

**S&P/NZX New Zealand
Fixed Interest Index Series
*Methodology***

July 2018

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Introduction

Index Objective

The S&P/NZX New Zealand Fixed Interest Index Series is a broad benchmark index family that measures the performance of the New Zealand bond market, while meeting certain investability criteria.

Collaboration

In July 2015, pursuant to an agreement between S&P Dow Jones Indices and NZX Limited, the existing suite of NZX Indices was co-branded and S&P Dow Jones Indices assumed responsibility for calculating, maintaining and licensing the indices. NZX continues to distribute and license the real-time and delayed index values via its data feed product.

With the introduction of the index series, New Zealand's indices have been placed at the forefront of the global market. The indices showcase the performance of the New Zealand fixed interest market.

Index Family

S&P/NZX Bond Indices. The S&P/NZX Bond Indices consist of the following:

- **S&P/NZX NZ Fixed Interest Composite Index.** The index tracks the performance of the investment grade New Zealand fixed income market, including sovereign bonds, corporates and bonds issued in New Zealand dollars by foreign entities ("Kauri bonds").
- **S&P/NZX Government Bond Index.** The index is comprised of sovereign bonds issued by the New Zealand Government. In addition to the main index, indices covering various maturity bands are also calculated.
- **S&P/NZX Government Inflation-Linked Bond Index.** The index is comprised of inflation-linked bonds issued by the New Zealand government. The constituents of this index are excluded from the S&P/NZX Government Bond Index.
- **S&P/NZX Local Authority Bond Index.** The index is comprised of bonds issued by Local Authorities in New Zealand, as well as bonds issued by the New Zealand Local Government Funding Agency. Bonds issued by Watercare Services Ltd., a council-controlled organization, wholly-owned by Auckland Council, are also eligible for inclusion in the index.
- **S&P/NZX Investment Grade Corporate Bond Index.** The index is comprised of investment grade, non-New Zealand government bonds issued by domestic entities in local currency. A sub-index comprising bonds with credit ratings of A- or above is also calculated (the **S&P/NZX A-Grade Corporate Bond Index**), as are composite indices combining the investment grade corporate and government bond indices, and A-grade corporate and government bond indices (the **S&P/NZX Composite Investment Grade Bond Index** and **S&P/NZX Composite A-Grade Bond Index**, respectively).
- **S&P/NZX Kauri Bond Index.** The index is comprised of investment grade bonds issued in New Zealand dollars by foreign entities ("Kauri bonds"). An index comprising eligible Kauri bonds and New Zealand government bonds is also calculated (the **S&P/NZX Composite Kauri Bond Index**).

S&P/NZX Swap Indices. This index family comprises nine indices representing the return of an individual swap maturity and a further six aggregate indices representing the average return of two or more individual maturities.

S&P/NZX Bank Bill Indices. These indices are designed to measure the performance of shorter-dated securities. 30-day and 90-day versions of the indices are calculated, representing a hypothetical portfolio of bills valued at either the 30-day, 60-day or 90-day market yield, depending on the number of days to maturity.

S&P/NZX Call Rate Deposit Index. This index represents the performance of a rolling overnight deposit at the New Zealand Reserve Bank Official Cash Rate (OCR).

Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology	Fixed Income Policies & Practices
S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology	Index Mathematics Methodology

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

Eligibility Criteria

Eligibility Factors

Currency and Market of Issue. Only New Zealand dollar-denominated bonds that are issued in the New Zealand market are eligible. Bonds issued through private placements are excluded from the index.

Maturity. Bonds must be of bullet maturity with no embedded optionally (no callable or extendable structures). Securities must have an initial term to maturity greater than or equal to one year.

Credit Rating Quality. Criteria are as follows:

- **New Issues.** New issues must be rated by at least one rating agency (S&P, Moody's or Fitch) to be considered at the next rebalancing.
- **Non-rated and Defaulted Bonds.** Bonds that are no longer rated or have defaulted are removed at the next rebalancing.
- **Investment Grade.** The minimum credit rating for inclusion is BBB-/Baa3/BBB-. The lowest of all available ratings (S&P, Moody's and Fitch) is used as the index rating.

For ratings-based sub-indices, the above rules are applied to the appropriate ratings band.

Pricing. - Mid pricing provided by Thomson Reuters. Bonds not priced by the designated pricing source are ineligible for index inclusion.

Coupon. Only fixed rate, non-zero coupon bonds are eligible. Fixed rate bonds with step-up, or extendable coupons, are excluded. All inflation adjusted coupon payout bonds are only applicable to S&P/NZX Government Inflation-Linked Bond Index.

Collateral Types. Bonds secured by mortgages, with the exception of Covered Bonds, are excluded.

Bond Type. Only fixed rate coupons are included. Deferral option callable, extendable and perpetual bonds are excluded.

Size. A minimum par amount of NZ\$ 100 million at each rebalancing selection date is required.

Reinvestment. Coupon payments and maturity cash flows are invested in the index daily.

Settlement. Bonds issued prior to the rebalancing reference date (regardless of the settlement date). Standard index settlement convention is same-day (e.g. T+0), unless otherwise specified. For month ends that fall on a weekend, the interest accrued during the month will be reflected within the calendar month, regardless of settlement convention. For rates that are not available at month-end (e.g. a rate with an unknown reset), the accrual will be based on the current rate and adjusted the first business day of the next month.

Index Construction

Index Calculations

Weighting. The indices are market-value-weighted.

Calculation. The total return is calculated by aggregating the interest return, reflecting the return due to paid and accrued interest, and price return, reflecting the gains or losses due to changes in the end-of-day price and principal repayments.

For details regarding swap, bank bill, and call rate deposit index calculations, please refer to Appendices 1-3 respectively.

For other information regarding Index Calculations, please refer to the S&P Dow Jones Indices' Fixed Income Mathematics Methodology

Index Maintenance

Rebalancing

S&P/NZX Bond Indices. The indices are reviewed and rebalanced in accordance with their stated schedule. The Index Committee, nevertheless, reserves the right to make adjustments to an index at any time that it believes appropriate.

Additions, deletions and other changes to the index arising from the rebalancing are made provided the security's reference information and pricing are available by designated pricing and data providers on the rebalancing reference date. Changes to the index are published on the announcement date and become effective on the rebalancing date. Information related to the rebalancing is obtained and disseminated after the close of business.

Non-Government Bonds and Deletions of Government Bonds¹

Rebalancing Schedule	
Rebalancing Frequency	Monthly
Rebalancing Date	Last business day of the rebalancing period (<i>T</i>)
Announcement Date	<i>T</i> – three business days (<i>T-3</i>)
Reference Date	<i>T</i> – three business days (<i>T-3</i>)

* All days reflect after the market close

Nominal and Inflation-Linked Government Bonds

Rebalancing Schedule	
Rebalancing Frequency	Daily
Rebalancing Date	Every business day up to <i>T-3</i> . The events on <i>T-3</i> are applied on the last business day of the month (<i>T</i>)
Announcement Date	Every business day up to <i>T-3</i>
Reference Date	The business day prior to a given rebalancing date.

* All days reflect after the market close

Ongoing Maintenance

The indices are also reviewed on an ongoing basis to account for the following:

- When an index bond is in default or misses an interest payment, the price reported by the pricing source is used. However, the Index Committee may determine that the bond be removed from the index at a different price and may specify a price of 0.00. The decision of the Index Committee is final.
- If an index bond is no longer priced by the pricing source, the last available price is used. However, the Index Committee may determine that a different price be used. The decision of the Index Committee is final. For clarity, index bonds that are no longer priced by the pricing source fail to meet the pricing eligibility factors and are removed at the next rebalancing date. If the bond is priced for at least one of the five business days prior to the rebalancing announcement date, the bond remains in the index. Otherwise, it is removed from the index at the subsequent rebalancing date.

¹ The migration among maturity bands for government bonds is reviewed during each monthly rebalancing, so no government bond would be dropped from maturity bands during the daily rebalancings.

S&P/NZX Swap Indices. The indices are rebalanced on the last business day of each month whereby the underlying positions are terminated at market value and replaced with new par swaps and cash deposits.

S&P/NZX Bank Bill Indices. The indices undergo a theoretical rebalancing on a daily basis, whereby each day a new bill with either thirty or ninety days to maturity is added to the index, replacing one bill that matures.

S&P/NZX Call Rate Deposit Index. The index represents the performance of a rolling overnight deposit and does not undergo a rebalancing in the manner of the indices described above.

Currency and Currency Hedged Indices

Additional currency and currency hedged versions of the indices, as well as maturity, sector and rating-based sub-indices, may be available. For a list of available sub-indices and tickers, please refer to S&P Dow Jones Indices' Fixed Income Index Directory available at www.spdji.com.

For more information on currency and currency hedged indices, please refer to S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology.

Index Governance

Index Committee

The S&P/NZX Fixed Income Index Committee maintains the indices. All members of the Committee are full-time professionals at S&P Dow Jones Indices or the NZX. Meetings are held whenever deemed appropriate.

The Committee oversees the management of the indices, including determinations of intra-rebalancing changes, maintenance and inclusion policies, and other matters affecting the maintenance and calculation of the indices.

In fulfilling its responsibilities, the Committee has full and complete discretion to (i) amend, apply, or exempt the application of index rules and policies as circumstances may require and (ii) add, remove, or by-pass any bond in determining the composition of an index.

The Committee may rely on any information or documentation submitted to it or gathered by it that the Committee believes to be accurate. The Committee reserves the right to reinterpret publicly available information and to make changes to the indices based on a new interpretation of that information at its sole discretion. All Index Committee discussions are confidential.

The Index Committee is separate from and independent of other analytical groups at S&P Global. In particular, the Index Committee has no access to or influence on decisions by S&P Global Ratings analysts.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.

Index Policy

Announcements

Announcements of any relevant information pertaining to the indices are made after market close. Press releases are posted on the S&P Dow Jones Indices' Web site at www.spdji.com.

Holiday Schedule

The indices are calculated daily, throughout the calendar year, with the following exceptions:

- New Zealand national holidays
- Wellington regional anniversary holidays
- Auckland regional anniversary holidays

A complete holiday schedule for the year is available at www.spdji.com.

Rebalancing

The Index Committee may change the date of a given rebalancing for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with reasonable advance notice where possible.

End-of-Day Calculation

Index levels are calculated and published at the end of each business day via S&P Dow Jones Indices' Web site. This may be subject to change.

Index Releases

Releases are issued by S&P Dow Jones Indices at the end of the business day.

Recalculation Policy

For information on the recalculation policy please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document.

Contact Information

For questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at www.spdji.com, major quote vendors (see codes below), numerous investment-oriented websites, and various print and electronic media.

Tickers

Index (Total Return Index)	Bloomberg
<i>S&P/NZX Bond Indices:</i>	
S&P/NZX NZ Fixed Interest Composite Index	SPBNZCT
S&P/NZX NZ Government Bond Index	SPBNGBT
S&P/NZX NZ Government Bond 0-3 Year Index	SPBNG3T
S&P/NZX NZ Government Bond 0-5 Year Index	SPBNG05T
S&P/NZX NZ Government Bond 3-7 Year Index	SPBNG37T
S&P/NZX NZ Government Bond 1+ Year Index	SPBNG1T
S&P/NZX NZ Government Bond 5+ Year Index	SPBNG5T
S&P/NZX NZ Government Bond 7+ Year Index	SPBNG7T
S&P/NZX NZ Inflation-Indexed Government Bond Index	SPBNILT
S&P/NZX A-Grade Corporate Bond Index	SPBNCAT
S&P/NZX Investment Grade Corporate Bond Index	SPBNCIT
S&P/NZX Local Authority Bond Index	SPBNLAT
S&P/NZX Kauri Bond Index	SPBNKAT
S&P/NZX Kauri Bond 0-5 Year Index	SPBNK05T
S&P/NZX Kauri Bond 5+ Year Index	SPBNK5T
S&P/NZX Composite Kauri Bond Index	SPBNCKT
S&P/NZX Composite A-Grade Bond Index	SPBNCOT
S&P/NZX Composite Investment Grade Bond Index	SPBNCOIT
<i>S&P/NZX Swap Indices:</i>	
S&P/NZX 1 Year Swap Index	SPBNS1T
S&P/NZX 2 Year Swap Index	SPBNS2T
S&P/NZX 3 Year Swap Index	SPBNS3T
S&P/NZX 4 Year Swap Index	SPBNS4T
S&P/NZX 5 Year Swap Index	SPBNS5T
S&P/NZX 7 Year Swap Index	SPBNS7T
S&P/NZX 10 Year Swap Index	SPBNS10T
S&P/NZX 15 Year Swap Index	SPBNS15T
S&P/NZX All Swaps Index (1Y – 10Y incl.)	SPBNSCT
S&P/NZX Short End Swap Index (1Y, 2Y & 3Y)	SPBNSST
S&P/NZX Short-Mid Curve Swap Index (1Y – 5Y incl.)	SPBNSMT
S&P/NZX Mid Curve Swap Index (3Y – 7Y incl.)	SPBNSMT
S&P/NZX Mid-Long End Swap Index (5Y, 7Y & 10Y)	SPBNSMLT
S&P/NZX Long End Swap Index (7Y & 10Y)	SPBNSLT
<i>S&P/NZX Bank Bill Indices:</i>	
S&P/NZX 30-Day Bank Bill Index	SPBNB30T
S&P/NZX 90-Day Bank Bill Index	SPBNB90T
<i>Other Indices:</i>	
S&P/NZX Call Rate Deposit Index	SPBNCRT

FTP

Daily index level data is available via FTP subscription.

For product information, please contact S&P Dow Jones Indices, www.spdji.com/contact-us.

Web site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spdji.com.

Appendix I – Swap Index Calculation

Swap Calculation

The present value of the swap is calculated by summing the present value of all future flows that will occur as a result of the swap. The present value of a flow is the amount multiplied by an appropriate discount factor. The discount factor is derived from current interest rates in the market, through a process called “bootstrapping”. Bootstrapping is a process of deconstructing periodic market bond or swap rates and combining them through forward-substitution to derive the equivalent zero-coupon rates from today to a given maturity. The resulting zero-coupon curve is continuous and used to find any discount factor by interpolation.

$$\sum_i PV_i = \sum DF_i * CF_i$$

where:

PV_i = Present value of future cash flow i .

DF_i = Discount factor of future cash flow i .

CF_i = Cash flow amount for period i .

Swap Index Calculation

Index values are calculated by taking the ratio of the present value of the swap today and after the previous rebalancing and multiplying this by the index value at the previous rebalancing:

$$IndexTR_t = \frac{\sum_i PV_{i,t}}{\sum_i PV_{i,Rebalance}} * IndexTR_{Rebalance}$$

Inputs and Yield Curve	
Inputs:	Mid-market swap and bill rates from Thomson Reuters; New Zealand Reserve Bank Official Cash Rate (OCR)
Settlement Dates:	Same day (T) for cash and bill rates; $T+2$ for swap rates
Spot Rate:	OCR compounded for two days
Day Count:	Actual/365
Convention:	Interest rate swaps are semi-quarterly
Interpolation:	Linear interpolation of market rates is used to derive rates for intervening dates

Appendix II – Bank Bill Index Calculations

30-Day Bank Bill Index Calculation

Index values are calculated by multiplying the previous day's index value by the ratio of the market value of the bank bill portfolio today to the market value on the previous day:

$$IndexTR_t = \frac{MVPortfolio_t}{MVPortfolio_{t-1}} * IndexTR_{t-1}$$

$$MVPortfolio_t = \sum_{i=0}^{i=29} \frac{1}{1+R_{30}(i/365)}$$

$$MVPortfolio_{t-1} = \sum_{i=1}^{i=30} \frac{1}{1+R_{30}(i/365)}$$

where:

$MV Portfolio_t$ = Market value of Bank Bill portfolio on day t .

$IndexTR_t$ = Index value on day t .

i = The number of days to maturity.

90-Day Bank Bill Index Calculation

Index values are calculated by multiplying the previous day's index value by the ratio of the market value of the bank bill portfolio today to the market value on the previous day:

$$IndexTR_t = \frac{MVPortfolio_t}{MVPortfolio_{t-1}} * IndexTR_{t-1}$$

$$MVPortfolio_t = \sum_{i=0}^{i=30} \frac{1}{1+R_{30}(i/365)} + \sum_{i=31}^{i=60} \frac{1}{1+R_{60}(i/365)} + \sum_{i=61}^{i=89} \frac{1}{1+R_{90}(i/365)}$$

$$MVPortfolio_{t-1} = \sum_{i=1}^{i=30} \frac{1}{1+R_{30}(i/365)} + \sum_{i=31}^{i=60} \frac{1}{1+R_{60}(i/365)} + \sum_{i=61}^{i=90} \frac{1}{1+R_{90}(i/365)}$$

where:

$MV Portfolio_t$ = Market value of Bank Bill portfolio on day t .

$IndexTR_t$ = Index value on day t .

i = The number of days to maturity.

Appendix III – Call Rate Deposit Index Calculation

$$IndexTR_t = \left(1 + \frac{n[T, T-1] * r}{365}\right) * IndexTR_{t-1}$$

where:

$n[T, T-1]$ = The number of days between the current and previous business days.

r = The Official Cash Rate (OCR) published by the New Zealand Reserve Bank.

Appendix IV – Methodology Changes

Methodology changes since 07/01/2015 are as follows:

Change	Effective Date (After Close)	Previous	Methodology Updated
Index rebalancing schedule change to <i>S&P/NZX Bond Indices</i>	3/31/2017	S&P/NZX Bond Indices are normally reviewed and rebalanced in accordance with the monthly rebalancing procedure. The monthly rebalancing reference date is T-5 business days.	New Zealand government bonds are reviewed on a daily basis, including bond additions, taps and buybacks. Non-government bonds and the deletions of government bonds are reviewed on a monthly basis. The monthly rebalancing reference date is T-3 business days for both government and non-government bonds.
Month end index return calculation change to the S&P/NZX Bank Bill indices, S&P/NZX Call Rate Deposit Index, and S&P/NZX Swap Indices	07/26/2016	Accrued interest on non-business days, including weekends and holidays, are incorporated into the index return on the following business day.	The index return on the last business day of the month incorporates the accrued interest up to and including the last calendar day of the month. The first business day of the following month only accounts for the accrued interest from the first calendar day of the new month to the first business day.

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