

OFL

Updated: 31 Mar 2016

Use OFL to calculate the price or yield of a bond with an odd first period, an odd last period, and a par value of 100. The OFL formula for a bond with an odd short first coupon is:

$$\text{PRICE} = \frac{C * \frac{DFC}{E} + \left(\frac{-C}{Y} + \frac{RV + C \times \sum_{i=1}^{NCL} \frac{DLC_i}{NLL_i}}{(1+Y)^{\sum_{i=1}^{NCL} \frac{DLC_i}{NLL_i}}} - \frac{-C}{Y} \right)}{(1+Y)^{\frac{DSC}{E}}} - A$$

Where

- A = C * accrued days / E
- C = 100 * coupon rate / frequency
- DFC = the number of days from the issue date to the first coupon date
- DLC_i = the number of days from the previous coupon date to the lesser of the next coupon date and the maturity date in the ith last quasi-coupon period
- DSC = number of days from settlement to coupon
- E = the normal length of the first quasi-coupon period
- N = the number of coupons between the first coupon date and the last coupon date
- NCL = the number of quasi-coupons from the last coupon date to the quasi-maturity date
- NLL_i = the normal length in days of the full ith quasi-coupon period in the odd last period
- RV = redemption value
- Y = yield / frequency

The OFL formula for a bond with an odd long first coupon is:

$$\text{PRICE} = \frac{C \times \left[\sum_{i=1}^{NCF} \frac{DFC_i}{NLF_i} \right] + \left(\frac{-C}{Y} + \frac{RV + C \times \sum_{i=1}^{NCL} \frac{DLC_i}{NLL_i}}{(1+Y)^{\sum_{i=1}^{NCL} \frac{DLC_i}{NLL_i}}} - \frac{-C}{Y} \right)}{(1+Y)^{Nqf + \frac{DSC}{E}}} - C \times \left[\sum_{i=1}^{NCF} \frac{A_i}{NLF_i} \right]$$

Where

- A_i = number of accrued days for the ith quasi-coupon period
- C = 100 * coupon rate / frequency
- DFC_i = number of days from the issue date to the first quasi-coupon date or the number of days in the quasi-coupon period
- DLC_i = the number of days from the previous coupon date to the lesser of the next coupon date and the maturity date in the ith last quasi-coupon period

- DSC = number of days from settlement date to the next quasi-coupon date or first coupon date.
- E = number of days in the quasi-coupon period in which settlement occurs
- N = the number of coupons between the first coupon date and the maturity date
- NCF = number of quasi-coupon periods that fit in the odd first period
- NCL = the number of quasi-coupons from the last coupon date to the quasi-maturity date
- NLF_i = normal length in days of the full ith quasi-coupon period within the odd period.
- NLL_i = the normal length in days of the full ith quasi-coupon period in the odd last period
- Nqf = the number of whole quasi-coupon periods between the settlement date and the first coupon.
- RV = redemption value
- Y = yield / frequency

The **OFL** function allows you to pass value for DFC₁, DFC₂, A₁, A₂, NLF₁, NLF₂, DLC₁, DLC₂, NLL₁, NLL₂, NCL, NCF, N, Nqf, DSC, E, and RV directly into the equation and automatically calculates Y and C. OFL does not support bonds with more than 2 quasi-coupons in either the first or last coupon periods.

Syntax

```
Public Shared Function OFL(
    ByVal Rate As Double,
    ByVal Yield As Double,
    ByVal Price As Double,
    ByVal RV As Double,
    ByVal Freq As Integer,
    ByVal A1 As Double,
    ByVal A2 As Double,
    ByVal DSC As Double,
    ByVal E As Double,
    ByVal N As Integer,
    ByVal ShortFirst As Boolean,
    ByVal ShortLast As Boolean,
    ByVal DLC1 As Double,
    ByVal DLC2 As Double,
    ByVal NLL1 As Double,
    ByVal NLL2 As Double,
    ByVal DFC1 As Double,
    ByVal DFC2 As Double,
    ByVal NLF1 As Double,
    ByVal NLF2 As Double,
    ByVal Nqf As Integer,)
```

Arguments

Rate

the bond's annual coupon rate. *Rate* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

Yield

the bond's annual yield. *Yield* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

Price

the price of the bond. *Price* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

RV

the bond's redemption value per 100 face value. *RV* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

Freq

the number of coupon payments per year. For annual payments, *Freq* = 1; for semi-annual, *Freq* = 2; for quarterly, *Freq* = 4; for bimonthly *Freq* = 6; for monthly *Freq* = 12. *Freq* is an expression that returns an **Integer**, or of a type that can be implicitly converted to **Integer**.

A1

the number of accrued days in the first quasi-coupon period of the odd first period. If *ShortFirst* = True or *ShortFirst* = False and *Nqf* = 1 then this is the number of accrued days for the bond. If *ShortFirst* = False and *Nqf* = 0 then this should be the same as the value entered in *DFC1*. *A1* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

A2

the number of accrued days in second quasi-coupon period in the odd first period. If *ShortFirst* = True then this should be NULL. *A2* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

DSC

the days from settlement to next coupon date (when *N* > 1) or the days from settlement to redemption (when *N* = 1). *DSC* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

E

the number of days in the settlement period. *E* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

N

the number of coupons from the first coupon date to the last coupon date. *N* is an expression that returns an **Integer**, or of a type that can be implicitly converted to **Integer**.

ShortFirst

a bit value which identifies the bond as having a short first coupon period (True) or a long first coupon period (False). *ShortFirst* is an expression that returns a **Boolean**, or of a type that can be implicitly converted to **Boolean**.

ShortLast

a bit value which identifies the bond as having a short last coupon period (True) or a long last coupon period (False). *ShortLast* is an expression that returns a **Boolean**, or of a type that can be implicitly converted to **Boolean**.

DLC1

the number of days from the last coupon date to the maturity date (when *ShortLast* = True) or the number of days from the last coupon date to the quasi-coupon date (when *ShortLast* = False). *DLC1* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

DLC2

the number of days from the quasi-coupon date to the maturity date. If *ShortLast* = True then *DLC2* should be NULL. *DLC2* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

NLL1

the normal length of the first quasi-coupon period. *NLL1* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

NLL2

the normal length of the second quasi-coupon period. If *ShortFirst* = True then *NLL2* should be NULL. *NLL2* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

DFC1

the number of days from the issue date to the quasi-coupon date (when *ShortFirst* = False) or the number of days from the issue date to the first coupon date (when *ShortFirst* = True). *DFC1* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

DFC2

the number of days from in the second quasi-coupon period. If *ShortFirst* = True then *DFC2* should be NULL. *DFC2* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

NLF1

the normal length of the first quasi-coupon period. *NLF1* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

NLF2

the normal length of the second quasi-coupon period. If *ShortFirst* = True then *NLF2* should be NULL. *NLF2* is an expression that returns a **Double**, or of a type that can be implicitly converted to **Double**.

Nqf

the number of whole coupon periods between the settlement date and the first coupon date. If *ShortFirst* = True then *Nqf* should be 0. *Nqf* is an expression that returns an **Integer**, or of a type that can be implicitly converted to **Integer**.

Return Type

Double

Remarks

- If *Rate* is NULL then *Rate* = 0.
- If *RV* is NULL then *RV* = 100.
- If *Freq* is NULL then *Freq* = 2.
- If *E* is NULL then *E* = 180.
- If *DSC* is NULL then *DSC* = 0.
- If *N* is NULL then *N* = 0.
- If *ShortFirst* is NULL then *ShortFirst* = True.
- If *ShortLast* is NULL then *ShortFirst* = True.
- If *A1* is NULL then *A1* = 0.
- If *A2* is NULL then *A1* = 0.
- If *DLC1* is NULL then *DLC1* = 0
- If *DLC2* is NULL then *DLC2* = 0
- If *DFC1* is NULL then *DFC1* = 0.
- If *NLL1* is NULL then *NLL1* = 180.
- If *NLL2* is NULL then *NLL2* = 180.
- If *DFC1* is NULL then *DFC1* = 0.
- If *DFC2* is NULL then *DFC2* = 0.
- If *NLF1* is NULL then *NLF1* = 0.
- If *NLF2* is NULL then *NLF2* = 0.
- If *Nqf* is NULL then *Nqf* = 0.
- If *Yield* is NULL and *Price* is NULL then NULL is returned.
- If *E* = 0 then NULL is returned.
- If *Freq* = 0 then NULL is returned.
- $C = 100 * Rate / Freq$
- $Y = Yield / Freq$
- If *Yield* is NOT NULL then price is calculated from the inputs otherwise yield is calculated from the inputs.

See Also

- BONDYIELD - Cash flows for a bond paying regular periodic interest
- DIRTYPRICE - Dirty price of a bond
- DIRTYYIELD - Yield of a bond from the dirty price
- DIS - Price, discount rate, and/or yield of a discount security
- DISC - Discount rate
- DISFACTORS - Factors for the price calculation of a discount security
- IAM - Price and/or yield of a security paying interest at maturity
- IAMFACTORS - Factors for the price calculation of a security paying interest at maturity
- ODDFPRICE - Price of a bond with an odd first coupon
- ODDFYIELD - Yield of a bond with an odd first coupon
- ODDLPRICE - Price of a bond with an odd last coupon
- ODDLYIELD - Yield of a bond with an odd last coupon
- OFC - Calculate the price and/or yield of a bond with an odd first coupon using the ODDFPRICE equation
- OFCFACTORS - Returns the components of the ODDFPRICE equation
- OFLFACTORS - Returns the components of the OFLPRICE equation
- OFLPRICE - Calculate the price of a security with an odd first and odd last period
- OFLYIELD - Calculate the yield of a security with an odd first and odd last period
- OLC - Calculate the price and/or yield of a bond with an odd last coupon using the ODDLPRICE equation
- OLCFACTORS - Returns the components of the ODDLPRICE equation
- PRICE - Price of a security paying regular periodic interest
- PRICEACT - Price of a bond where coupon amounts are based on number of days in the coupon period
- PRICEACTV - Cash flows and discount factors for a bond where coupon amounts are based on number of days in the coupon period
- PRICEDISC - Price of a discounted security
- PRICEFR - Price of a bond with forced redemptions
- PRICEMAT - Price of an interest-at-maturity security
- PRICESTEP - Price of a security with step-up rates
- RPI - Calculate the price and/or yield of a bond with regular periodic coupons
- RPIFACTORS - Factors for the calculation of the price of a bond that pays regular periodic interest
- TBILLEQ - Bond equivalent yield of a Treasury Bill
- TBILLPRICE - Price of a Treasury Bill
- TBILLYIELD - Yield of a Treasury Bill
- YIELD - Yield of a bond paying regular periodic interest
- YIELDACT - Yield of a bond where coupon amounts are based on number of days in the coupon period

- YELDDISC - Yield on a discount security
- YELDFR - Yield of a bond with forced redemptions
- YELDMAT - Yield on an interest-at-maturity security
- YELDSTEP - Yield of a security with step-up rates