



## No Interest Cashflow Specification

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# Chapter 1

## No Interest Cashflow

### 1.1 Properties of Cashflow

A no interest cashflow is a transfer of the **amount** of  $N$  in **currency** on the **flow date** (FD), as illustrated in Figure 1.1. Principal repayment of a loan is an example of no interest cashflow.



Figure 1.1: No interest cahflow

### 1.2 Definitions

In this section, we define terms that are specific to no interest cashflow.

**amount** is the amount in **currency** that one has to transfer on the **flow date**.

**currency** is the currency that the transfer is in.

**flow date** is the date that the cashflow transfer occurs.

### 1.3 Cashflow Inputs

A no interest cashflow is specified by the mandatory fields in Table 1.1, the optional field in Table 1.2, with their restrictions in Table 1.3.

<i>Field</i>	<i>Description</i>	<i>Data Type</i>	<i>Symbol</i>
PayReceive	The pay/receive direction of the cashflow	string	direction
Currency	The <b>currency</b>	string	ccy
FlowDate	The date of the cashflow payment, i.e. the <b>flow date</b>	date	FD
Amount	The <b>amount</b> of the transfer	double	$N$

Table 1.1: Mandatory fields for No Interest Cashflow

<i>Field</i>	<i>Description</i>	<i>Data Type</i>	<i>Symbol</i>	<i>Default Value</i>
DiscountReference	Alternative discounting curve	string		
LegID	The identifier of the leg	string		
Description	The description of the flow	string		

Table 1.2: Optional field for No Interest Cashflow

<i>Field</i>	<i>Restriction</i>
PayReceive Amount	Pay, Receive, P, R $N > 0$

Table 1.3: Field restrictions for No Interest Cashflow

### 1.3.1 Required Curves

The following curves are required by a no interest cashflow:

- *Currency FX spot curve*: FX Spot Curve — (FX.PRICE.Currency.BaseCurrency), and
- *Currency discounting curve*: Money Market Zero Curve: (MM.ZERO.SWAP.Currency) <sup>1</sup>.

When the optional field DiscountReference is provided, the reference curve is used as the Currency discounting curve.

## 1.4 Formula

A no interest cashflow gives a transfer of  $N$  in **currency** on the **flow date**.

If the Valuation Date is less than or equal to the **flow date**, the value of a no interest cashflow in Base Currency is

$$N \times E_{\text{ccy}} \times \mathbb{I}_{\text{pr}} \times Df_t,$$

where

- $N$  is the **amount** of the transfer in **currency**,
- $E_{\text{ccy}}$  is the spot exchange rate in units of Base Currency per **currency**, from the Currency FX spot curve,
- the discount factor from Valuation Date to **flow date** is

$$Df_t = e^{-r_{\text{ccy}} t},$$

- $r_{\text{ccy}}$  is the continuous zero rate of **currency** from Valuation Date to **flow date** in Actual/365 (Fixed) day count convention, from the Currency discounting curve,
- $t$  is the time in years from Valuation Date to **flow date** in Actual/365 (Fixed) day count convention, and
- the indicator for pay or receive direction is

$$\mathbb{I}_{\text{pr}} = \begin{cases} 1, & \text{if direction is 'R'}, \\ -1, & \text{if direction is 'P'}. \end{cases}$$

If the Valuation Date is greater than the **flow date**, then the no interest flow has expired and thus has a value of zero.

<sup>1</sup>For certain products, e.g. FX Forward or Cross Currency Swap, FX ZERO curve is used for discounting.

## 1.5 Examples

This section provides some deal examples of no interest cashflow.

**Example 1.1.** A no interest cashflow:

- PayReceive: Pay
- Currency: GBP
- FlowDate: 2013-11-15
- Amount: 60,000,000

On 2013-11-15, there is a payment of \$60,000,000 GBP.

**Example 1.2.** A no interest cashflow:

- PayReceive: Receive
- Currency: AUD
- FlowDate: 2013-11-15
- Amount: 100,000,000

On 2013-11-15, one receives \$100,000,000 AUD.

# Glossary

**Base Currency** The currency that the risk engine is configured to return values in.

**Valuation Date** The date that we value the trades as.