Final Report (Outline): Research Project to Contribute to Preparation of the Next Medium-Term Plan

GPIF's Aim (Vision) as Foundation of the Medium-term Plan

March 2020
Mizuho Research Institute
Key Statements to Be Delivered in the 4th Medium-Term Plan

Megatrends surrounding GPIF

- Low birth rate and aging population primarily in developed countries → Slow economic growth and low interest rate environments
- Growing presence of social issues: climate change, depletion of natural resources → Increasing importance of ESG investment, etc. for sustainable growth
- Technological development → AI, RPA, and more elaborate data management

Vision

GPIF’s aim

As a universal owner and cross-generational investor, GPIF secures stable returns by making diversified investments and realizing a sustainable society through stewardship activities and ESG investment.

- Building a framework with a staff plan so as to be qualified as a universal owner and cross-generational investor, and strengthening business models.
  → Building a framework with recruitment of personnel so as to be qualified as the world’s largest Fund of Funds manager
  → Bolstering the business model that utilized outsourcing by using external resources, aiming to achieve operational efficiency: Focus to create the best mix of internal and external resources
  → With respect to investment, enhancing alignment particularly with key partners of external asset managers and index providers
- Securing returns under low interest rate environments → Investment diversification with a variety of investment types such as alternative investment
- Enabling sustainable society (sustainability) → Stewardship activities, ESG investment
- Leverage advanced technology → Strengthening of risk management and internal control functions
  Using cutting-edge technology and reinforcing data management

Focused area

Target investment return

- Investment return required for pension finance: In addition to achieving a real rate of return* of 1.7%, GPIF aims to secure an excess rate of return over benchmarks by asset class and compound benchmarks, and improve returns in the entire market through ESG investment.
  * Net investment yield on the pension reserve less the nominal wage growth rate.

To achieve the vision (aim) and target investment returns

Strategy for allocation of management resources

- Strengthening Asset Management Department (front-office), and Data Management and Others, and Internal Control Departments (middle-office)
The pension reserve over the next 100 years, based on the Financial Valuation conducted in 2019, is projected to approximately triple from 159 trillion yen as of March 31, 2019 to 479 trillion yen at the peak with a continued increase over a 60-year period.

→ Universal Owner (an investor with a very large fund size and a widely diversified portfolio) and Cross-Generational Investor (responsible for supporting pension finance with an investment horizon of as long as 100 years)

As of March 31, 2019 (result)

159 trillion yen

At Peak (estimate)

479 trillion yen

3 times

Investment Rate of Return Required for Pension Finance

Real Rate of Return* of 1.7%

Note: The above data indicate the sum of the former Employees’ Pension reserve and the National Pension reserve. (Scenario III of the Financial Valuation in 2019)

* Net investment yield on the pension reserve less the nominal wage growth rate.
Low Interest Rate Environments, Increasing Importance of ESG Investment, etc., and Use of Technology

Low birth rate and aging population seen primarily in developed countries
Slowing economic growth, and other factors
→ Worldwide low interest rate environments

Growing presence of social issues (climate change, depletion of natural resources, etc.)
→ Increasing importance of ESG investment, etc.

Benchmarks of domestic bonds and foreign bonds

- Foreign bond benchmark index (FTSE World Government Bond Index (excl. JPY)) Yield
- Domestic bond benchmark index (Nomura BPI (excl. ABS)) Yield

ESG investments worldwide

- Investment assets (trillion US dollars)
- Number of institutions that signed PRI

Influence from evolving AI

Advanced AI technology

- Enhancement of computer processing capacity
- Enabling deep learning
- Development of big data technology

Areas of growth potential through collaboration with AI

- Robotics
- IoT
- Fintech

AI control
- Automatic driving and advanced driving assistance
- Industrial robots

AI analysis
- Credit investigation
- Individual identification and biometric identification

...others, a variety of technologies under development
GPIF’s Aim Based on Megatrend and Key Areas Focused On

GPIF’s aim

As a universal owner and cross-generational investor, GPIF secures stable returns by making diversified investments and realizing a sustainable society through stewardship activities and ESG investment.

Key focused areas to achieve the aim

1. Building a framework with a staff plan so as to be qualified as a universal owner and cross-generational investor, and strengthening business models.

- Building a framework with recruitment of personnel so as to be qualified as the world’s largest Fund of Funds manager
- Bolstering the business model that utilized outsourcing by using external resources, aiming to achieve operational efficiency:
  - Focus to create the best mix of internal and external resources
  - With respect to investment, enhancing alignment particularly with key partners of external asset managers and index providers

Focus on the following initiatives by using such infrastructure:

2. Securing investment returns under low interest rate environment

- Diversified investment with a variety of investment types (alternative investment, etc.)

3. Enabling sustainable society (sustainability)

- Stewardship activities and ESG investment

4. Using advanced technology (AI, RPA and others)

- Strengthening of risk management and internal control functions

5. Using cutting-edge technology and reinforcing data management
Framework to Be Qualified as the World’s Largest Fund of Funds Manager

Projected pension reserve based on the 2019 Financial Valuation

As of March 31, 2019 (result) 159 trillion yen
At Peak (estimate) 479 trillion yen

Number of constituents in major indices, and number of equities owned by GPIF (As of March 31, 2019)

<table>
<thead>
<tr>
<th>Index</th>
<th>Domestic equities owned by GPIF</th>
<th>Foreign equities owned by GPIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPIX</td>
<td>2,124</td>
<td>2,380</td>
</tr>
<tr>
<td>MSCI ACWI (excluding Japan)</td>
<td>2,449</td>
<td>2,731</td>
</tr>
</tbody>
</table>

(Reference) Comparison of assets, personnel, and business expenses in major pension funds

<table>
<thead>
<tr>
<th>Fund name</th>
<th>Investment assets (As of Sept. 30, 2019)</th>
<th>Number of staff</th>
<th>Fees paid to external asset managers (Expenses for FY ended March 31, 2019)</th>
<th>In-house investment ratio to total investment assets (As of March 31, 2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government Pension Investment Fund (GPIF)</td>
<td>Approx. 161.8 trillion yen</td>
<td>148 staff (Incl. executives. As of Sept. 30, 2019)</td>
<td>29.5 billion yen (0.02%)</td>
<td>22.0%</td>
</tr>
<tr>
<td>California Public Employees’ Retirement System (CalPERS: USA)</td>
<td>Approx. 41.6 trillion yen (As of Oct. 31, 2019)</td>
<td>2,875 staff (Incl. staff in charge of work related to pension payout) of which, front-office department: 238 staff (Number of staff planned for FY2018 and FY2019)</td>
<td>79.0 billion yen (0.20%) (Expenses for FY ended June 30, 2018)</td>
<td>73.3% (As of June 30, 2019)</td>
</tr>
<tr>
<td>Canada Pension Plan Investment Board (CPPIB: Canada)</td>
<td>Approx. 33.4 trillion yen (As of Sept. 30, 2019)</td>
<td>1,661 staff of which, front-office department: not disclosed (As of March 31, 2019)</td>
<td>131.7 billion yen (0.42%) (Expenses for FY ended March 31, 2019)</td>
<td>Executed investment through external asset managers for PE and part of the absolute return strategy (As of March 31, 2019)</td>
</tr>
<tr>
<td>The Government Pension Fund Global (GPFG: Norway)</td>
<td>Approx. 115.8 trillion yen (As of Sept. 30, 2019)</td>
<td>601 staff of which, front-office department: 262 staff (As of Dec. 31, 2018)</td>
<td>17.7 billion yen (0.02%) (Expenses for FY ended Dec. 31, 2018)</td>
<td>96.1% (As of Dec. 31, 2018)</td>
</tr>
</tbody>
</table>

The ratios in brackets indicate ratios of expenses to the average balance of the investment assets at the end of the previous and current fiscal years.

Building a framework with recruitment of personnel so as to be qualified as the world’s largest Fund of Funds manager

Staffing plan (conceptual image)

As of March 31, 2019 Approx. 150 staff
5 years later Approx. 200 staff
10 years later

- Strengthening structure along with business expansion
- Streamlining operation through advanced RPA, etc.
Strengthening Outsourced Business Model

Outsourced business model

As of March 31, 2019 (result)

159 trillion yen

Efficient operation

Streamlined organization

Internal resources

External resources

Using external resources

Bolstering outsourced business model aiming for operational efficiency

Focus to create the best mix of internal and external resources

Maximizing use of internal resources at the minimum requirement

Using external resources

(Reference) Cost comparison between GPIF and overseas public pension funds

GPIF Average of overseas public pension funds

Maximum

Minimum

%
Strengthening Alignment with External Asset Managers and Index Providers

Introduction of Asset Manager Registration System: February 2018

GPIF

Data Entry → Assessment → Screening with utilizing advice given by external advisors → Evaluation → Data Management

New external asset managers → Existing external asset managers

Existing external asset managers → Existing external asset managers

Introduction of New Performance-Based Fee Structure: April 2018

- Investment fees should be linked to excess returns (i.e., performance-based fees), while active managers that do not deliver excess returns will only receive fees on a par with those paid to passive managers (i.e., basic fees).
- The fee scheme is structured so that the fee rate applied to funds that achieved target excess return rate is assumed to be the same level as former performance-based fee structure.
- In exchange for applying fees linked to long-term investment results to some external asset managers, a multi-year contract is concluded with some external asset managers based on market cycles.

Strengthening alignment with external asset managers and index providers serving as important partners

GPIF

Support from important partners

Active managers

- Achieving excess returns in the long term
- Ownership

Passive managers

- Creating additional value
- Engagement activities

Index providers

- Alignment by concluding direct contracts
- Accountability for the selection of equities
Diversified Investment with a Variety of Investment Types

- Given low interest rate environments worldwide, GPIF aims to maintain and improve the profitability of portfolios by strengthening globally diversified investment and alternative investment.
- GPIF promotes building an appropriate framework and system to bolster globally diversified investment and alternative investment.

**Investment Rate of Return Required for Pension Finance: Real Rate of Return* of 1.7%**

New policy asset mix (composition ratio)

- Foreign equities 25%
- Domestic bonds 25%
- Foreign bonds 25%
- Domestic equities 25%

Trends of asset size based on new policy asset mix

- Domestic bonds
- Domestic equities
- Foreign bonds
- Foreign equities

*Net investment yield on the pension reserve less the nominal wage growth rate.*

*The figure is an image.*
Aiming to enable a sustainable society (sustainability), GPIF pursues long-term and sustainable value creation in the financial market by promoting stewardship activities and ESG investment.
GPIF promotes strengthening of risk management and internal control functions across the entity, with the aim of achieving more elaborate and diversified investment and secure human resources for that purpose.

- Improving legal functions, reinforcing internal system of checks and balances, enabling more elaborate risk management, etc.

- Enhancing usage of cutting-edge technology and stricter data management
  - Installation of Data Management Office (DMO) and proactive use of information technology

**Data Management Office (DMO)**

**Internal Fixed Income Investment Department**

**External asset manager (traditional assets)**

**External asset manager (alternative)**

**Private Market Investment Department**

**Custodian (trust bank, global custodian)**

**IBOR**

Latest portfolio data, etc.

**Risk analysis system**

**Users of investment management data**

**Other data**

Portfolio data, market data, processed/analyzed data, various external information, internal management data, etc.

**GPDR**

**Flows of major data**

GPIF
Achieving excess returns (α)

✓ GPIF primarily takes a passive investment approach, but out of a total of 160 trillion yen as its operational assets, it allocates approximately 20% to active investment to gain excess returns.

✓ With the assumption that an efficient capital market would help produce successful results in passive investment, GPIF recognizes that active investment is essential to bring about market efficiency.

✓ GPIF introduced a new performance-based fee structure to encourage external asset managers to achieve excess returns.

Periodic verification of effects of ESG investment

✓ Given that ESG investment aims to achieve long-term returns, periodically verifying the effects of ESG investment to ensure the appropriate direction for initiatives and obtaining understanding from the public are important.

✓ GPIF works on initiatives, such as releasing a wide range of information on multidimensional measurement of the effects of ESG investment and the result, and promoting information disclosure of corporations, and thus contributes to improving long-term returns of investment portfolios and sustainability of the financial market.

Rate of excess return from FY2014 to FY2018 (annualized rate)

<table>
<thead>
<tr>
<th>Investment in domestic bonds</th>
<th>Passive investment</th>
<th>Active investment</th>
<th>Passive investment</th>
<th>Active investment</th>
<th>Passive investment</th>
<th>Active investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-weighted rate of return</td>
<td>1.61%</td>
<td>1.75%</td>
<td>7.92%</td>
<td>8.55%</td>
<td>2.00%</td>
<td>3.17%</td>
</tr>
<tr>
<td>Benchmark rate of return</td>
<td>1.60%</td>
<td>1.92%</td>
<td>8.02%</td>
<td>8.02%</td>
<td>1.98%</td>
<td>2.20%</td>
</tr>
<tr>
<td>Excess rate of return</td>
<td>+0.01%</td>
<td>-0.17%</td>
<td>-0.10%</td>
<td>+0.53%</td>
<td>+0.02%</td>
<td>+0.96%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Domestic equities</th>
<th>Passive investment</th>
<th>Active investment</th>
<th>Passive investment</th>
<th>Active investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-weighted rate of return</td>
<td>8.55%</td>
<td>8.94%</td>
<td>8.47%</td>
<td>8.47%</td>
</tr>
<tr>
<td>Benchmark rate of return</td>
<td>8.02%</td>
<td>8.69%</td>
<td>8.47%</td>
<td>8.47%</td>
</tr>
<tr>
<td>Excess rate of return</td>
<td>+0.53%</td>
<td>+0.25%</td>
<td>-0.00%</td>
<td>-0.00%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foreign bonds</th>
<th>Passive investment</th>
<th>Active investment</th>
<th>Passive investment</th>
<th>Active investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-weighted rate of return</td>
<td>2.00%</td>
<td>3.17%</td>
<td>8.47%</td>
<td>8.94%</td>
</tr>
<tr>
<td>Benchmark rate of return</td>
<td>1.98%</td>
<td>2.20%</td>
<td>8.47%</td>
<td>8.69%</td>
</tr>
<tr>
<td>Excess rate of return</td>
<td>+0.02%</td>
<td>+0.96%</td>
<td>-0.00%</td>
<td>+0.25%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foreign equities</th>
<th>Passive investment</th>
<th>Active investment</th>
<th>Passive investment</th>
<th>Active investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time-weighted rate of return</td>
<td>8.47%</td>
<td>8.94%</td>
<td>8.47%</td>
<td>8.94%</td>
</tr>
<tr>
<td>Benchmark rate of return</td>
<td>8.47%</td>
<td>8.69%</td>
<td>8.47%</td>
<td>8.69%</td>
</tr>
<tr>
<td>Excess rate of return</td>
<td>-0.00%</td>
<td>+0.25%</td>
<td>-0.00%</td>
<td>+0.25%</td>
</tr>
</tbody>
</table>

Employing investment approaches using ESG indices

- ESG integrated indices
- Empowering Women Index (WIN)
- Carbon Efficient Index

Measurement of ESG investment effects

- Performance of ESG indices
- ESG evaluation of portfolios
- Correlation of ESG evaluation
- Climate change risks of portfolios
- Greenhouse gas emission risks of portfolios
- Scenario analysis of portfolios

Enhancing research projects and information disclosure concerning ESG

Promoting improvement of corporate disclosure of climate-related information

Implementation of initiatives to achieve excess returns for the entire assets as well as for each asset class

Contribution to boosting long-term returns of portfolios and improving sustainability of financial markets
Areas Requiring Strengthening

Four areas requiring strengthening:

(i) Response to investment diversification and elaboration
- Alternative investment
- Traditional investment, etc.

(ii) Promoting investment activities focused on sustainability
- Stewardship activities
- ESG investment, etc.

(iii) Reinforcement of risk management and internal control functions
- Improving legal functions
- Strengthening internal system of checks and balances
- Developing investment risk administration, etc.

(iv) Usage of cutting-edge technology / Strengthening data management
- Proactive use of information technology
- Installation of DMO, etc.
Major PDCA Cycles of Business Activities

**Plan**
- Resolution of the Medium-Term Plan (including the budget) at the Board of Governors
- Resolution of the Annual Plan (including the budget) at the Board of Governors

**Do**
- The Executive Office implements the budget.
- Regarding procurement items which account for the majority of the budget for business activities, the Procurement Committee with all Audit Committee members participating as observers examines estimates in light of appropriate and fair competitiveness.

**Action**
- The Executive Office incorporates various opinions received from the Board of Governors into the Medium-Term Plan and Annual Plan in the following fiscal term.

**Check**
- The Board of Governors resolves the fiscal report with awareness of the reason for any discrepancy between the actual result and budget.
- The Board of Governors resolves the Review of Operations which evaluates the achievement of operating performance.
- Regarding commissioned research projects, the Research Project Committee of Executive Office is in charge of the PDCA cycle and provides a report to the Board of Governors.
This report describes the result of the research on the Research Project to Contribute to Preparation of the Next Medium-Term Plan, which Mizuho Research Institute Ltd. was entrusted to examine by the Government Pension Investment Fund. Government Pension Investment Fund reserves the rights to this report.