NOMURA

NOMURA-BPI/Extended

CROSS-ASSET

Index rulebook

Global Markets Research

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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 make 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.

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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 assumes the 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; 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.

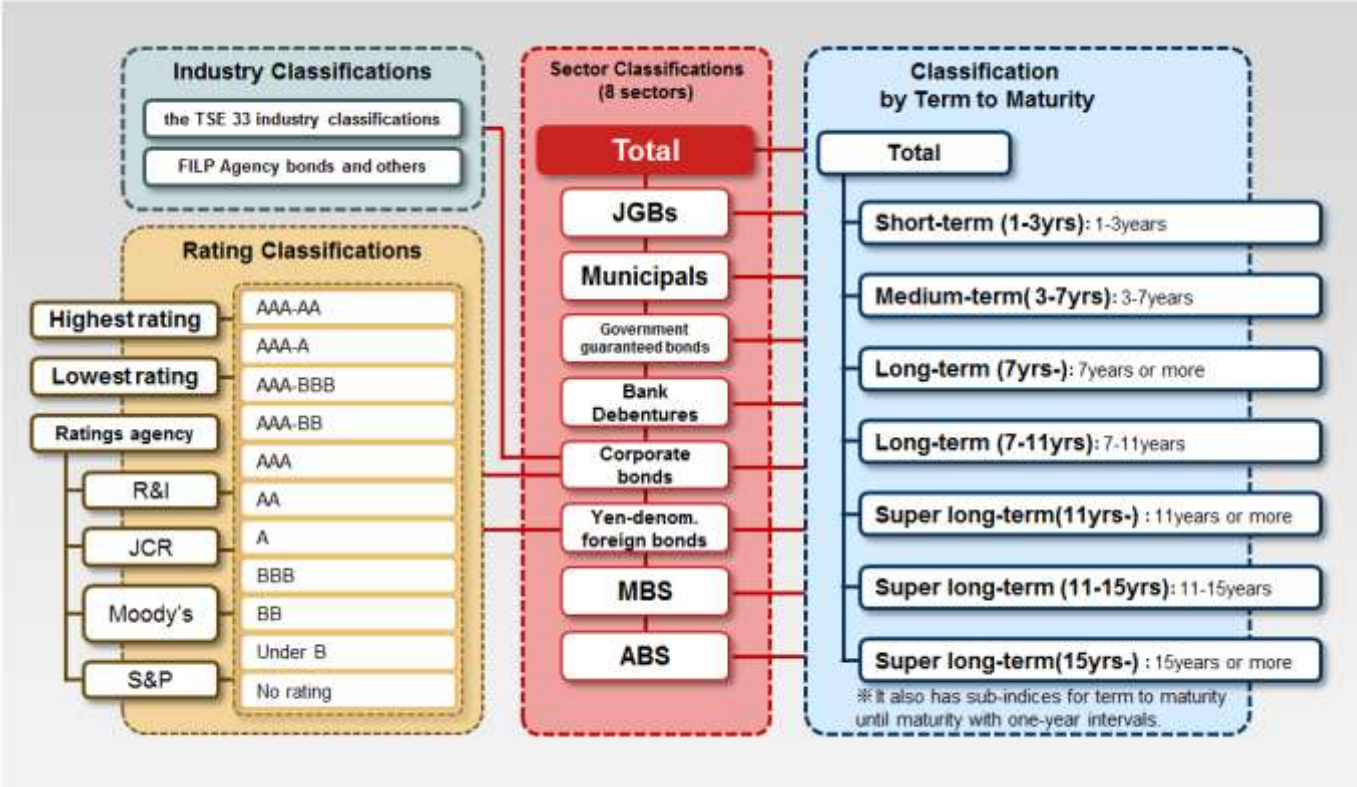
The NOMURA-BPI/Extended is meant to be used as:

- 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 government[1]. 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 government[2]. 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 debentures[3] 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.

Aside 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 sector[4]) (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)[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	・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	・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	・Highest rating	AAA--AA AAA—A AAA-BBB AAA AA A BBB

Source: NSC

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

2.4.2 Criteria for assigning ratings

- Classification by highest rating[7]

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

- 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.

[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..

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 month[8]

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. However, 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 obligation (CLO)
- MBS that fall in 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
- Perpetual bonds
- Bonds listed in TOKYO PRO-BOND Market

4.1.2 Currency denomination

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

4.1.3 Coupon

The NOMURA-BPI/Extended only covers fixed-coupon bonds (i.e., coupon payments remain unchanged from the issuance until maturity). However, 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 bond

4.1.4 Outstanding face value

The NOMURA-BPI/Extended only includes bonds with an outstanding face value amount[10] 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 one year (365 days) or longer until scheduled redemption as of the last day of the month following the scheduled reconstitution base date. Please see “2.2 Term to maturity” for more details.

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 date[11]
- Bank debentures: Issues until the last day of the month two months before the portfolio determination date
- Other bonds: Issues until the last day of the month before the portfolio determination date

[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.

4.1.8 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 portfolio. Any such change would be announced in advance.

4.1.9 Other policies related to eligibility for inclusion

- Subordinate bonds

There are no inclusion criteria for the NOMURA-BPI/Extended based on claim seniority. Even a corporate debt security that is subordinate to senior issues may be included if it meets NOMURA-BPI/Extended inclusion criteria.

- Basel III-compliant bonds

Even a debt security with bail-in clauses and/or write-off clauses for non-viability may be included in the index portfolio if it meets NOMURA-BPI/Extended inclusion criteria.

- Callable/puttable bonds

There are no inclusion criteria based on call or put provisions. If the issue meets the inclusion criteria of the NOMURA-BPI/Extended, it will be added to the index portfolio.

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 amount[12] 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 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 factor[13] and a rescheduled factor[14], which are announced by the JHF:

$$\text{Remaining face value amount } i(\text{last business day of next month}) = \text{Original face value amount } i \times \text{ performance factor } i \text{ (next month)}$$

For issues for which the next month 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:

$$\begin{aligned}\text{Remaining face value amount } i \text{ (last business day of next month)} \\ = \text{ Original face value amount } i \\ \times \text{ projected scheduled factor } i \text{ (next month)}\end{aligned}$$

$$\begin{aligned}\text{Projected scheduled factor } i \text{ (next month)} \\ = \text{Performance factor (this month)} i \\ \times \frac{\text{Rescheduled factor } i \text{ (next month)}}{\text{Rescheduled factor } i \text{ (this month)}}\end{aligned}$$

In addition, the projected scheduled factor (i) of the next month sets 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.

[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 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).

4.2.2 Term to maturity (scheduled redemption)

The NOMURA-BPI/Extended excludes bonds that are dated less than one year (365 days) until scheduled redemption as of the last day of the month following the scheduled reconstitution base date[15]. Please see “2.2 Term to maturity” for more details.

4.2.3 Rating

For corporate bonds, Samurai bonds, MBS and ABS, issues that have lost all their triple-B status (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.

[15] In accordance with business practice, bonds with less than one year remaining to maturity consider leap days, while bonds with more than one year to maturity do not count occurrences of February 29 in the interval.

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 become aware that a security in the portfolios for the next month comes to meet any of the following categories:

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 reinvested at 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 return in terms of capital gains. Assuming that 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 at the following portfolio reconstitution.

$$BPIc_{(today)} = BPIc_{(e.l.m.)} \times \left(1 + \frac{MVLc_{(today)} - MVLc_{(e.l.m.)} + RD_{(e.l.m.,today)}}{MVLt_{(e.l.m.)}}\right)$$

Provided that:

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

$BPIc_{(today)}$	:	Capital index value, today
$BPIc_{(e.l.m)}$	:	Capital index value, the last business day of the previous month
$MVLc_{(today)}$	:	Market value amount (excluding accrued interest) of index portfolio, today
$MVLc_{(e.l.m)}$	:	Market value amount (excluding accrued interest) of index portfolio, the last business day of the previous month
$MVLt_{(e.l.m)}$	:	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 Return[16]

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)

[16] 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., 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 Market Division value Nomura prices for its own daily valuation process, and the NSC is one of the key financial instruments 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)[17] (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)[18] (The same as the NOMURA-BPI's until 29 Dec 1995.)	Apr 2008

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

[18] 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 [19]
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

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

P	:	Dirty price

- **Convexity** Cv

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

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

[19] 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 [20]
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

[20] 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 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 last business day of the month to the 25th of the month, and inclusion standards then change as follows: ・Inclusion determined based on rating as of the 25th of that month. ・Inclusion determined based on remaining value as of end of following month using data through the 25th of that month.
April 2003	Government Housing Loan Corporation MBS are added.
June 2005	Date for 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.

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:

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Appendix A-1

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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.
Transactions involving convertible bonds are subject to a sales commission of up to 1.08% of the transaction amount (or a commission of ¥4,320 if this would be less than ¥4,320). 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.
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% 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% (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.
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.
No account fee will be charged for marketable securities or monies deposited. Transfers of equities to another securities company via the Japan Securities Depository Center are subject to a transfer fee of up to ¥10,800 per issue transferred depending on volume.

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