

Index rulebook

Key features of the NOMURA-BPI/Extended

-
- The Nomura Bond Performance Index Extended (NOMURA-BPI/Extended) was developed to reflect the performance of the entire secondary market for publicly offered, yen-denominated, fixed-income bonds rated as equivalent to Triple B or higher issued in Japan.
- The portfolio of bonds that makes up the index (hereafter, the index portfolio) is determined based on given inclusion criteria.
- Securities in the NOMURA-BPI/Extended are classified into eight sectors: JGBs, municipals, government-guaranteed, bank debentures, corporate bonds, Samurai bonds (yen-denominated foreign bonds), MBS and ABS.
- The performance of NOMURA-BPI/Extended is calculated based on the marked-to-market valuation of the bonds that make up the index portfolio.
- The NOMURA-BPI/Extended has sub-index portfolios by sectors and by term to maturity. Their performance indices and portfolio indicators are also released.
- Bonds included in the NOMURA-BPI/Extended are reviewed monthly.

Major rule changes, additions, etc.

[September 27, 2019]

- Relaxation of the exclusion criteria with regard to TOKYO PRO-BOND Market listed bonds
- Established First entry rule

Global Markets Research

27 September 2019

Visit [Nomura Connects](#) for our global thought leadership.

Research analysts

[Japan Bond Indices](#)

Index Operations Dept. - NSC
idx_mgr@jp.nomura.com
+81 3 6703 3986

Contents

1. Introduction	3
2. Sub-indices	4
2.1 NOMURA-BPI/Extended Sectors	4
2.2 Term to maturity.....	5
2.3 Corporate bonds industry classifications	6
2.4 Ratings (corporate bonds and Samurai bonds).....	6
3. Scheduled portfolio reconstitution	9
3.1 Scheduled reconstitution date	9
3.2 Portfolio determination date.....	9
3.3 Scheduled reconstitution base date	9
3.4 Portfolio reconstitution announcement	9
4. Portfolio inclusion/exclusion criteria	10
4.1 Portfolio inclusion criteria for next month.....	10
4.2 Portfolio exclusion criteria for next month.....	12
5. Unscheduled portfolio reconstitution	14
5.1 Exclusion of defaulted debt and fully called bonds.....	14
5.2 Other criteria for unscheduled reconstitution.....	14
5.3 Announcement of unscheduled portfolio reconstitution.....	14
6. Calculating index value	15
6.1 Method for calculating index	15
6.2 Return	16
6.3 Reference for obtaining market data	17
6.4 Key indices and data released.....	18
7. Definition of NOMURA-BPI/Extended indicators	19
7.1 Definition of issue-specific return-risk indicators	19
7.2 Definition of portfolio indicators.....	21
Appendix: Past rules on NOMURA-BPI/Extended index composition	22
Sector Changes in the NOMURA-BPI/Extended Total.....	22
Past Changes in NOMURA-BPI/Extended Inclusion Criteria	23
Changes in Pricing.....	23
Data delivery services	24
NOMURA-BPI/Extended data providers.....	24
Detailed data including next month's index portfolios.....	24
Contact for further inquiries	25
Policies with regard to NSC's indices	26
Appendix A-1	27

1. Introduction

The Nomura Bond Performance Index Extended (NOMURA-BPI/Extended) is a bond performance index that reflects the performance of the entire secondary market for publicly offered, yen-denominated, fixed-income bonds issued in Japan. The Index Operations Dept. (IOD) in Nomura Securities Co., Ltd. (NSC) is the Administrator of the NOMURA-BPI/Extended, and Nomura Research Institute, Ltd. (NRI) serves as the Calculation Agent.

The IOD has primary responsibility for the daily calculation of the bond performance indices, as well as their production and operation. Specifically, the IOD, in its role as operations manager:

- Maintains records of the index weightings of all constituents;
- Reviews the index portfolios according to the inclusion/exclusion criteria, and replaces securities in these portfolios as necessary, reflecting these changes in the performance and other indicators; it reviews the index portfolio inclusion criteria.
- Announces changes in securities included in the index portfolios, which are determined as a result of daily operations management and scheduled reviews; and
- Distributes the index portfolio performances, either through NRI's data delivery service or on its own.

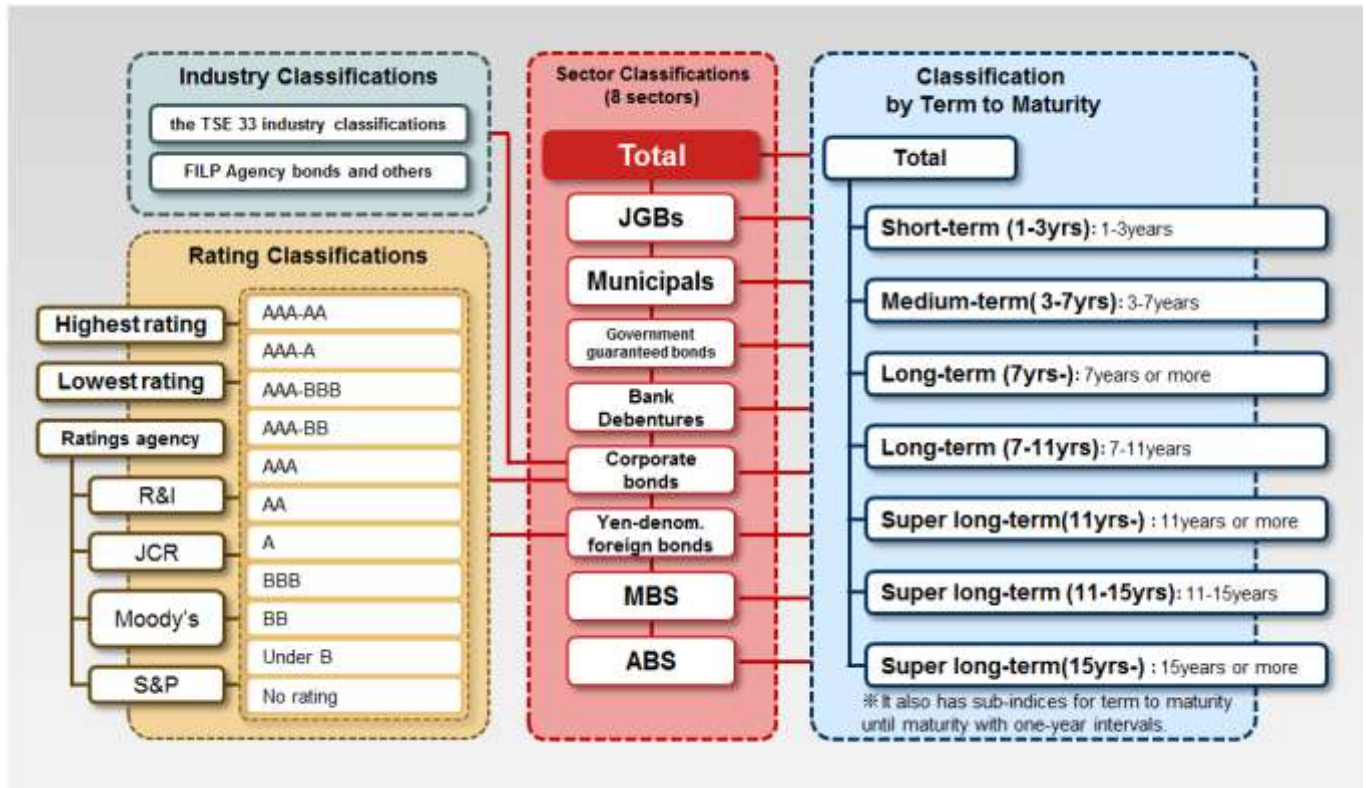
The NOMURA-BPI/Extended is meant to be used as:

- A tool for determining investment policies (asset allocation strategies);
- A tool for determining investment manager structure;
- An investment management benchmark;
- A tool for portfolio management;
- An investment performance indicator; and
- A risk management tool.

2. Sub-indices

The NOMURA-BPI/Extended has sub-index portfolios by sectors, by term to maturity, by industry and by ratings. The IOD computes and releases sub-index performance indices and portfolio indicators for each of these portfolios.

Fig.1: The structure of NOMURA-BPI/Extended



Source: NSC

Listed below are the NOMURA-BPI/Extended sub-indices, which are subject to change:

NOMURA-BPI/Extended (Sectors) <Industry> <Rating> <Term to maturity>

(There is a space between each classification. If each <classification> describes "all", the name is optional.)

2.1 NOMURA-BPI/Extended Sectors

Securities in the NOMURA-BPI/Extended are classified into eight sectors (Figure 1).

- **JGBs**

The portfolio includes bonds issued by the Japanese government. It is further classified into sub-sectors by the term to maturity at the time of the issuance (2yr, 5yr, 10yr and 20yr).

- **Municipals**

The portfolio includes bonds issued by municipal governments and the Japan Finance Organization for Municipalities (including the former Japan Finance Corporation for Municipal Enterprises and the Japan Finance Organization for Municipal Enterprises), but excludes issues whose principal and interest are guaranteed by the Japanese government¹. Bonds included in this sector are classified into those issued by municipal governments and other issuers. Municipal government bonds are further classified into those issued by the Tokyo Metropolitan

¹ These bonds are classified as government-guaranteed bonds.

government, five major (government-designated) cities and other municipal governments.

- **Government guaranteed bonds**

The portfolio includes bonds issued by public institutions and special corporations whose principal and interest are guaranteed by the Japanese government².

Government-guaranteed bonds are classified into municipal public corporation bonds and other government-guaranteed bonds.

- **Bank debentures**

The portfolio includes bonds issued by a specific group of financial institutions (generally referred to as publicly-offered bank debentures). The issuance of these bonds is governed by special laws (Long-Term Credit Bank Law and others). Bank debentures are further classified into specific bank debentures³ and other bank debentures.

- **Corporate bonds**

The portfolio includes bonds issued by domestic corporations and those issued by public institutions and special corporations whose principal and interest are not guaranteed by the Japanese government. Corporates' sub-indices are classified by their industrial sector and ratings.

- **Samurai bonds (yen-denominated foreign bonds)**

The portfolio includes JPY-denominated bonds issued in Japan by non-Japanese issuers. Samurai bonds' sub-indices are classified by their ratings.

- **MBS (Mortgage-Backed Securities)**

The portfolio includes securities backed by real estate loans (mortgages).

- **ABS (Asset-Backed Securities)**

The portfolio includes securities backed by various types of assets. ABS are classified into life insurance fund (capital securities) bonds/subordinated-loan backed bonds, REIT-corporation bonds and securities backed by fiscal-loan funds.

Apart from the sector indices noted above, NOMURA-BPI/Extended has sub-indices such as NOMURA-BPI/Extended excluding JGBs, NOMURA-BPI/Extended excluding specific bank debentures, NOMURA-BPI/Extended excluding ABS, NOMURA-BPI/Extended excluding MBS, and NOMURA-BPI/Extended excluding MBS/ABS.

2.2 Term to maturity

The NOMURA-BPI/Extended is classified into seven sectors based on the number of years remaining until maturity as of the last day of the month (Figure 2). It also has sub-indices for term to maturity with one-year intervals, between year one and year 40. There are two types of terms to maturity, one based on scheduled redemption and the other based on early redemption. The first is the term until the final redemption date, and the latter is the term to maturity calculated using the weighted average of the future principal cash flow. The NOMURA-BPI/Extended uses the one based on scheduled redemption for classifying bonds by term to maturity.

² Public institution bonds and specific corporation bonds whose principal and interest are not guaranteed by the Japanese government are classified as corporate bonds.

³ Specific bank debentures are those rated BBB or lower by all of the four rating agencies as of the portfolio determination date. For bank debentures that are not rated, ratings assigned to the financial institution's senior bonds or its issuer rating are referenced.

Fig 2: Portfolio classification by term to maturity

Classification	Term to maturity (scheduled redemption)
Short-term (1-3yrs)	1yr or more and less than 3yrs
Medium-term (3-7yrs)	3yrs or more and less than 7yrs
Long-term (7yrs -)	7yrs or more
Long-term (7-11yrs)	7yrs or more and less than 11yrs
Super long-term (11yrs -)	11yrs or more
	Super long-term (11- 15yrs) 11yrs or more and less than 15yrs
	Super long-term (15yrs -) 15yrs or more

Source: NSC

2.3 Corporate bonds industry classifications

Corporate bonds are classified by industry, based on 34 classifications (i.e., the TSE33 industry classifications and FILP Agency bond and others sector⁴) (Figure 3).

Fig 3: NOMURA-BPI/Extended corporates industry classifications

Fishery, Agriculture & Forestry	Mining
Construction	Foods
Textiles & Apparels	Pulp & Paper
Chemicals	Pharmaceutical
Oil & Coal Products	Rubber Products
Glass & Ceramics Products	Iron & Steel
Nonferrous Metals	Metal Products
Machinery	Electric Appliances
Transportation Equipment	Precision Instruments
Other Products	Electric Power & Gas
Land Transportation	Marine Transportation
Air Transportation	Warehousing & Harbor Transportation Services
Information & Communication	Wholesale Trade
Retail Trade	Banks
Securities	Insurance
Other Financing Business	Real Estate
Services	FILP Agency bonds ⁵ and others

Source: NSC

2.4 Ratings (corporate bonds and Samurai bonds)

2.4.1 Classification by ratings

Corporate bonds and Samurai bonds included in the NOMURA-BPI/Extended are classified into sub-indices by their ratings. The classification refers to the individual issue rating, not to issuer rating (Figure 4). For bonds that are not rated by a ratings agency, the classification may refer to deemed ratings. Long-term senior debt ratings and issuer ratings are not considered in the classification.

- Deemed ratings in NOMURA-BPI/Extended

For bonds that are not rated by a ratings agency (hereafter, “unrated bonds”), the classification may refer to a rating considered equivalent to one assigned to other debt from the same issuer (hereafter referred to as “deemed rating”), provided the original and deemed ratings meet all of the following conditions:

⁴ FLIP stands for “Fiscal Investment and Loan Program”

⁵ Bonds issued by a corporation that is subject to governing law for incorporation and not listed in the stock market.

- Both are assigned to the same issuer
- Both are assigned under the same terms (i.e., subject to the same specific financial clauses and credit enhancements)⁶
- Both are rated by the same ratings agency, and,
- An issue assigned the original rating is dated one year or longer until scheduled redemption.

Deemed ratings are referred to as “X-equivalent.”

Fig 4: Rating classifications

Sector	Criteria for assigning ratings	Classification
Corporate bonds	<ul style="list-style-type: none"> • Highest rating • Lowest rating • R&I rating • JCR rating • Moody’s rating • S&P rating 	AAA--AA-equivalent AAA--A AAA--BBB AAA--BB AAA AA A BBB BB Under B No rating
Samurai bonds	<ul style="list-style-type: none"> • Highest rating • Lowest rating • R&I rating • JCR rating • Moody’s rating • S&P rating 	AAA--AA AAA--A AAA--BBB AAA--BB AAA AA A BBB BB Under B No rating
Corporate bonds & Samurai bonds	<ul style="list-style-type: none"> • Highest rating 	AAA--AA AAA—A AAA-BBB AAA AA A BBB

Source: NSC

2.4.2 Criteria for assigning ratings

- Classification by highest rating⁷

The classification refers to the highest of the ratings assigned by R&I, JCR, Moody’s and S&P.

⁶ In-substance defeasance issues are grouped separately from unsecured senior debt from the same issuer.

⁷ If the classification of criteria for assigning ratings is “the highest rating”, only “AAA-AA”, “AAA-A”, “AAA-BBB”, “AAA”, “AA”, “A”, and “BBB” fall under its category..

- Classification by lowest rating

The classification refers to the lowest of the ratings assigned by R&I, JCR, Moody's and S&P.

- Classification by ratings agency

The classification refers to ratings among those assigned by the same ratings agency.

3. Scheduled portfolio reconstitution

The IOD reviews and reconstitutes the NOMURA-BPI/Extended portfolios every month. Next month's portfolios are determined on the portfolio determination day of each month.

3.1 Scheduled reconstitution date

NOMURA-BPI/Extended portfolios are reconstituted on the first business day of the month (scheduled reconstitution date), with the inclusion/exclusion implemented after the bond market closes on the business day before the scheduled reconstitution date.

3.2 Portfolio determination date

In principle, next month's portfolio determination date is one of the following dates, whichever is the earlier:

- The business day after the 25th day of the month
- The three business days before the last business day of the month

However, the portfolio determination date may be changed if a JGB auction that may have a non-negligible impact is held between the day after the determination date and the last day of the month. Any such changes will be announced in advance.

3.3 Scheduled reconstitution base date

Next month's portfolio base is determined on the day before the portfolio determination date. The new portfolio structure is determined on the portfolio determination date based on disclosed information available as of the scheduled reconstitution base date.

3.4 Portfolio reconstitution announcement

Information about scheduled portfolio reconstitution is announced through NRI's data delivery service and other media, except in cases where definite information on new portfolios is unavailable due to unexpected circumstances.

4. Portfolio inclusion/exclusion criteria

4.1 Portfolio inclusion criteria for next month⁸

The NOMURA-BPI/Extended incorporates all securities that meet the inclusion criteria listed in Figure 5 as of the scheduled reconstitution base date into the index portfolios for the following month.

Fig. 5: NOMURA-BPI/Extended inclusion criteria

Issuance process	Publicly offered bonds issued in Japan	
Currency denomination	JPY	
Coupon	Fixed	
Outstanding face value	JPY1 billion or more	
Term to maturity (scheduled redemption)	1 year or more	
Rating	JGBs, municipals, government-guaranteed bonds, bank debentures	... No rating criteria
	Corporate bonds, Samurai bonds, MBS, ABS	... Equivalent to Triple B or higher
Issue date	JGBs	Issues until the portfolio determination date ⁹
	Bank debentures	Issues until the last day of the month two months before the portfolio determination date
	Others	Issues until the last day of the month prior to the portfolio determination date

Source: NSC

⁸ The NOMURA-BPI/Extended is an index measuring the performance of the entire secondary bond market, and the inclusion criteria have been revised based on changes in the market environment. Please see Appendix 2 for more details on changes in the inclusion criteria.

⁹ This rule will be implemented from the April 2018 portfolio reconstitution date. Until then, JGB issues until the last day of the month of the portfolio determination date will be eligible for the following month's index portfolio inclusion.

4.1.1 Issuance process

The NOMURA-BPI/Extended is designed to reflect the performance of all publicly offered bonds issued in Japan. Note that it excludes the following types of bonds from the pool of eligible securities:

- JGBs not publicly offered in the market (i.e., JGBs tailored for retail investors and sold New OTC sales system, those issued for BOJ Rollover)
- JGBs for Subscription/Contribution
- Corporate bonds offered specifically to retail investors
- Municipal bonds issued specifically to local residents (mini municipal bonds)
- Convertible bonds, warrant bonds
- Collateralized bond obligations (CBO), Collateralized loan obligations (CLO)
- MBS that are neither JHF MBS nor GHLC MBS, both of which are issued by the Japan Housing Finance Agency (JHF; formerly the Government Housing Loan Corporation, or GHLC)
- ABS that do not fall into any of these categories; life insurance fund bonds, life insurance subordinate loan ABS, investment corporation bonds and FILP ABS
- Bonds listed in TOKYO PRO-BOND Market and subject to disclosure rules of the Financial Instruments and Exchange Act, namely the securities that are not subject to the disclosure exemption stated in Article 3 of the Financial Instruments and Exchange Act.

4.1.2 Currency denomination

The NOMURA-BPI/Extended includes JPY-denominated bonds in terms of redemption, principal and interest payments.

4.1.3 Coupon

The NOMURA-BPI/Extended only covers fixed-coupon bonds (i.e., coupon payments remain unchanged from the issuance until maturity). Note that it does not include the following types of bonds:

- Step-up bonds
- Fix-to-Float bonds (issued as fixed-coupon bonds, with coupon payments changed to variable from the first call date)
- Discount bonds
- Deferred interest bonds
- Deferrable bonds
- Perpetual bonds

4.1.4 Outstanding face value

The NOMURA-BPI/Extended only includes bonds with an outstanding face value amount¹⁰ of JPY1bn or more as of the last business day of the month following the scheduled reconstitution base date.

4.1.5 Term to maturity (scheduled redemption)

The NOMURA-BPI/Extended only includes bonds that are dated 365 days or more after the last day of the month following the scheduled reconstitution base date to the full redemption date. 29 February is also counted in.

4.1.6 Rating

For corporate bonds, Samurai bonds, MBS and ABS, a rating equivalent to Triple B or higher in terms of their highest ratings as of the scheduled reconstitution base date is required for inclusion in the NOMURA-BPI/Extended index portfolio. Please see “2.4 Ratings (corporate bonds and Samurai bonds)” for more details on rating requirements.

4.1.7 Issue date

Inclusion criteria in terms of issue date are as follows:

- JGBs: Issues until the portfolio determination date¹¹

¹⁰ Additional issuance after the portfolio determination date is disregarded.

¹¹ This rule will be implemented from the May 2018 portfolio determination day (24 April, 2018). Until then, JGB issues until the last day of the month of the portfolio determination date will be eligible for the following month's index portfolio inclusion.

- Bank debentures: Issues until the last day of the month two months before the portfolio's determination date
- Other bonds: Issues until the last day of the month before the portfolio's determination date

4.1.8 Other policies related to eligibility for inclusion

- Subordinate bonds

The difference between senior and subordinated bonds is not taken into account in selecting bonds.

- Basel III-compliant bonds

The presence or absence of bail-in clauses and/or write-off clauses for non-viability is not considered in the selection of bonds.

- Callable/puttable bonds

The presence or absence of callable clauses, prepayment clauses or puttable clauses is not considered in the selection of bonds.

4.1.9 First Entry Rule

As a general rule, for bonds whose eligibility cannot be determined by the inclusion criteria set forth in this rule book, an investigation is conducted within a certain monitoring period from the issue date of the relevant bond, and whether or not they are to be included is determined. Announcements are made before and after the monitoring period. However, if public information, such as laws or regulation changes, clarifies the rationality for inclusion of the relevant bond, an announcement will be made without setting a monitoring period.

4.1.10 Other potential for inclusion

If an event that is material in terms of portfolio inclusion occurs after the portfolio determination date, the issue in question may be included in the next month's portfolio. Any such change would be announced in advance.

4.2 Portfolio exclusion criteria for next month

Any issues that fall short of the inclusion criteria (Figure 5) as of the scheduled reconstitution base date will be excluded from the index portfolio in the following month.

Listed below are specific criteria for exclusion from the index portfolio.

4.2.1 Outstanding face value

Debt issues, whose outstanding face value amount¹² will decrease to levels below JPY1bn on the last business day of the month following the scheduled reconstitution base date, will be excluded from the index portfolio.

For the JHF (GHLC) MBS sector, the remaining face value amount (i) at the last business day of the next month is calculated based on a performance factor¹³ and a rescheduled factor¹⁴, which are announced by the JHF:

Remaining face value amount_i (last business day of next month) =
Original face value amount_i × performance factor_i (next month)

For issues for which the next month's performance factor information is not available by the scheduled reconstitution base date, the remaining face value amount at the last business day of the next month is calculated using a projected scheduled factor for the next month defined as below:

¹² Additional issuance after the portfolio determination date is disregarded.

¹³ For MBS, the performance factor indicates the ratio of remaining principal to the original face amount (the projected repayment amount of the current month is considered). Data on the performance factor for the next month are announced on the 25th of every month (or the prior business day if the 25th is a weekend or holiday), provided by each MBS issue on the JHF website.

¹⁴ The rescheduled factor indicates the ratio of remaining principal to the original face amount, which is updated every six months by reflecting repayment progress since issuance. The rescheduled factor for each MBS issue is announced on the JHF website on the 25th of every month (or the prior business day if the 25th is a weekend or holiday).

Remaining face value amount_{*i*} (last business day of next month)

$$= \text{Original face value amount}_i \\ \times \text{projected scheduled factor}_i \text{ (next month)}$$

Projected scheduled factor_{*i*} (next month)

$$= \text{Performance factor (this month)}_i \\ \times \frac{\text{Rescheduled factor}_i \text{ (next month)}}{\text{Rescheduled factor}_i \text{ (this month)}}$$

In addition, the projected scheduled factor (i) of the next month is set to 0% when the next month corresponds to the clean-up call month (April or October) of the MBS issue (i), and its performance factor (i) of this month (March or September) becomes 10% or less at the scheduled reconstitution base date.

4.2.2 Term to maturity (scheduled redemption)

The NOMURA-BPI excludes bonds of less than 365 days until the full redemption date as of the last day of the month following the scheduled reconstitution base date. 29 February is also counted in.

4.2.3 Credit rating

For corporate bonds, Samurai bonds, MBS and ABS, bonds that have lost all their Triple B grades (i.e., downgraded to Double B or lower) in terms of their highest ratings as of the scheduled reconstitution base date would be excluded from the NOMURA-BPI/Extended index portfolio. Please see “2.4 Ratings (corporate bonds and Samurai bonds)” for more details on rating requirements.

4.2.4 Other potential for exclusion

If a full early redemption and/or a default – and/or a similar material credit event – occurs after the portfolio determination date, the issue in question may be excluded from the next month index portfolio. Any such change would be announced in advance.

5. Unscheduled portfolio reconstitution

In principle, index portfolios for the next month, as determined on the portfolio determination date, will remain unchanged. However, these planned portfolios may be subject to an unscheduled reconstitution, which will be implemented between the portfolio determination date and the last business day of the month, if the IOD becomes aware that a security in the portfolios for the next month meets any of the following criteria:

5.1 Exclusion of defaulted debt and fully called bonds

Default

In the event of a default, the debt issue concerned would be removed from the NOMURA-BPI/Extended index portfolio the first business day after its last trading day.

Full early redemption

Callable bonds are excluded from the index portfolio on the day they are called fully.

5.2 Other criteria for unscheduled reconstitution

A material event other than these explained in 5.1 may lead to an unscheduled portfolio reconstitution. Any such change would be announced in advance.

5.3 Announcement of unscheduled portfolio reconstitution

Information about unscheduled portfolio reconstitution is announced through NRI's data delivery service and other media, except in cases where definite information on such a change is unavailable until that actually takes place due to unexpected circumstances.

6. Calculating index value

6.1 Method for calculating index

6.1.1 Total investment return index (Total index)

This is an index of investment returns including capital and income gains. Assuming the index portfolio was purchased on the last business day of the previous month at a value including accrued interest, coupon payments and redemptions are added the market value amount (including accrued interest), which is announced as the index value for the day. All coupon payments and redemptions are assumed to be received in cash without interest on the day they are made, and are reinvested in the following portfolio reconstitution. Coupon payments made on weekends and holidays are assumed to be made on the following business days.

$$BPI_{(today)} = BPI_{(e.l.m.)} \times \frac{MVLt_{(today)} + CF_{(e.l.m.,today)}}{MVLt_{(e.l.m.)}}$$

Where

$$MVLt_{(i)} = P_{(i)} \times Amount_{(i)} \times \frac{1}{100}$$

$BPI_{(today)}$: Total index value, today
$BPI_{(e.l.m.)}$: Total index value, the last business day of the previous month
$MVLt_{(today)}$: Market value amount (including accrued interest) of index portfolio, today
$MVLt_{(e.l.m.)}$: Market value amount (including accrued interest) of index portfolio, the last business day of the previous month
$CF_{(e.l.m.,today)}$: Total income gains and redemptions paid from the last business day of the previous month through today
$P_{(i)}$: "Dirty price" at point i
$Amount_{(i)}$: Outstanding face value amount at point i

6.1.2 Capital investment return index (Capital index)

This is an index of investment returns in terms of capital gains. Assuming the index portfolio was purchased on the last business day of the previous month at the “dirty price”, redemptions are added at the market value amount (excluding accrued interest). All redemptions are assumed to be received in cash without interest on the day they are made, and reinvested in the following portfolio reconstitution.

$$BPI_{C(today)} = BPI_{C(e.l.m.)} \times \left(1 + \frac{MVL_{C(today)} - MVL_{C(e.l.m.)} + RD_{(e.l.m.,today)}}{MVL_{t(e.l.m.)}} \right)$$

Provided that:

$$MVL_{C(i)} = SP_{(i)} \times Amount_{(i)} \times \frac{1}{100}$$

$BPI_{C(today)}$: Capital index value, today
$BPI_{C(e.l.m.)}$: Capital index value, the last business day of the previous month
$MVL_{C(today)}$: Market value amount (excluding accrued interest) of index portfolio, today
$MVL_{C(e.l.m.)}$: Market value amount (excluding accrued interest) of index portfolio, the last business day of the previous month
$MVL_{t(e.l.m.)}$: Market value amount (including accrued interest) of index portfolio, the last business day of the previous month
$RD_{(e.l.m.,today)}$: Mid-term redemptions arising from the last business day of the previous month through today
$SP_{(i)}$: Clean price at point i
$Amount_{(i)}$: Outstanding face value amount at point i

6.2 Return¹⁵

6.2.1 Total return (annualized)

$$Rt(m,n) = \left(\frac{BPI(n)}{BPI(m)} - 1 \right) \times \frac{365}{\Delta t_D}$$

Point m is assumed to precede point n in a given timeline.

$Rt(m,n)$: Total return from point m through point n
$BPI(i)$: Index value at point i
$\Delta t_D (> 0)$: Days between point m and point n (excluding the settlement date)

¹⁵ Only monthly data were created for investment return before 30 September 1993.

6.2.2 Capital return (annualized)

$$Rc(m,n) = \left(\frac{BPIc(n)}{BPIc(m)} - 1 \right) \times \frac{365}{\Delta t_D}$$

Point m is assumed to precede point n in a given timeline.

$Rc(m,n)$:	Capital return from point m through point n
$BPIc(i)$:	Principal investment return index at point i
$\Delta t_D (> 0)$:	Days between point m and point n (excluding the settlement date)

6.2.3 Income return (annualized)

$$Ri(m,n) = Rt(m,n) - Rc(m,n)$$

Point m is assumed to precede point n in a given timeline.

$Ri(m,n)$:	Income return from point m through point n
$Rt(m,n)$:	Total return from point m through point n
$Rc(m,n)$:	Capital return from point m through point n

6.3 Reference for obtaining market data

The NOMURA-BPI/Extended references bond market pricing data for the marked-to-market valuation of the index portfolios (listed in descending order of priority):

- ✓ JS Price
- ✓ Nomura price

These data are provided on a settlement-day basis, and should be converted to traded-day basis data for use as reference in calculating portfolio and performance indicators.

JS Price is evaluated and calculated by Nomura Securities Co., Ltd. and later examined by Nikkei Inc., Nikkei Financial Technology Research Institute, Inc., and Nomura Research Institute, Ltd.. JS Prices are reliable for a variety of purposes, including mark-to-market accounting. JS Prices are calculated by the reasonable and consistent methodology with passing through the process which examines validations to detect relative/absolute outlier by the methodology designed by Nikkei Inc., Financial Technology Research Institute Inc., Nomura Research Institute, Ltd., and Nomura Securities Co., Ltd..

In addition, JS Price lists more than 12,000 bonds in total (mainly publicly offered and private placement domestic bonds) and covers almost 100% of index portfolios. Furthermore, JS Price offers daily prices with good continuity.

NSC dealers in the front office trading desk at Global Markets Division value Nomura prices for its own daily valuation process, and the NSC is one of the key financial instrument firms in the yen bond market, and is actively engaged in transactions with other financial instruments firms and its clients. For this reason, NSC is in a good position to obtain traded prices and/or quotations in the secondary market.

6.4 Key indices and data released

Key indices provided in the NOMURA-BPI/Extended and their base dates are as follows (base dates vary depending on the index):

Index	Base date (= Base index value)	Publication start date
NOMURA-BPI/Extended	28 Dec 1983 (=100) ¹⁶ (The same as the NOMURA-BPI's until 29 Dec 1995.)	Oct 2000
NOMURA-BPI/Extended MBS	31 Mar 2003 (=100)	Apr 2003
NOMURA-BPI/Extended excluding ABS	28 Dec 1983 (=100) ¹⁷ (The same as the NOMURA-BPI's until 29 Dec 1995.)	Apr 2008

¹⁶ Prior to 31 August 1993, indices were provided on a monthly basis.

¹⁷ Prior to 31 August 1993, indices were provided on a monthly basis.

7. Definition of NOMURA-BPI/Extended indicators

7.1 Definition of issue-specific return-risk indicators

In NOMURA-BPI/Extended, the issue-specific return-risk indicators are defined as follows (see *Japan Bond Indices Handbook*, 14 June 2016, for the definition of future cash flow and return-risk indicators in the MBS sector):

- **Current yield CY (%)**

$$CY = \frac{Cpn \times FV}{SP}$$

SP	:	Clean price (JPY)
Cpn	:	Coupon rate (%)
FV	:	Face value (JPY100)

- **Simple yield SY (%)**

$$SY = \frac{Cpn + \frac{FV - SP}{Yr}}{SP} \times 100$$

SP	:	Clean price (JPY)
Cpn	:	Coupon rate (%)
FV	:	Face value (JPY100)
Yr	:	Term to maturity (scheduled redemption)

- **Compound yield r (%)**

Multiple values r fit formula below

$$P = \sum_i CF_i \times \left(1 + \frac{r}{100} \times \frac{1}{2}\right)^{-2t_i}$$

P	:	Dirty price
CF_i	:	i th future cash flow (JPY)
t_i	:	Number of years until CF_i occurs

Future cash flow CF_i includes principal and interest payments (unless otherwise specified)

- **T-spread $Tspd$ (%)**

$$Tspd = r - \bar{r}$$

Let \bar{P} be a dirty price of the bond, which is assumed a JGB that has the same cash flow as the one for which $Tspd$ is calculated:

$$\bar{P} = \sum_i CF_i \times DF(t_i)$$

Calculate \bar{r} (compound yield) for \bar{P} as:

$$\bar{P} = \sum_i CF_i \times \left(1 + \frac{\bar{r}}{100} \times \frac{1}{2}\right)^{-2t_i}$$

CF_i	:	i th future cash flow (JPY)
$DF(t_i)$:	Discount coefficient at point t_i ¹⁸
t_i	:	Number of years until CF_i occurs

- **Term to maturity (considering early redemption) WAL**
(Weighted Average Life; years)

$$WAL = \frac{\sum_i t_i \times CFP(t_i)}{\sum_i CFP(t_i)}$$

t_i	:	Number of years until CF_i occurs
$CFP(t_i)$:	Principal cash flow at point t_i

- **Duration D (years)**

$$D = \sum_i \frac{CF_i \times \left(1 + \frac{r}{100} \times \frac{1}{2}\right)^{-2t_i} \times t_i}{P}$$

CF_i	:	i th future cash flow (JPY)
t_i	:	Number of years until CF_i occurs
P	:	Dirty price

- **Modified duration mD**

$$mD = \frac{D}{1 + \frac{r}{100} \times \frac{1}{2}} \left(= -\frac{1}{P} \frac{dP}{dr} \right)$$

P	:	Dirty price
-----	---	-------------

- **Convexity Cv**

$$CV = \sum_i \frac{CF_i \times \left(1 + \frac{r}{100} \times \frac{1}{2}\right)^{-2t_i-2} \times t_i \times \left(t_i + \frac{1}{2}\right)}{P} \left(= -\frac{1}{P} \frac{d^2P}{dr^2} \right)$$

CF_i	:	i th future cash flow (JPY)
t_i	:	Number of years until CF_i occurs
P	:	Dirty price

¹⁸ The JGB discount factor is computed using the NOMURA Par Yield Model.

- **Effective duration $EffD$, effective convexity $EffCV$**

$$EffD = \frac{1}{P} \sum_i t_i \times CF_i \times DF(t_i) \times \exp(-\alpha t_i)$$

$$EffCV = \frac{1}{P} \sum_i t_i^2 \times CF_i \times DF(t_i) \times \exp(-\alpha t_i)$$

Where α (yield curve spread) satisfies the following formula

$$P = \sum_i CF_i \times DF(t_i) \times \exp(-\alpha t_i)$$

CF_i	:	i th future cash flow (JPY)
$DF(t_i)$:	Discount coefficient at point t_i ¹⁹
t_i	:	Number of years until CF_i occurs
P	:	Dirty price

7.2 Definition of portfolio indicators

Portfolio indicators are calculated using the issue-specific indicators of all issues in the index portfolio. The weighted average is used in the calculation, as shown in Figure 6.

Fig. 6: Portfolio Indicator Calculation Methods

Indicator	Calculation Method
Coupon rate Term to maturity (scheduled redemption) Term to maturity (considering early redemption) Dirty price	Outstanding face value amount weighted average
Clean price Current yield Simple interest yield Compound interest yield	Market value amount (excluding accrued interest) weighted average
Duration Modified duration Convexity Effective duration Effective convexity	Market value amount (including accrued interest) weighted average

Source: NSC

¹⁹ The JGB discount factor is computed using the NOMURA Par Yield Model.

Appendix: Past rules on NOMURA-BPI/Extended index composition

Sector Changes in the NOMURA-BPI/Extended Total

Fig. 7: Sector Changes in the NOMURA-BPI/Extended

May 2003	Some petroleum bonds were taken over by the government following a repeal of the Japan National Oil Corporation Law. Government-guaranteed petroleum bonds were thus reclassified as JGBs, instead of government-guaranteed bonds.
January 2004	With the repeal of the Electric Power Development Promotion Law, electric power development corporation bonds were reclassified as electric/gas utility bonds, instead of FILP agency bonds and others.
February 2004	As with the change in May 2003, government-guaranteed petroleum bonds taken over by the government were reclassified as JGBs, instead of government-guaranteed bonds.
January 2005	Portfolio index released in accordance with rating classifications by ratings agency.
April 2009	Securities issued by the Japan Finance Corporation for Municipal Enterprises and the Japan Finance Organization for Municipal Enterprises were classified as follows: Municipal corporation bonds backed by government: government-guaranteed bonds (same as before) Municipal corporation bonds backed by government: government-guaranteed bonds (same as before) Bonds issued by the Japan Finance Organization for Municipal Enterprises: corporate bonds (through March 2009), municipal bonds (from April 2009)

Source: NSC

Past Changes in NOMURA-BPI/Extended Inclusion Criteria

Fig. 8: Past Changes in NOMURA-BPI/Extended Inclusion Criteria

June 2002	Date for determining inclusion in portfolio changed from the last business day of the month to the 25th of the month, and inclusion standards then changed as follows: <ul style="list-style-type: none"> • Inclusion determined based on rating as of the 25th of that month. • Inclusion determined based on remaining value as of end of the following month using data through the 25th of that month.
April 2003	Government Housing Loan Corporation MBS are added.
June 2005	Date for the following month's portfolio determination date: Changed to earlier of: 1) first business day after the 25th; or 2) three business days before the last business day of the month. Note that the inclusion selection is made one business day prior to the portfolio determination day. Note: The portfolio determination day may be changed if the JGB auction for a given month falls later than the day after the portfolio determination date.
April 2008	Some ABS included (FILP ABS, REIT bonds, life insurance capital fund notes and subordinated loan bonds).
April 2014	"Retail investor bonds (corporate bonds tailored for retail investors and local government bonds for retail subscription)" will be excluded from the index portfolio.
October 2019	Changed exclusion criteria for TOKYO PRO-BOND Market listed bonds.

Source: NSC

Changes in Pricing

Fig. 9: Changes in Pricing

	Listed bonds		Unlisted bonds
	JGBs	Non-JGBs	
Oct.10, 2000- Feb.1, 2002	Nomura price		
Feb.2, 2002-	Japan Standard Bond Price (JS Price), and if not available, Nomura price		

Source: NSC

Data delivery services

Data on performance indices, such as the total investment return index, and portfolio indicators are available from the following sources:

NOMURA-BPI/Extended data providers

- Nomura Securities' Securities Market Benchmarks' website
<http://qr.nomuraholdings.com/en/bpi/index.html>

- Quick

NRIJ001 NOMURA Indices guidance

NRIJ112-NRIJ119 NOMURA-BPI/Extended

- Reuters

NMSBPI NOMURA-BPI/Extended guidance

- Bloomberg

NBPI<GO> NOMURA-BPI/Extended guidance

- Jiji Press

BPIXG/12400 NOMURA-BPI/Extended total investment return index

Detailed data including next month's index portfolios

Detailed data on portfolio indices and issue-specific indicators are available on IDS, NRI's data delivery services.

Contact: Nomura Research Institute Investment Data Service Department

+ 81-45-613-7200

ids-sales@nri.co.jp

Contact for further inquiries

For inquiries on the use of NOMURA-BPI/Extended as investment benchmark, please see the contact details below:

Nomura Securities Co., Ltd

Global Research Division, Financial Engineering & Technology Research Center

Index Operations Dept.

Tel : 03-6703-3986

e-mail : bpi@jp.nomura.com

The intellectual property rights and any other rights, in NOMURA-BPI/Extended belong to Nomura Securities Co., Ltd. (“Nomura”). Nomura does not guarantee accuracy, completeness, reliability, usefulness, marketability, merchantability or fitness of the Index, and does not account for business activities or services that any index user and/or its affiliates undertakes with the use of the Index.

A license agreement with Nomura Securities is required to use the index and access detailed data. In the case of an unavoidable event such as computer breakdown or natural disaster, calculation of the index may be delayed or suspended. While every effort is made to ensure that the information used in this report and all published information is based on reliable data, it should be noted that data may be changed or amended when necessary.

Policies with regard to NSC's indices

The below index-related policies are published on our website.

See the following link for details:

<http://gr.nomura.co.jp/en/guides/index.html>

- Index Calculation Policy
- Complaints Handling Policy
- Glossary (Fixed Income)
- Index Governance Framework
- Conflicts of Interest Policy

Appendix A-1

Analyst Certification

I, Index Operations Dept., hereby certify (1) that the views expressed in this Research report accurately reflect my personal views about any or all of the subject securities or issuers referred to in this Research report, (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this Research report and (3) no part of my compensation is tied to any specific investment banking transactions performed by Nomura Securities International, Inc., Nomura International plc or any other Nomura Group company.

Important Disclosures

Online availability of research and conflict-of-interest disclosures

Nomura Group research is available on www.nomuranow.com/research, Bloomberg, Capital IQ, Factset, Reuters and ThomsonOne. Important disclosures may be read at <http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx> or requested from Nomura Securities International, Inc., or Instinet, LLC on 1-877-865-5752. If you have any difficulties with the website, please email grpsupport@nomura.com for help.

The analysts responsible for preparing this report have received compensation based upon various factors including the firm's total revenues, a portion of which is generated by Investment Banking activities. Unless otherwise noted, the non-US analysts listed at the front of this report are not registered/qualified as research analysts under FINRA rules, may not be associated persons of NSI or ILLC, and may not be subject to FINRA Rule 2241 restrictions on communications with covered companies, public appearances, and trading securities held by a research analyst account.

Nomura Global Financial Products Inc. ("NGFP") Nomura Derivative Products Inc. ("NDPI") and Nomura International plc. ("Nlplc") are registered with the Commodities Futures Trading Commission and the National Futures Association (NFA) as swap dealers. NGFP, NDPI, and Nlplc are generally engaged in the trading of swaps and other derivative products, any of which may be the subject of this report.

ADDITIONAL DISCLOSURES REQUIRED IN THE U.S.

Principal Trading: Nomura Securities International, Inc and its affiliates will usually trade as principal in the fixed income securities (or in related derivatives) that are the subject of this research report. Analyst Interactions with other Nomura Securities International, Inc. Personnel: The fixed income research analysts of Nomura Securities International, Inc and its affiliates regularly interact with sales and trading desk personnel in connection with obtaining liquidity and pricing information for their respective coverage universe.

Valuation methodology - Fixed Income

Nomura's Fixed Income Strategists express views on the price of securities and financial markets by providing trade recommendations. These can be relative value recommendations, directional trade recommendations, asset allocation recommendations, or a mixture of all three.

The analysis which is embedded in a trade recommendation would include, but not be limited to:

- Fundamental analysis regarding whether a security's price deviates from its underlying macro- or micro-economic fundamentals.
- Quantitative analysis of price variations.
- Technical factors such as regulatory changes, changes to risk appetite in the market, unexpected rating actions, primary market activity and supply/ demand considerations.

The timeframe for a trade recommendation is variable. Tactical ideas have a short timeframe, typically less than three months. Strategic trade ideas have a longer timeframe of typically more than three months.

For the purposes of the EU Market Abuse Regulation, the distribution of ratings published by Nomura Global Fixed Income Research is as follows:

55% have been assigned a Buy (or equivalent) rating; 25% of issuers with this rating were supplied material services by the Nomura Group**.*

0% have been assigned a Neutral (or equivalent) rating.

45% have been assigned a Sell (or equivalent) rating; 33% of issuers with this rating were supplied material services by the Nomura Group.

As at 3 July 2019.

**As defined by the EU Market Abuse Regulation*

***The Nomura Group as defined in the Disclaimer section at the end of this report*

Disclaimers

This publication contains material that has been prepared by the Nomura Group entity identified on page 1 and, if applicable, with the contributions of one or more Nomura Group entities whose employees and their respective affiliations are specified on page 1 or identified elsewhere in the publication. The term "Nomura Group" used herein refers to Nomura Holdings, Inc. and its affiliates and subsidiaries including: Nomura Securities Co., Ltd. ('NSC') Tokyo, Japan; Nomura Financial Products Europe GmbH ('NFPE'), Germany; Nomura International plc ('Nlplc'), UK; Nomura Securities International, Inc. ('NSI'), New York, US; Instinet, LLC ('ILLC'); Nomura International (Hong Kong) Ltd. ('NIHK'), Hong Kong; Nomura Financial Investment (Korea) Co., Ltd. ('NFIK'), Korea (Information on Nomura analysts registered with the Korea Financial Investment Association ('KOFIA') can be found on the KOFIA Intranet at <http://dis.kofia.or.kr>); Nomura Singapore Ltd. ('NSL'), Singapore (Registration number 197201440E, regulated by the Monetary Authority of Singapore); Nomura Australia Ltd. ('NAL'), Australia (ABN 48 003 032 513), regulated by the Australian Securities and Investment Commission ('ASIC') and holder of an Australian financial services licence number 246412; PT Nomura Sekuritas Indonesia ('PTNSI'); Nomura Securities Malaysia Sdn. Bhd. ('NSM'), Malaysia; NIHK, Taipei Branch ('NITB'), Taiwan; Nomura Financial Advisory and Securities (India) Private Limited ('NFASL'), Mumbai, India (Registered Address: Ceejay House, Level 11, Plot F, Shivsagar Estate, Dr. Annie Besant Road, Worli, Mumbai- 400 018, India; Tel: +91 22 4037 4037, Fax: +91 22 4037 4111; CIN No: U74140MH2007PTC169116, SEBI Registration No. for Stock Broking activities : INZ000255633; SEBI Registration No. for Merchant Banking : INM000011419; SEBI Registration No. for Research: INH000001014. 'CNS Thailand' next to an analyst's name on the front page of a research report indicates that the analyst is employed by Capital Nomura Securities Public Company Limited ('CNS') to provide research assistance services to NSL under an agreement between CNS and NSL. 'NSFSP' next to an employee's name on the front page of a research report indicates that the individual is employed by Nomura Structured Finance Services Private Limited to provide assistance to certain Nomura entities under inter-company agreements. The "BDO-NS" (which stands for "BDO Nomura Securities, Inc.") placed next to an analyst's name on the front page of a research report indicates that the analyst is employed by BDO Unibank Inc. ("BDO Unibank") who has been

seconded to BDO-NS, to provide research assistance services to NSL under an agreement between BDO Unibank, NSL and BDO-NS. BDO-NS is a Philippines securities dealer, which is a joint venture between BDO Unibank and the Nomura Group.

THIS MATERIAL IS: (I) FOR YOUR PRIVATE INFORMATION, AND WE ARE NOT SOLICITING ANY ACTION BASED UPON IT; (II) NOT TO BE CONSTRUED AS AN OFFER TO SELL OR A SOLICITATION OF AN OFFER TO BUY ANY SECURITY IN ANY JURISDICTION WHERE SUCH OFFER OR SOLICITATION WOULD BE ILLEGAL; AND (III) OTHER THAN DISCLOSURES RELATING TO THE NOMURA GROUP, BASED UPON INFORMATION FROM SOURCES THAT WE CONSIDER RELIABLE, BUT HAS NOT BEEN INDEPENDENTLY VERIFIED BY NOMURA GROUP.

Other than disclosures relating to the Nomura Group, the Nomura Group does not warrant or represent that the document is accurate, complete, reliable, fit for any particular purpose or merchantable and does not accept liability for any act (or decision not to act) resulting from use of this document and related data. To the maximum extent permissible all warranties and other assurances by the Nomura Group are hereby excluded and the Nomura Group shall have no liability for the use, misuse, or distribution of this information.

Opinions or estimates expressed are current opinions as of the original publication date appearing on this material and the information, including the opinions and estimates contained herein, are subject to change without notice. The Nomura Group is under no duty to update this document. Any comments or statements made herein are those of the author(s) and may differ from views held by other parties within Nomura Group. Clients should consider whether any advice or recommendation in this report is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The Nomura Group does not provide tax advice.

The Nomura Group, and/or its officers, directors and employees, may, to the extent permitted by applicable law and/or regulation, deal as principal, agent, or otherwise, or have long or short positions in, or buy or sell, the securities, commodities or instruments, or options or other derivative instruments based thereon, of issuers or securities mentioned herein. The Nomura Group companies may also act as market maker or liquidity provider (within the meaning of applicable regulations in the UK) in the financial instruments of the issuer. Where the activity of market maker is carried out in accordance with the definition given to it by specific laws and regulations of the US or other jurisdictions, this will be separately disclosed within the specific issuer disclosures.

This document may contain information obtained from third parties, including ratings from credit ratings agencies such as Standard & Poor's. Reproduction and distribution of third-party content in any form is prohibited except with the prior written permission of the related third-party. Third-party content providers do not guarantee the accuracy, completeness, timeliness or availability of any information, including ratings, and are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such content. Third-party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability or fitness for a particular purpose or use. Third-party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including lost income or profits and opportunity costs) in connection with any use of their content, including ratings. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase hold or sell securities. They do not address the suitability of securities or the suitability of securities for investment purposes, and should not be relied on as investment advice.

Any MSCI sourced information in this document is the exclusive property of MSCI Inc. ('MSCI'). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, re-disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI and the MSCI indexes are services marks of MSCI and its affiliates.

The intellectual property rights and any other rights, in Russell/Nomura Japan Equity Index belong to Nomura Securities Co., Ltd. ("Nomura") and Frank Russell Company ("Russell"). Nomura and Russell do not guarantee accuracy, completeness, reliability, usefulness, marketability, merchantability or fitness of the Index, and do not account for business activities or services that any index user and/or its affiliates undertakes with the use of the Index.

Investors should consider this document as only a single factor in making their investment decision and, as such, the report should not be viewed as identifying or suggesting all risks, direct or indirect, that may be associated with any investment decision. Nomura Group produces a number of different types of research product including, among others, fundamental analysis and quantitative analysis; recommendations contained in one type of research product may differ from recommendations contained in other types of research product, whether as a result of differing time horizons, methodologies or otherwise. The Nomura Group publishes research product in a number of different ways including the posting of product on the Nomura Group portals and/or distribution directly to clients. Different groups of clients may receive different products and services from the research department depending on their individual requirements.

Figures presented herein may refer to past performance or simulations based on past performance which are not reliable indicators of future performance. Where the information contains an indication of future performance, such forecasts may not be a reliable indicator of future performance. Moreover, simulations are based on models and simplifying assumptions which may oversimplify and not reflect the future distribution of returns. Any figure, strategy or index created and published for illustrative purposes within this document is not intended for "use" as a "benchmark" as defined by the European Benchmark Regulation.

Certain securities are subject to fluctuations in exchange rates that could have an adverse effect on the value or price of, or income derived from, the investment.

With respect to Fixed Income Research: Recommendations fall into two categories: tactical, which typically last up to three months; or strategic, which typically last from 6-12 months. However, trade recommendations may be reviewed at any time as circumstances change. 'Stop loss' levels for trades are also provided; which, if hit, closes the trade recommendation automatically. Prices and yields shown in recommendations are taken at the time of submission for publication and are based on either indicative Bloomberg, Reuters or Nomura prices and yields at that time. The prices and yields shown are not necessarily those at which the trade recommendation can be implemented.

The securities described herein may not have been registered under the US Securities Act of 1933 (the '1933 Act'), and, in such case, may not be offered or sold in the US or to US persons unless they have been registered under the 1933 Act, or except in compliance with an exemption from the registration requirements of the 1933 Act. Unless governing law permits otherwise, any transaction should be executed via a Nomura entity in your home jurisdiction.

This document has been approved for distribution in the UK as investment research by NIPIC. NIPIC is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority. NIPIC is a member of the London Stock Exchange. This document does not constitute a personal recommendation within the meaning of applicable regulations in the UK, or take into account the particular investment objectives, financial situations, or needs of individual investors. This document is intended only for investors who are 'eligible counterparties' or 'professional clients' for the purposes of applicable regulations in the UK, and may not, therefore, be redistributed to persons who are 'retail clients' for such purposes. This document has been approved for distribution in the European Economic Area as investment research by Nomura Financial Products Europe GmbH ("NFPE"). NFPE is a company organized as a limited liability company under German law registered in the Commercial Register of the Court of Frankfurt/Main under HRB 110223. NFPE is authorized and regulated by the German Federal Financial Supervisory Authority (BaFin).

This document has been approved by NIHK, which is regulated by the Hong Kong Securities and Futures Commission, for distribution in Hong Kong by NIHK. This document has been approved for distribution in Australia by NAL, which is authorized and regulated in Australia by the ASIC. This document has also been approved for distribution in Malaysia by NSM. In Singapore, this document has been distributed by NSL. NSL accepts legal responsibility for the content of this document, where it concerns securities, futures and foreign exchange, issued by their foreign affiliates in respect of recipients who are not accredited, expert or institutional investors as defined by the Securities and Futures Act (Chapter 289). Recipients of this document in Singapore should contact NSL in respect of matters arising from, or in connection with, this

document. Unless prohibited by the provisions of Regulation S of the 1933 Act, this material is distributed in the US, by NSI, a US-registered broker-dealer, which accepts responsibility for its contents in accordance with the provisions of Rule 15a-6, under the US Securities Exchange Act of 1934. The entity that prepared this document permits its separately operated affiliates within the Nomura Group to make copies of such documents available to their clients.

This document has not been approved for distribution to persons other than 'Authorised Persons', 'Exempt Persons' or 'Institutions' (as defined by the Capital Markets Authority) in the Kingdom of Saudi Arabia ('Saudi Arabia') or a 'Market Counterparty' or a 'Professional Client' (as defined by the Dubai Financial Services Authority) in the United Arab Emirates ('UAE') or a 'Market Counterparty' or a 'Business Customer' (as defined by the Qatar Financial Centre Regulatory Authority) in the State of Qatar ('Qatar') by Nomura Saudi Arabia, Nlplc or any other member of the Nomura Group, as the case may be. Neither this document nor any copy thereof may be taken or transmitted or distributed, directly or indirectly, by any person other than those authorised to do so into Saudi Arabia or in the UAE or in Qatar or to any person other than 'Authorised Persons', 'Exempt Persons' or 'Institutions' located in Saudi Arabia or a 'Market Counterparty' or a 'Professional Client' in the UAE or a 'Market Counterparty' or a 'Business Customer' in Qatar. Any failure to comply with these restrictions may constitute a violation of the laws of the UAE or Saudi Arabia or Qatar.

For Canadian Investors: This research report was approved for distribution to Canadian investors by Instinet Canada Limited ("ICL"), member of the Investment Industry Regulatory Organization of Canada ("IIROC") and member of the Canadian Investor Protection Fund. An affiliate of ICL prepared the research report (an "Affiliate Research Report") in accordance with the regulatory requirements applicable to research in the affiliate's local jurisdiction, which include conflict of interest disclosure. ICL reviewed this Affiliate Research Report for the purpose of ensuring Canadian disclosures required by IIROC are included. ICL does not receive compensation in respect of the distribution of Affiliate Research Reports. Pursuant to ICL's policies and procedures regarding the dissemination of research, ICL makes available Affiliate Research Reports to ICL clients and prospective clients only, in electronic and/or in printed form. ICL endeavours to make available and/or distribute Affiliate Research Reports to all intended recipients at the same time. This Affiliate Research Report is not a recommendation and does not take into account the investment objectives, financial situation or particular needs of any particular account.

For report with reference of TAIWAN public companies or authored by Taiwan based research analyst:

THIS DOCUMENT IS SOLELY FOR REFERENCE ONLY. You should independently evaluate the investment risks and are solely responsible for your investment decisions. NO PORTION OF THE REPORT MAY BE REPRODUCED OR QUOTED BY THE PRESS OR ANY OTHER PERSON WITHOUT WRITTEN AUTHORIZATION FROM NOMURA GROUP. Pursuant to Operational Regulations Governing Securities Firms Recommending Trades in Securities to Customers and/or other applicable laws or regulations in Taiwan, you are prohibited to provide the reports to others (including but not limited to related parties, affiliated companies and any other third parties) or engage in any activities in connection with the reports which may involve conflicts of interests. INFORMATION ON SECURITIES / INSTRUMENTS NOT EXECUTABLE BY NOMURA INTERNATIONAL (HONG KONG) LTD., TAIPEI BRANCH IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT BE CONSTRUED AS A RECOMMENDATION OR A SOLICITATION TO TRADE IN SUCH SECURITIES / INSTRUMENTS.

NO PART OF THIS MATERIAL MAY BE (I) COPIED, PHOTOCOPIED, OR DUPLICATED IN ANY FORM, BY ANY MEANS; OR (II) REDISTRIBUTED WITHOUT THE PRIOR WRITTEN CONSENT OF A MEMBER OF THE NOMURA GROUP. If this document has been distributed by electronic transmission, such as e-mail, then such transmission cannot be guaranteed to be secure or error-free as information could be intercepted, corrupted, lost, destroyed, arrive late or incomplete, or contain viruses. The sender therefore does not accept liability for any errors or omissions in the contents of this document, which may arise as a result of electronic transmission. If verification is required, please request a hard-copy version.

Disclaimers required in Japan

Credit ratings in the text that are marked with an asterisk (*) are issued by a rating agency not registered under Japan's Financial Instruments and Exchange Act ("Unregistered Ratings"). For details on Unregistered Ratings, please contact the Research Production Operation Dept. of Nomura Securities Co., Ltd.

Investors in the financial products offered by Nomura Securities may incur fees and commissions specific to those products (for example, transactions involving Japanese equities are subject to a sales commission of up to 1.404%*1 (1.3% tax excluded) of the transaction amount or a commission of ¥2,808*2 (¥2,600 tax excluded) for transactions of ¥200,000 or less, while transactions involving investment trusts are subject to various fees, such as commissions at the time of purchase and asset management fees (trust fees), specific to each investment trust). In addition, all products carry the risk of losses owing to price fluctuations or other factors. Fees and risks vary by product. Please thoroughly read the written materials provided, such as documents delivered before making a contract, listed securities documents, or prospectuses.

*1,*2 As of October 1, 2019, the consumption tax rate of 10% will be applied to *1 at 1.43% and *2 at ¥2,860.

Transactions involving Japanese equities (including Japanese REITs, Japanese ETFs, and Japanese ETNs, Japanese Infrastructure Funds) are subject to a sales commission of up to 1.404%*1 (1.3% tax excluded) of the transaction amount (or a commission of ¥2,808*2 (¥2,600 tax excluded) for transactions of ¥200,000 or less). When Japanese equities are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Japanese equities carry the risk of losses owing to price fluctuations. Japanese REITs carry the risk of losses owing to fluctuations in price and/or earnings of underlying real estate. Japanese ETFs and ETNs carry the risk of losses owing to fluctuations in the underlying indexes or other benchmarks. Japanese Infrastructure Funds carry out the risk of losses owing to fluctuations in price and/or earnings of underlying infrastructures.

*1,*2 As of October 1, 2019, the consumption tax rate of 10% will be applied to *1 at 1.43% and *2 at ¥2,860.

Transactions involving foreign equities are subject to a domestic sales commission of up to 1.026%*1 (0.95% tax excluded) of the transaction amount (which equals the local transaction amount plus local fees and taxes in the case of a purchase or the local transaction amount minus local fees and taxes in the case of a sale) (for transaction amounts of ¥750,000 and below, maximum domestic sales commission is ¥7,668*2 (¥7,100 tax excluded)). Local fees and taxes in foreign financial instruments markets vary by country/territory. When foreign equities are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Foreign equities carry the risk of losses owing to factors such as price fluctuations and foreign exchange rate fluctuations.

*1,*2 As of October 1, 2019, the consumption tax rate of 10% will be applied to *1 at 1.045% and *2 at ¥7,810.

Margin transactions are subject to a sales commission of up to 1.404%*1 (1.3% tax excluded) of the transaction amount (or a commission of ¥2,808*2 (¥2,600 tax excluded) for transactions of ¥200,000 or less), as well as management fees and rights handling fees. In addition, long margin transactions are subject to interest on the purchase amount, while short margin transactions are subject to fees for the lending of the shares borrowed. A margin equal to at least 30% of the transaction amount (at least 33% for online transactions) and at least ¥300,000 is required. With margin transactions, an amount up to roughly 3.3x the margin (roughly 3x for online transactions) may be traded. Margin transactions therefore carry the risk of losses in excess of the margin owing to share price fluctuations. For details, please thoroughly read the written materials provided, such as listed securities documents or documents delivered before making a contract.

*1,*2 As of October 1, 2019, the consumption tax rate of 10% will be applied to *1 at 1.43% and *2 at ¥2,860.

Transactions involving convertible bonds are subject to a sales commission of up to 1.08%*1 (1% tax excluded) of the transaction amount (or a commission of ¥4,320*2 (¥4,000 tax excluded) if this would be less than ¥4,320*2). When convertible bonds are purchased via OTC transactions (including offerings), only the purchase price shall be paid, with no sales commission charged. However, Nomura Securities may charge a separate fee for OTC transactions, as agreed with the customer. Convertible bonds carry the risk of losses owing to factors such as interest rate fluctuations and price fluctuations in the underlying stock. In addition, convertible bonds denominated in foreign currencies also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.

*1,*2 As of October 1, 2019, the consumption tax rate of 10% will be applied to *1 at 1.10% and *2 at ¥4,400.

When bonds are purchased via public offerings, secondary distributions, or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Bonds carry the risk of losses, as prices fluctuate in line with changes in market interest rates. Bond prices may also fall below the invested principal as a result of such factors as changes in the management and financial circumstances of the issuer, or changes in third-party valuations of the bond in question. In addition, foreign currency-denominated bonds also carry the risk of losses owing to factors such as foreign exchange rate fluctuations.

When Japanese government bonds (JGBs) for individual investors are purchased via public offerings, only the purchase price shall be paid, with no sales commission charged. As a rule, JGBs for individual investors may not be sold in the first 12 months after issuance. When JGBs for individual investors are sold before maturity, an amount calculated via the following formula will be subtracted from the par value of the bond plus accrued interest: (1) for 10-year variable rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used, (2) for 5-year and 3-year fixed rate bonds, an amount equal to the two preceding coupon payments (before tax) x 0.79685 will be used.

When inflation-indexed JGBs are purchased via public offerings, secondary distributions (uridashi deals), or other OTC transactions with Nomura Securities, only the purchase price shall be paid, with no sales commission charged. Inflation-indexed JGBs carry the risk of losses, as prices fluctuate in line with changes in market interest rates and fluctuations in the nationwide consumer price index. The notional principal of inflation-indexed JGBs changes in line with the rate of change in nationwide CPI inflation from the time of its issuance. The amount of the coupon payment is calculated by multiplying the coupon rate by the notional principal at the time of payment. The maturity value is the amount of the notional principal when the issue becomes due. For JI17 and subsequent issues, the maturity value shall not undercut the face amount. Purchases of investment trusts (and sales of some investment trusts) are subject to a purchase or sales fee of up to 5.4%*1 (5.0% tax excluded) of the transaction amount. Also, a direct cost that may be incurred when selling investment trusts is a fee of up to 2.0% of the unit price at the time of redemption. Indirect costs that may be incurred during the course of holding investment trusts include, for domestic investment trusts, an asset management fee (trust fee) of up to 5.4%*1 (5.0% tax excluded/annualized basis) of the net assets in trust, as well as fees based on investment performance. Other indirect costs may also be incurred. For foreign investment trusts, indirect fees may be incurred during the course of holding such as investment company compensation.

Investment trusts invest mainly in securities such as Japanese and foreign equities and bonds, whose prices fluctuate. Investment trust unit prices fluctuate owing to price fluctuations in the underlying assets and to foreign exchange rate fluctuations. As such, investment trusts carry the risk of losses. Fees and risks vary by investment trust. Maximum applicable fees are subject to change; please thoroughly read the written materials provided, such as prospectuses or documents delivered before making a contract.

*1 As of October 1, 2019, the consumption tax rate of 10% will be applied to 5.5%.

In interest rate swap transactions and USD/JPY basis swap transactions ("interest rate swap transactions, etc."), only the agreed transaction payments shall be made on the settlement dates. Some interest rate swap transactions, etc. may require pledging of margin collateral. In some of these cases, transaction payments may exceed the amount of collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the transaction. Interest rate swap transactions, etc. carry the risk of losses owing to fluctuations in market prices in the interest rate, currency and other markets, as well as reference indices. Losses incurred as such may exceed the value of margin collateral, in which case margin calls may be triggered. In the event that both parties agree to enter a replacement (or termination) transaction, the interest rates received (paid) under the new arrangement may differ from those in the original arrangement, even if terms other than the interest rates are identical to those in the original transaction. Risks vary by transaction. Please thoroughly read the written materials provided, such as documents delivered before making a contract and disclosure statements.

In OTC transactions of credit default swaps (CDS), no sales commission will be charged. When entering into CDS transactions, the protection buyer will be required to pledge or entrust an agreed amount of margin collateral. In some of these cases, the transaction payments may exceed the amount of margin collateral. There shall be no advance notification of required collateral value or collateral ratios as they vary depending on the financial position of the protection buyer. CDS transactions carry the risk of losses owing to changes in the credit position of some or all of the referenced entities, and/or fluctuations of the interest rate market. The amount the protection buyer receives in the event that the CDS is triggered by a credit event may undercut the total amount of premiums that he/she has paid in the course of the transaction. Similarly, the amount the protection seller pays in the event of a credit event may exceed the total amount of premiums that he/she has received in the transaction. All other conditions being equal, the amount of premiums that the protection buyer pays and that received by the protection seller shall differ. In principle, CDS transactions will be limited to financial instruments business operators and qualified institutional investors.

Transfers of equities to another securities company via the Japan Securities Depository Center are subject to a transfer fee of up to ¥10,800*1 (¥10,000 tax excluded) per issue transferred depending on volume. No account fee will be charged for marketable securities or monies deposited.

*1 As of October 1, 2019, the consumption tax rate of 10% will be applied to ¥11,000.

Nomura Securities Co., Ltd.

Financial instruments firm registered with the Kanto Local Finance Bureau (registration No. 142)

Member associations: Japan Securities Dealers Association; Japan Investment Advisers Association; The Financial Futures Association of Japan; and Type II Financial Instruments Firms Association.

The Nomura Group manages conflicts with respect to the production of research through its compliance policies and procedures (including, but not limited to, Conflicts of Interest, Chinese Wall and Confidentiality policies) as well as through the maintenance of Chinese Walls and employee training.

Additional information regarding the methodologies or models used in the production of any investment recommendations contained within this document is available upon request by contacting the Research Analysts listed on the front page. Disclosures information is available upon request and disclosure information is available at the Nomura Disclosure web page:

<http://go.nomuranow.com/research/globalresearchportal/pages/disclosures/disclosures.aspx>

Copyright © 2019 Nomura Securities Co., Ltd. All rights reserved.