

Debt calculation

Inputs

Debt Components:

- Value
- Issuing Date
- Loan Period
- Due Dates
- Redemption Mode
- Redemption Free Period
- Redemption Frequency
- Interest
- Method of Payment

Calculation

Profit & Loss statement	Interest Rate x Debt.Balance Sheet(t-1)																																																			
Cashflow statement	<p>Different Due Dates affect the Cashflow statement. Multiply Due Dates can be defined for Capex, Transaction Expenditures and Construction Loans. On these Due Dates there is a cash drain cash inflow.</p> <p>When Capex expenditures with an amount of for example EUR 10'000'000 are necessary, these costs can be distributed on different Due Dates. The following table shows the defined Due D</p> <table border="1"> <thead> <tr> <th>Driver</th> <th>Value</th> <th>Unit</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Transaction</td> <td>0</td> <td>Month</td> <td>60</td> </tr> <tr> <td>Transaction</td> <td>24</td> <td>Month</td> <td>25</td> </tr> <tr> <td>Transaction</td> <td>36</td> <td>Month</td> <td>15</td> </tr> </tbody> </table> <p>At Transaction 60% of Capex are due, 24 months later 25% and 36 months after Transaction the remaining 15%.</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th>12.2015</th> <th>01.2016</th> <th>...</th> <th>11.2017</th> <th>12.2017</th> <th>01.2016</th> <th>...</th> <th>11.2018</th> <th>12.2018</th> <th>01.2019</th> </tr> </thead> <tbody> <tr> <td>Cashflow statement</td> <td>-10'000'000</td> <td>-6'000'000</td> <td>0</td> <td>...</td> <td>0</td> <td>-2'500'000</td> <td>0</td> <td>...</td> <td>0</td> <td>-1'500'000</td> <td>0</td> </tr> </tbody> </table>												Driver	Value	Unit	Percentage	Transaction	0	Month	60	Transaction	24	Month	25	Transaction	36	Month	15			12.2015	01.2016	...	11.2017	12.2017	01.2016	...	11.2018	12.2018	01.2019	Cashflow statement	-10'000'000	-6'000'000	0	...	0	-2'500'000	0	...	0	-1'500'000	0
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Linear Redemption

Debt Tranches and Shareholder Loans have to be redeemed. Therefore a Redemption Frequency and a Redemption Free Period is defined. When the Redemption Free Period expires the Debt/Shareholder Loan is redeemed during the Loan Period in regular intervals according to the Redemption Frequency.

When Debt with an amount of EUR 2'000'000, a Loan Period of 10 years, 24 months Redemption Free Period and a Redemption Frequency of 3 months is issued in 12 / 2015, the following Cashflow statement yields from this Debt and the connected Redemptions:

		12.2015	01.2016	...	03.2016	04.2016	05.2016	06.2016	07.2016	08.2016	...	09.2025	10.2025	11.2025	12.2025
Redemption	0	2'000'000	0	...	-62'500	0	0	-62'500	0	0	...	-62'500	0	0	-62'500

The Redemption occurs within 8 years respective 96 months. Thus a monthly Redemption of EUR 20'883 is necessary. Based on the quarterly Redemptions, an amount of EUR 62'500 has to be redeemed every third month.

Annuity Redemption

When the debt is redeemed per annuity, the annual sum of Redemption amounts and Interest payments build a constant value. The Interest expense declines from year to year because the debt gets less too. Therefore the Redemption amount has to increase to get an annuity Redemption.

The Annuity amount can be calculated with the following formula:

$$\text{Annuity} = \text{Loan} * \frac{(1 + i)^n * i}{(1 + i) - 1}$$

with:

$$m = 12 / \text{Redemption Frequency}$$

$$n = \text{Redemption Period in years} * m$$

$$i = \text{Interest Rate} / m$$

When Debt with an amount of EUR 2'000'000, a Loan Period of 10 years, 24 months Redemption Free Period and a Redemption Frequency of 3 months is issued in 12 / 2015, an annuity redemption amount of annually EUR 304'86 or quarterly EUR 76'216 yields.


		12.2015	01.2016	...	03.2016	...	03.2018	04.2018	05.2018	06.2018	07.2018	08.2018	09.2018	...	12.2025
Issuing	2'000'000	2'000'000	0	...	0	...	0	0	0	0	0	0	0	...	0
Redemption	-2'000'000	-2'000'000	0	...	0	...	-51'216	0	0	-51'856	0	0	-52'504	...	-75'275
Interest	-638'906	0	0	...	-25'000	...	-25'000	0	0	-24'360	0	0	23'712	...	-941
Sum		2'000'000	0	...	-25'000	...	-76'216	0	0	-76'216	0	0	-76'216	...	-76'216

Bullet Redemption

When Bullet Redemption is selected as Redemption Mode the whole loan is redeemed at the end of the loan period.

When Debt with an amount of EUR 2'000'000 and a Loan Period of 10 years is issued in 12 / 2015, the whole amount of EUR 2'000'000 is redeemed in 12 / 2025.

		12.2015	01.2016	...	03.2018	04.2016	05.2016	06.2016	07.2016	08.2016	...	09.2025	10.2025	11.2025	12.2025
Redemption	0	2'000'000	0	...	0	0	0	0	0	0	...	0	0	0	-2'000'000

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Balance Sheet

The Balance Sheet gets calculated from the closing Balance Sheet of the previous period and from the difference between the Profit & Loss statement and the Cashflow statement of the actual period.

$$\text{Balance Sheet}(t) = \text{Balance Sheet}(t - 1) + \text{Profit \& Loss statement}(t) - \text{Cashflow statement}(t)$$

The following example explains this functionality:

		01.2016	02.2016	03.2016	04.2016	05.2016	06.2016	07.2016	08.2016	09.2016	10.2016	11.2016	12.2016
Profit & Loss statement	48	4	4	4	4	4	4	4	4	4	4	4	4
Cashflow statement	48	0	0	12	0	0	12	0	0	12	0	0	12
Balance Sheet		4	8	0	4	8	0	4	8	0	4	8	0

For 06 / 2016 the book value is calculated as follows:

$$\text{Balance Sheet}(06.2016) = 8 + 4 - 12 = 0$$