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## Topic 1: Overview

There are two types of Australian Government Bonds traded on ASX via the Chess Depository Interest (CDI) mechanism - Exchange-traded Treasury Bonds and Exchange-traded Treasury Indexed Bonds.

	TB	TIB
Face value	Fixed	Variable
Payment frequency	6 months	3 months

**1. Exchange-traded Treasury Bonds (TBs)** are medium to long-term debt securities that pay an annual rate of interest fixed over the life of the security, payable six monthly. The face value is fixed at \$100 for the life of the securities.

**2. Exchange-traded Treasury Indexed Bonds (TIBs)** do not have a fixed face value. Their face value is adjusted for movements in the Consumer Price Index (CPI). Coupons are paid quarterly rather than six monthly.

This module focuses on Exchange-traded Treasury Bonds.

### Why invest in Exchange-traded Treasury Bonds?

Exchange-traded Treasury Bonds (TBs) are one of the most secure investments available with a very low risk of not receiving your interest payments or the payment of face value at maturity.

Investment needs	Investment feature
I want income	Regular interest payments
I want payment of face value at maturity	Credit standing
I don't want to be locked in	Traded on market

TBs pay a defined income that does not change over the life of the investment.

TBs can be readily sold on market. This means your money is not locked up as is the case with, say, term deposits.

The market price of TBs is typically more stable than share prices.

### What are Exchange-traded Treasury Bonds?

Exchange-traded Treasury Bonds replicate all the essential features of Treasury Bonds traded in the wholesale market.

Each TB has a face value of \$100. Note that the face value of a TB may not be the price you pay when you buy a TB. The price you pay is the prevailing market price.



At maturity of a TB, you receive face value - \$100.

While you hold the TB you receive a fixed rate of interest referred to as the coupon rate. This is paid to you every six months.

In order to facilitate trading by retail investors TBs are settled using the CHESS Depository Interest (CDI) mechanism.

**You have a choice of coupon rates and maturity dates**

The Australian Government issues different series of Treasury Bonds. A series is characterised by a unique coupon rate, coupon payment dates and maturity date.

New series of TBs become available to trade on ASX as the Australian Government issues new series into the wholesale market.



ASX Code	Coupon	Maturity
GSBW13	5.50%	15-December-2013
GSBK14	6.25%	15-June-2014
GSBS14	4.50%	21-October-2014
GSBG15	6.25%	15-April-2015
GSBS15	4.75%	21-October-2015
GSBK16	4.75%	15-June-2016
GSBC17	6.00%	15-February-2017
GSBM17	4.25%	21-July-2017
GSBA18	5.50%	21-January-2018
GSBE19	5.25%	15-March-2019
GSBG20	4.50%	15-April-2020
GSBI21	5.75%	15-May-2021
GSBM22	5.75%	15-July-2022
GSBG23	5.50%	21-April-2023
GSBG24	2.75%	21-April-2024
GSBG27	4.75%	21-April-2027
GSBG29	3.25%	21 April 2029

## Topic 2: Income and price

### Fixed coupon rate

TBs pay a fixed rate of interest. The amount of income you receive is called the 'coupon rate' and is expressed as a percentage of the TB's face value.

Your payments do not vary and you know exactly how much income you will receive each coupon payment date.

Coupons are paid twice per year (semi-annually).

All TBs have a face value (the amount paid to you at maturity) of \$100.

For example, if a TB has a coupon rate of 5% pa, you would receive coupons totalling \$5 each year being made up of two payments of \$2.50 every six months.

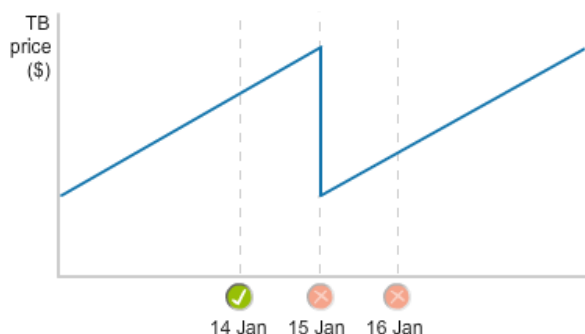
### Market price of a TB includes accrued interest

The market price of a TB includes the interest that has accumulated since the last coupon payment. This means you can expect the price of a TB to increase incrementally each day as a coupon payment approaches and then drop back on the ex-interest date.

The ex-interest date is important to understand. To be entitled to the current coupon payment you must hold the TB before the ex-interest date. If you purchase the TB on or after the ex-interest date you are not entitled to the current coupon payment.

(Bond market professionals sometimes use the term the 'dirty price' to refer to this market price that includes accrued interest, as opposed to the 'clean price' that does not include accrued interest.)

Coupon rate	Coupon	Market price
5.5%	\$2.75	\$109
4.5%	\$2.25	\$106
6%	\$3	\$112

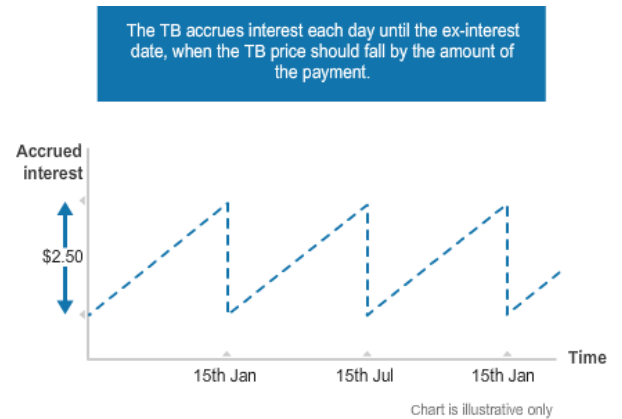


## Pricing example of interest accruing

A TB with a 5% interest rate pays a coupon of \$2.50 every six months. Interest accrues at the rate of approximately 1.6 cents per day ( $\$5/365$  days). The market price of a TB incorporates the accrued interest.

The market price can be expected to increase as the ex-date approaches, and then to drop by the semi-annual interest payment (\$2.50) on the ex-interest date, as a new buyer will not be entitled to the semi-annual interest payment.

This is an equivalent process to a share price falling on the ex-date for a dividend.



## Topic 3: Realising your investment

### Holding a TB until maturity or selling beforehand

You can realise your investment in a TB by holding it until maturity or selling it beforehand.

#### At maturity

If you hold a TB until maturity, you will receive the face value and the last coupon.

When a TB's face value is paid out, it is called 'redemption'.

#### Before maturity

If you want to exit your investment before maturity, you will have to sell your TB. The value you receive for your investment is determined by the price of the TB in the market.

When you sell on market there is no guarantee you will receive either what you paid for the TB or its face value.

### Why the market price for a TB can be different to its face value

If interest rates have changed since the time the TB was issued, or as expectations about the direction of interest rates changes, the TB's price will probably have changed too.

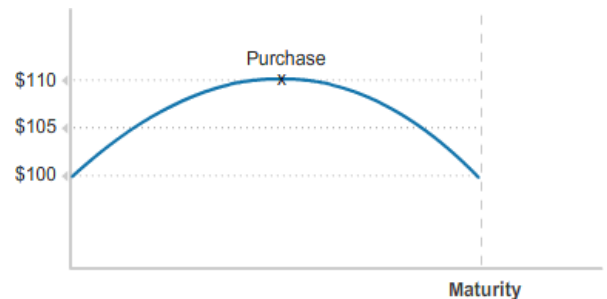
As noted in Module 2, there is an inverse relationship between interest rates and the market price of a TB:

- as interest rates rise, prices fall, and
- as interest rates fall, prices rise.

### Capital gain/loss on redemption or sale

If you buy a TB and hold it until maturity, you may make a capital gain or loss depending on the difference between your purchase price and the face value you receive at maturity.

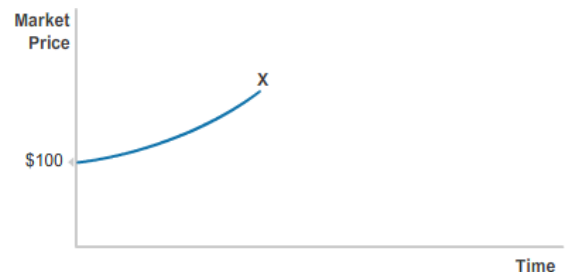
If you buy and sell a TB on ASX, you may make a capital gain or loss depending on the difference between your purchase price and your sale price.



- You bought a TB for \$110
- Made a capital loss of \$5

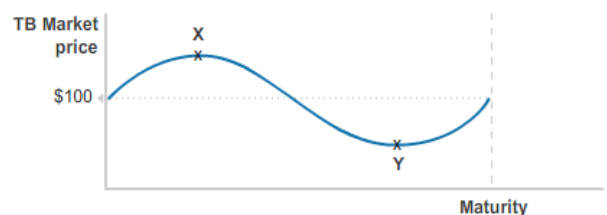
Did you:

- Hold to maturity
- Sell on market



At point 'X' have interest rate expectations moved up or down?

- Up
- Down



Bought at X, sold at Y	Capital loss
Bought at X, redeemed	Capital loss
Bought at Y, redeemed	Capital gain

Any capital gain/loss you make on redemption or sale of your TB should be taken into account when you consider your overall return from the TB.

Your total return on a TB includes:

- regular interest payments, and
- any capital gain/loss on redemption or sale.




### Calculating your return

A TB's yield to maturity (YTM) is the most useful measure for an investor expecting to hold a TB until maturity. This is because it captures both income you will earn and any expected capital gain/loss on redemption.

Yield to maturity enables you to compare TBs with different coupons and different prices. You can find YTM information on the ASX website's price results or using the ASX bond calculator.

The YTM for a TB is not an inflation adjusted figure. Recall that inflation is an investment risk as it can erode the value of your capital over time.

For more information on yield to maturity, refer to Module 2.

Market price (\$)	Coupon (%)	Yield to maturity (%)	
100	4.0	3.6	
105	3.5	4.0	
101	3.7	3.9	



## Topic 4: Example of TBs trading at different prices

### Looking at the range of TBs on issue

The range of TBs on issue will change as maturity dates are reached and new series are issued.

This topic's example will reference the table of TBs on the right.

### Different TBs have different market prices

In our example table, each TB has a different coupon and/or maturity date. A TB with a higher coupon will trade at a higher price than a TB with a similar maturity but lower coupon.

For example, the 15 February 2017 TB has a coupon of 6%.

The 21 July 2017 TB has a coupon of 4.25%.

Even though the maturity date of the two securities is quite close, the difference in the coupon rate will mean that the price they trade at in the market is likely to be different, perhaps significantly so.

For example, on 25 June 2012, the price for the February 2017 TB was \$117.12, which included \$2.16 in accrued interest. The price for the July 2017 TB was \$109.37, which included \$1.82 in accrued interest.

### Why TBs with a similar yield might trade at different prices

If you purchased the February 2017 TB you would have received a coupon of \$3.00 every six months.

At maturity, you would receive \$100 (the face value of the bond) plus the final coupon of \$3.00.

Using these variables, the yield to maturity (YTM) for this bond is 2.56% pa.

Coupon	Maturity	Market price 25-06-2012
5.50%	15-December-2013	
6.25%	15-June-2014	
4.50%	21-October-2014	
6.25%	15-April-2015	
4.75%	21-October-2015	
4.75%	15-June-2016	
6.00%	15-February-2017	\$117.12
4.25%	21-July-2017	\$109.37
5.50%	21-January-2018	
5.25%	15-March-2019	
4.50%	15-April-2020	
5.75%	15-May-2021	
5.75%	15-July-2022	
5.50%	21-April-2023	
2.75%	21-April-2024	
4.75%	21-April-2027	
3.25%	21 April 2029	

Coupon	Maturity	Market price 25-06-2012	Yield to maturity
5.50%	15-December-2013		
6.25%	15-June-2014		
4.50%	21-October-2014		
6.25%	15-April-2015		
4.75%	21-October-2015		
4.75%	15-June-2016		
6.00%	15-February-2017	\$117.12	2.56%
4.25%	21-July-2017	\$109.37	2.65%
5.50%	21-January-2018		
5.25%	15-March-2019		
4.50%	15-April-2020		
5.75%	15-May-2021		
5.75%	15-July-2022		
5.50%	21-April-2023		
2.75%	21-April-2024		
4.75%	21-April-2027		
3.25%	21 April 2029		

Compare this to the July 2017 TB. Making a purchase on the same date, you would receive a coupon of \$2.13 every six months. At maturity, you would receive the \$100 face value plus the final coupon of \$2.13. So if you purchased that bond for that market price, the yield to maturity is 2.65%pa.

Given they have very similar YTM's - why is their price different?

### Why TBs with a similar yield might trade at a different price

The price difference can be explained by comparing the coupon rates.

A higher coupon rate means the investor earns more income. This is because income (coupon payments) is calculated by multiplying the coupon rate (which is a percentage) by the face value of the bond.

The end result is that the yield on these two TBs is quite similar (only 0.09% difference), but there is a reasonably significant difference in their price (\$7.75). This reflects the larger income stream an investor would earn from the February 2017 TB relative to the July 2017 TB.

Coupon	Maturity	Market price 25-06-2012	Yield to maturity
5.50%	15-December-2013		
6.25%	15-June-2014		
4.50%	21-October-2014		
6.25%	15-April-2015		
4.75%	21-October-2015		
4.75%	15-June-2016		
<b>6.00%</b>	<b>15-February-2017</b>	<b>\$117.12</b>	<b>2.56%</b>
<b>4.25%</b>	<b>21-July-2017</b>	<b>\$109.37</b>	<b>2.65%</b>
5.50%	21-January-2018		
5.25%	15-March-2019		
4.50%	15-April-2020		
5.75%	15-May-2021		
5.75%	15-July-2022		
5.50%	21-April-2023		
2.75%	21-April-2024		
4.75%	21-April-2027		
3.25%	21 April 2029		

## Summary

- A TB pays you a fixed rate of interest (the coupon rate) based on its face value (\$100).
- Interest is paid twice a year in arrears.
- At maturity, you are paid the face value (\$100).
- If you want to sell your TBs before maturity, you can do so on market at the prevailing market price, which may be above or below the face value.
- A TB's market price may be different from its face value. Consequently, you may make a capital gain or loss if you hold to maturity or sell a TB.
  - regular interest payments, and
  - any capital gain/loss on redemption or sale.
- The main risk of TBs is that interest rates may move unfavourably, causing a fall in their market price and an increased potential for capital loss.