GOVERNMENT BOND FUTURES

The government bond futures offered for 2, 5 and 10-year maturities are used as a complement to the cash bonds market offering more liquidity and trading opportunities The contract has standardized expiration days, i.e. IMM days, and liquidity is concentrated to a limited number of contracts which benefits trading.

Facts about government bond futures

Contract type	Futures contract with a combination of daily cash settlement and delivery of underlying cash instrument at fixing
Contract base	Synthetic Swedish government bond with a maturity of two-, five- or ten years at the expiration settlement day. The synthetic bond has an annual coupon of one percent
Contract base size	Nominal value of underlying is SEK 1,000,000
Tick size	0.001
Price	Price expressed in accordance with the underlying cash instrument as effective interest rate with a 30E/360 day convention
Deliverable instrument	Swedish government bonds with a remaining maturity of two- five- and ten years, or as close to two-, five- and ten years as possible at the expiration settlement day
Expiration months	March, June, September and December
Expiration settlement day	The third Wednesday of the expiration month
Expiration day	Four bank days prior to the expiration settlement day. Last time for registration is 12.00 CET on the expiration day
Expiration fix	Established on expiration day at 11.00 CET
Daily settlement	Cash settlement of the difference between the trade price and the daily fix takes place on the registration day. All following settlement amounts will be the difference between current fix and previous fix
Offsetting	Set-Off of Contracts may occur every Bank Day during the entire Term. Only a net position is held against the clearinghouse.
Series term	Six months

Market model

Trades in futures will either take place on the regulated market of Nasdaq Stockholm AB (the Exchange) and reported as block trades or reached through bilateral negotiations between buyers and sellers and reported to NASDAQ Clearing (the Clearinghouse) for central counterparty clearing.

The exchange has agreements with a number of market makers regarding the maintenance of a market with two-way prices aimed at ensuring ample liquidity in the contract. Market makers are expected to establish indicative two-way prices in the exchange's trading system in accordance with standard market practices in the Swedish interest-rate market.

Trade registration

Trades can be registered via Nasdaq supplied front-ends Trading Workstation and Q-port or via FIX or OMnet API.
For more information about technical protocols and Genium Inet Front-Ends please visit
https://www.nasdaq.com/solutions/genium-inet-front-ends and https://www.nasdaq.com/solutions/genium-inet-protocol-specifications.

Contract base and deliverable instrument

The contract base is a synthetic Swedish government bond with a maturity of two-, five - or ten years at expiration and an annual coupon of one percent. The future contract offers a combination of daily cash settlement and delivery of underlying instrument at expiry. The deliverable instrument is a Swedish government bond with a remaining maturity of two- five- or ten years at the expiration settlement day and will be settled with a DVP instruction in Euroclear Sweden. There will only be one Deliverable Instrument per Futures contract. The list with deliverable bonds are published via exchange notices and at https://www.nasdaq.com/solutions/fixed-income-derivatives-clearing.

When determining which instruments shall be the Deliverable Instrument for each Series the Clearinghouse will consider the expiration date as well as the issued amount. The Clearinghouse may contact the Issuer in order to determine the Deliverable instrument but is not required to do so. In practice the Clearinghouse will compare the expiration date of the Futures contracts with that of the available bonds and the one(s) with expiration that deviate as little as possible from the contract base is chosen as Deliverable Instrument.

Name standard

Contracts are listed by the contract base short name SGB2Y, SGB5Y or SGB10Y followed by a letter designation for the delivery month and the number of the year in which the expiration month falls.

Expiration month codes		Expiration Month	2-Year Future	5-Year Future	10-Year Future
March	H	September 2019	SGB2YU9	SGB5YU9	SGB10YU9
June	M	December 2019	SGB2YZ9	SGB5YZ9	SGB10YZ9
September	U	March 2020	SGB2YH0	SGB5YH0	SGB10YH0
December	Z	June 2020	SGB2YM0	SGB5YM0	SGB10YM0

Example of 2-Year government bond future with expiration month in June 2017 - SGB2YM7

On March 22 2017, 1500 June 2-year government bond futures representing a nominal amount of SEK 1500 000 000 at transaction yield 1,86 are bought. The contract expires on June 15 and changes in market value is settled daily against the Daily Fix. If the bought contracts are held until expiry the buyer will take delivery of nominal 1500 000 000 of the deliverable bonds from the seller in exchange for payment based on the Expiration Day Fix[1]. Final cash settlement and physical delivery of the underlying bond will take place on June 21 (IMM-day) in Euroclear Sweden.
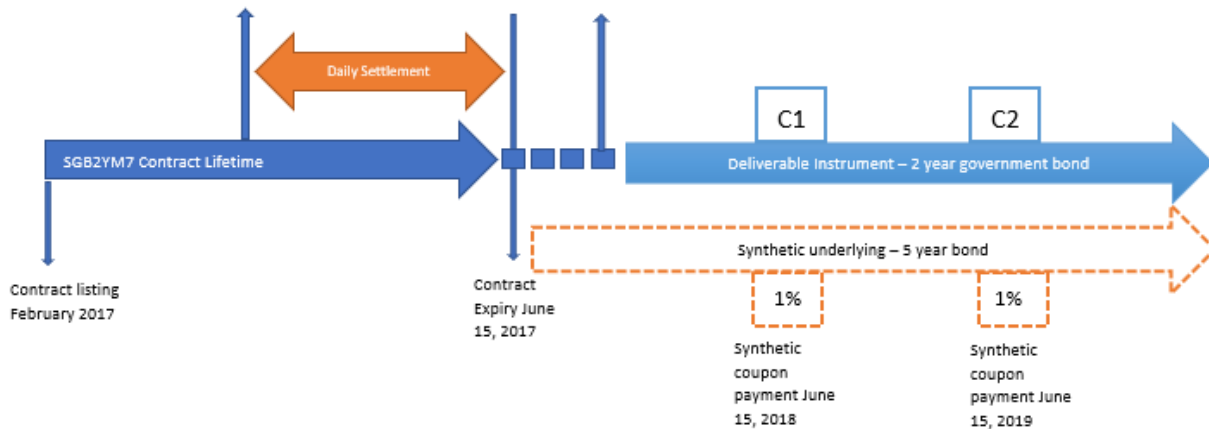
Example of cash settlement calculation on trade date

At the end of trade date March 22, 2017, the fix for SGB2YM7 is determined to be 1.885 percent. The held position is marked-to-market based on the difference between the transaction price and the daily fixing value. The contract base for the SGB2YM7 contract is a synthetic 2-year government bond which is deemed to have a maturity of two years calculated from the final settlement day of the contract, a coupon rate of 1% and 1 year (360 days) until next coupon.

Market value based on the transaction rate of 1.86 percent:

$$\left(\frac{\frac{1}{1.86/100} * \left[\left(1 + \frac{1.86}{100}\right)^2 - 1 \right] + 100}{\left(1 + \frac{1.86}{100}\right)^{(2-1)+\frac{360}{360}}} \right) * \frac{1\ 500\ 000\ 000}{100} = 1,474,902,300.00$$

Market value based on the current market rate 1.885 percent:

$$\left(\frac{\frac{1}{1.885/100} * \left[\left(1 + \frac{1.885}{100}\right)^2 - 1 \right] + 100}{\left(1 + \frac{1.885}{100}\right)^{(2-1)+\frac{360}{360}}} \right) * \frac{1\ 500\ 000\ 000}{100} = 1,474,182,300.00$$

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[1] Daily and Expiration Day Fix is the median value of the average bid and ask yields published by each respective market maker for each series in question

Profit/loss for the position (buyer): -720,000.00 SEK.
The buyer of the contracts thus makes a loss since the fixing is higher than the agreed rate.

Valuation of government bond futures

Every new trade that is registered for clearing will be valuated independently of each other on trade date according to above example. When the new trades have been marked-to-market on trade date, they will be aggregated into a net position. The new net position will on the following day be marked-to-market based on the current fix and previous fix.

Hence, a trade valuation will differ from a position valuation with respect to the following:

	Trade Valuation	Position Valuation
R	Trade price	Previous fix
R2	Current fix	Current fix
Nam	Single Trade	Aggregated position

The following formula is used to calculate the settlement amount for mark-to-market:

$$B = \left(\left(\frac{\frac{K}{R/100}*\left[\left(1+\frac{R}{100}\right)^{n}-1\right]+IK}{\left(1+\frac{R}{100}\right)^{(n-1)+\frac{d}{360}}}\right)*\frac{Nam}{100}\right) - \left(\left(\frac{\frac{K}{R2/100}*\left[\left(1+\frac{R2}{100}\right)^{n}-1\right]+IK}{\left(1+\frac{R2}{100}\right)^{(n-1)+\frac{d}{360}}}\right)*\frac{Nam}{100}\right)$$

B	Settlement Amount
K	Coupon
R	Trade price / previous fix
R2	Current fix / final fix
n	Number of remaining Coupons
d	Number of days until next coupon
IK	Redemption price
Nam	Nominal Amount Single trade / aggregated position

Yield conversion to price

Bond futures market valuation is performed by converting the contracted rate quoted in yield to a price in money. The same is done for the end of day fixing value. The full price of the bond can be determined by using the following equation:

$$P = \frac{C}{(1+r)} + \frac{C}{(1+r)^2} + \frac{C}{(1+r)^3} \ldots + \frac{C}{(1+r)^n} + \frac{C+N}{(1+r)^n}$$

This equation is also helpful in order to understand the implications should the daily fix, or trade price, be zero. Should "r" equal zero then the price is equal to the sum of nominal amount and coupons. I.e. a 2-year contract will have a price of 102 (1+101), a 5-year contract will have a price of 105 and a 10-year contract a price of 110.

The contract base for the SGB2YM7 contract is a synthetic 2-year government bond which is deemed to have a maturity of two years calculated from the final settlement day of the contract and a coupon rate of 1%.

The price (P) of the bond in the above example can thus be calculated as:

$$P = \frac{C}{(1+r)} + \frac{C+N}{(1+r)^2}$$

C = the coupon rate in percent (1)
N = the nominal amount of the bond in percent (100)

Price calculation based on transaction yield 1,86 percent:

$$P = \frac{1}{(1+0,0186)} + \frac{101}{(1+0,0186)^2}$$

$$P = 98,32682$$

Price calculation based on fixing yield 1,885 percent

$$P = \frac{1}{(1+0,01885)} + \frac{101}{(1+0,01885)^2}$$

$$P = 98,27882$$

$$Profit\ and\ loss\ 1500\ SGB2YM7 = -720\,000 = 1500\,000\,000 * \frac{(98,27882 - 98,32682)}{100}$$