

## 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.

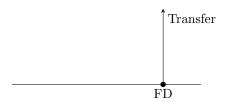


Figure 1.1: No interest cahflow

### 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.

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

Table 1.1: Mandatory fields for No Interest Cashflow



6 1 No Interest Cashflow

Field	Description	Data Type	Symbol	Default Value
DiscountReference LegID Description	Alternative discounting curve The identifier of the leg The description of the flow	$rac{ ext{string}}{ ext{string}}$		

Table 1.2: Optional field for No Interest Cashflow

Field	Restriction
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) 1.

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

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

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

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



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## 1.5 Examples

This section provides some deal examples of no interest cashflow.

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

PayReceive: PayCurrrency: GBPFlowDate: 2013-11-15Amount: 60,000,000

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

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

PayReceive: ReceiveCurrrency: AUDFlowDate: 2013-11-15Amount: 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.

