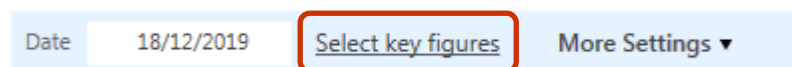


Bond Calculator

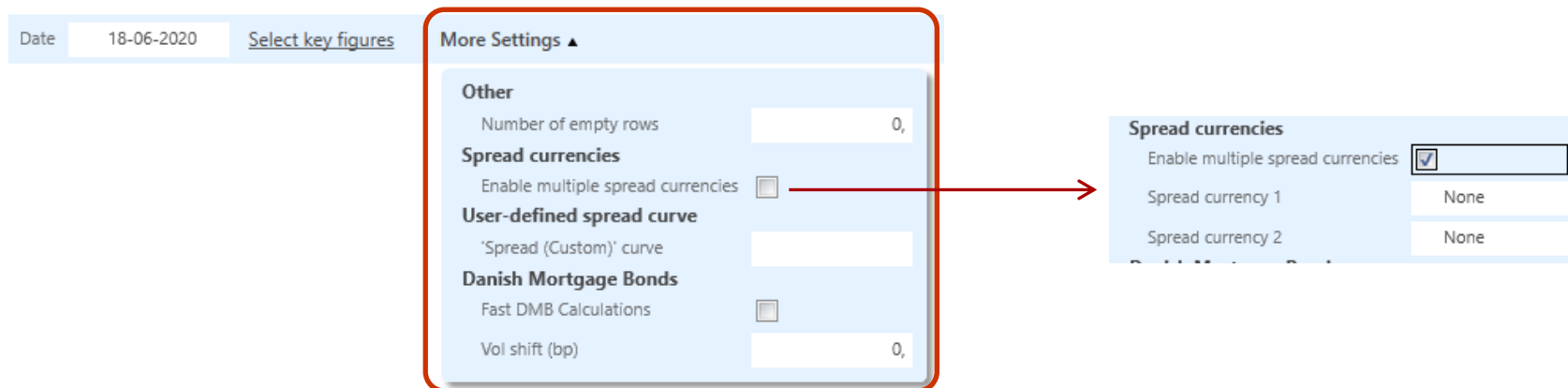
Description

Bond Calculator provides an overview of real-time key figures for relevant bonds. The list of the key figures available can be found in a separate section of this report description.

The selection of key figures can be specified in the report settings “Select key figures”.



Under “More Settings” settings several additional settings can be set.



“Number of empty rows” enables you to include empty rows in the calculated report. This can be used for entering ISIN codes directly in the report for quick ad.hoc. calculations on additional instruments not included in your portfolio.

“Enable multiple spread currencies” lets you define if spread calculations should be calculated against a curve in a different currency than the default curve of the bond. When enabled it is possible to define up to two currencies in order to compare spread vs curve in different currencies. This is only applicable if the key figures “Spread (Gov)”, “Spread (Libor 3M)”, “Spread (Libor 6M)” or Spread (OIS)” has been enabled in the key figure selection.

“Spread (Custom)’ curve” lets you define a curve to be used for the spread calculations, if the key figure “Spread (Custom)” has been enabled in the key figure selection.

Danish Mortgage Bonds

Enabling “Fast DMB Calculations”, will speed up the calculations at the cost of precision in calculated key figures. This is done by decreasing the number of paths used in the calculations.











“Vol shift (bp)” will shift the volatility surface used in the calculations by the specified bps.

Scenarios

In the bottom left pane of the report, interest rate scenarios can be added to see the effects on calculated key figures. The default selection is “Par +0”, meaning calculations based on current interest rate level. Multiple scenarios can be selected, and key figures will be calculated and displayed in separate data grids.

Additional report content

Scenarios + ↕ ⌵

-  Par -100
-  Par -75
-  Par -50
-  Par -25
-  Par +0
-  Par +25
-  Par +50
-  Par +75
-  Par +100
-  Solvency Down
-  Solvency Up



SCENARIO: PAR -100

ISIN	Name	Coupon	Time	Price	Yield	Spread (Default)
DK0009295065	RD 1 01Apr23 Bit A (T)	1,000	11:36:17	104,2405	-0,321 %	117,3
DK0009796864	NYK 1 01Jul23 Bit A (H)	1,000	11:36:17	104,5034	-0,301 %	118,0

SCENARIO: PAR +0

ISIN	Name	Coupon	Time	Price	Yield	Spread (Default)
DK0009295065	RD 1 01Apr23 Bit A (T)	1,000	11:36:17	104,2405	-0,321 %	18,3
DK0009796864	NYK 1 01Jul23 Bit A (H)	1,000	11:36:17	104,5034	-0,301 %	19,0

SCENARIO: PAR +100

ISIN	Name	Coupon	Time	Price	Yield	Spread (Default)
DK0009295065	RD 1 01Apr23 Bit A (T)	1,000	11:36:17	104,2405	-0,321 %	-81,7
DK0009796864	NYK 1 01Jul23 Bit A (H)	1,000	11:36:17	104,5034	-0,301 %	-81,0

Report output and Interactivity/user-defined input

Bond Calculator provides the functionality to overwrite certain cells and calculate key figures based on user input. Examples of this are Price, Yield, etc. highlighted with orange below. As soon as you change the value of a cell (and press enter) the key figures of the row in question will start calculating

The cell “Time” will display the time stamp for when the curve was extracted. In case of the value in a cell in the specific row is has been changed, this cell will display a spinner showing that calculations are ongoing.

The cell “Status” will display the calculation status of the row. This cell will be included if any errors occurred during the calculations.

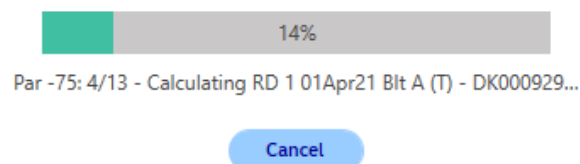
SCENARIO: PAR +0

ISIN	Name	Coupon	Time	Price	Yield	Spread	ASW	Acc Int	PV	YCS	BPV	Mod Dur	Mac Dur	Curve	Status
NO0010821598	NST480	2.000	12:01:25	104.3800	1.438 %	4.4072	4.5118	1.3041	105.6841	4.4072	8.0209	7.5895	7.6948	NOKGOV	12:02:16 - Calculations succeeded
DK0009295735	RD 1 01Jan20 Bit A (T)	1.000	12:01:28	100.0582	-0.760 %	-11.4903	-11.6783	0.9671	101.0254	-11.4903	0.0362	0.0359	0.0329	DKKSWAP Disc OIS	12:02:16 - Calculations succeeded
DK0009294761	RD 1 01Apr20 Bit A (T)	1.000	12:01:28	100.4463	-0.578 %	3.6575	3.7070	0.7186	101.1649	3.6575	0.2864	0.2831	0.2814	DKKSWAP Disc OIS	12:02:16 - Calculations succeeded

In case of multiple scenarios have been selected, one data grid will be shown for each scenario.

Cancellation of report calculation

Calculations can be cancelled by clicking the “Cancel” button. Cancellations will be cancelled after the current ongoing sub-calculation has been completed. This will usually mean once the calculation for the displayed instrument has completed. All completed calculations, in the current calculation from before cancellation, will be displayed in the report after cancellation.



Key figure description

The following provides an overview of the key figures available in Bond Calculator:

Key figure	Interactive/editable	Description
Accrued Interest	No	Accrued interest is the interest that has accumulated since the previous interest payment date.
Assumed next fixing rate	Yes	The assumed next coupon or fixing rate for a FRN's (floaters). In most cases that would be NIBOR 3M or STIBOR 3M.
ASW	Yes	Asset Swap Spread. The spread is the pick-up you obtain from swapping the fixed leg into a floating yield compared to an interbank offered rate. The prepayments are calculated as optimal prepayment behaviour. ASW is only calculated when the price of the bond is below 100.
ASW (fix. frequency)	Yes	The fixing frequency of the floating yield to be used in the ASW (MM) and ASW (PP) calculation
ASW (MM)	Yes	Asset Swap Spread (Matched Maturity). The spread is the pick-up you obtain from swapping the fixed leg into a floating yield compared to an interbank offered rate. The spread is calculated as difference in yield between bond and swap to same maturity.
ASW (PP)	Yes	Asset Swap Spread (Par Par). The spread is the pick-up you obtain from swapping the fixed leg into a floating yield compared to an interbank offered rate. The spread is applied to the floating leg such that $\text{Swap PV} = 100 - \text{bond dirty price}$.
BPV	No	Basis Point Value is the price sensitivity at a parallel shift in the zero-coupon yield curve of 1% point.
BPV (Yield)	No	Price sensitivity at a 1%-point change in the yield on the asset.
BPV 3M, BPV 6M, etc.	No	Shows how the price sensitivity is distributed between the different maturities (key rates) on the yield curve. E.g. BPV3M is the price sensitivity at an upward shift of 1% point in the 3-month point on the zero-coupon yield curve.
Convexity	No	Convexity is the BPV sensitivity at a parallel shift in the zero-coupon yield curve of 1% point. It also measures the curvature of the price-yield curve.
Convexity (FW)	No	Fisher-Weil convexity is the 2nd order relative price sensitivity to a parallel shift in zero rates.
Convexity (Yield)	No	Convexity calculated by shifting the yield
Dirty Price	No	Clean price + accrued interest

Key figure	Interactive/editable	Description
Fisher-Weil Duration	No	Fisher-Weil duration. For callable Danish mortgage bonds, the non-callable cash flow is used.
Forward Date	Yes	The date on which Forward Price, Forward Spreads etc. are calculated.
Forward Price	Yes	The dirty price on the Forward Date. By default, calculated using Price, accrued interest and the repo rate.
Forward Spread (default, gov etc.)	Yes	Spread to the relevant zero-coupon yield curve on the Forward Date based on the Forward Price. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. Calculated based on the default curve of the bond.
Forward Yield	Yes	Yield to maturity is calculated from the Forward Price using the deterministic cash flow after the Forward Date – not taking prepayments into account.
Macauley Duration	No	A measure of the security's life. For callable Danish mortgage bonds, the non-callable cash flow is used.
Modified Duration	No	The percentage change in the bond price at a parallel shift in the zero-coupon yield curve of 1% point. Modified duration = $(BPV / price) * 100$
Modified Duration (Yield)	No	Macauley duration divided by $(1 + yield)$.
NPV	No	Net present value. The difference between present value at spread = 0 and dirty price.
OA Life	No	Calculated as a Fisher-Weil measure (the percentage change in the bond price at a parallel shift in the zero-coupon yield curve of 1% point) using a fixed option-adjusted cash flow. May be interpreted as a measure of the average remaining life.
Price	Yes	Clean price
PV	No	Present value is the theoretical (dirty) price (discounted value) taking the corresponding spread into account. For Danish Mortgage Bonds, the cash flow is corrected for estimated prepayments (option adjusted).
Rate to next fixing	Yes	The assumed rate for the time period from settlement to next coupon. Analytics interpolate the rate using the curve in question.
Repo rate	Yes	The rate between the calculation date and Forward Date. By default, calculated from the zero-coupon yield curve.

Key figure	Interactive/editable	Description
Return 3M -50bp, 3M +50bp etc.	No	Return is the expected return of holding the bond from the calculation date till the return horizon. If the calculation date is today, the return is retrieved from the previous business day to improve performance. The parallel yield curve shifts are applied linearly between the calculation date and return horizon.
Spread (default)	Yes	Spread to the relevant zero-coupon yield curve. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. Calculated based on the default curve of the bond.
Spread (Gov)	Yes	Spread to the relevant Government zero-coupon yield curve. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. If setting "Enable multiple currencies" has been enabled, the curve used for calculations will be based on the currency specified.
Spread (Libor 3M)	Yes	Spread to the relevant 3 months Libor zero-coupon yield curve. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. Only available for DKK denominated bonds. If setting "Enable multiple currencies" has been enabled, the curve used for calculations will be based on the currency specified.
Spread (Libor 6M)	Yes	Spread to the relevant 6 months Libor zero-coupon yield curve. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. If setting "Enable multiple currencies" has been enabled, the curve used for calculations will be based on the currency specified.
Spread (Custom)	Yes	Spread to the user-specified yield curve. The spread to be added to/subtracted from the discounting curve for the theoretical price to equal the actual price. Only calculated if a curve have been specified in "Spread (Custom)' curve" under "More Settings"
Spread Duration	Yes	Spread to the curve in question, where the interest rates curve is plotted as a function of duration and not maturity. For FRN's (Floating Rate Note) "Spread Duration" can be interpreted at the return earned in addition to the index underlying the floating rate note. Dis is sometimes referred to as the "discount margin".
Spread Risk	No	Price sensitivity to spread changes.
Vega	No	Vega measures the price sensitivity of the bond to volatility surface shifts.
Vega Buckets	No	Vega buckets shows how the price sensitivity to volatility shifts is distributed across the volatility surface. The volatility surface is divided into 10 buckets to suit the Vega exposure on Danish Mortgage Bonds. See table below for further details.

Key figure	Interactive/editable	Description
YCS	No	Yield Curve Spread is the spread to the relevant zero-coupon yield curve. For callable Danish mortgage bonds, the deterministic cash flow is used.
Yield	Yes	Yield to maturity is calculated from the price using the deterministic cash flow – not taking prepayments into account.

Vega buckets shows how the price sensitivity to volatility shifts is distributed across the volatility surface. The volatility surface is divided into 10 buckets to suit the Vega exposure on Danish Mortgage Bonds:

