CALCULATION OF ICELANDIC TREASURY COUPON NOTES

Clean price of Treasury notes is calculated as follows:

Equation 1

$$Price = \left[\frac{redemption}{\left(1+\frac{yield}{frequency}\right)^{\left(N-1+\frac{DSC}{E}\right)}}\right] + \left[\sum_{k=1}^{N}\frac{100*\frac{rate}{frequency}}{\left(1+\frac{yield}{frequency}\right)^{\left(k-1+\frac{DSC}{E}\right)}}\right] - \left(100*\frac{rate}{frequency}*\frac{A}{E}\right)$$

Where:

DSC = Number of days from settlement to next coupon date.
E = Number of days in coupon period in which the settlement date falls.
N = Number of coupons payable between settlement date and redemption date.
A = Number of days from beginning of coupon period to settlement date.
Rate = Annual coupon rate
Frequency = Number of coupon payments per year. For annual payments, frequency = 1.

Example 1: The coupon bond RIKB 13 0517.

May 17, 2013, maturity date
January 12, 2006, settlement date
7,25 percent annual coupon
7,50 percent yield
100 redemption value
Frequency is annually
The annual date for payment of interest due is May 17.
Actual/actual (AFB method)

According to equation 1, the clean price = 98,567446

Accrued interest is calculated as follows:

Equation 2

$$\text{Accrued interest} = 100*\frac{rate}{frequency}*\sum_{i=1}^{NC}\frac{Ai}{NLi}$$

Where:

Ai = Number of days from beginning of coupon period to settlement date
NC = number of coupon periods.

NLi = Number of days in coupon period in which the settlement date falls (365 or 366 days if leap year).
Frequency = Number of coupon payments per year.

According to example 1:

Accrued interest = $100 * \frac{0{,}0725}{1} * \frac{240}{365} = 4{,}767123$

Dirty price is the sum of clean price and accrued interest:

Clean price	98,567446
Accrued interest	4,767123
Dirty price	103,334569

Example 2: The coupon bond RIKB 10 0317

March 17, 2010, maturity date
January 12, 2006, settlement date
7,00 percent annual coupon
7,20 percent yield
100 redemption value
Frequency is annually
The annual date for payment of interest due is March 17.
Actual/actual. (ISMA method see http://www.isda.org/c_and_a/pdf/mktc1198.pdf)

Using equation 1 the clean price is = 99,264670
Using equation 2 the accrued interest is = 5,772603

Yield is calculated as follows:

Equation 3

If there is one coupon period or less until redemption, yield is calculated as follows:

$$Yield = \frac{\left(\frac{redemption}{100} + \frac{rate}{frequency}\right) - \left(\frac{price}{100} + \left(\frac{A}{E} * \frac{rate}{frequency}\right)\right)}{\frac{price}{100} + \left(\frac{A}{E} * \frac{rate}{frequency}\right)} * \frac{frequency * E}{DSR}$$

A = number of days from the beginning of the coupon period to the settlement date (accrued days).

DSR = number of days from the settlement date to the redemption date.
E = number of days in the coupon period.

If there is more than one coupon period until redemption, yield is calculated through a hundred iterations. The resolution uses the Newton method, based on equation 1 used for the function Price. The yield is changed until the estimated price given the yield is close to price.

In Microsoft Excel you can run the setup program to install the Analysis Toolpak. After you install the Analysis ToolPak, you must enable it by using the Add-Ins command on the Tools menu. Then you find the necessary functions to calculate the yield, accrued interest and yield for the Icelandic bonds. The names of the functions are PRICE(), ACCRINT() and YIELD(). There are also additional functions i.e. DURATION() and MDURATION() to calculate the duration and modified duration for a security.