

# Instruments of Norwegian Government Borrowing

Norwegian State (Ministry of Finance)  
issues two types of debt instruments

- ▶ Treasury Bills
- ▶ Government Bonds

## T Bills

### **Treasury bills**

Treasury bills are government securities, with an original maturity of less than one year. Treasury bills do not pay any fixed or floating interest during the life of the bill. A Treasury bill is therefore a zero-coupon security. This means that the bill is issued at a discount, i.e. the offer price is lower than the face value and the return on the bill will be the difference between the offer price and the face value paid at maturity.

Treasury bills are normally issued in connection with IMM dates each year. The IMM dates are the third Wednesday in March, June, September and December. New 12-month Treasury bills are issued on each IMM date. Existing Treasury bills are usually expanded at auctions held between the IMM dates.

*Definition from Norges Bank*

## **Government bonds**

A bond is an interest-bearing security with an original maturity of more than 1 year.

Government bonds have a fixed interest rate (called the coupon rate) which determines the amount of interest payable on a specific date once a year, over the life of the bond. At maturity, the bondholder is paid the face value of the bond in addition to the coupon rate. Information concerning government bonds usually includes both the coupon rate and the date of maturity. Each bond is registered in the Norwegian Central Securities Depository with a special International Securities Identification Number (ISIN). The bond's coupon rate reflects the market rate at the time that the bond was first issued. Therefore, there are different coupon rates on different bonds since market rates have varied over time.

Norwegian government bonds are normally issued with a maturity of between two and eleven years. Four to six benchmark loans which cover the benchmark yield curve have been established.

*Definition from Norges Bank*

## Why does the Norwegian Government Issue Debt?

The Norwegian State is in the enviable position that it does not really *need* to borrow to finance a government budget deficit. Why does the government still issue bills and bonds?

A primary reason for the maintenance of government issued securities is that they provide a *service* for the capital market, government securities provide *benchmarks*.

The most important benchmark is the *risk free interest rate(s)*

## Why government debt?

From Norges Bank:

*“On the whole, the Norwegian government’s net asset position is positive. This means that total assets exceed total debt. Government assets include deposits in Norges Bank, investments made by the Government Pension Fund Global, shares in domestic enterprises, lending and direct investment in state banks, state-owned enterprises and state limited companies. Government debt consists primarily of government bonds and Treasury bills.*

*In most countries, the government must issue government securities in domestic or foreign currency in order to have funds to repay existing debt which falls due and to finance government activities. Since the Norwegian government’s net asset position is positive, the government could repay all government debt without raising new loans.”*

## Why government debt?

From Norges Bank:

*“The Norwegian government nevertheless chooses to raise new loans by issuing Treasury bills or government bonds because:*

- ▶ *The government must have a certain liquidity reserve in order to be able to cover daily payments. There are wide daily fluctuations in outgoing and incoming payments in government accounts, and it is difficult to calculate the size of these flows in advance. This is particularly the case for incoming tax payments. Adjustments in the government borrowing program can only partially smooth these fluctuations. The aim is therefore to ensure that the normal cash reserves do not fall below NOK 50 billion.”*

## Why government debt? (ctd)

From Norges Bank:

- ▶ *“Government borrowing affects the banking system’s total deposits in/borrowing from Norges Bank. The implementation of the government borrowing program may therefore be adjusted to some degree to Norges Bank’s operations to manage liquidity in the banking system.”*

## Why government debt? (ctd)

From Norges Bank:

- ▶ *“Another objective of government borrowing is to maintain and develop smoothly functioning and efficient financial markets in Norway. By issuing government bonds and Treasury bills, the government provides a risk-free yield curve for investments with a maturity of from about one month to about 10 years. Another important aspect of government securities is that they increase liquidity in the Norwegian capital market. Without the supply of government securities, the markets would be less efficient. Other loans and debt instruments are often priced in relation to government loans. Thus, government loans provide a good overview of the Norwegian securities market.*



# Trading of Norwegian Government Debt

All treasury securities are listed at the Oslo Stock Exchange (OSE)

The way the market works:

an electronic trading platform, reporting the best bid and ask prices, and the last trade price.

All trading is in terms of bond prices.

## Statslån benchmark

Kursutvikling		Avkastning										
Ticker	Kjøper	Selger	Siste	+/-	Tid	Omsatt (mill)	Siste reg	Basis	Eff. rente	Sluttdato	Kupong	Utestående (mill)
<a href="#">NST16</a>	99,67	99,70	99,68	-	28 jun	0	28.06.2012	Siste	1,52	19.09.2012	-	81 218
<a href="#">NST17</a>	99,28	99,35	99,29	-	28 jun	0	28.06.2012	Siste	1,54	19.12.2012	-	104 158
<a href="#">NST18</a>	98,93	99,03	99,00	-	28 jun	0	28.06.2012	Siste	1,42	20.03.2013	-	17 000
<a href="#">NST19</a>	98,56	98,67	98,62	-	28 jun	0	28.06.2012	Siste	1,45	19.06.2013	-	11 000
<a href="#">NST470</a>	104,20	104,35	104,36	-	28 jun	0	28.06.2012	Siste	1,39	15.05.2013	6,50	66 544
<a href="#">NST471</a>	110,10	110,26	110,37	-	28 jun	0	28.06.2012	Siste	1,29	15.05.2015	5,00	58 125
<a href="#">NST472</a>	112,80	113,27	113,00	-	12:13	315	28.06.2012	Siste	1,47	19.05.2017	4,25	47 737
<a href="#">NST473</a>	118,20	118,65	118,45	0,05	10:42	350	28.06.2012	Siste	1,65	22.05.2019	4,50	35 000
<a href="#">NST474</a>	115,20	115,85	115,40	-0,50	10:42	25	28.06.2012	Siste	1,80	25.05.2021	3,75	33 000
<a href="#">NST475</a>	99,40	100,03	99,65	-0,35	10:42	175	28.06.2012	Siste	2,00	24.05.2023	2,00	13 000

The trading picture on 13:30, 29 jun 2012 for Benchmark Norwegian Government Securities at the Oslo Stock Exchange.

## From Prices to Interest Rates

A bond is traded in terms of its price, but one will typically discuss interest rates instead of bond prices.

We therefore translate the bond prices into the equivalent interest rates.

## Exercise

It is today 29 jun 2012, and you observe the following prices and interest rates for Norwegian State T-bills, traded at the Oslo Stock Exchange.

Ticker	Price (last)	Final Date	Coupon
NST16	99.68	19 sep 2012	-
NST17	99.29	19 dec 2012	-
NST18	99.00	20 mar 2013	-
NST18	98.62	19 jun 2013	-

On 29 jun 2012 the price of a Treasury bill maturing on 19 jun 2013 is 98.62.

What is the implicit annualised interest rate in this price?

This implicit interest rate is typically called the *yield*.

Note that we can calculate corresponding yields for the various bond maturities.

The collection of yields calculated at the various maturities is called the *term structure of interest rates*.

## Looking up yields

Some examples of treasury data from the Norwegian Central Bank web page.

### Bills

	3-mth	6-mth	9-mth	12-mth
05.09.2017	0.36	0.36	0.36	0.41
04.09.2017	0.37	0.36	0.36	0.41
01.09.2017	0.36	0.36	0.36	0.41
31.08.2017	0.36	0.36	0.36	0.41
...				

### Bonds

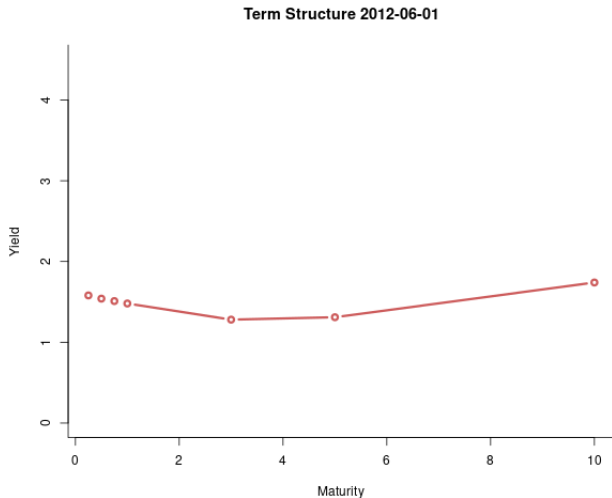
	3-year	5-year	10-year
05.09.2017	0.76	1.02	1.56
04.09.2017	0.76	1.03	1.58
01.09.2017	0.76	1.04	1.60

Source: Oslo Stock Exchange 4 pm. Calculations by Norges Bank.

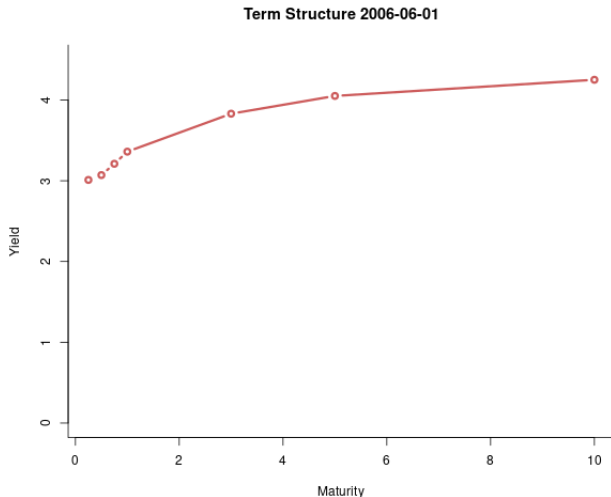
Note that the numbers are given as point on the yield curve.

## Term Structure of Interest Rates

The relationship between interest rates and maturity is often showed graphically by plotting the yield versus the maturity.



# Norwegian Term Structure 2006



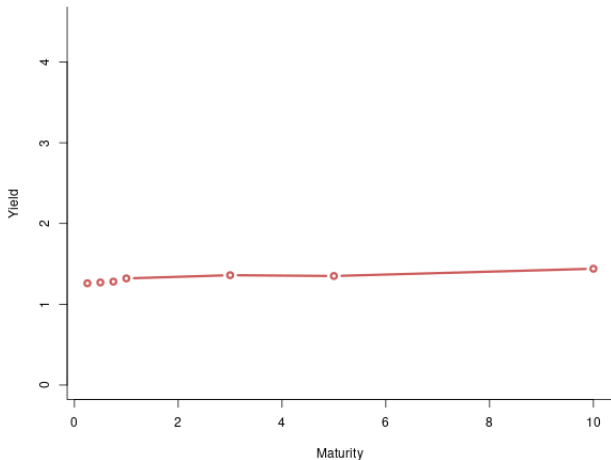
## Term Structure 2006 jun 1

The relationship between interest rate (yield), and maturity of the underlying bond. Using Norwegian Treasury bond prices traded on 2 jan 2006, and resulting benchmark yields (calculated by Norges Bank)



# Norwegian Term Structure Jan 2020

Term Structure 2020-01-13



## Term Structure 2020 Jan 13

The relationship between interest rate (yield), and maturity of the underlying bond. Using Norwegian Treasury bond prices traded on 13 Jan 2020, and resulting benchmark yields (calculated by Norges Bank)

# Time series evolution of Norwegian Interest Rates

## **The near past (since 2000)**

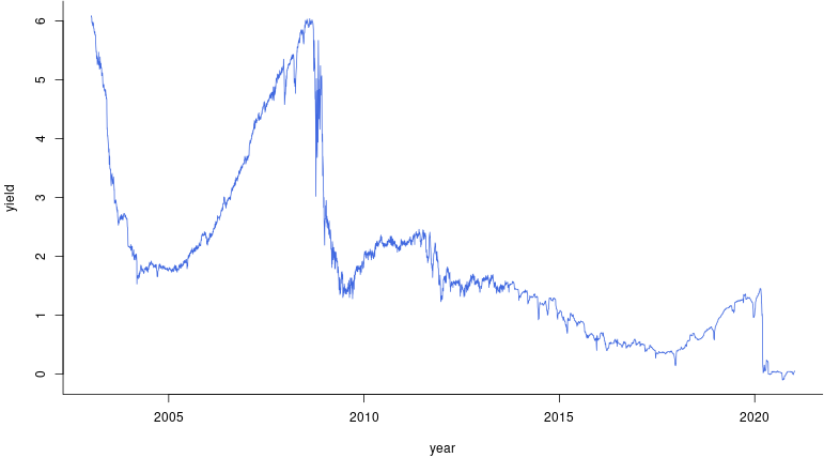
We look at the evolution of government interest rates.

As we have seen the interest rate is different for different maturities (term structure).

We first show interest rates for three different maturities: 3m, 1y and 5y:

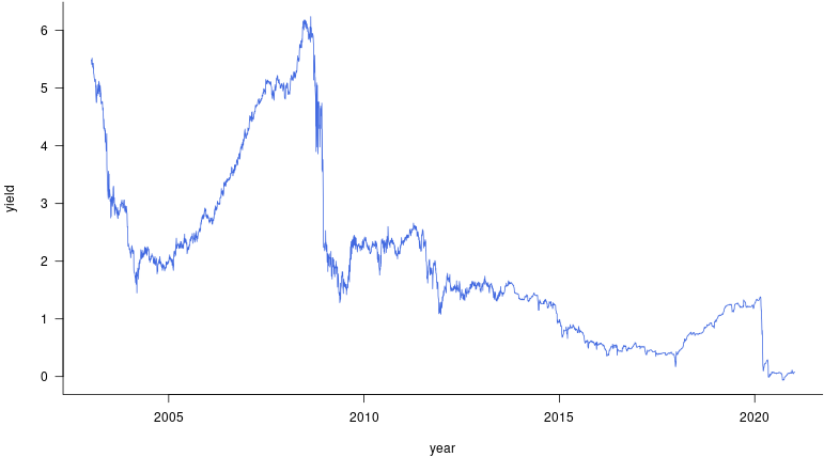
# Evolution of 3 month interest rates

Yield on 3 month Norwegian Government Debt



# Evolution of 1 year interest rates

Yield on 1 year Norwegian Government Debt

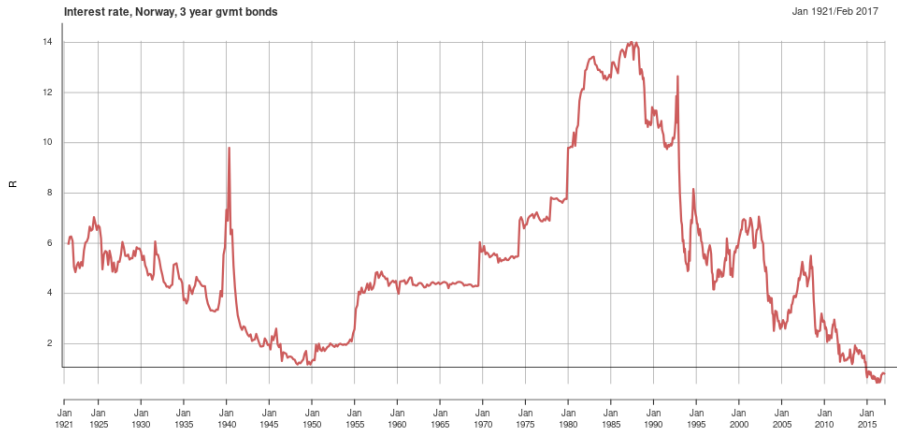


# Evolution of 5 year interest rates

Yield on 5 year Norwegian Government Debt



# The distant past (20th century)



## Yield on 3 year Government Debt

Source Eitrheim, Klovland, and Qvigstad (2006) and Norges Bank

# The distant past (20th century) - 5 year interest rate



Yield on 5 year Government Debt

Source Eitrheim et al. (2006).

# Both Time and Term Structure

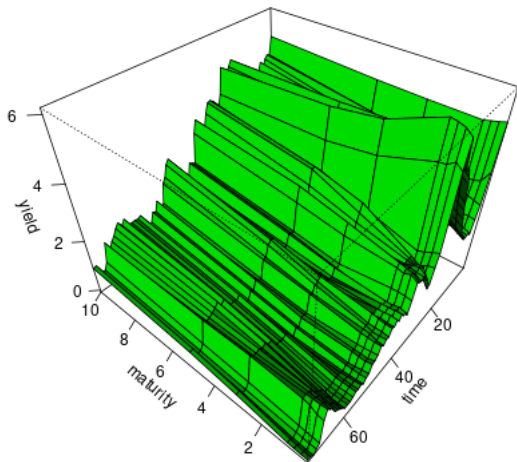
Now, as we have seen, there are several things varying which we can calculate from observed government bonds:

- ▶ Level of interest rates are changing
- ▶ Shape of term structure shifts.

It is hard to visualize both of these at the same time, but we can make a try.



## Term structure evolution 2003-2012



Øyvind Eitrheim, Jan T Klovland, and Jan F Qvigstad, editors. *Historical Monetary Statistics for Norway 1819–2003*. Number 35 in Norges Bank Occasional Papers. Norges Bank, 2006.