SPECTRUM ASSET MANAGEMENT

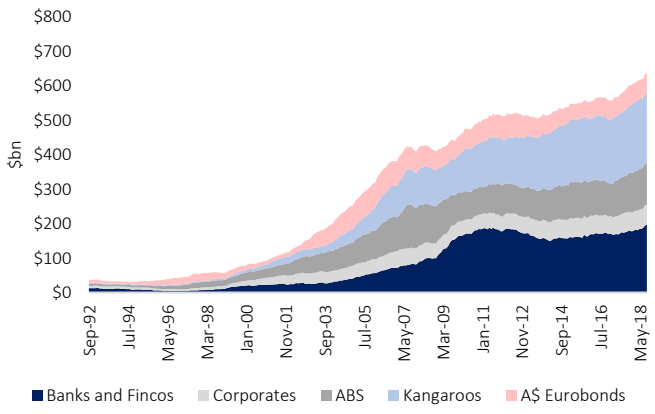
Australian corporate bond market

Statistics, facts, and analysis

February 2019

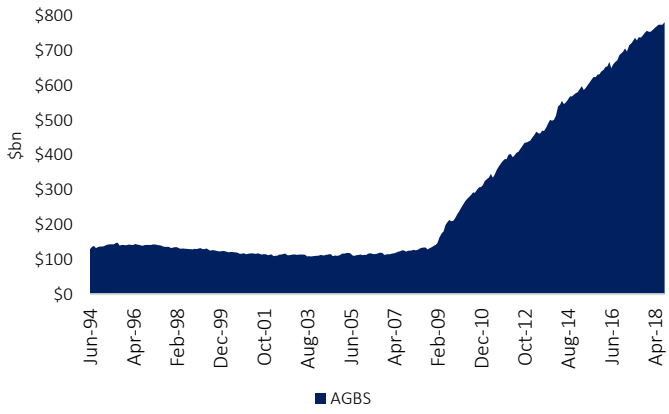
Australian Fixed income market overview

Australian dollar corporate bond market
Excluding listed and OTC retail bonds



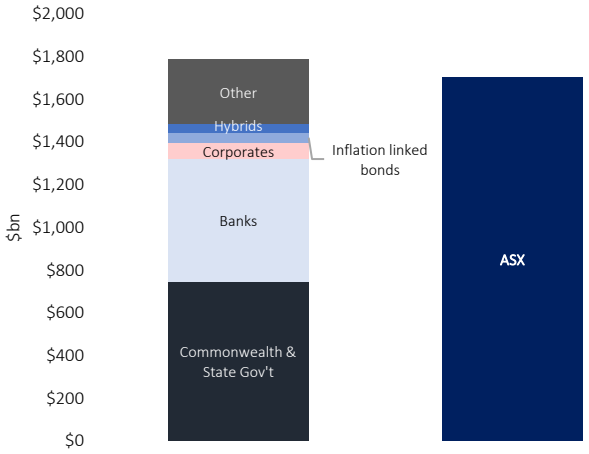
Sources: RBA, Spectrum

Australian Commonwealth and state securities



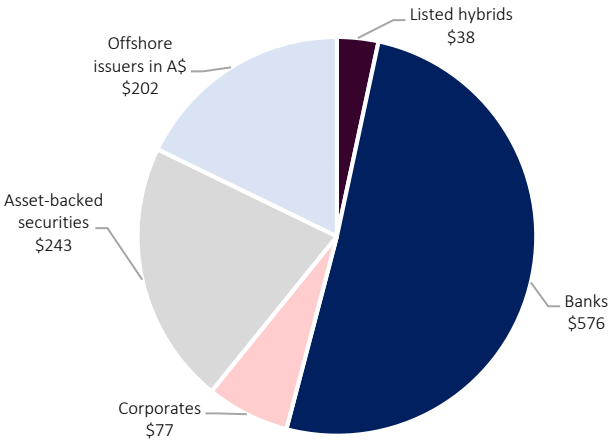
Sources: RBA, Spectrum

Bond and stock market around the same size
Australian dollar bonds vs Australian share market



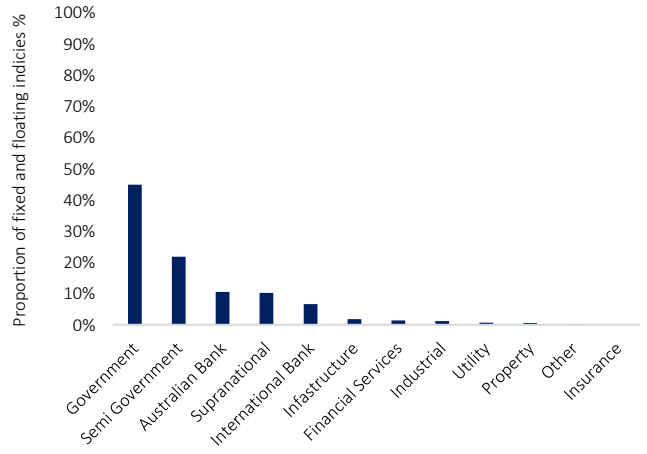
Sources: RBA, ASX, UBS, Spectrum

Australian dollar credit securities - $bn
31 December 2018



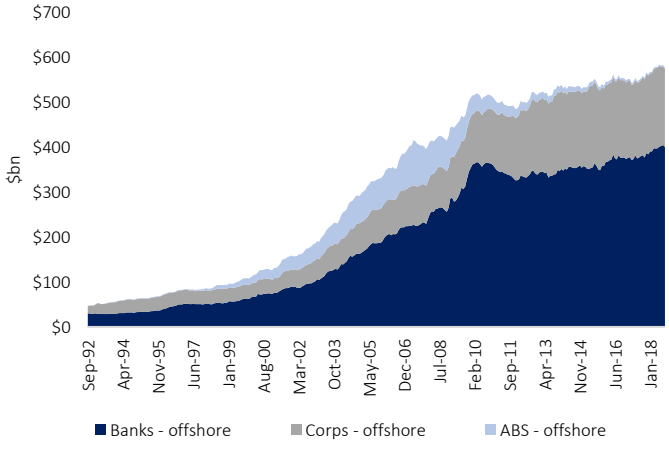
Sources: RBA, ASX, Spectrum

Australian dollar corporate bond market
Sector breakdown - 31/12/2018



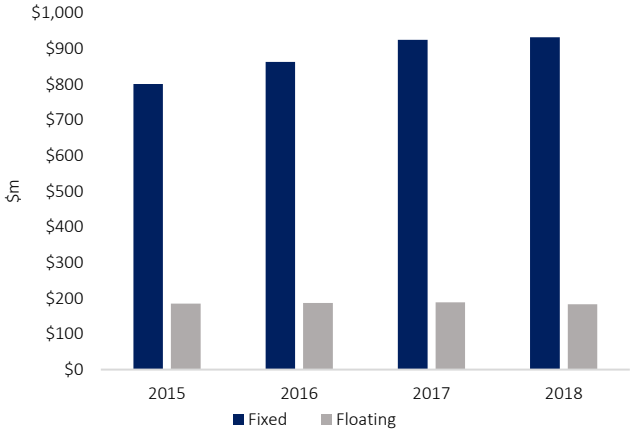
Sources: UBS, Spectrum

Australian issuers - offshore markets



Sources: RBA, Spectrum

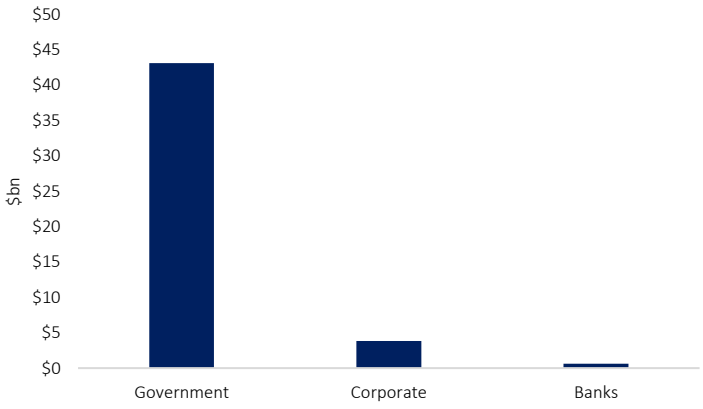
Total market value - Fixed and floating



Sources: UBS, Spectrum

Total market value - Inflation linked index

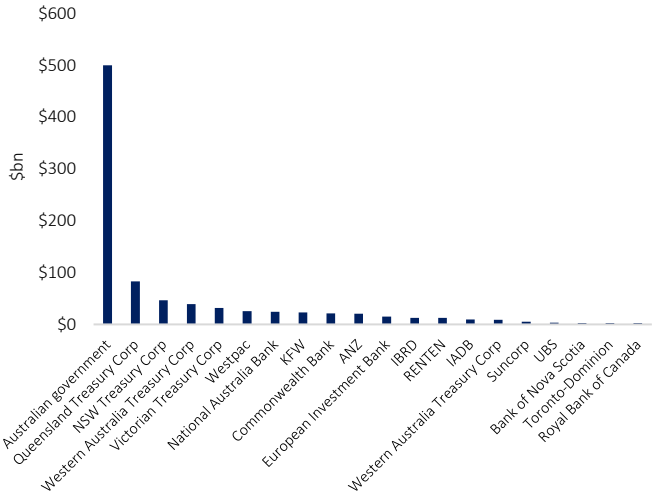
31 December 2018



Sources: UBS, Spectrum

Largest Australian dollar issuers

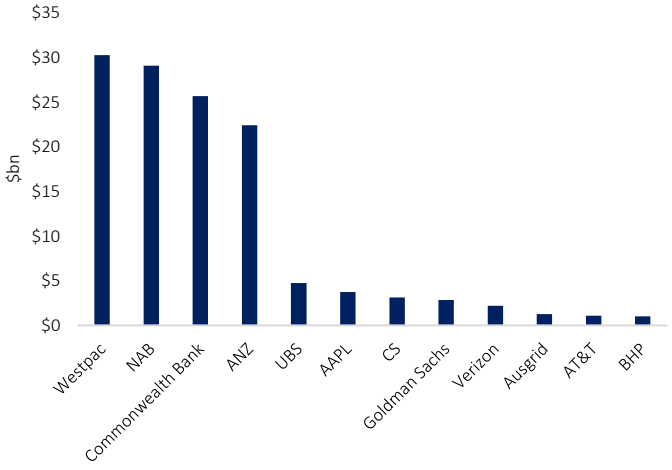
Index issuance only - 31 December 2018



Sources: UBS, Spectrum

Largest Australian dollar issuers - corporates

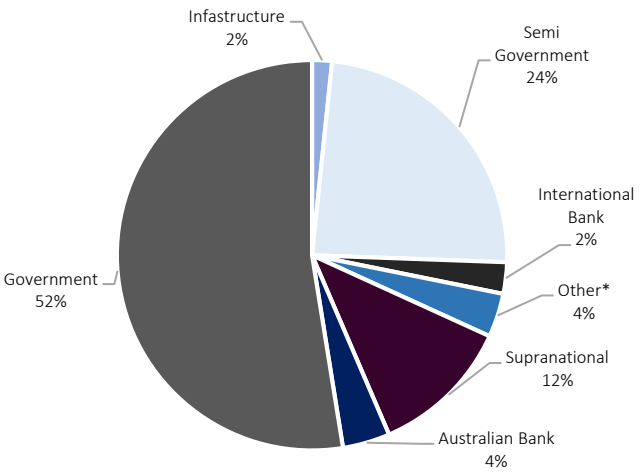
Index issuance only - 2018



Sources: UBS, Spectrum

Australian fixed rate bond index

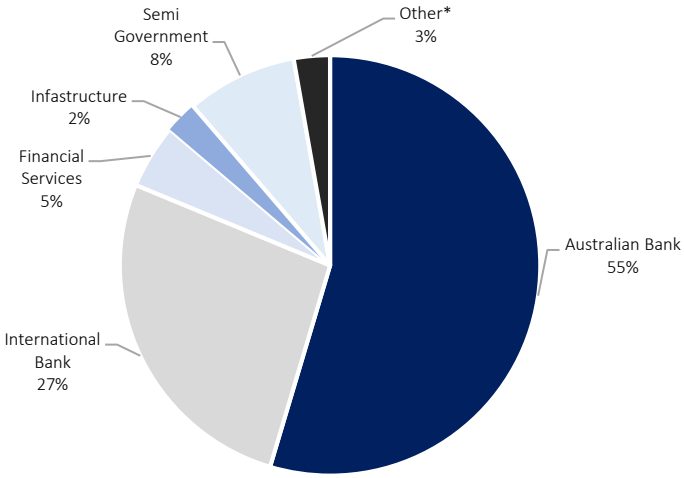
Sector breakdown - 31 December 2018



**Other includes: Insurance, Utility, Industrial, Property and Financial services sectors.*
Sources: UBS, Spectrum

Australian Floating rate note index

Sector breakdown - 31 December 2018



**Other includes: Insurance, Utility, Industrial and Supranational sectors.*
Sources: UBS, Spectrum

Sovereign debt

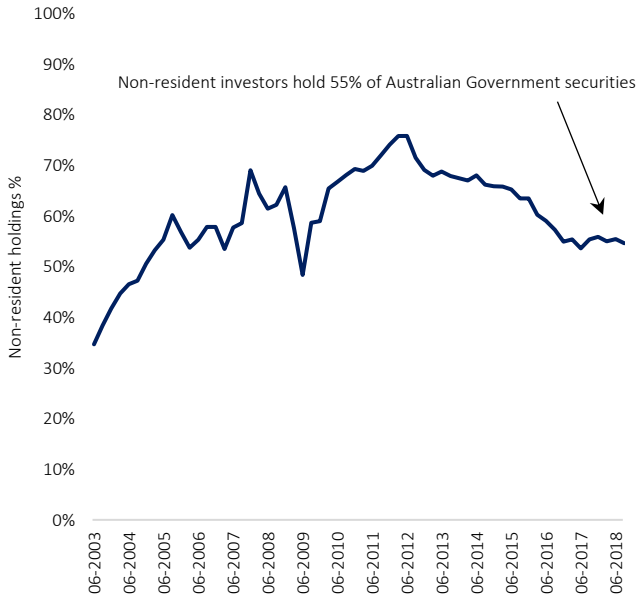
G20	GDP YoY %	GDP Per Capita	Debt/GDP	S&P	Moodys	Fitch
Australia	2.4%	$53,800	37%	AAA	Aaa	AAA
Canada	3.0%	$45,032	71%	AAA	Aaa	AAA
Germany	2.5%	$44,470	61%	AAA	Aaa	AAA
United States	2.2%	$59,532	98%	AA+	Aaa	AAA
European Union	1.9%	$33,723	86%	AA	Aaa	AAA
France	2.3%	$38,477	99%	AA	Aa2	AA
United Kingdom	1.8%	$39,720	86%	AA	Aa2	AA
South Korea	3.1%	$29,743	39%	AA	Aa2	AA-
China	6.9%	$8,827	48%	A+	A1	A+
Japan	1.9%	$38,428	201%	A+	A1	A
Saudi Arabia	-0.9%	$20,849	18%	A-	A1	A+
Mexico	2.3%	$8,910	36%	BBB+	A3	BBB+
Italy	1.6%	$31,953	133%	BBB	Baa3	BBB
Indonesia	5.1%	$3,847	30%	BBB-	Baa2	BBB
India	6.3%	$1,942	69%	BBB-	Baa2	BBB-
Russia	1.6%	$10,743	15%	BBB-	Ba1	BBB-
South Africa	1.3%	$6,151	56%	BB	Baa3	BB+
Brazil	1.1%	$9,821	87%	BB-	Ba2	BB-
Turkey	7.4%	$10,546	29%	B+	Ba3	BB
Argentina	2.9%	$14,398	81%	B	B2	B

Sources: Thomson Reuters, BIS, Spectrum

Government Bonds

Non-resident holdings

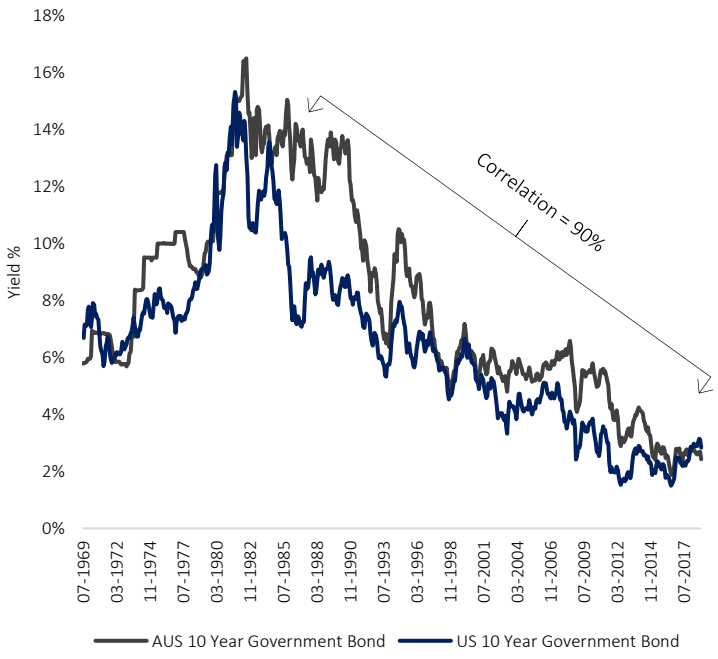
Australian Government Securities



Sources: AFOM, ABS, Spectrum

Government bonds yields collapse since 1980s

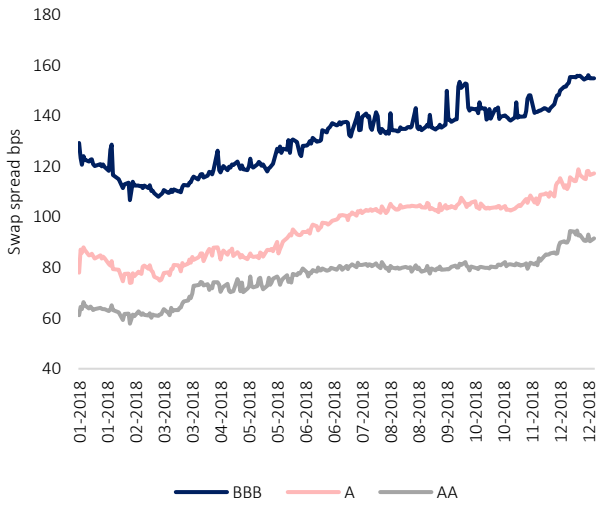
US vs. AUS 10 year government bond yield



Sources: RBA, US St Louis Fed Reserve, Spectrum

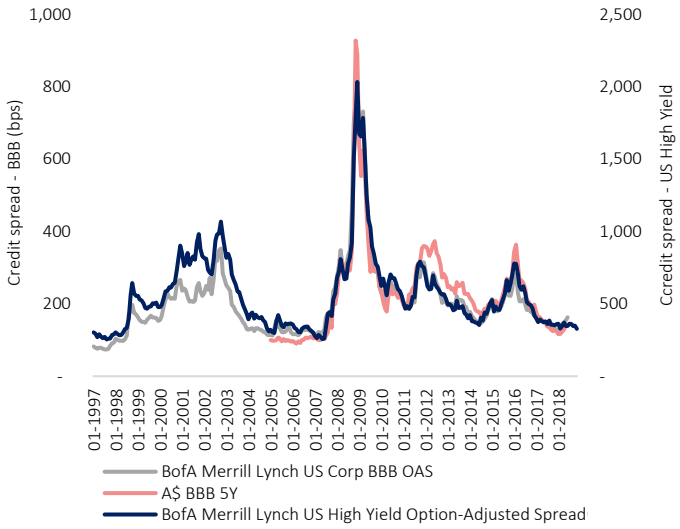
Credit spreads

Australian credit spreads
Spreads widen over 2018



Sources: Thomson Reuters, Spectrum

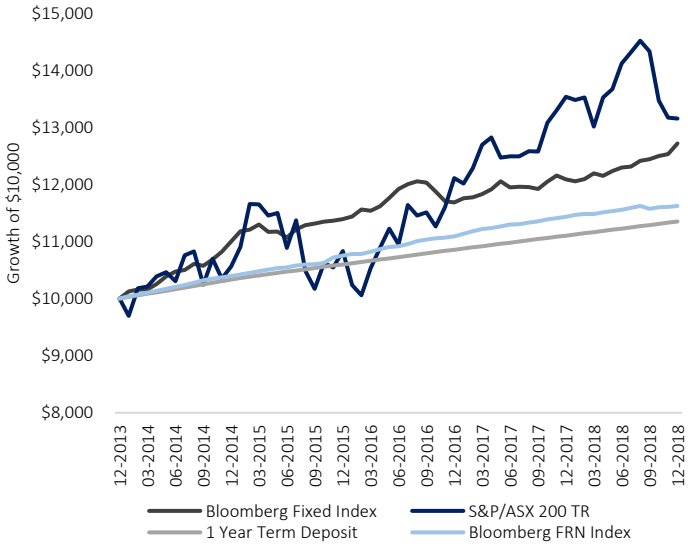
US market drives Australian corporate bonds



Sources: US St Louis Fed Reserve, RBA, Spectrum

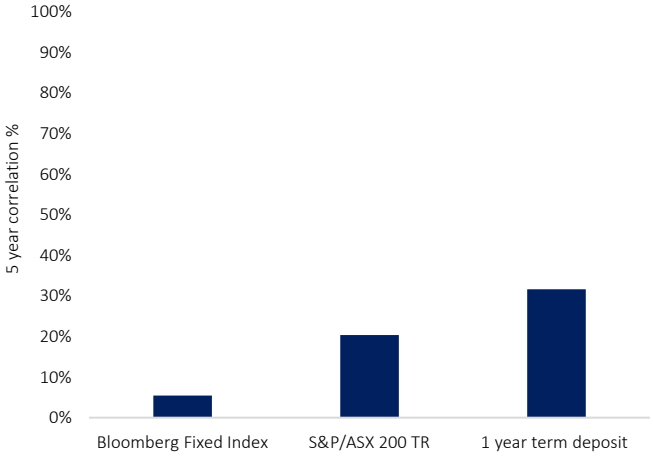
Performance of fixed income indices vs peers

Growth of $10,000 over 5 years



Sources: Thomson Reuters, Spectrum

Correlation with Bloomberg FRN index
5 year correlation - 31/12/2013 to 31/12/2018



Sources: Thomson Reuters, Spectrum

Correlations – 5 years*	S&P/ASX 200 (TR) ç	Bloomberg Fixed Index †	Bloomberg FRN Index ɨ
S&P/ASX 200 (TR)	100%	7%	20%
Bloomberg Fixed Index	7%	100%	5%
Bloomberg FRN Index	20%	5%	100%

**Dates from 31/12/2013 to 31/12/2018*
ç S&P/ASX 200 Total Return Index
ɨ Bloomberg AusBond Credit Floating Rate Note Index
† Bloomberg AusBond Composite Index

CDS market

Australian ITRAXX
CDS spreads wider over 2018

Sources: Thomson Reuters, Spectrum

Australian big four bank average CDS

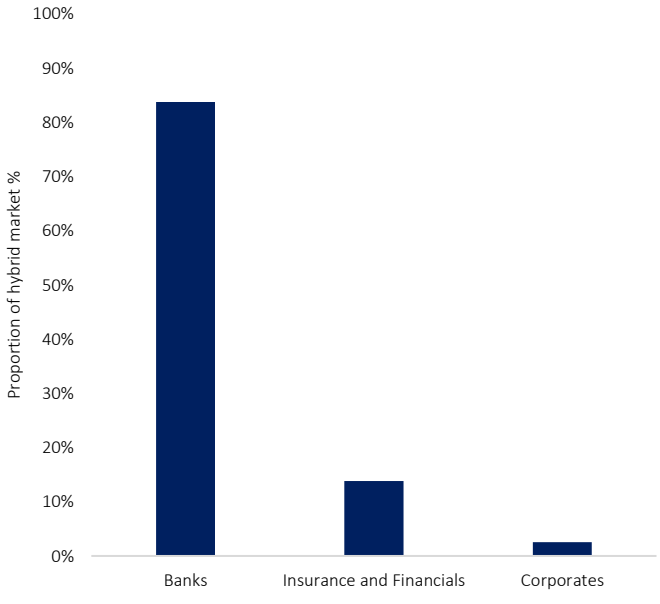
Sources: Thomson Reuters, Spectrum

Hybrid market

Spectrum hybrid index

Sources: Spectrum

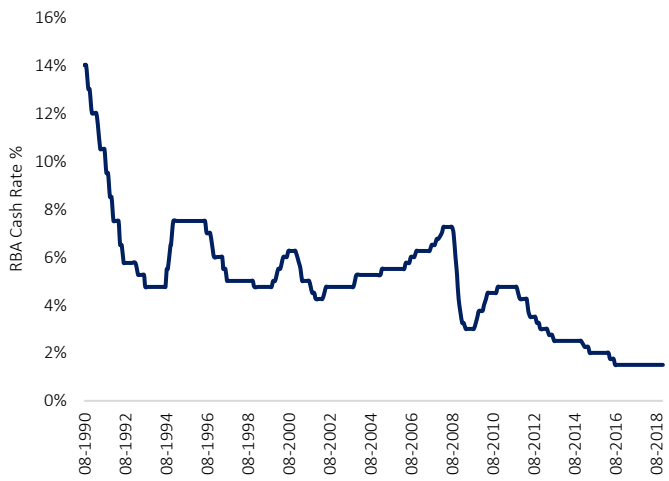
Australian listed hybrid market
Outstanding securities - 31 December 2018



Sources: ASX, Spectrum

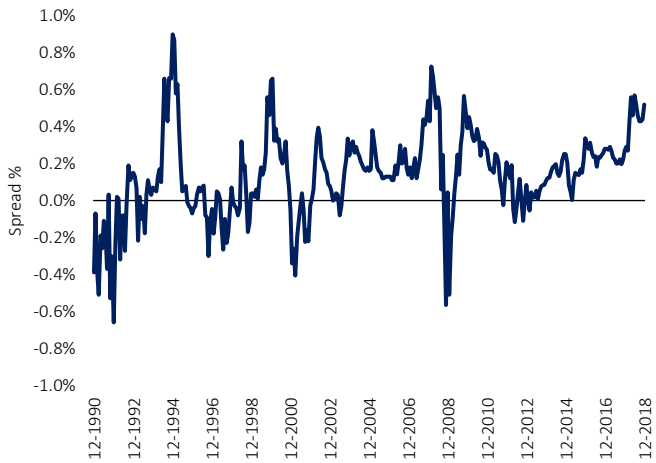
Money market

RBA Cash Rate



Sources: RBA, Spectrum

Bank Accepted Bills - Spread over cash rate

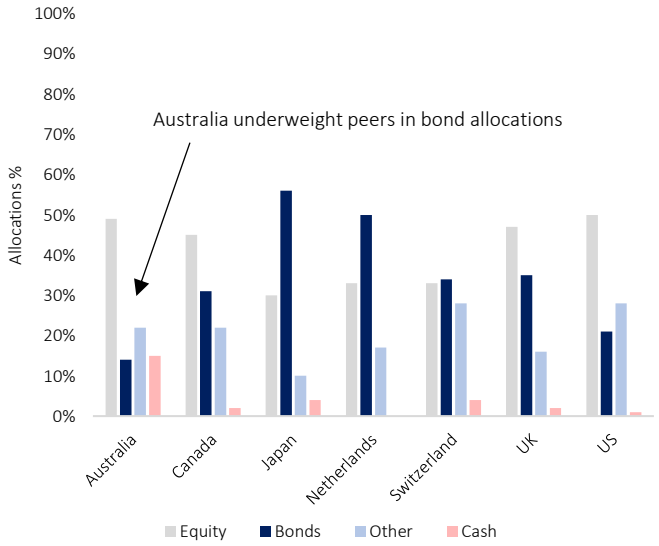


Sources: RBA, Spectrum

Asset allocation into fixed income

Asset allocation - Australia vs. peers

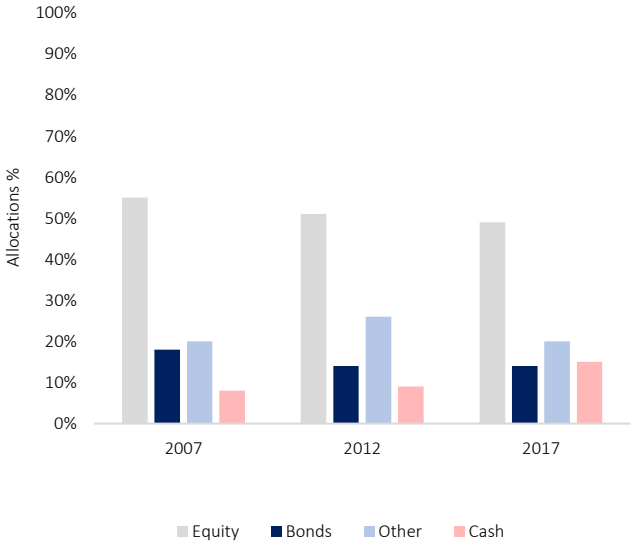
Australia underweight peers in fixed income - 2017



Sources: Wlillis Towers Watson, Spectrum

Asset allocation - Australian superannuation

Historic allocations



Sources: Willis Watson Towers, Spectrum

BENEFITS OF FIXED INCOME

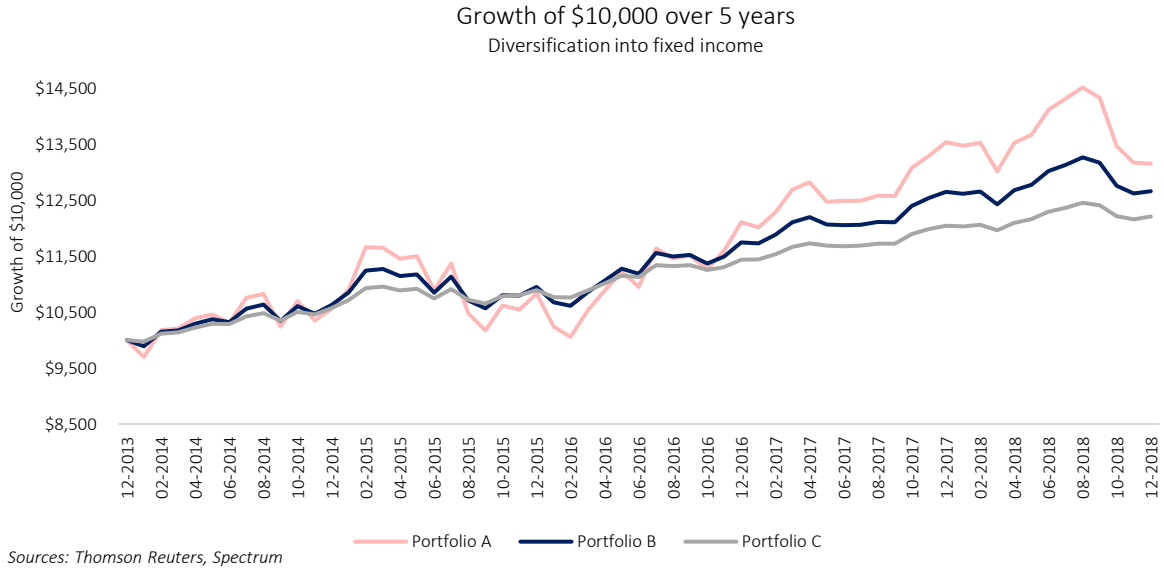
What are the benefits of investing into bonds?

The potential benefits of fixed income are best expressed via the volatility reducing effects of diversification. Given a portfolio that is 100% invested into Australian equities, a 50/50 split into fixed income (50% in fixed rate bonds and 50% in floating rate notes) can yield substantial reductions in volatility.

Fixed income has the effect of 'smoothing' the returns of an investment portfolio. In combination with further diversification, such as an allocation to term deposits, additional volatility reduction can be achieved.

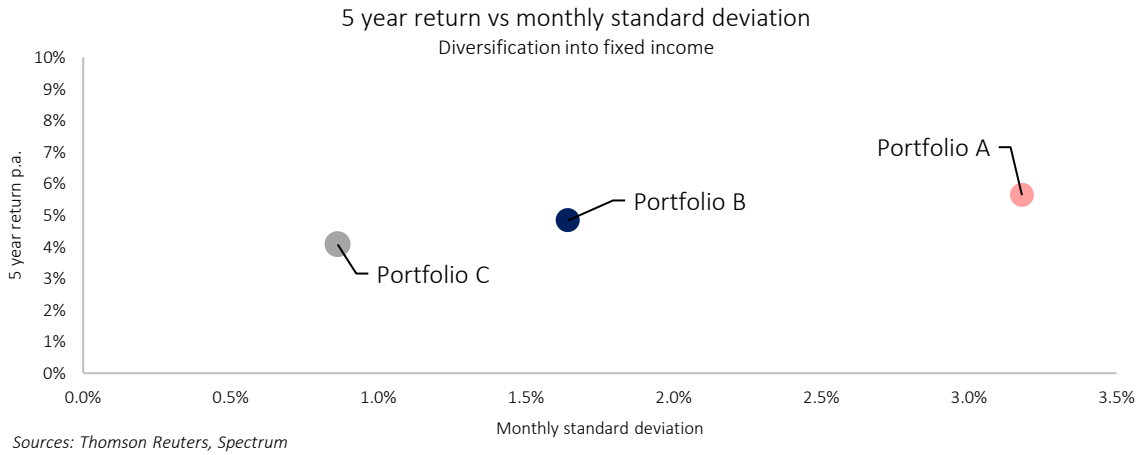
Weights	Australian Equities	Floating rate notes	Fixed rate bonds	Term deposits
Portfolio A	100%	0%	0%	0%
Portfolio B	50%	25%	25%	0%
Portfolio C	25%	25%	25%	25%

Australian Equities: S&P/ASX 200 Total Return Index
Floating rate notes: Bloomberg AusBond Credit Floating Rate Note Index
Fixed rate bonds: Bloomberg AusBond Composite Index
Term deposits: RBA - 1 Year Term Deposit rate; $10,000



Sources: Thomson Reuters, Spectrum

As shown below, despite a modest decrease in returns, allocating into fixed income can lead to a significant reduction in the monthly standard deviation over five years.



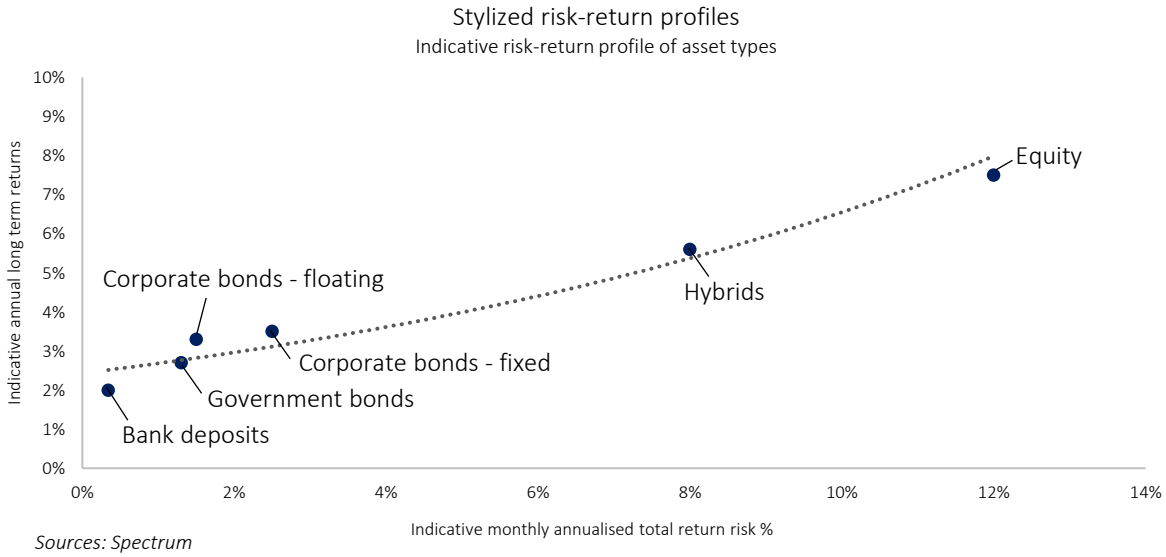
Sources: Thomson Reuters, Spectrum

BOND BASICS

Bond basics

The term 'Fixed income' refers to a class of financial assets consisting of securities ranging from loans, to certificates of deposit, to bonds. The key underlying premise of a fixed income security is based upon a series of cash flows in the future, paid to an investor, in exchange for an initial investment today. One of the most common fixed income assets is known as a bond and will be used as the primary reference moving forward.

Bonds are typically classified as lower risk investments and provide defensive benefits when compared to assets such as equities or hybrids, which are more likely to display higher price volatility.

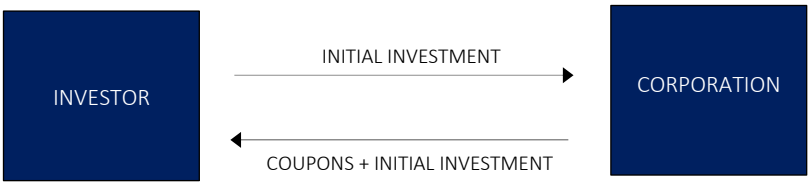


Sources: Spectrum

How do bonds work?

While there are many variations of bonds, a typical plain vanilla bond is a simple exchange – similar to a loan. An investor who purchases a bond is acting as a lender to a borrowing entity, such as a corporation, in the hopes that the borrower will repay both the interest on the loan and the principle over a certain timeframe. Bonds are in effect a 'tradeable' loan – a loan that can be sold and purchased to and from other investors.

The interest rate paid to the investor is known as the '*coupon*' over a set timeframe called the '*tenor*', up until the initial investment (the principle) is repaid on the final day – known as the '*maturity date'*.



Face value and coupon

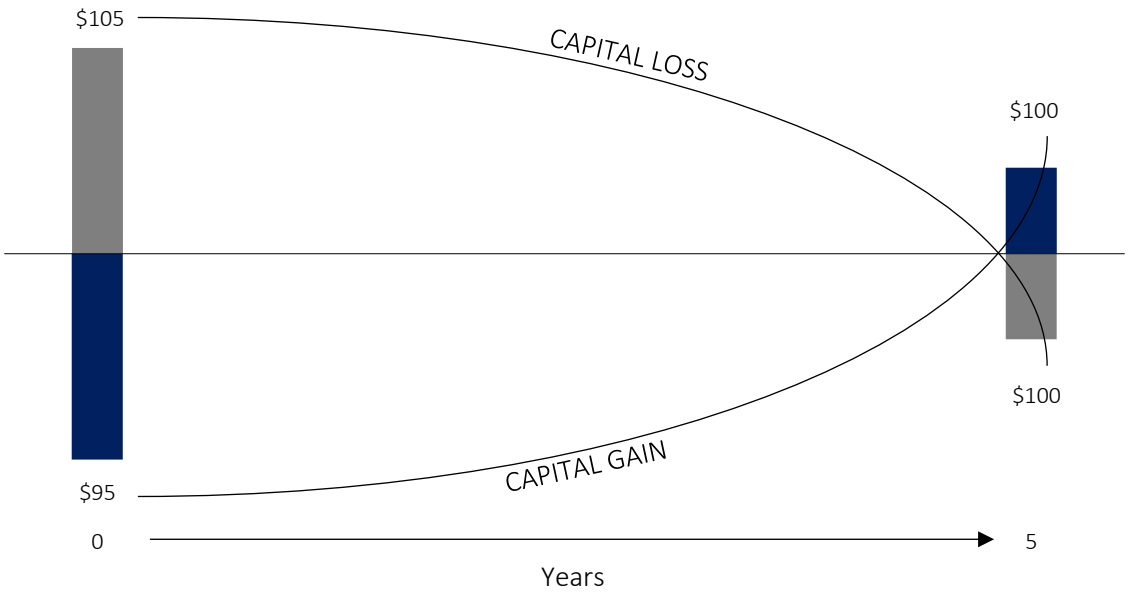
When a bond is first sold to investors in the '*primary market*', each bond is usually sold at its '*face value*' – typically $100 in the Australian corporate bond market. For example, if an investor buys 5 bonds with a face value of $100, they will pay an initial investment of $500. This $500 will be returned to the investor at the maturity date if the company has the capacity to repay.

The coupon is the rate of interest paid to the investor, expressed as an annual percentage rate, and can be paid periodically throughout the year. The coupon represents only part of the equation when it comes to determining the overall expected return provided by investing into a bond.

Expected bond returns

The return on a bond is a combination of the income paid and the capital gain or loss. While the bond is sold in the primary market at the face value, bonds can also be bought and sold in the '*secondary market*' after issuance, which means the price of the bond can trade above or below the face value.

The diagram below displays the capital gain and loss made if a bond with a 5-year tenor and a face value of $100 is purchased in the secondary market at $95 or $105 respectively.



Thus, it can be stated that the total return on a plain vanilla bond is a function of its coupon rate and the capital gain or loss.

$$Total\ return = Coupon\ rate + Capital\ gain/loss$$

This, however, begs the question - why would an investor buy a bond trading at a price higher than the face value if it causes a capital loss? The '*Yield to Maturity*' can help answer this.

Yield to Maturity

One of the most misunderstood concepts in relation to bonds is the yield to maturity (YTM). The yield to maturity is an annualised reflection of the total return of the plain vanilla bond if it is held until its maturity date. In other words, it is a single number, expressed as a percentage, which illustrates the total return of the bond split over each year of its remaining tenor as a function of its coupon rate and the capital gain or loss.

Therefore, even if a bond has a price higher than its face value, if the yield to maturity is positive, the bond will produce a positive total return if held to the maturity date. Given the bond's price, its tenor, and the coupon, the yield to maturity can be solved for simultaneously. The price of the bond can also be computed as the summation of the future cash flows discounted by the yield to maturity at each period in the future.

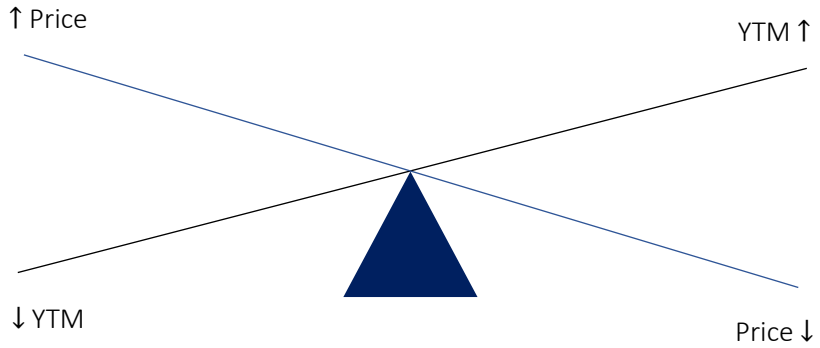
$$Bond\ Price = Coupon_1 \times (1 + YTM)^{-1} + \cdots + Coupon_n \times (1 + YTM)^{-n} + Face\ Value \times (1 + YTM)^{-n}$$

$$\therefore Bond\ Price = \sum_{i=1}^{n} C_n \times (1 + YTM)^{-n} + Face\ Value \times (1 + YTM)^{-n}$$

Yield to price relationships: The yield to maturity of a bond shares an inverse relationship with its price. As the yield to maturity increases, the bond's price will fall. As the yield to maturity decreases, the bond's price will rise. A bond which has a price equal to its face value, will have a yield to maturity equal to the coupon rate. These relations are simply reflections of the embedded capital gains or losses at different bond prices.

$$\uparrow Bond\ Price = Yield\ to\ Maturity\ \downarrow$$

$$\downarrow Bond\ Price = Yield\ to\ Maturity\ \uparrow$$



Risks

Interest rate risks: There are two major risks associated with plain vanilla bonds. The first major risk is known as '*duration*' risk. Duration is a measure of sensitivity of the bond's price to either an increase or decrease in its yield to maturity. Duration is measured in 'years' and is an estimation of expected changes. The greater the duration of the bond, the more sensitive the bond's price is to changes in its yield to maturity. Mathematically, duration is expressed as the summation of the time weighted cash flows of the bond, over, the current price of the bond.

$$Duration = \frac{\sum_{i=1}^{n} \frac{C_n}{(1 + YTM)^n} \times t_n + \left[\frac{Face\ Value}{(1 + YTM)^n} \times t_n\right]}{\left[\sum_{i=1}^{n} C_n \times (1 + YTM)^{-n}\right] + Face\ Value \times (1 + YTM)^{-n}}$$

Duration can be manipulated algebraically into '*modified duration*', which expresses the sensitivity of the bond as a linear relationship. For example, a bond with a modified duration of 5 years and a face value of $100 will lose $5 if its yield to maturity increases by 1%.

$$Modified\ duration = \frac{Duration}{(1 + \frac{YTM}{n})}$$

Credit risk: The second major risk is known as '*credit risk*'. This is the risk that the issuer may not be able to honour their obligations to pay the coupons or initial investment back to the investor. Credit risk can be mitigated via '*credit research*' – the process by which the underlying financial health of the issuing entity is assessed. Credit risk is often represented via a '*credit rating*' assigned by a credit rating agency– which ranges from 'AAA' (highly credit worthy) to as low as 'CCC-D' (near default or in default).

Any credit rating at 'BBB-' or higher is considered to be investment grade. Credit ratings below 'BBB-' are considered speculative or junk credit ratings.

	S&P	Moody's
	AAA	Aaa
	AA+	Aa1
	AA	Aa2
	AA-	Aa3
	A+	A1
	A	A2
	A-	A3
	BBB+	Baa1
	BBB	Baa2
Investment grade ↑	BBB-	Baa3
Sub-investment grade ↓	BB+	Ba1
	BB	Ba2
	BB-	Ba3
	B+	B1
	B	B2
	B-	B3
	CCC+	Caa1
	CCC	Caa2
	CCC-	Caa3
	CC	Ca
	C	C
	D	D

Sources: S&P Global, Moody's Investor Services

Valuations

There are multiple methodologies used to assess the value of a bond. In essence, the value of a bond can be represented as the difference between the bond's yield to maturity and a benchmark that is perceived to be risk-free. For example, we may compare a 5-year corporate bond's yield to maturity to the yield to maturity of a 5-year government bond.

$$Credit\ Spread = YTM_{Corporate\ Bond} - YTM_{Benchmark}$$

The difference, known as '*credit spread*' is a reflection of the value (the reward or premium above and beyond what a risk-free investment provides) provided by a corporate bond over a benchmark. There are multiple variations for the assessment of the credit spread, such as swap spreads or option adjusted spreads, but the generality is found in its application as a starting point to determine the reward for investing in a corporate bond, as opposed to, an investment which is perceived to be risk-free.

Floating rate notes

A bond does not necessarily have to have a coupon which is completely fixed and does not change. A variation to plain vanilla bonds are floating rate notes (FRNs). An FRN pays a coupon, whereby proportion of the coupon is held steady, and the other proportion is pegged to a market interest rate.

As the market interest rate changes over a certain period, the coupon on the FRN also changes to reflect the market interest rate. In the Australian corporate bond market, the convention is to utilise the '*Bank Bill Swap* Rate' (BBSW) as the short-term market interest rate. Depending on the '*frequency*' of the coupon payment, the 30, 90, or 180-day BBSW is used. The proportion of the coupon held steady is known as the '*Quoted Margin*' (QM).

$$Coupon_{FRN} = BBSW_n + QM$$

As a result of the repricing mechanism of an FRN, the sensitivity to changes in government bond yields are very low. As the market interest rate changes, the income paid to the investor will reflect the increasing or decreasing interest rate environment. It is for this reason FRNs are often regarded as having low duration – for the maximum duration is limited to the payment frequency of the coupon.

The key risk for an FRN is known as '*Credit spread duration*', which is an expansion of the duration concept to encompass the sensitivity of the FRN to changes in credit spread. Credit spread duration can be calculated (as an estimation) by taking the modified duration of the FRN and holding the coupon fixed until maturity at the current market interest rate.

$$Credit\ spread\ duration \approx Modified\ duration$$

Inflation bonds

There are multiple variations of bonds available to investors. One particular variation is the '*inflation-linked*' bond. Inflation bonds are similar to traditional bonds, with the major point of difference being the indexation of the principle and interest payments to the inflation rate. This means as inflation changes, the coupons and the initial principle will be revalued in line with the inflation benchmark on a daily basis.

As inflation increases, so too does the value of the bond. As inflation decreases, the value of the bond also falls. In effect, inflation linked bonds help hedge against rising inflation as the coupon and principle value will rise as well, offsetting the wealth depreciating effects of increasing consumer prices. In the Australian context, the most common inflation bonds are capital indexed bonds (whereby the principle value is adjusted for inflation) or indexed annuity bonds (a bond which amortises until its maturity date whereby the cashflows, which include principle and interest, are linked to the inflation rate and adjusted periodically).

The key risk for these securities is deflation. As the inflation rate falls below zero, so too, does the value of the bond below its face value.

$$\uparrow Inflation\ rate = Value\ of\ the\ inflation\ bond\ \uparrow$$

$$\downarrow Inflation\ rate\ = Value\ of\ the\ inflation\ bond\ \downarrow$$

Glossary

- **Bank Bill Swap Rate:** A short-term money market reference rate used commonly for the pricing of securities. The Bank Bill Swap Rate is the average mid-rate for prime bank eligible securities calculated as a volume weighted average price each day across multiple tenors.
- **Bond:** A fixed income security which allows an issuer (the borrower) to raise funds from investors (the lenders). Bonds, given secondary market liquidity, can be actively purchased and sold, unlike loans which aren't easily tradeable.
- **Coupon rate:** The annual rate of interest paid by the bond to an investor.
- **Credit rating:** The representation of credit risk through a scale ranging from 'AAA' to 'CCC/D'. The higher the credit rating, the less risky the issuing entity is perceived to be. Credit ratings are the opinion of a credit rating agency.
- **Credit research:** The process by which a credit analyst will assess an issuing entity in order to determine a sense of the credit risk associated with the borrower.
- **Credit spread:** A measure of value which can be expressed in multiple ways – most simply – the difference between the yield to maturity of a bond and a perceived risk-free benchmark.
- **Credit spread duration:** An estimation of sensitivity of an FRN's price to changes in its credit spread. Expressed as an approximation of modified duration for the FRN with the coupon held fixed at the current BBSW until maturity.
- **Credit risk:** The risk that the borrowing entity may not have the capability to repay their debt obligations – the risk of default.
- **Duration:** A measure of sensitivity of a bond's price to changes in its yield - expressed in years.
- **Face Value:** The initial price the bond is sold at into the market – typically $100 in the Australian corporate bond market.
- **Fixed Income:** An asset class encompassing securities which pay a series of cash flows in the future, in exchange for, a lump sum investment today.
- **Floating Rate Note:** A bond which pays a coupon whereby a proportion of the coupon is fixed (quoted margin) and a proportion floats in reference to a short-term market rate – commonly the Bank Bill Swap Rate in Australia.
- **Frequency:** The frequency of which the coupon payment on a bond is paid – annually, semi-annually, quarterly, or monthly.
- **Inflation linked bond:** A type of bond whereby the cashflows are linked to the consumer price index and adjusted to reflect changes in the inflation rate.
- **ITRAXX:** A benchmark of CDS spreads across the most liquid 25 investment grade corporate CDS contracts in Australia. Calculated as an equally weighted average across a portfolio of these contracts.
- **Modified duration:** A measure of sensitivity of a bond's price to changes in its yield, calculated as a linear relationship and expressed in years.
- **Primary Market:** The market for initial issuance of bonds to, primarily, sophisticated investors.
- **Quoted Margin:** The proportion of an FRN's coupon which is held steady.
- **Secondary Market:** The market where securities which are trading post issuance are purchased and sold.
- **Standard deviation:** The dispersion of observations around an average point – a measure of volatility whereby a larger standard deviation implies greater historic variation in the data set.
- **Tenor:** The length of the bond's life in years, measured from the issuance date to the maturity date.
- **Yield to Maturity:** The annualised expected return of a bond if it is held until the maturity date. It is a function of the capital gain/loss and the coupon rate.

This report has been prepared by Spectrum Asset Management Limited.

(ABN 31 096 442 198, AFSL 225069).

It is for information purposes only and does not constitute or form part of, and should not be construed as, an offer, invitation or inducement to purchase or subscribe for any shares nor shall it or any part of it form the basis of, or be relied upon in connection with, any contract or commitment whatsoever. It also does not constitute a recommendation regarding any shares.

The information in this document has been obtained from sources believed to be reliable but no representation or warranty, express or implied, is given hereby as to the fairness, accuracy or completeness of the information or opinions contained herein. This presentation reflects the information available as of the date this presentation was prepared and is subject to change without notice to the recipient.

Past performance may not necessarily be repeated and is no guarantee or projection of future results.

This presentation is intended solely for the information of the person to whom it has been delivered. It is not an advertisement and is not intended for public use or distribution. No part of this presentation may be reproduced or distributed in any manner without prior written permission of Spectrum Asset Management Limited.