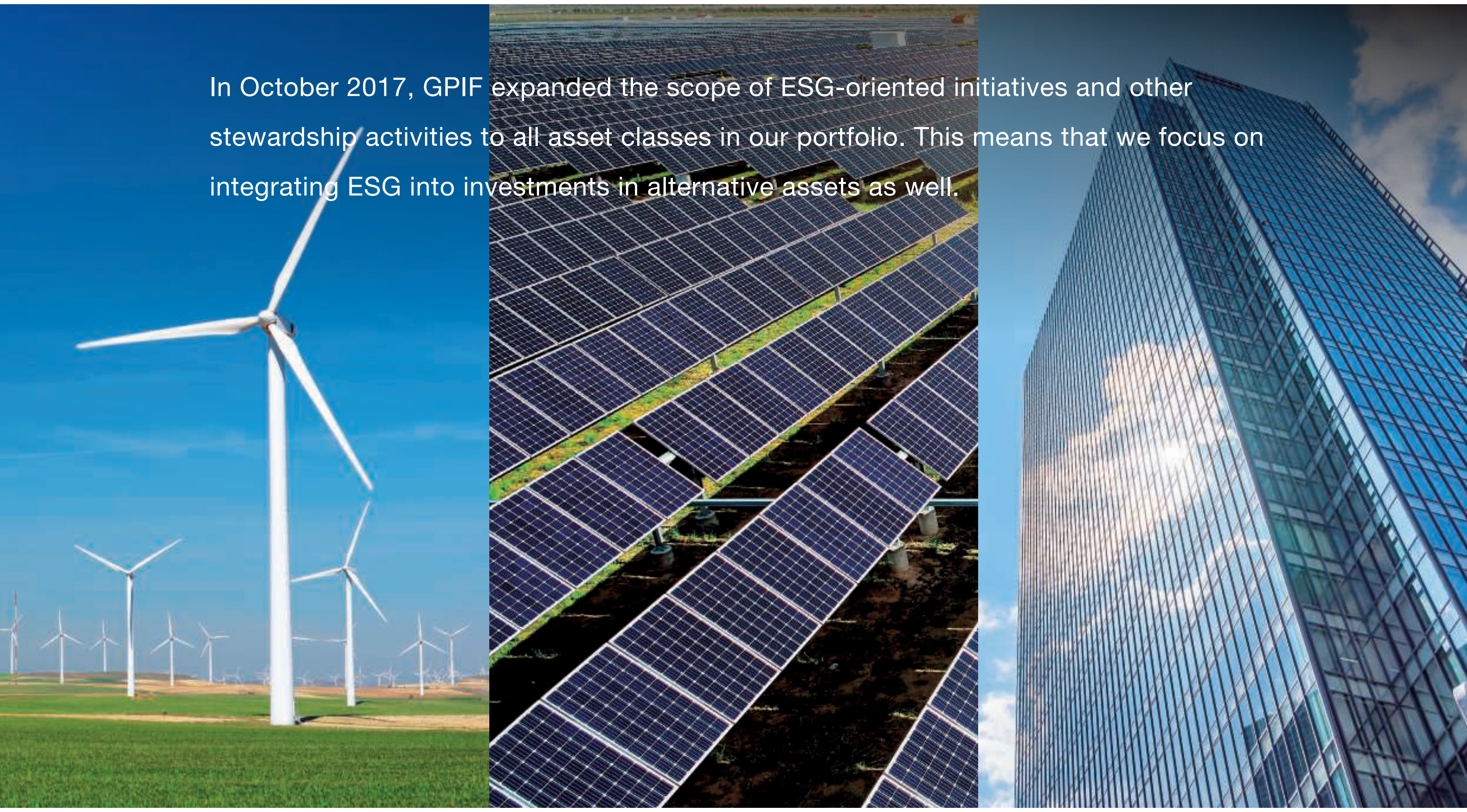
Note: Only includes constituents of the FTSE JAPAN INDEX as of the end of 2018. ESG rating is as of the end of 2018.
Source: Prepared by GPIF based on data from FTSE International Limited ("FTSE") ©FTSE 2019

Expectation for improvement in ESG scores

As can be seen on pages 35–36, Japanese companies' ESG scores have recently been improving at a relatively slower pace than those at overseas companies. As more Japanese companies take a greater interest in ESG scoring, however, we expect the pace in improvement to accelerate in the future. Also, to prevent bias towards the views and opinions of index providers and ESG evaluators, GPIF provides an opportunity for listed companies to express their perspective on ESG scoring methods and the dialogue they have with index providers and ESG evaluators by including these topics in a survey that we conduct of listed companies (page 19). Active dialogues among the major players within the investment chain – investee companies, index providers and ESG evaluators, asset managers, and asset owners – serve not only to improve ESG evaluations and increase their accuracy, but are essential in improving the sustainability of the market.

Alternative Assets

ESG in Alternative Asset Management



In October 2017, GPIF expanded the scope of ESG-oriented initiatives and other stewardship activities to all asset classes in our portfolio. This means that we focus on integrating ESG into investments in alternative assets as well.

ESG in alternative assets

The holding period for alternative assets (infrastructure, real estate, and private equity) is generally quite long, and in some cases, the asset manager itself is involved in the corporate management and business operations of the investee. As a result, more asset managers are integrating ESG factors in their investment process in order to identify and understand the risks encountered during the holding period and, conversely, find opportunities for sustainable asset value growth and improvement of corporate value. This trend has become particularly prominent among overseas asset managers in recent years.

We use the general phrase "alternative asset management," but in fact, material ESG factors differ depending on the individual characteristics of the asset and/or business in question, and the asset manager's individual investment strategies also make a difference in the ESG initiatives they engage in. With an understanding of these differences, GPIF as an asset owner monitors how alternative assets are managed and have constructive dialogues with managers.

Integrating ESG factors in real estate investment

ESG integration for investment and development of real estate includes reducing hazardous materials, promoting energy efficiency measures, bolstering environmental risk monitoring capacity, and ensuring the convenience and comfort of tenants. In the domestic real estate market, environmentally friendly properties are referred to as “green buildings” and are recognized as properties that can potentially add significant value.

Example of investment in green buildings

Integrating ESG factors in infrastructure investment

Renewable energy projects such as wind and solar power now account for approximately 30% of the total investment value of the global infrastructure market. A significant number of infrastructure funds have signed on to the Principles for Responsible Investment (PRI), consider ESG factors when conducting due diligence, and have established processes for investigating and evaluating ESG factors when deciding on an investment.

Example of investment in wind power

Integrating ESG into asset manager evaluations

(1) ESG evaluations when selecting asset managers

Since introducing an alternative asset manager selection process that adopts a multi-manager strategy in April 2017, GPIF has added an examination of prospective asset managers’ approaches to ESG to our screening criteria. Screenings are conducted from many different aspects, including through due diligence questionnaires, interviews with ESG staff, and evaluations by third-party consultants. We look at the manager’s company-wide ESG policies, how they incorporate ESG factors into their investment decisions, their oversight systems and how they report to investors after an investment is made, among other things.

(2) Post-investment monitoring

GPIF monitors asset managers in areas such as their approach to ESG and the ESG elements of the funds in which they invest to establish a diversified portfolio. In addition to requesting that each asset manager provide a report detailing the status of their ESG initiatives, we make certain to actively engage and keep up to date on these issues through regular dialogue with them.

(3) Establishing and reviewing evaluation criteria

As the alternative asset management industry starts paying more attention to ESG elements, methods for evaluation and monitoring are also gradually evolving. In fiscal 2018, we revised ESG-related asset manager evaluation criteria based on the PRI framework and input from external consultants, and will continue to pursue best practices while continuing our dialogues with them.

Collaboration with Overseas Public Pension Funds and Other Institutions

Signatory of:

PRI Principles for Responsible Investment

Signed in September 2015

GPIF has been stepping up its ESG activities since we signed the PRI in September 2015. Every year, we report our ESG activities to the PRI and receive a full assessment on how we're doing. We received an A+ rating on strategy and governance in our 2018 assessment. GPIF's Chief Investment Officer (CIO) and Executive Managing Director Mizuno has served as a Managing Director of PRI since January 2017.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

Declared support in December 2018

GPIF declared our support for the Task Force on Climate-related Financial Disclosures (TCFD) in December 2018 (See pages 27–28 for more information).

Convening the Global Asset Owners' Forum

GPIF established the Global Asset Owners' Forum together with overseas public pension funds in 2016 as a platform where we can share knowledge on stewardship activities and other issues on a regular basis. The Forum is co-organized by GPIF, CalPERS and CALSTRS. The fourth meeting of the Global Asset Owners' Forum convened in Tokyo in October 2018, and the fifth meeting convened in Washington, D.C. in March 2019. CEOs, CIOs and other members discussed the concerns and issues they had throughout the entire investment chain.

GPIF collaborates with a wide range of domestic and foreign institutions. In fiscal 2018, we participated in Climate Action 100+ and declared our support for the TCFD. GPIF has also continuously convened the Global Asset Owners' Forum.

Participated from November 2016

Both the Thirty Percent Coalition in the U.S. and the 30% Club in the U.K. are initiatives that seek diversity in listed company boards by increasing the proportion of female board members to 30%. GPIF has participated in these initiatives as an observer since November 2016.

Participated from October 2018

Climate Action 100+ is an investor-led climate change initiative launched in September 2017. Members of this initiative hold constructive dialogues with companies that have a significant impact on the resolution of climate change issues. Participants discuss improving climate change-related governance, making efforts to reduce greenhouse gas emissions, and enhancing information disclosure. Currently, 359 investors participate in the initiative*, including pension funds and other asset owners as well as asset managers. GPIF has participated in Climate Action 100+ as a supporter since October 2018.

*As of July 2019

Participating in lectures and government meetings

GPIF participates in government meetings on ESG and conducts lectures at conferences both in Japan and overseas. President Takahashi has served as a member of the "SDGs Promotion Roundtable Meetings" established under the leadership of the Sustainable Development Goals (SDGs) Promotion Headquarters of the Japanese government. Executive Managing Director Mizuno also served as a member of the "Meeting on a Long-Term Strategy under the Paris Agreement as Growth Strategy" established under the Prime Minister of Japan. GPIF will continue to seek opportunities to spread understanding of ESG investment amongst the general public.

Support for TCFD and Climate-Related Information Disclosure

GPIF declared our support for the TCFD, an initiative established to promote the disclosure of information related to climate change, in December 2018. GPIF has disclosed our climate-related information in this report in accordance with the recommendations published by the TCFD.

Climate-related information disclosure consistent with TCFD recommendations

Climate change initiatives have been spreading throughout financial markets, and with growing interest in the impact of climate change on financial systems, the G20 Summit in 2015 called on the Financial Stability Board (FSB) to investigate how the financial sector should account for the risks presented by climate change. In response, the FSB established the Task Force on Climate-related Financial Disclosures (TCFD) in December of that year, and in June 2017, the TCFD released their recommendations on how companies can better disclose information related to climate change risks and opportunities.

Currently, the recommendations of the TCFD are endorsed by 792 organizations* around the world, from pension funds, asset owners, asset managers, banks and other financial institutions to companies and national governments. We declared our support for the TCFD in December 2018.

The recommendations published by the TCFD outline a series of information disclosure practices for companies and other organizations in the fields of (1) governance, (2) strategy, (3) risk management, and (4) metrics and targets, in relation to climate change.

Although the potential impact may vary in size, global warming risks and other climate change issues exist across all companies and asset classes simultaneously, and such risks cannot be completely eliminated simply through diversification. These risks are also highly likely to manifest at least over the long-term, and we therefore believe that they should be tackled proactively by asset owners. At GPIF, we've taken actions such as linking a portion of our passive equity portfolio to environmental stock indices and investing in green bonds, in addition to announcing our support for the TCFD and Climate Action 100+.

Other than climate change-focused investments and activities, the issue is regarded as one of the most important themes for ESG activities in general. Accordingly, the "disclosures recommended by the TCFD" (on the following page) include not only initiatives that focus on climate change, but the content of ESG activities in general.

While these kinds of efforts have only just begun, GPIF will work to improve the sustainability of the entire market by promoting climate-related information disclosure and ESG in general.

* As of June 2019

Disclosures recommended by the TCFD and GPIF's response

Disclosures recommended by the TCFD		GPIF's disclosure information and page number
Governance	Disclose the organization's governance around climate-related risks and opportunities.	● GPIF proactively integrates ESG in investments according to our investment and other principles (page 58). ● The Board of Governors, which oversees the Executive Office, receives reports on ESG from the Executive Office as necessary (page 13). ● The Executive Office, which consists of officers and employees under the President, convenes Investment Committee meetings to make decisions on climate change and other ESG-related initiatives. The Office also develops an organizational framework for implementing these initiatives (page 14).
Strategy	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	● As a universal owner, GPIF stresses sustainable enhancement of the corporate value of each investee company, which is realized through minimizing the impact of environmental and social issues and fostering the long-term sustainability of society as a whole (page 3). ● GPIF proactively integrates ESG over all asset classes. In equity investment, we incorporate external asset managers' ESG activities into their evaluations (page 17), and in fixed income investment, we provide external asset managers with investment opportunities in sustainability bonds (social bonds and green bonds) (page 18). We also promote ESG integration in our alternative investments (pages 23–24). ● In relation to environment (E) in particular, we use indices for equity investment that focus on each company's carbon efficiency (pages 15–16) and invest in green bonds through fixed-income investment (page 18). ● We conduct scenario analysis on the impact that climate change-related and other policy changes have on GPIF's portfolio, and consider how to deal with this impact (pages 49–52).
Risk management	Disclose how the organization identifies, assesses, and manages climate-related risks.	● GPIF is preparing an organizational framework for monitoring the GHG emissions (carbon footprint and carbon intensity) of its entire portfolio as well as for each fund for which management has been outsourced. ● GPIF confirms each external asset manager's support for the TCFD and their policies for the future. We also promote ESG integration through our evaluations of external asset managers (page 17).
Metrics and targets	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	● GPIF is preparing an organizational framework for monitoring the GHG emissions (carbon footprint and carbon intensity) of its entire portfolio as well as for each fund for which management has been outsourced. We also perform a time-series analysis of GHG emissions (pages 45–48).

ESG Information Disclosure Study

Enhancing the quantity and quality of ESG-related disclosure information is vital to advancing a wide range of ESG initiatives. At GPIF, we researched effective and efficient ESG information disclosure approaches that are conducive to enhancing the sustainability of the entire investment chain with a particular focus on corporate disclosure methods.

Study background and issue awareness

We believe that enhancing the quantity and quality of ESG-related disclosure information is vital in advancing a wide range of ESG initiatives. In fiscal 2018, GPIF commissioned Nissay Asset Management Co., Ltd. to create the "Study of ESG Information Disclosure."

One motivation for this study is that while increased awareness about the financial materiality of ESG information has promoted better disclosure, there is currently a yawning gap between disclosure leaders and laggards. A possible catalyst behind this trend is that front line staff responsible for ESG disclosure may be bewildered by an array of different ESG disclosure standards, frameworks, and guidelines sprouting up one after another both within and outside Japan. The study also considers how to enhance the sustainability of the investment chain as a whole through effective and efficient ESG information disclosure by examining the way asset managers and asset owners (pension funds, etc.) should disclose ESG information as well.

Key findings and recommendations for companies (investor relations)

This study investigates the background of the major Japanese and global ESG information disclosure frameworks and standards, and maps them across two axes: 1) whether the framework "emphasizes information on company-driven economic, environmental and/or social impact, or emphasizes information on financial impact for the company," and 2) whether the framework "emphasizes information specific to each company, or emphasizes normalization, quantification and comparability." This approach revealed that the globally recognized "International Integrated Reporting Framework (established by IIRC)," "GRI Standards," and "SASB Standards" regard completely different information as material. The chart on the right illustrates these differences by detailing the key information required for each investment strategy and how each framework relates to each.

Ideally, corporate IR departments should disclose enough ESG information to meet a wide range of investor needs, but realistically, company resources are limited. For efficient, effective IR, companies would be well advised to first identify and focus on the "common parts" of each information disclosure framework/standard, then strategically broaden the scope of information they disclose based on an understanding of the various (ESG) investment strategies. After sorting out the individual disclosure items and indicators of the major ESG information disclosure frameworks/standards, it became clear that the SASB Standards have considerable overlap with all the other standards. Over the course of the study, however, we also found that there were subtle differences in the description of different disclosure items and indicators for each ESG information disclosure framework/standard, which made it difficult to strictly identify features as "common" or "not common" in many cases. This is one cause of confusion for companies when disclosing ESG information. To resolve this problem, several of the major ESG information disclosure organizations have collaborated to launch the Better Alignment Project in November 2018, with the purpose of clarifying common parts and differences in ESG information disclosure frameworks/standards and improving consistency in the overlapping areas.

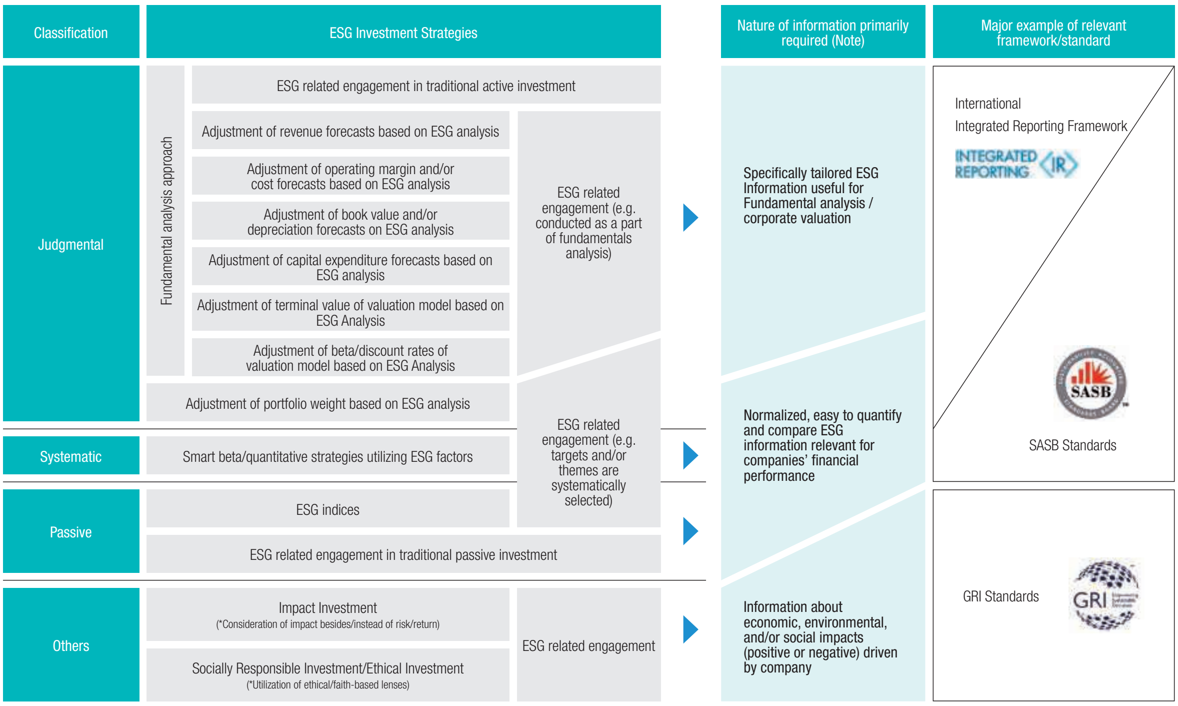
Recommendations for asset owners

Additionally, the study includes a survey of major global pension funds about the significance and purpose of ESG information disclosure for asset owners and disclosure about ESG issues that they put particular emphasis on (materiality). The interviews conducted revealed that in addition to "accountability" and "transparency," asset owners, who are universal owners, also emphasize "influence," where they strive to create an impact on the investment behavior of asset managers and the disclosure practices of investee companies. As GPIF is prohibited to directly engage with companies, this report recommends that ESG information disclosure be actively utilized as a tool for engagement. The report further recommends that, similar to other major global asset owners, GPIF should consider disclosing the ESG issues that it considers material in investment management, which would provide a useful point of reference for companies unsure about what kind of ESG information they should disclose amidst the sea of ESG information disclosure frameworks/standards.

The full text of the Study of ESG Information Disclosure is available on our website.

https://www.gpif.go.jp/en/investment/esg.html

ESG investment strategies and information needs



Note: The figure indicates only ESG information that is considered particularly important for each strategy, and does not imply that ESG information not mentioned is not useful.
Source: Prepared by Nissay Asset Management Co., Ltd. on the basis of CFA Institute & PRI (2018) "Guidance and case studies for ESG integration: equities and fixed income" and other various data.

ESG Index Performance

While the ESG indices selected by GPIF mostly outperformed market averages for the past two years, we believe that a true assessment of ESG index performance can only be made over the long term.

Attribution analysis of ESG index performance

Four out of five ESG indices selected by GPIF outperformed their parent indices and market averages (TOPIX for Japanese equities and MSCI ACWI (excluding Japan) for foreign equities) during the two years from April 2017 to March 2019 (A), but these are only short-term results. For ESG investments, the longer the timeframe, the higher risk-adjusted returns are expected to materialize, so we believe that these types of investments can only be accurately assessed over the long-term.

Among the ESG indices selected by GPIF, those that we have been investing in since 2017 – (1) MSCI Japan ESG Select Leaders Index, (2) MSCI Japan Empowering Women Index, and (3) FTSE Blossom Japan Index – have a large cap bias and are mainly composed of medium and large cap stocks due to research coverage issues in ESG evaluators. On the other hand, the TOPIX includes many small cap stocks and thus benefits from the so-called small cap effect (stocks with small market caps tend to have relatively higher returns than large cap stocks).

(B) on the right compares the performance of the above three ESG indices and the large cap index (TOPIX 100) relative to the market average (TOPIX) by dividing the price of each index by the price of the TOPIX. Between April 2017 and March 2018, the relative price of the TOPIX 100 to the TOPIX fell below one, meaning small cap stocks outperformed the overall market. This rebounded to around one, however, between April 2018 and March 2019, which meant that large cap stocks outperformed the overall market over this time.

This market environment resulted in both (1) the MSCI Japan ESG Select Leaders Index and (2) the MSCI Japan Empowering Women Index underperforming the market average (TOPIX) over one year beginning April 2017, but outperforming the same benchmark over two years beginning on the same date.

The performance of ESG indices can be significantly affected by factors unrelated to ESG, such as the small cap effect. The number of stocks included in (1) the MSCI Japan ESG Select Leaders Index increased from 500 to 700 as coverage of ESG evaluation expanded for the parent index (constituent universe) in December 2018. As the scope of ESG scoring expands to small cap stocks, ESG index performance will be able to benefit more from the small cap effect and smaller companies will have an incentive to improve their ESG scores.

A Benchmark returns of five ESG indices selected by GPIF

Domestic equities

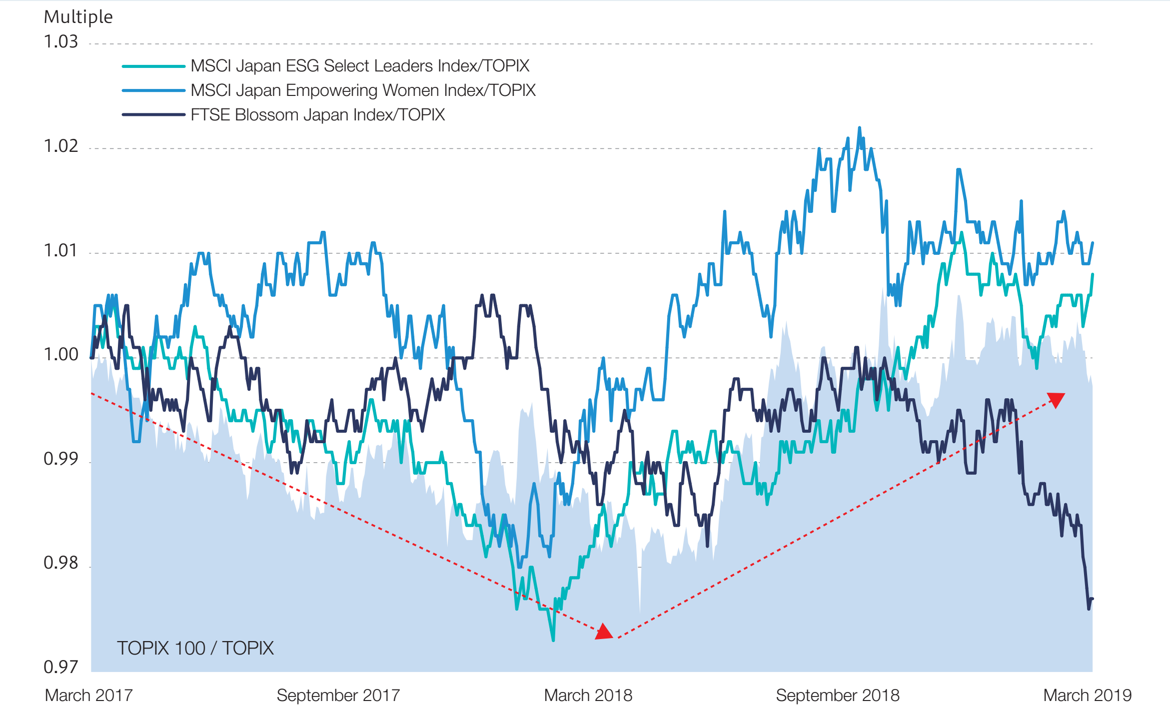
	Benchmark return			Excess return	
	ESG Index (a)	Parent index (b)	TOPIX c)	Excess return over parent index (a-b)	Excess return over TOPIX (a-c)
(1) MSCI Japan ESG Select Leaders Index	5.17%	5.14%	4.90%	0.04%	0.28%
(2) MSCI Japan Empowering Women Index	5.55%	5.15%	4.90%	0.40%	0.65%
(3) FTSE Blossom Japan Index	3.90%	5.05%	4.90%	-1.15%	-0.99%
(4) S&P/JPX Carbon Efficient Index	5.10%	4.90%	4.90%	0.21%	0.21%

Foreign equities

	Benchmark return			Excess return	
	ESG Index (a)	Parent index (b)	MSCI ACWI ex J (c)	Excess return over parent index (a-b)	Excess return over MSCI ACWI ex J (a-c)
S&P Global Ex-Japan LargeMid Carbon Efficient Index	9.16%	9.11%	8.95%	0.05%	0.21%

(Note 1) Benchmark returns are from April 2017 to March 2019 (inclusive of dividends; annualized basis) GPIF actually began investment tracking ESG indices at a different time.
(Note 2) The parent index (constituent universe) for (1) is comprised of the top 700 companies by market capitalization included in the MSCI Japan IMI Index (increased from the top 500 companies in December 2018).
The parent index (constituent universe) for (2) is comprised of the top 500 companies by market capitalization included in the MSCI Japan IMI Index.
The parent index (constituent universe) for (3) is the FTSE JAPAN INDEX.
The parent index (constituent universe) for (4) is the TOPIX.
The parent index (constituent universe) for (5) is the S&P Ex-Japan LargeMid Index.
(Source) Prepared by GPIF based on data from each index provider. FTSE Russell data is as of 2019 ©2019 MSCI ESG Research LLC. Reproduced with permission.
S&P Trucost Limited © Trucost 2019

B ESG indices (1) to (3) and small cap (size) effect



(Note) Relative prices are normalized to one as of March 31, 2017.
(Source) Prepared by GPIF based on data provided by each index provider. FTSE Russell data is as of 2019 ©2019 MSCI ESG Research LLC. Reproduced with permission.
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Portfolio ESG Scoring

GPIF invests in a broad range of equity and fixed-income assets in Japan and overseas through external asset management companies. The results of an ESG evaluation we conducted on our equity portfolio indicated that both domestic and foreign equities continued to improve.

Analysis of Portfolio ESG Scoring

Through the asset managers to which we consign investment management, GPIF invests in a broad range of equity and fixed-income assets both within Japan and abroad, with about 2,380 domestic equities and 2,731 foreign equities currently in our portfolio. Similar to last year, in this year's report we once again measured the ESG score of our equity portfolio as below.

Using ESG ratings by FTSE and MSCI, we calculated the weighted average (excluding missing values) ESG scores for each according to the market capitalization weight of each issue in GPIF's portfolio. We observed the change over the two years from 2017 to 2018.

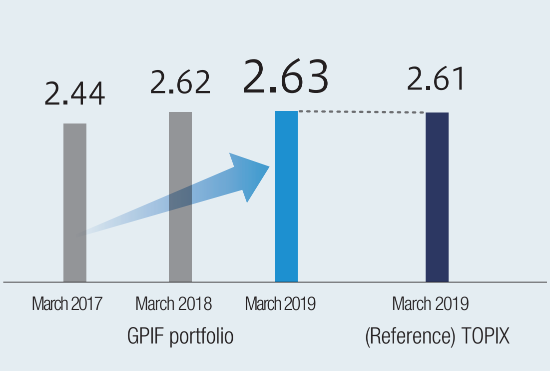
Results showed that our equity portfolio's ESG score (market cap weighted averages) for both FTSE and MSCI continued to improve for both domestic and foreign equities A to D.

Next, we compared these scores to those for the whole market by calculating the ESG scores (market cap weighted average) of market-representative indices, using TOPIX in the case of domestic equities and the MSCI ACWI (excluding Japan) in the case of foreign equities. Results showed that, similar to last year, there was little difference between the ESG scores of the index portfolios and those of the GPIF holdings for both domestic and foreign equities for both FTSE and MSCI A to D.

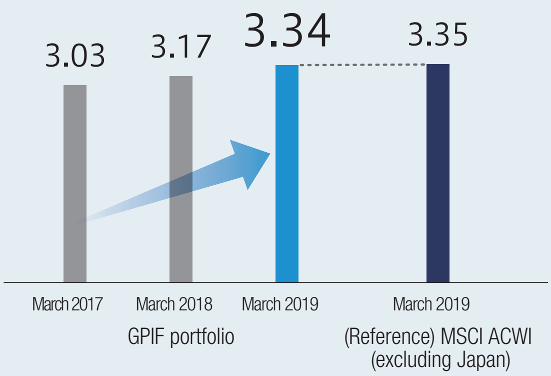
These results were most likely mainly due to the fact that GPIF's assets are largely allocated to passive investment funds, whose performance tracks the performance of their benchmarks.

GPIF, as a universal owner, aims to boost the risk-adjusted return of its portfolio while enhancing the sustainability of financial markets as a whole by integrating ESG factors into the investment process.

A FTSE ESG ratings, domestic equities (ESG scores)

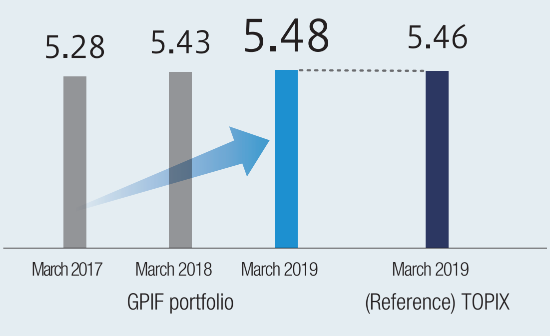


B FTSE ESG ratings, foreign equities (ESG scores)

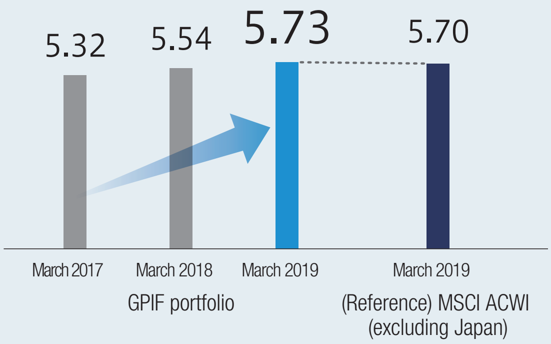


(Note) GPIF holdings: Among the stocks held by GPIF, we analyzed those subject to ESG evaluations by FTSE.
(Source) Prepared by GPIF based on data provided by FTSE. FTSE Russell data is as of 2019

C MSCI ESG ratings, domestic equities (ESG scores)



D MSCI ESG ratings, foreign equities (ESG scores)



(Note) GPIF holdings: Among the stocks held by GPIF, we analyzed those subject to ESG evaluations by MSCI.
(Source) Prepared by GPIF based on data provided by MSCI.

Column

What is a market cap-weighted ESG score?

GPIF calculates the “market cap-weighted average” of the ESG scores of its portfolio stocks in this report. While a simple average treats all elements equally, a weighted average assigns a weight to each element according to its importance. Using the ESG scores of GPIF’s portfolio companies as an example, the simple average is calculated by dividing the sum of the ESG score of all companies surveyed by the number of such companies, and the market cap-weighted average weights each surveyed company’s ESG score by the relative market capitalization of that company within the portfolio.

Generally speaking, large companies tend to perform better in ESG information disclosure and thus receive higher ESG scores. As such, a market cap-weighted average ESG score is likely to be higher than a simple average.

For example, FTSE’s market cap-weighted average ESG score for Japan’s TOPIX stock benchmark is 2.61, while page 36 of this report shows that the simple average ESG score for domestic equities is 2.18. The difference in values is mainly attributable to the difference between weighted average and simple average calculation methods.

ESG Score Ranking by Country

GPIF keeps track of the average ESG score and rate of improvement for major index component companies from each country in order to gauge the level and changes in ESG scoring for Japanese companies. Although the ESG scores of Japanese firms are improving, companies in other countries are improving at a faster rate.

ESG score ranking by country

GPIF calculated the simple average ESG score of surveyed companies for each of the nine leading countries/regions included in the major FTSE and MSCI indices as of March 2017, March 2018, and March 2019. We then created a ranking of ESG scores by country/region.

Analysis results are shown in A. Companies in western countries such as France, the U.K., and Canada are ranked highly by both FTSE and MSCI.

Rate of improvement in ESG scores by country

Next, GPIF examined the rate of improvement in ESG scores by country for the companies covered in the analysis above. The results, shown in B and C, reveal that the pace of improvement at Japanese companies has lagged that of other countries for both FTSE and MSCI ESG scores.

While Asian companies generally rank low in terms of the absolute level of ESG scores, Hong Kong and Indian companies have been improving at a particularly fast pace. This is probably due to new government and/or stock exchange mandates for listed companies to disclose ESG information and the requisite corporate response.

ESG score distribution for Japanese companies

Although we calculated the country-level average ESG score for all surveyed companies, ESG scores actually vary widely among companies within the same country. Below, we focused on the distribution of ESG scores for Japanese companies included in the above analysis.

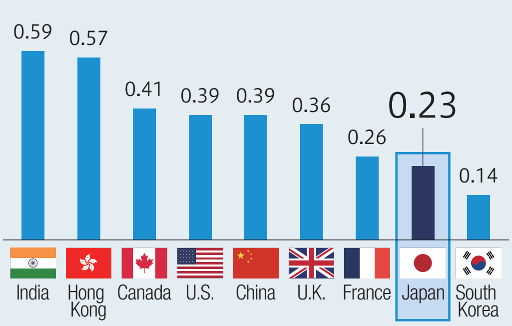
The results of this analysis are shown in D and E. We observe that in both charts, the distribution of ESG scores are shifting to the right (i.e. they are improving).

Japanese companies rank at the top among major countries in terms of the percentage of companies contacting MSCI over the course of the index provider's ESG scoring process (page 22), which illustrates a heightened interest among these companies with respect to ESG scores. They are expected to further improve their handling of ESG issues and information disclosure going forward, which will help elevate their ESG scores even higher.

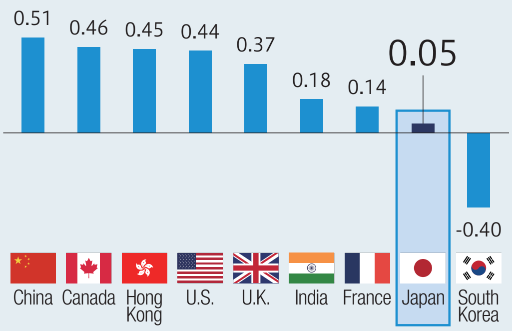
A ESG score ranking by country

FTSE				MSCI			
March 2017	March 2018	March 2019 (latest value)		March 2017	March 2018	March 2019 (latest value)	
France	France	France	3.64	France	France	France	7.19
U.K.	U.K.	U.K.	3.63	U.K.	U.K.	U.K.	6.93
Canada	Canada	Canada	3.15	Canada	Canada	Canada	5.67
U.S.	U.S.	U.S.	2.87	Japan	Japan	Japan	**5.19**
India	India	India	2.83	U.S.	U.S.	U.S.	4.95
Japan	Japan	Hong Kong	2.49	South Korea	India	Hong Kong	3.99
Hong Kong	Hong Kong	Japan	**2.18**	India	Hong Kong	India	3.96
South Korea	South Korea	South Korea	1.85	Hong Kong	South Korea	South Korea	3.42
China	China	China	1.54	China	China	China	2.69

B Rate of improvement in FTSE ESG scores by country (two years) March 2017 to March 2019

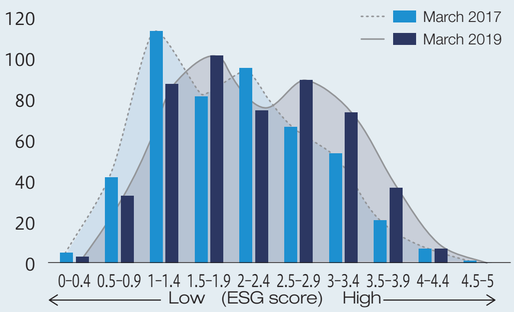


C Rate of improvement in MSCI ESG scores by country (two years) March 2017 to March 2019

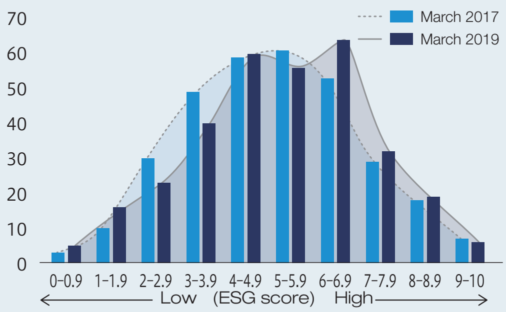


(Note) The analysis focused on companies whose ESG score data was available both at the end of March 2017 and the end of March 2019, and had changed during the two years from the end of March 2017 to the end of March 2019.

D FTSE ESG score distribution for Japanese companies
(number of companies)



E MSCI ESG score distribution for Japanese companies
(number of companies)



(Note 1) Among the companies included in FTSE's "FTSE Developed Index" and "FTSE Emerging Index" and MSCI's "MSCI All Country World Index," the analysis focused on those that had an ESG score.
(Note 2) Ranking by country and rate of improvement by country includes Hong Kong.
(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell data is as of 2019 ©2019 MSCI ESG Research LLC. Reproduced with permission.

ESG Score Correlation

Unlike financial analysis, ESG scoring has a short history and no definitive standard has been established. This means that scores vary widely from evaluator to evaluator. This year, the correlation of ESG scores was higher for foreign companies than the previous year but remained flat for Japanese companies.

Analysis of ESG score correlation

Unlike financial analysis, ESG scoring has a short history and there is currently no definitive standard for scoring methodology. Within GPIF's 2017 press release announcing the selection of ESG indices for Japanese equities, we pointed out that ESG scores vary widely among ESG evaluators. We estimate that the large discrepancy may be attributable to the fact that: (i) ESG scoring methods are still evolving and (ii) there is still room for improvement in corporate ESG disclosure. Accordingly, we began to examine changes in ESG score correlation among evaluators in last year's ESG Report.

In this year's report, GPIF selected Japanese companies that had been scored by both FTSE and MSCI in March 2017, March 2018, and March 2019, and analyzed the correlation between the two ESG evaluators' scores for identical companies A to C.

The next page provides a series of scatter charts showing the two evaluators' ESG scores for identical companies in March 2017 A, March 2018 B, and March 2019 C. FTSE ESG scores are plotted on the vertical axis and MSCI ESG scores are plotted on the horizontal axis. We then verified the correlation between the two sets of ESG scores at each point in time.

The results show that the correlation became stronger from March 2017 A to March 2018 (B), but largely remained flat from March 2018 B to March 2019 C.

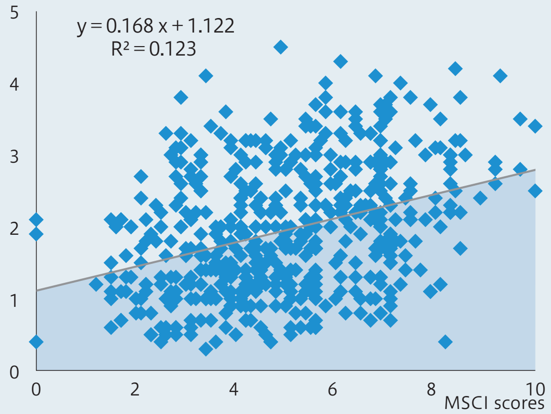
Similar to Japanese companies, GPIF also selected foreign companies that had been scored by both FTSE and MSCI in March 2017, March 2018, and March 2019, and analyzed the correlation between the two ESG evaluators' scores for identical companies.

The results show that the correlation for foreign companies continued to get stronger from March 2017 to March 2018, and from March 2018 to March 2019 D. Scores will likely converge to a certain extent as ESG scoring accuracy improves through better ESG disclosure and more developed scoring methodologies, and we believe this will eventually lead to corporate value creation as companies begin to appreciate ESG scores based on better methodologies and start behaving accordingly.

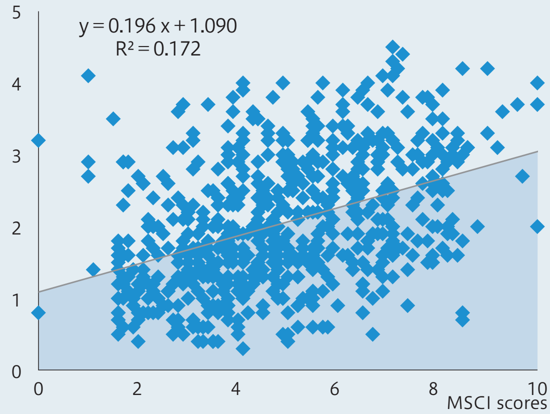
Although ESG score convergence for Japanese companies appears to have stalled, dialogues between GPIF and ESG evaluators and between ESG evaluators and companies about ESG scoring are increasing, and we hope that this leads to more convergence down the line.

FTSE and MSCI ESG score correlation charts

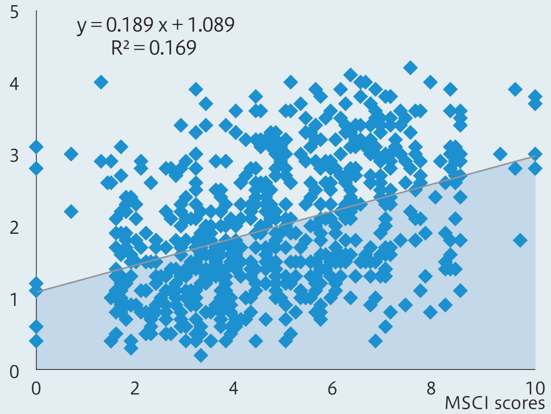
A Domestic equities (end of March 2017)



B Domestic equities (end of March 2018)



C Domestic equities (end of March 2019)



(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell data is as of 2019 ©2019 MSCI ESG Research LLC. Reproduced with permission.

D Regression analysis of FTSE and MSCI ESG scores: Coefficient of determination (R^2) and slope (β)

R^2	March 2017	March 2018	March 2019
Domestic equities	0.123	0.172	0.169
Foreign equities	0.249	0.256	0.299

β	March 2017	March 2018	March 2019
Domestic equities	0.168	0.196	0.189
Foreign equities	0.208	0.213	0.231

(Source) Prepared by GPIF based on data from FTSE and MSCI. FTSE Russell data is as of 2019 ©2019 MSCI ESG Research LLC. Reproduced with permission.

Society (S) and Governance (G) Aspects of Japanese Companies

What progress has been made by Japanese companies in terms of ESG? Among the three areas, here we provide an overview of Japanese companies' initiatives with respect to social (S) and governance (G) issues.

Social (S) — Women in the workplace at Japanese companies

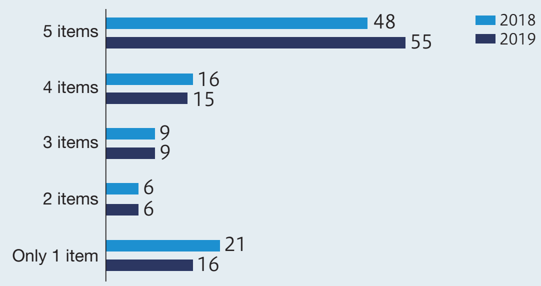
GPIF has adopted the MSCI Japan Empowering Women Index (WIN) as a benchmark for social themes within the framework of ESG. Employment and advancement of women is a key factor in human resource diversity and a central element of "S". As with the last fiscal year, below we take a look at progress made in the employment and advancement of women at Japanese companies using data utilized in the WIN index scoring methodology.

The WIN index covers, among other things, five items ((i) to (v) in B and C) for which disclosure by companies is required under the Act on Promotion of Women's Participation and Advancement in the Workplace. In this report, we reviewed how companies have progressed in disclosing information under these five categories.

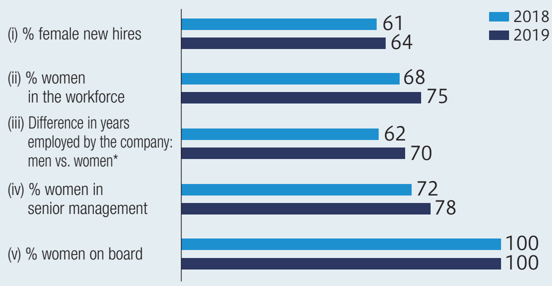
The first thing we see is that disclosure has steadily improved. Looking at the distribution of the number of items disclosed A, while the number of companies disclosing information in only one category fell, more companies disclosed information in all five categories. The rate of disclosure for each scoring item B grew across the board except for (v), which has already reached 100%.

Turning to the actual values for each item scored C, (iii) and (v) show little change, while the others slightly increased. The indicators remain low for 2019 as well, however, with "(ii) proportion of women in the workforce" standing at 18.8% and "(iv) the proportion of women in senior management" at 4.6%.

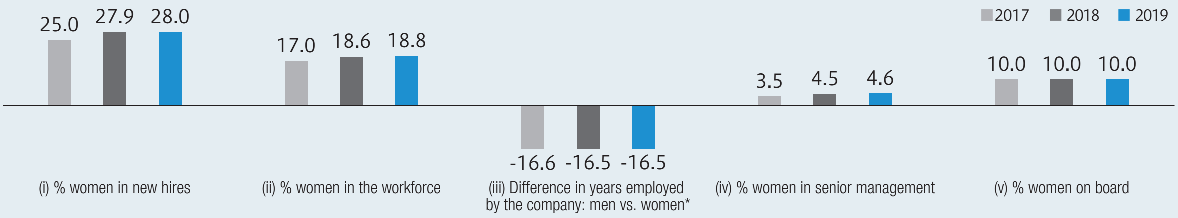
A Distribution of number of items disclosed (% of companies)



B Rate of disclosure for each score item (% of companies)



C Actual values for each score item (median, %)



Note: Research covers the top 500 listed stocks included in the MSCI Japan IMI by market capitalization. (iii) Difference in years employed by the company: men vs. women* = (average years employed for women – average years employed for men) / average years employed for men.

(Source) Prepared by GPIF based on materials from MSCI. ©2019 MSCI ESG Research LLC. Reproduced with permission.

Governance (G) – Progress made by Japanese companies in governance issues

GPIF asks external equity managers about which ESG issues they consider material, and is aware that active domestic equity managers view governance issues such as the composition and evaluation of the board of directors as a pressing concern (page 20). Likewise, in a survey of listed companies conducted by GPIF, corporate governance was the most commonly cited theme for ESG activities that they are engaged in (page 19). The Task Force on Climate-related Financial Disclosures (TCFD), which we endorse, requires not only recognition and analysis of risks and opportunities arising from climate change and related corporate strategies, but also calls for disclosure of the governance framework used for carrying out these responsibilities. In other words, strong corporate governance is crucial for companies to be able to deal with long-term issues such as climate change and other environmental and social issues. We see that investors and companies have developed a common understanding that corporate governance encourages sustainable growth and improvement in corporate value over the mid- to long-term.

The table below lists those corporate governance-related areas that are examined within the ESG indices selected by GPIF. While each ESG evaluator focuses on different aspects of corporate governance, there are several commonalities among both, including board of director composition and evaluation, dealing with corruption, and tax transparency. In evaluating a company's board of directors, both companies examine whether the board is independent from the executive office, whether individual directors have the qualifications and experience necessary to manage a business, whether the directors diligently attend board meetings, and whether or not directors are involved in a scandal.

An increase in the number of independent outside directors at companies listed on the First Section of the Tokyo Stock Exchange D, and a reduction in cross-shareholdings at major companies E are encouraging signs that corporate governance is improving.

MSCI

Corporate Governance

- Board
- Pay
- Ownership
- Accounting

Corporate Behavior

- Business Ethics
- Financial System Instability
- Corruption & Instability
- Tax Transparency
- Anti-Competitive Practices

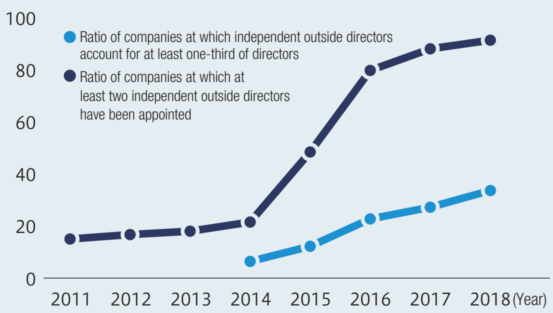
FTSE

Governance

- Corporate Governance
- Anti-corruption
- Risk management
- Tax transparency

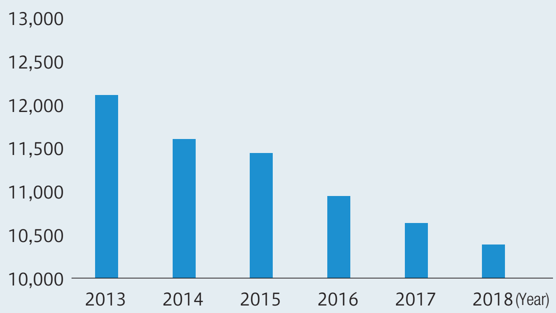
(Source) ©2019 MSCI ESG Research LLC. Reproduced with permission. FTSE Russell data is as of 2019

D Proportion of Tokyo Stock Exchange First Section-listed companies appointing independent outside directors (%)



(Source) Prepared by GPIF based on the *TSE Listed Companies White Paper on Corporate Governance 2019* published by the Tokyo Stock Exchange

E Reduction in cross-shareholdings held by major companies (cumulative) (number of companies in which stocks are held)



(Note) Values are as of March 31 each year. Includes 100 leading companies on the Tokyo Stock Exchange (TOPIX 100) excluding financial institutions and one company with special attributes (86 companies total).

(Source) Prepared by GPIF based on the *TSE Listed Companies White Paper on Corporate Governance 2019* published by the Tokyo Stock Exchange

Column

Scandals and ESG Scoring

Even as their ESG ratings improve, a growing number of Japanese companies are finding themselves embroiled in some type of serious scandal. Some research suggests that stronger ESG measures provide a check on serious scandals in the long term. We at GPIF pay acute attention to the relationship between ESG score and scandals.

Scandal assessment and difficulties in interpretation thereof

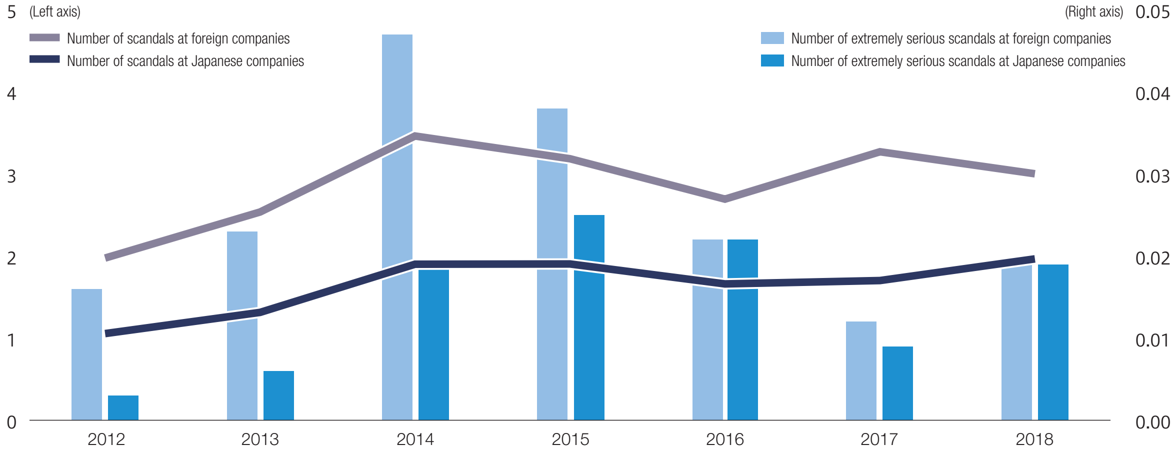
In recent years, many people have come under the impression Japan is subject to an endless number of corporate scandals. To be certain, there have been a multitude of incidents: suspect accounting by management, defects in apartment construction, and falsification of quality data — and these are only the scandals given daily coverage by the mass media. Given this state, it is hardly surprising that critics are questioning whether the ethical standards of Japanese companies have fallen, and whether their efforts at strengthening ESG and corporate governance are all form and no substance.

However, a more measured assessment reveals the extreme difficulty in evaluating scandals objectively. There is indeed a risk that people will develop an unduly negative impression when scandals are heavily colored by gossip and are fanned by the mass media for days on end. At the same time, if the general level of public concern is low, then even systematic organization-level scandals may not be seen as serious in the absence of media exposure. There is also a tendency to focus more on scandals that happen in your own country due to differences in the amount of information available. Furthermore, looking at individual cases — automobile recalls, for example — it is quite difficult to determine whether a car maker plagued by recalls is producing a lot of defective products or if the manufacturer is honest and does not conceal issues that mandate a recall. If scandals that were long concealed in the past are coming to light as a result of stepped-up corporate governance and internal controls, this may be viewed favorably as it is positive evidence that systems are working.

International comparison of scandal assessment

Based on data from RepRisk AG, where analysts use artificial intelligence to evaluate scandals using harmonized global assessment criteria, we tabulated the number of scandals involving constituents of the MSCI ACWI ex Japan Index and MSCI Japan Index A. Looking at the number of scandals per company, we find that (1) Japanese companies have fewer scandals than foreign companies, and (2) if we look only at serious scandals, the number of such cases has increased in recent years among Japanese companies, and the difference with foreign companies has disappeared. Based on this data, the intuitive impression that the number of scandals is increasing is wrong in terms of the total number, but is true in terms of serious cases.

A Number of scandals per company in Japan and overseas (no. of cases)

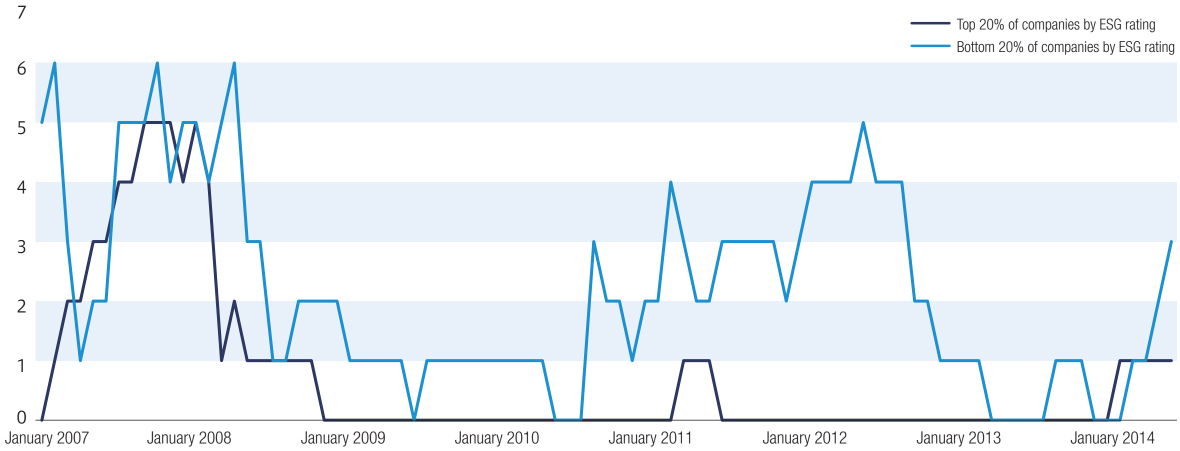


(Note) Calculated based on total occurrence of scandals that occurred in MSCI World constituent companies and evaluated by RepRisk over a one-year period, divided by the total number of constituent companies.
(Source) Prepared by GPIF based on RepRisk data

Relationship between ESG score and scandal risk

We believe a large number of investors embrace ESG integration and engagement based on the idea that companies with high ESG scores and sound corporate governance face a diminished existential threat due to fewer scandals and/or a more appropriate response thereto. In this regard, although both ESG scoring and scandal assessment are in their infancy and data and analysis is still insufficient, according to research using MSCI data, companies that have a high ESG score have been shown to have lower existential risk (= total number of companies sustaining at least a 95% loss in market capitalization over three years from each given month) than those with low ESG scores B. Looking at very recent developments, however, we do not see a pattern similar to that observed in the research given the increase in serious scandals among Japanese companies despite improving ESG scores. Taking account of these factors, GPIF will continue to focus on the way ESG scores correlate with corporate governance and scandal risk.

B Number of companies sustaining at least a 95% loss in market capitalization over three years from each given month (by ESG score) (company)



(Note) MSCI World constituent stocks
(Source) Giese, G., L. Lee, D. Melas, Z. Nagy, and L. Nishikawa. (2019). "Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk, and Performance". The Journal of Portfolio Management. forthcoming.

Portfolio Climate-Related Risk

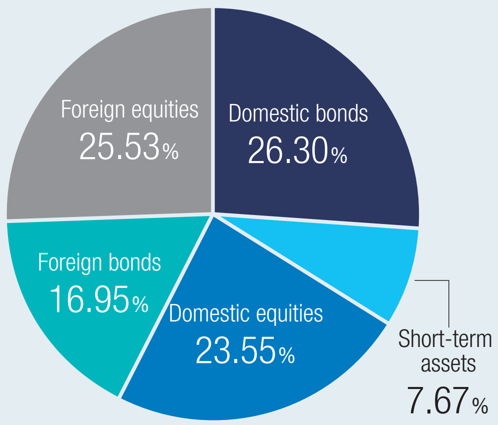
An accurate assessment of portfolio climate-related risk requires an understanding of portfolio asset classes and sector weightings.

Features of GPIF's portfolio

The GPIF conducted a portfolio climate-change analysis in line with TCFD recommendations using data provided by Trucost Plc. The analysis looked at four asset classes in GPIF's portfolio: domestic and foreign bonds and domestic and foreign equities. At this time, we have not included alternative assets such as infrastructure and real estate, which account for a relatively small part of our overall portfolio (0.26% of total market capitalization), and short-term assets (7.67%). Below are the results of an analysis of greenhouse gas emission volume (carbon footprint) and scenario analysis relating to all four asset classes using data as of March 31, 2019. Because analysis results are heavily influenced by the investment amount and sector weighting of each asset class, it is important to understand these characteristics prior to interpreting the results.

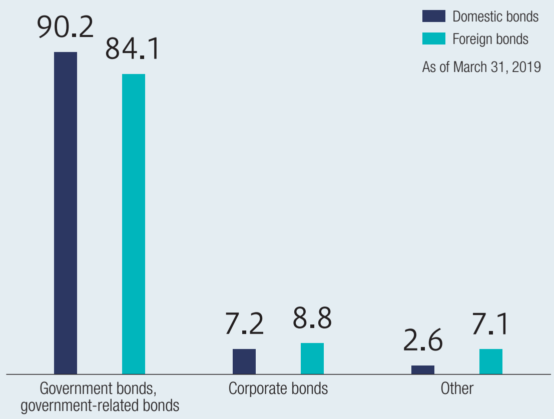
The GPIF portfolio is comprised of roughly half bonds and half equities by overall market value A. On the fixed income side, domestic bonds accounted for 26.30% of all holdings while foreign bonds accounted for 16.95%. For equities, domestic issues comprise 23.55% of the total portfolio and overseas issues 25.53%. The majority of bond holdings, both Japanese and foreign, consist of government bonds, followed by corporate bonds B.

A Breakdown of portfolio asset types (total for GPIF's pension reserves)



(Note) As of March 31, 2019
(Source) GPIF

B Breakdown by category in GPIF bond portfolio (%)



(Note) "Other" includes securitized products
(Source) GPIF

For the analysis of climate-related risk, different methods are used for government and corporate bonds. The below analysis only considers corporate bonds; an analysis of government bonds can be found on page 48.

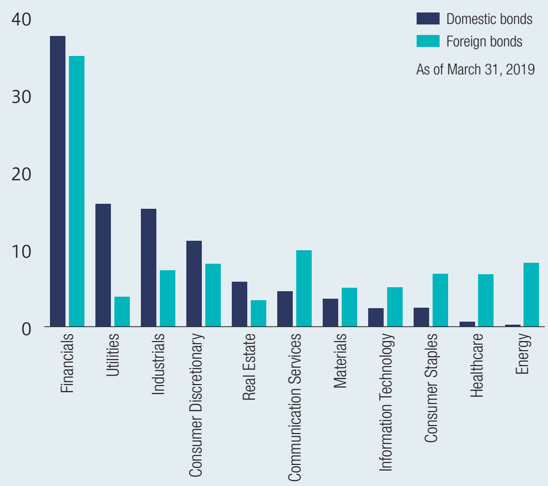
When we categorize corporate bonds by sector based on total market value, the largest sector for both domestic and foreign bonds is financials C. Among domestic bonds, the proportion of utilities is higher than that for foreign bonds. Since utilities includes electric power companies, this sector has relatively higher greenhouse gas emissions when compared with other sectors. In addition, we can see that the proportion of industrials, which also have relatively high greenhouse gas emissions, is also higher for domestic bonds.

Among foreign bonds, the proportion of energy and materials companies, which have relatively high greenhouse gas emission volumes, is greater than that for domestic bonds. On the other hand, the proportion of bonds issued by information technology, communication services and healthcare companies, who have low emission volumes, is also high. Overall, the environmental impact of foreign bond issuers is lower than that for domestic bond issuers.

Likewise, in the equities portfolio, we see a difference in the sector breakdown by market capitalization between domestic and foreign equities D. The domestic equity portfolio has a higher proportion of industrials and consumer discretionary companies, which have a high level of greenhouse gas emission volumes, while the foreign equities portfolio has a high proportion of financials and information technology companies, which are sectors that have relatively low emissions.

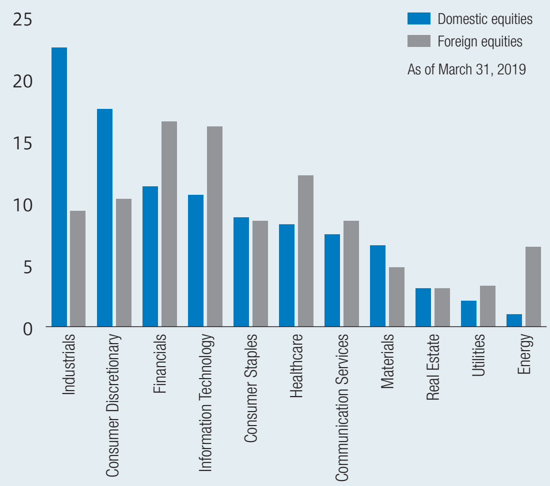
It is necessary to bear in mind these factors when examining the results of the analysis in the following pages. Around 90% of stock investments and 70% of bond investments by GPIF are passive investments, which means our investment is virtually identical to the sector ratios of each benchmark.

C Breakdown of GPIF bond portfolio by sector (%)



(Note) Among domestic and foreign bonds, only corporate issues are analyzed
(Source) GPIF

D Breakdown of GPIF equity portfolio by sector (%)



(Source) GPIF

E Greenhouse Gases emissions per million yen of sales (CO_2 equivalent tons)

$tCO_2e/mJPY$	Communication Services	Consumer Discretionary	Consumer Staples	Energy	Financials	Healthcare	Industrials	Information Technology	Materials	Real Estate	Utilities
Domestic equities	0.40	0.89	2.12	**4.55**	0.07	0.48	1.80	0.98	**7.96**	0.67	**17.35**
Foreign equities	0.43	0.81	1.78	**6.21**	0.35	0.37	1.72	0.71	**10.28**	1.25	**19.33**
Domestic bonds	0.39	0.84	1.69	**5.13**	0.07	0.43	2.10	0.85	**10.89**	0.86	**21.16**
Foreign bonds	0.35	0.94	2.04	**7.72**	0.14	0.52	1.59	0.55	**9.71**	0.73	**25.82**

(Note) In each asset class, the top three sectors by volume of greenhouse gases emitted are shaded. Among domestic and foreign bonds, only corporate issues are analyzed. Data are as of March 31, 2019.
(Source) GPIF

Portfolio Greenhouse Gas ("GHG") Emission Analysis

This analysis measures the GHG emissions of the companies held within GPIF's portfolio. Results indicate that GHG emissions for each asset class depend significantly on the size and sector bias present within each class.

Carbon footprint (GHG emissions)

The scope of GHG emissions calculated includes each company's direct carbon dioxide and other GHG emissions (Scope 1) in addition to CO_2 emissions generated by purchased electricity and the 1st tier of the supply chain (scope 2 and 3). Looking at total emissions broken down by asset class, domestic equities were found to have the highest level of emissions, followed by foreign equities, domestic corporate bonds, and foreign corporate bonds A. This does not necessarily mean that domestic companies are less carbon efficient than foreign companies, but rather reflects the relative size and sector holding bias of each asset class within GPIF's portfolio.

Across asset classes we see that significant emissions are generated not only directly but also within the supply chain, which illustrates how important it is for companies to pay attention to both aspects when formulating their GHG reduction strategies. Looking at emission trends by asset class B, from a base of 100 in FY 2016, we observed that total emissions increased across all asset classes other than domestic corporate bonds in FY 2017, while emissions for all but foreign equities decreased in FY 2018. Total GHG emissions for a given asset class largely depend on the carbon efficiency of individual companies within that class – for example, the decrease in emissions from the domestic corporate bond portfolio observed in FY 2017 resulted from both a decrease in the amount invested as well as a decrease in GHG emissions from the energy companies within that asset class. On the other hand, the divergence in emission trends between the foreign equity and foreign corporate bond portfolios in FY 2018 was due to the fact that exposure to companies in the equity portfolio that had a high contribution to total emissions and the emissions from these companies themselves both increased, while the amount invested in highly emitting companies within the bond portfolio and these emissions themselves both decreased. These examples illustrate that investment exposure and individual company efforts significantly impact trends in total portfolio GHG emissions, and that accurately assessing these trends requires a holistic approach.

Carbon intensity

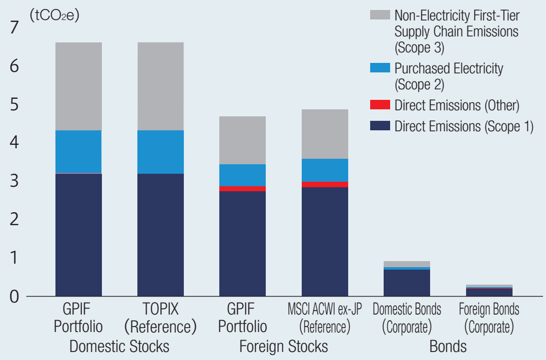
Carbon intensity is calculated by dividing GHG emissions by value added per unit or some other metric. While carbon intensity can be calculated a variety of ways, we calculate weighted average carbon intensity ("WACI"), in line with TCFD recommendations. WACI is calculated by multiplying each company's carbon emissions to revenue (C/R) by the weight of that company in the portfolio, then taking the sum of those products to get the weighted average of carbon intensity.

Out of the GPIF's four portfolios, WACI was found to be largest for domestic corporate bonds. This number was almost twice as high as that for foreign corporate bonds C. As previously explained in the "Portfolio Climate-Related Risk" section (page 43), we infer that sector biases are the main drivers of these differences. Compared to foreign corporate bonds, the domestic corporate bond portfolio includes issuances by many high GHG-emitting electric companies and other utilities, and since the ratio of utilities is relatively high even for an investor such as GPIF who holds assets across nearly the entire market, WACI for the domestic corporate bond portfolio can be expected to be higher than that for the foreign corporate bond portfolio.

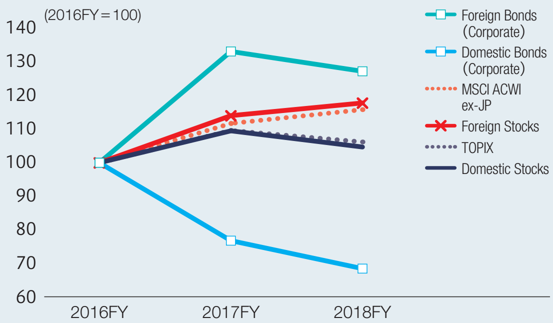
When reviewing the equity portfolio, we found that absolute carbon emissions and carbon intensities did not necessarily trend in the same direction; domestic equities had higher total GHG emissions A but also turned out to be more carbon efficient in terms of WACI when compared with foreign equities C. One main reason domestic equities had higher total GHG emissions was due to the size of manufacturing companies' weight within the portfolio.

Similar results were seen when examining portfolio exposure to coal-related activities D. The domestic corporate bond portfolio was found to have substantial exposure to coal-related businesses due to investments in companies engaged in coal-based power generation.

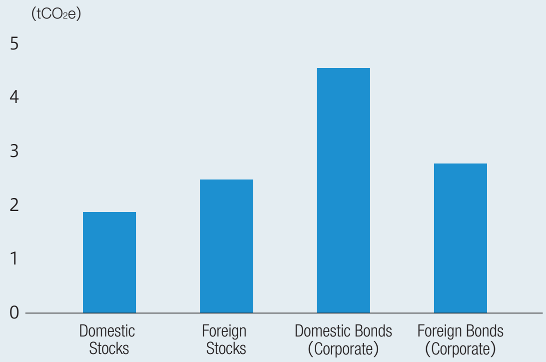
A Greenhouse gas emissions by scope



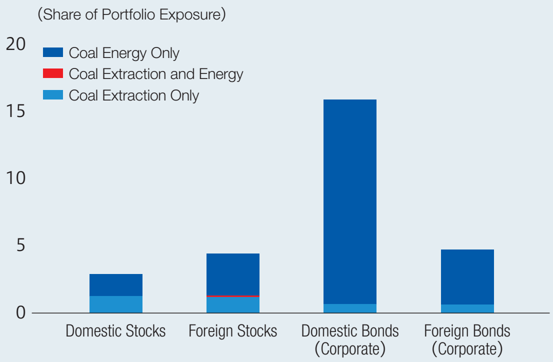
B Greenhouse gas emission trends



C Weighted average carbon intensity (WACI) by asset class



D Exposure to coal-related companies



Note: In general, Trucost uses data disclosed by individual companies to determine GHG emissions. When such data is incorrect or incomplete, however, Trucost uses a proprietary model to estimate emissions.
(Source) S&P Trucost Limited © Trucost 2019

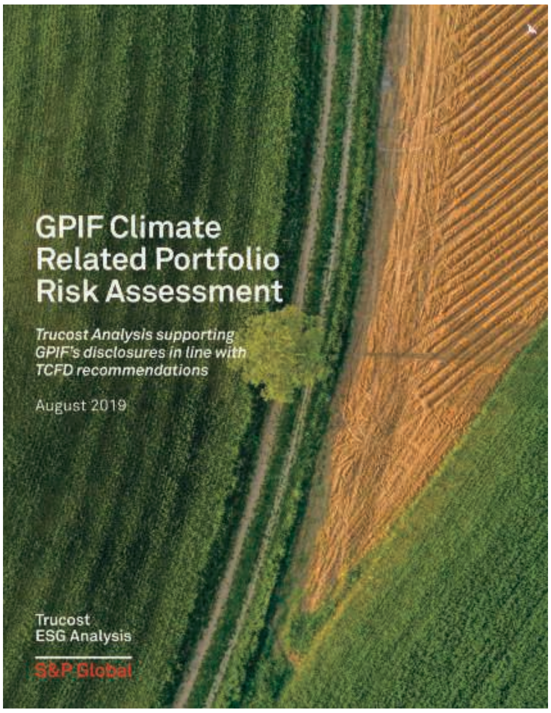
Trucost Report

Trucost's "GPIF Climate Related Portfolio Risk Assessment (Summary)" report

Trucost, a UK-based consultancy, was commissioned by GPIF to conduct the analysis for TCFD-aligned climate-related disclosures. Portions of this expansive, comprehensive analysis not highlighted in this ESG report can be found in the "GPIF Climate Related Portfolio Risk Assessment (Summary)" report available separately.

About Trucost

Established in 2000, Trucost is a pioneer in the field of carbon data and reporting, and has compiled a comprehensive and growing dataset that includes over 15,000 companies. Acquired by S&P Global in October of 2016, Trucost is continuing to provide not only environmental data, but also essential ESG related data on a global scale.



Reference

Carbon intensity as an indicator

Carbon intensity, which is calculated by dividing carbon emissions by some unit of business activity, is a specific type of carbon efficiency indicator that can be used to make comparisons across sectors or individual companies. The unit used in the denominator can be revenue, units produced, value invested, or some other metric. The analysis conducted by Trucost examined carbon emissions to total revenue (C/R) and carbon emissions per value invested (C/V).

Investors should also analyze their portfolio's Weighted Average Carbon Intensity ("WACI"), which indicates carbon intensity proportional to the investment weight for each company within the entire portfolio's market capitalization. TCFD guidelines for asset owners cite WACI as a preferred disclosure metric. In this report, WACI was calculated using C/R and the value invested for each company in each GPIF portfolio.

In addition, the Carbon Efficient Index Series which are employed as benchmarks by GPIF also consider carbon efficiency (carbon intensity) – calculated by dividing GHG emissions by revenue – in determining the weight of each individual constituent within the index.

Sovereign bond climate change risk analysis

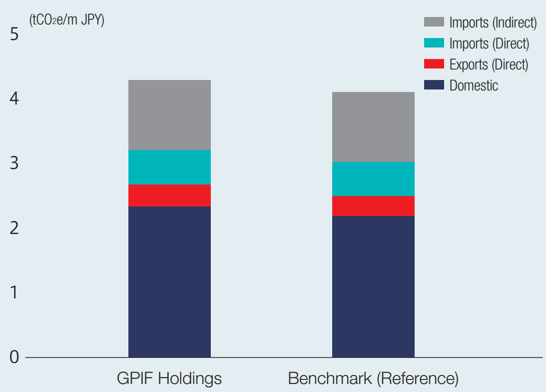
The bond portfolio climate risk analysis in this report until this point has been limited to only corporate bonds and has not included sovereign bonds, because while conducting an analysis across different types of assets using the same evaluation criteria would be ideal, the inherent differences between sovereign bonds and corporate bonds necessitate a different approach. For this reason, we combine Japanese Government Bonds and foreign sovereign bonds into a separate, independent category to measure and analyze the carbon footprint of these particular assets.

There are broadly two ways to evaluate an investor's scope of responsibility with regards to their sovereign bond portfolio: one is to consider only GHG emissions produced by the government sector of the nation issuing the bond, while the other takes into account the entire sphere of influence of the nation as a whole, including GHG emissions generated from the activities of that country's corporations and individuals. The analysis conducted for this report adopts the latter viewpoint.

There are several other issues in aggregating the data. For example, if the weighted average carbon footprint is calculated using the value of a given country's debt held in the portfolio divided by the total amount of debt issued by that country, then investing in the sovereign debt of countries that have a higher level of debt will seemingly be more efficient (i.e. lower climate change risk). As such, rather than simply taking the sum of the carbon footprints of each country held in the sovereign bond portfolio, this analysis adopts the same weighted average carbon intensity (WACI) calculation method used in evaluating corporate bonds. Specifically, we multiply GHG emissions per dollar of GDP for each country within the GPIF's sovereign bond portfolio by that country's weight in the portfolio, then add those values to get the weighted average. This value is then compared to the benchmark (a combination of the amount invested in Japanese Government Bonds and the FTSE World Government Bond ex. Japan Index).

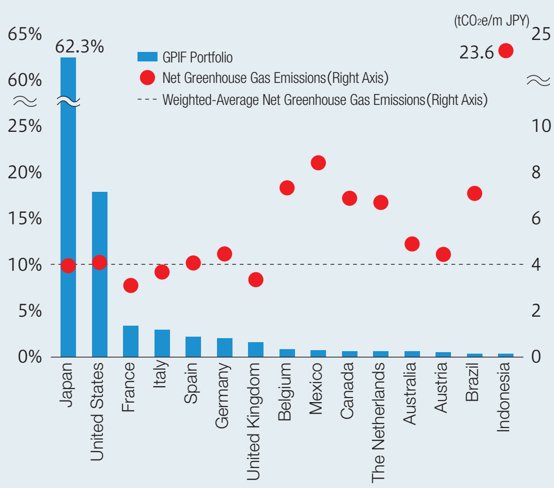
Since GPIF invests in sovereign bonds in a primarily passive manner, the results of the analysis showed that the portfolio had a very similar WACI to the benchmark E. Next, by examining the carbon intensity and the respective exposure for each major sovereign holding in the GPIF's portfolio, Japanese Government Bonds and French sovereign bonds appear to have the most positive impact with respect to improving the WACI of the overall portfolio F.

E WACI of GPIF's sovereign bond investments



Note: As of the end of FY2017, due to usage of GDP data
(Source) S&P Trucost Limited © Trucost 2019

F Carbon intensity by country and weight in GPIF sovereign bond portfolio



Note: As of the end of FY2017, due to usage of GDP data
(Source) S&P Trucost Limited © Trucost 2019

Portfolio Scenario Analysis

— Transitioning towards a 2˚C target —

The GPIF conducted a scenario analysis of our portfolio to attain a better understanding of our current alignment with 2˚C targets. The methodology employed a "transition pathway analysis." According to the analysis, which was performed by Trucost, GPIF's current portfolio is not aligned to achieve 2˚C targets.

Transitioning to a 2˚C target

In the past, GHG emissions analyses have generally taken a backward looking approach, but by using the data currently available and setting some assumptions, a scenario analysis can provide insight into the impact that future emissions may have.

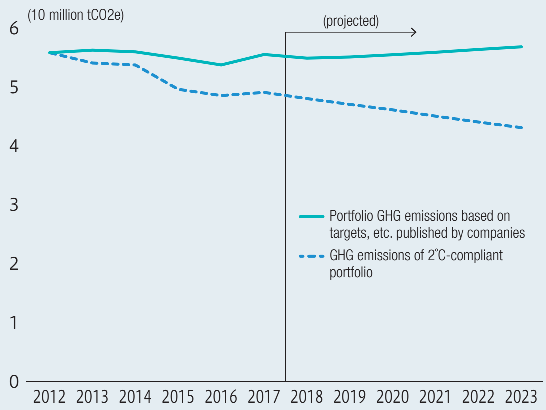
Here, Trucost has conducted a transition pathway analysis (page 50) which uses the GHG emissions for each of the GPIF portfolio companies to analyze emission trends from 2012 through to 2023. One of the lines (solid) shown in Graph A is based on data such as publicly disclosed company GHG emission reduction targets. The other line (dashed) shows the pathway when companies in the portfolio are successful in aligning their GHG emission reduction targets to a 2˚C target.

The pathway for 2˚C target alignment indicates that while GPIF needed to achieve continuous GHG emission reductions in its portfolio since 2012, actual emission levels remained constant over the years. Meeting the 2˚C target by 2023 will require continuous reductions of portfolio GHG emissions collectively, and considering current individual company GHG emission targets, achieving the portfolio target will be difficult.

Exhibit B compares potential temperature increase scenarios by asset class. Out of all asset classes, only the scenario for domestic bonds (corporate bonds) is likely to meet the 2˚C target. As already explained in "Portfolio Climate-Related Risk" (page 43), a large portion of domestic bonds (corporate bonds) are attributed to the utilities sector. Some companies in this sector have been open to setting reduction targets given their enormous levels of GHG emissions, and this has pushed down the temperature rise scenario for domestic bonds (corporate bonds) below the 2˚C target. In contrast, the scenarios for all other asset classes predict temperature rises of 3˚C or above, pushing up the scenario for the entire portfolio to 3˚C or above.

In theory, it is possible for an asset owner to align its portfolio GHG emissions with the 2˚C target through divestment, but the GPIF is steadfast in its policy of addressing climate change and other ESG challenges by engaging in efforts to promote improvement at invested companies rather than divesting and losing its position as a shareholder (see the column on page 4).

A GHG emissions pathway of GPIF portfolio holdings (2012 to 2023)



(Source) S&P Trucost Limited © Trucost 2019

B Level of warming by asset class

Overall Portfolio	>3℃
Domestic Equities	>3℃
Foreign Equities	>3℃
Domestic Bonds (Corporate)	<2℃
Foreign Bonds (Corporate)	>3℃

(Note) "<2˚C" indicates that the portfolio is in line with a 2˚C target, while ">3˚C"indicates that the portfolio is consistent with a scenario in which average global temperatures rise by 3˚C or more by the year 2100.
(Source) S&P Trucost Limited © Trucost 2019

Reference

Overview of transition pathway analysis methodology

A transition pathway analysis can be used to examine alignment with the carbon budget, which is the limit to GHG gas emissions required to keep global warming below a certain threshold. This analysis examines whether emissions from portfolio holdings are aligned with the 2˚C target set by the Paris Agreement.

The analysis results show: 1) the model case, in which the trajectory of GHG emissions from portfolio holdings are in line a 2˚C target taking into account each constituent's portfolio weight, and 2) the current status, which shows the trajectory of emissions based on forward looking data such as GHG emission reduction targets publicly disclosed by portfolio companies. We can get an idea of how far off the portfolio may be from a 2˚C target by comparing the GHG emissions of portfolio companies under these two cases.

To estimate the companies' GHG gas emissions Trucost uses both the Sectoral Decarbonization Approach ("SDA") and the Greenhouse gas Emissions per unit of Value Added ("GEVA") approach. These are the methodologies recommended by the Science Based Target Initiative ("SBTi").

A key advantage of the transition pathway approach is that it does not require limiting the analysis to certain sectors and business activities as would be the case for the Energy Transition assessment. As a result, investors can evaluate the GHG gas emissions of their entire portfolio, and the companies themselves can also review their GHG emissions targets and think about their future transition pathways. More than 500 companies around the world have either set verified targets with SBTi, or have formally commited to setting targets in the future.

*** "2˚C target"**

The 2˚C target is a framework set out in the Paris Agreement which outlined international goals on GHG emissions beyond 2020. It aims to limit global temperature rise to below 2 degrees above pre-industrial levels by the end of the 21st century.

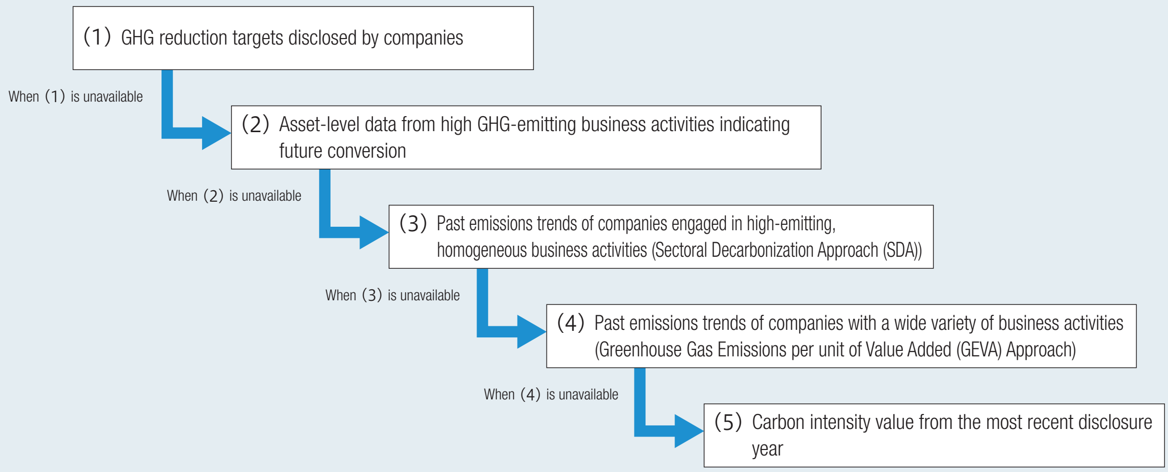
Supplementary information related to transition pathway analysis

Data Used

Since the transition pathway analysis is conducted under a medium-term time horizon, the analysis incorporates both historical performance as well as forward looking indicators (targets and estimates). This avoids the uncertainties of using only forward-looking data, and the time horizon is sufficiently long enough to dampen the effect of any year-on-year volatility. Historical data on GHG emissions and company activity levels is incorporated from the base year of 2012.

Forward-looking data sources are used to track likely future transition pathways from the most recent year of disclosed data through to 2023, and is created based on the following hierarchy of data sources. The scope of GHG emissions is a combination of both Scope 1 and Scope 2.

C Forward looking data creation flow



(Source) GPIF based on information from Trucost

Sectoral Decarbonization Approach (SDA)

The SDA approach uses scenarios developed by the International Energy Agency (IEA) and outlined in Energy Technology Perspectives ("ETP") 2017. The analysis applies to companies engaged in high-emitting, homogeneous business activities, such as power generation, steel, cement, and airlines.

The idea behind this approach is that companies in each industry must reduce their "emissions per industry unit" (such as tCO_2e per GWh, or tCO_2e per tonne of steel) to a level consistent with a 2℃ target by 2050. Companies are evaluated by comparing the emissions per industry unit consistent with a 2℃ target and the actual reduction targets that companies have publicly disclosed.

Other factors need to be considered when using this methodology, however. For example, GHG emissions may naturally be different based on an industry's available technologies or costs of mitigation, such as when the integration of renewable energy enables energy companies to reduce emissions at a faster rate than, say, cement companies. Even within a given industry, the pace of emissions reduction depends on the individual company. Furthermore, companies with low base year emissions and low production growth may be considered to be have a low GHG emission growth rate, and thus judged to be able to reduce their emissions at a more gradual rate in order to meet 2˚C targets. On the other hand, companies with high emissions or high production growth must make faster reductions.

In the SDA assessment, companies are assessed against parameters consistent with 1.75˚C, 2˚C, and 2.7˚C of warming.

Greenhouse Gas Emissions per unit of Value Added (GEVA) Approach

The scenarios used in GEVA assessments are the Representative Concentration Pathway (RCP) scenarios use in the AR5 report from The Intergovernmental Panel on Climate Change (IPCC). This approach is applied to companies with relatively low emissions and covers a broad array of business activities, such as consumer discretionary and services, information technology, financials, capital goods/services, and energy. This approach considers the GHG emission reduction target required for the economy as a whole, then allocates responsibility for this reduction to each company according to its size. In other words, each company is expected to reduce its GHG emissions per unit of production from the base year to the targets necessary for a 2˚C scenario. Unlike the SDA approach, GEVA uses GHG emissions per inflation-adjusted gross profit to measure total emissions intensity.

Using the GEVA approach, companies are assessed against parameters consistent with 2°, 3˚, 4˚, and 5˚C of warming.

Science Based Target initiative (SBTi)

SBTi is a collaboration between non-governmental organizations including the Carbon Disclsoure Project (“CDP”), the United Nations Global Compact (“UNGC”), the World Resources Institute (“WRI”) and the World Wide Fund for Nature (“WWF”). Companies are recommended to set GHG emission reduction targets according to current scientific understanding, and the initiative certifies the targets that companies set.

Current State of Corporate Disclosure

Better company disclosure is essential for better ESG evaluations and hence a deeper understanding of the climate change-related risks associated with a given portfolio. In addition to the direct benefit of having more transparent disclosure, the preparation process itself allows companies to gain a better understanding internally of potential issues that may not otherwise be discussed.

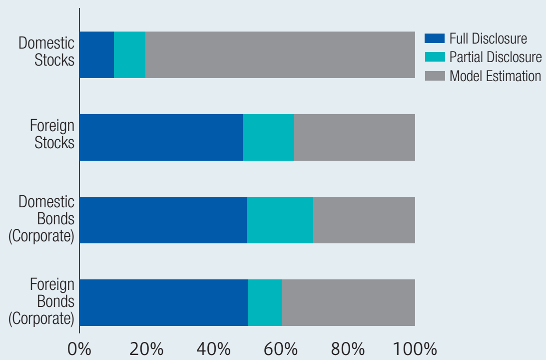
This analysis reviewed the level of disclosure by each company within the different asset classes held in the GPIF's portfolio. In terms of the number of companies, the foreign corporate bond portfolio had the highest rate of disclosure, with over 50 percent of companies disclosing GHG emissions, followed by domestic corporate bonds, and then foreign equities A. Within these asset classes, the percentage of companies that at least partially disclose emissions is around 60–70%. On the other hand, only about 10% of companies in the domestic equity portfolio have fully disclosed, with just 20% of companies having at least partial disclosure.

In contrast, weighting disclosure rates by the share of GHG generated produces a significantly higher disclosure rate for each asset class. This is likely due to the fact that companies with high emissions are more inclined to disclose climate-related information. Over 60 percent of companies in both the domestic and foreign corporate bond portfolio fully disclose GHG emissions, and over 80 percent at least partially disclose. Foreign equities also have comparable disclosure rates, but the partial disclosure rate for domestic equities is slightly lower at 70%.

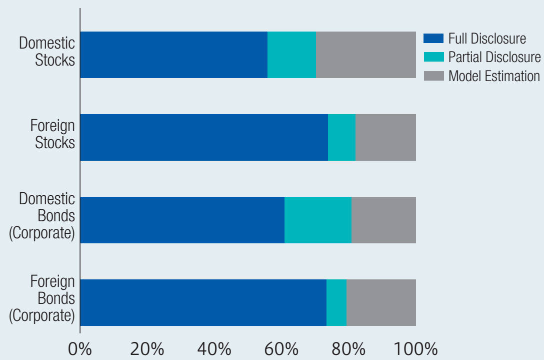
Enhancing both the breadth and depth of disclosed data is essential for companies to better understand and manage the climate-associated risks that they face.

Disclosure of GHG emissions (Scope 1) by companies

A Disclosure rates by number of companies



B Disclosure rates weighted by ghg emissions



Note: In general, Trucost uses data disclosed by individual companies to determine GHG emissions. When such data is incorrect or incomplete, however, Trucost uses a proprietary model to estimate emissions.
(Source) S&P Trucost Limited © Trucost 2019

Column

Global Perspective on GPIF's ESG Activities

GPIF's ESG activities attract attention from all around the world. In fiscal 2018, Harvard Business School cited GPIF's ESG initiatives in a case study.

Harvard Business School case study

GPIF's ESG activities were cited within a case study used for teaching at Harvard Business School (HBS). In January 2019, Professors Rebecca Henderson, George Serafeim, Josh Lerner and another co-author published *Should a Pension Fund Try to Change the World? Inside GPIF's Embrace of ESG* – a case study that uses a narrative format to delve into the history and background of GPIF's ESG efforts, specific activities such as the selection of ESG indices and engagement with asset managers, changes occurring within Japanese investee companies, the response by overseas pension funds, and remaining challenges.

The case study was used as a teaching material for the class "Reimagining Capitalism" taken by about 400 second year HBS students, and in April 2019, CIO Hiro Mizuno was invited by Professors Henderson and Serafeim to speak at HBS. There, students, professors and Mizuno engaged in a lively discussion on topics such as whether the concept of "universal ownership" can apply to small pension funds, how the roles of active and passive managers can be separated, and who should pay for the costs arising from ESG activities.

Editor's Note

Impressions gained during the compilation of the ESG Report

In last year's ESG Report, " ESG evaluation timing" and "revision of ESG evaluation criteria" were both cited as issues that remain to be addressed with respect to ESG evaluations. GPIF works towards progress in these areas by continuing to proactively engage in dialogue with ESG evaluators and others. We faced many different challenges in compiling this report, and by sharing our experiences, we hope to provide other asset owners and asset managers with useful advice as they consider their own ESG initiatives and disclosures.

Information disclosure: Benefits and issues

A particularly challenging aspect of summarizing ESG activities in this report was, as with many entities, deciding what format should be used for TCFD-compliant reporting. In this report, we did not include targets related to climate change risk, and for the scenario analysis, we restricted ourselves to a trial analysis of compatibility with the 2°C targets cited in in the Paris Agreement. Additionally, there is no analysis in this report relating to physical risk due to climate change (impact on the portfolio of severe weather events and rising sea levels, etc.). GPIF is well aware that this report is not perfect. We also expect to be criticized for using analysis methods that have not yet been firmly established. Overall, however, we judged that the benefits of disclosing this information outweighed the negatives.

While it goes without saying that increased transparency is a direct benefit, the very act of compiling this report serves effectively as an opportunity for raising awareness of and sharing issues within GPIF. As a result of Trucost's scenario analysis, we discovered that the current GPIF portfolio was found to be inconsistent with the 2°C target in the Paris Agreement. This means that presently, our assets under management would suffer greatly from, say, stronger environmental regulations implemented by governments to achieve the 2°C target.

As an investor that mainly invests passively with no divestment, what we can do and what we should do remain big issues for us. Hopefully, the information disclosed in this report will serve as a catalyst for broadened discussion on how asset owners who profess to be universal owners should address climate change risk.

Difficulties of cross-asset evaluation

We faced numerous hurdles in conducting cross-asset class evaluations for the purpose of measuring the ESG score and carbon-footprint of our portfolio.

In last year's ESG Report, we limited our ESG score and carbon footprint analysis only to the equity portfolio, and thus used GPIF's share of the company's total market capitalization of all outstanding shares for each portfolio company in these calculations.

This year, we expanded the scope of our carbon footprint analysis to the bond portfolio, which allowed us to measure the footprint on an Enterprise Value (EV) basis. EV is calculated by adding market capitalization to interest-bearing debt, and thus shows the share of total corporate value – including liabilities – accounted for by GPIF. Multiplying that figure by the target company's total carbon footprint, we can clarify the extent of GPIF's responsibility with regard to that company's footprint. Adding up these figures for all companies in our portfolio enables us to measure the total carbon footprint of the GPIF portfolio. While this method enables us to assess the portfolio by considering both bonds and equities, the fact that both asset classes are evaluated on an equal basis may raise questions among those who believe that equity investments carry a larger responsibility as they come with shareholder voting rights.

Government bonds are even harder to evaluate. As already touched on in the climate change risk analysis section for government bonds (page 48), it is extremely difficult to carry out an analysis of ESG and climate change risk across equities, corporate bonds and government bonds, as these asset classes are completely different in nature. Going forward, we will continue to consider how to improve our evaluation methods and approaches to information disclosure.

Announcement

Each year, GPIF publishes an annual report that provides a detailed explanation of portfolio developments during the year. We also disseminate information through our website, SNS, and other means.

With regard to fund management and operation, we make every effort to further deepen public understanding and trust, and make our published documents easier to understand. We also work to continuously enhance our information disclosure and PR activities in accordance with diversified and sophisticated investment.

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Investment Principles

1 Our overarching goal should be to achieve the investment returns required for the public pension system with minimal risks, solely for the benefit of pension recipients from a long-term perspective, thereby contributing to the stability of the system.

2 Our primary investment strategy should be diversification by asset class, region, and timeframe. While acknowledging fluctuations of market prices in the short term, we shall achieve investment returns in a more stable and efficient manner by taking full advantage of our long-term investment horizon. At the same time, we shall secure sufficient liquidity to pay pension benefits.

3 We formulate the policy asset mix and manage and control risks at the levels of the overall asset portfolio, each asset class, and each investment manager. We employ both passive and active investments to attain benchmark returns (i.e., average market returns) set for each asset class, while seeking untapped profitable investment opportunities.

4 By fulfilling our stewardship responsibilities (including the consideration of ESG (Environmental, Social, and Governance) factors), we shall continue to maximize medium- to long-term investment returns for the benefit of pension recipients.

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