

Relative Value

Description

The **Relative Value** report calculates return over the horizon period and key figures at the horizon date for a range of customisable scenarios.

Settings

It is possible to specify the following settings

Date	07/04/2020	Horizon Date	07/04/2021	Currency	DKK	Reinvestment	
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Date: Defines the date for when the calculations are done. Default is today i.e. real-time.

Horizon Date: The date for when horizon key figures should be calculated and marks the end date for the return period.

Currency: Specifies the currency in which the certain key figures, such as horizon return, is calculated

Reinvestment: User is able to enter the rate that cash flows should be reinvested at. If empty, it will be reinvested at the relevant libor or repo rate.

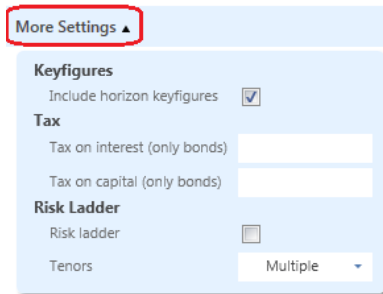
Reinvest in series	<input checked="" type="checkbox"/>	Align to forward curve	<input type="checkbox"/>	Fast DMB Calculations	<input type="checkbox"/>
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Reinvest in series: When enabled, cash flows will be reinvested in the same bond series if possible. If it is not, then the reinvestment rate above will be used.

Align to forward curve: When enabled, the interest rate curve used for horizon calculations will be the relevant forward curve.

Fast DMB Calculations: Reduces the calculation time for Danish Mortgage Bonds at the cost of precision.

More settings



More Settings ▲

Keyfigures
Include horizon keyfigures

Tax
Tax on interest (only bonds)
Tax on capital (only bonds)

Risk Ladder
Risk ladder
Tenors

Include horizon key figures: When rate is entered, the report will include price, spread, yield at horizon and estimated prepayments in the period from Date to Horizon Date.

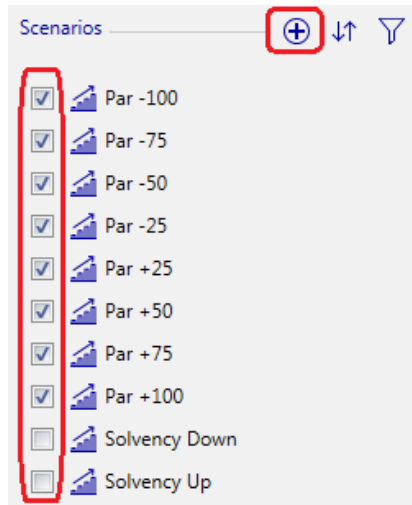
Tax on interest (only bonds): When a rate is entered, interest payments during the horizon period are taxed using this rate.

Tax on capital (only bonds): When a rate is entered, capital gains during the horizon period are taxed using this rate.

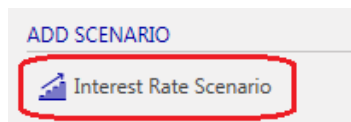
Risk Ladder & Tenors: When Risk Ladder is enabled, a delta ladder is calculated for the points specified in Tenors. Note this setting will significantly increase the calculation time for Danish Mortgage Bonds.

Interest rate scenarios

In the bottom left, interest rate scenarios can be enabled / disabled.



Selecting the + sign allows new scenarios to be created by choosing Interest Rate Scenario



By default the new scenarios will shift all curves (discount and fixing curve for potentially both legs of all instruments) for all currencies upwards by 100 basis points. This can be changed to fit the needs of the analysis.

Solvency up and down shifts are defined by the European commission as follows:

SCR.5.29. The altered term structures are derived by multiplying the current interest rate curve by $(1+s^{\text{up}})$ and $(1+s^{\text{down}})$, where both the upward stress $s^{\text{up}}(t)$ and the downward stress $s^{\text{down}}(t)$ for individual maturities t are specified as follows:

<i>Maturity t (years)</i>	<i>relative change $s^{\text{up}}(t)$</i>	<i>relative change $s^{\text{down}}(t)$</i>
0.25	70%	-75%
0.5	70%	-75%
1	70%	-75%
2	70%	-65%
3	64%	-56%
4	59%	-50%
5	55%	-46%
6	52%	-42%
7	49%	-39%
8	47%	-36%
9	44%	-33%
10	42%	-31%
11	39%	-30%
12	37%	-29%
13	35%	-28%
14	34%	-28%
15	33%	-27%
16	31%	-28%
17	30%	-28%
18	29%	-28%
19	27%	-29%
20	26%	-29%
21	26%	-29%
22	26%	-30%
23	26%	-30%
24	26%	-30%
25	26%	-30%
30	25%	-30%

For example, the “stressed” 15-year interest rate $R_1(15)$ in the upward stress scenario is determined as

$$R_1(15) = R_0(15) \cdot (1 + 0.33)$$

where $R_0(15)$ is the 15-year interest rate based on the current term structure.

Report elements

The report elements are described below.

Portfolio Overview

This table summarizes the key figures of the portfolio and are calculated using the date under Settings.

PORTFOLIO OVERVIEW	
Key figures	
PV	913.14
BPV	57.23
Horizon Return (07/04/2021)	-2.55
- Fixing carry	0.00
- Curve roll	-2.55

All key figures in the table are expressed in the same currency, which is chosen under Settings. For example, the PV key figure is the sum of the *PV* column, not *PV (Dom. ccy)* in Instrument Overview table.

Instrument Overview

The table summarizes the key figures for each position in the portfolio and are calculated using the date under Settings.

Some key figures like PV, BPV, and CVX are calculated both in the currency of the instrument (Dom. ccy) and the currency chosen under Settings. Dom. ccy is short for domestic currency referring to the key figure is calculated in the currency of the instrument. Looking at column

PV (Dom. ccy), the first instrument is denominated in EUR and its present value of 108 is therefore also in EUR. The present value in column PV of 809 is based on the currency setting and therefore in DKK in this example.

Horizon Return are split into two parts: Fixing Carry and Curve Roll. Fixing Carry is the part related to payments (coupons, redemptions etc) within the period whereas Curve Roll accounts for changes in prices.

INSTRUMENT OVERVIEW

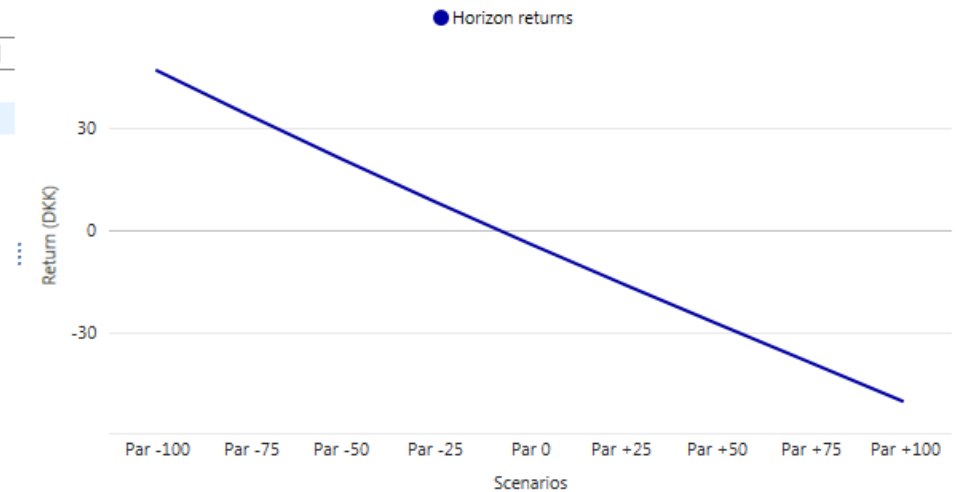
Name	Instrument	Maturity	Paid Currency	Received Currency	Nominal	Yield	PV (Dom. ccy)	PV	BPV (Dom. ccy)	BPV	CVX (Dom. ccy)	CVX	Fixing Carry	Curve Roll	Horizon Return
DE 0.5 15Aug27	Non-callable Bond	15/08/2027	EUR	EUR	100	-0.56 %	108	809	7.87	58.77	0.66	4.91	0	-2	-2
NDA 3 01Oct47 (2)	Danish Mortgage Bond	01/07/2046	DKK	DKK	100	2.36 %	108	108	-1.21	-1.21	0.87	0.87	0	-2	-2

Horizon Return

The return over the horizon period is shown for all instruments and the portfolio for each selected scenario, including the base scenario Par 0.

HORIZON RETURN (DKK)

Name	Par -100	Par -75	Par -50	Par -25	Par 0	Par +25	Par +50	Par +75	Par +100
DE 0.5 15Aug27	51.01	37.48	24.20	11.17	-1.63	-14.19	-26.53	-38.64	-50.54
NDA 3 01Oct47 (2)	-3.67	-3.45	-3.09	-2.59	-1.93	-1.18	-0.41	0.27	0.71
Total	47.34	34.03	21.11	8.58	-3.56	-15.37	-26.94	-38.37	-49.83



Price/Spread/Yield at horizon and prepayments

Price, spread, and yield at horizon shows the key figures calculated at the horizon date. These calculations are using market data available on the report date *Date*, selected under Settings, and for various scenarios.

The last table shows the estimated prepayments for Danish mortgage bonds between the report date and horizon date for the selected scenarios.

PRICE AT HORIZON

Name	Par -100	Par -75	Par -50	Par -25	Par 0	Par +25	Par +50	Par +75	Par +100
DE 0.5 15Aug27	114.06	112.26	110.49	108.75	107.05	105.37	103.73	102.11	100.53
NDA 3 01Oct47 (2)	108.16	108.00	107.96	108.06	108.26	108.50	108.72	108.80	108.66

SPREAD AT HORIZON

Name	Par -100	Par -75	Par -50	Par -25	Par 0	Par +25	Par +50	Par +75	Par +100
DE 0.5 15Aug27	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
NDA 3 01Oct47 (2)	7.65	7.65	7.65	7.65	7.65	7.65	7.65	7.65	7.65

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YIELD AT HORIZON

Name	Par -100	Par -75	Par -50	Par -25	Par 0	Par +25	Par +50	Par +75	Par +100
DE 0.5 15Aug27	-1.59 %	-1.34 %	-1.09 %	-0.84 %	-0.59 %	-0.34 %	-0.09 %	0.17 %	0.42 %
NDA 3 01Oct47 (2)	2.29 %	2.30 %	2.30 %	2.30 %	2.28 %	2.26 %	2.24 %	2.23 %	2.24 %

PREPAYMENTS BETWEEN 07/04/2020 AND 07/04/2021

Name	Par -100	Par -75	Par -50	Par -25	Par 0	Par +25	Par +50	Par +75	Par +100
NDA 3 01Oct47 (2) - Jul 2020	23.55 %	22.69 %	21.80 %	20.87 %	19.92 %	18.94 %	17.94 %	16.94 %	15.92 %
NDA 3 01Oct47 (2) - Oct 2020	23.02 %	21.88 %	20.57 %	19.09 %	17.49 %	15.78 %	14.02 %	12.25 %	10.52 %
NDA 3 01Oct47 (2) - Jan 2021	21.73 %	20.70 %	19.34 %	17.63 %	15.60 %	13.37 %	11.05 %	8.78 %	6.73 %
NDA 3 01Oct47 (2) - Apr 2021	20.08 %	19.35 %	18.13 %	16.37 %	14.08 %	11.43 %	8.70 %	6.20 %	4.15 %

User defined inputs

At the bottom of the report is an interactive table where the different parameters can be changed such as quote, spread change at horizon, prepayment speed and prepayment percentage from report date till horizon.

USER DEFINED INPUTS

	Quote	PP speed	Spread change Par -100	Spread change Par 0	Spread change Par +100	Prepayment Par -100	Prepayment Par 0	Prepayment Par +100
DE 0.5 15Aug27	108.7560							
NDA 3 01Oct47 (2)	107.9500	1.00						