IBM Planning Analytics
FX Conversion Model/Template/Sample

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1. About this Document

This document describes a proven practices-based Foreign Currency Exchange (FX) lookup and calculation model. The FX model described herein is also leveraged within various IBM Analytics Services Solution Assets, Templates & Quick Wins.

2. FX Model

2.1 Overview

FX model
- Input of Foreign Currency to USD FX rates,
- Triangulation of other FX rates via USD FX rates per FX cube rule

| FX |
| --- |
| Transaction Currency |
| Currency |
| Version |
| Time Period |
| FX Measure |
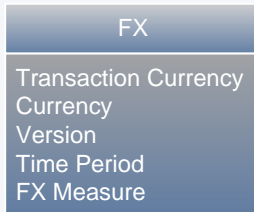
The FX model holds FX rates (Actual rates and BP rates) that are used for FX conversion from Transaction currency (local, transaction, legal entity currency data) to Reporting Currencies.
The dual-FX dimension design allows the model to provide FX rates for any FX combination.

2.1.1 Transaction Currency Dimension
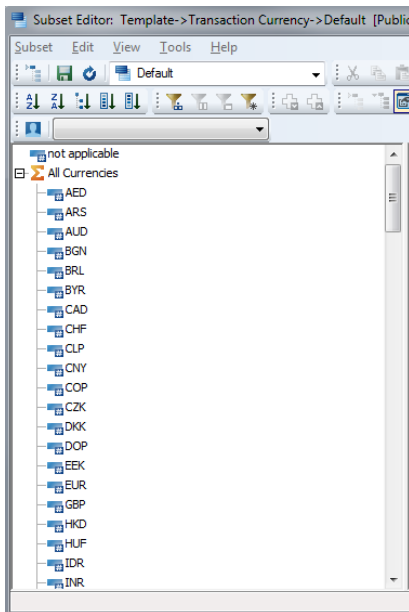
Non $ inputs are stored against element 'not applicable'. Transaction Currency Inputs are stored against their respective 3-character FX Codes. The element 'All Currencies' in this dimension is needed to consolidate transaction currency translations: let's say we have transactions in USD, EUR & GBP; all are to be translated to USD (USD element in the reporting currency dimension). To get a total USD Reporting Currency output, we have to look at 'all' transactions (but translated).

2.1.2 Reporting Currency Dimension
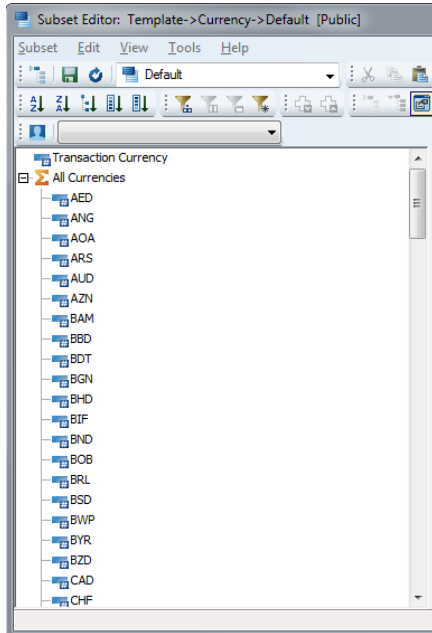
Transaction Currency Inputs are stored against element 'Transaction Currency'. FX translation rules are applied to all currencies (3-character FX Code). The element 'All Currencies' in this dimension should be ruled to 0, it is only needed for feeding purposes (i.e. transaction currency' values feed to 'All Currencies' to 'feed' translation to all reporting currencies).

2.2 FX rate Data Requirements

As an input, the FX model needs USD FX rates in the following format: **Foreign Currency Unit = 1USD * *FX Rate* = X USD** (Example: 1EUR = 1USD * FX Rate = 1.3 USD).

Foreign Currency	Reporting Currency	Version	TimePeriod	FX_Type	FX_Rate
EUR	US	Actual	YYYYMM	...	1.3

While rules are pre-configured for USD FX rates input, any other currency or currencies can or course be handled instead or in addition.

2.3 FX translation

2.3.1 Triangulation

FX rates for USD to Foreign Currency are derived via the inverse of the former FX rate. The inverse rate:

Transaction Currency	Currency	FX Measure	201201	201202	201203	201204	201205
USD	EUR	Actual Rate Balance	$0.74	$0.72	$0.73	$0.72	$0.73
		Actual Rate PnL	$0.73	$0.74	$0.72	$0.73	$0.72
		Business Plan Rate	$0.00	$0.00	$0.00	$0.00	$0.00
	GBP	Actual Rate Balance	$0.61	$0.60	$0.60	$0.59	$0.60
		Actual Rate PnL	$0.60	$0.61	$0.60	$0.60	$0.59
		Business Plan Rate	$0.00	$0.00	$0.00	$0.00	$0.00
	USD	Actual Rate Balance	$1.00	$1.00	$1.00	$1.00	$1.00
		Actual Rate PnL	$1.00	$1.00	$1.00	$1.00	$1.00
		Business Plan Rate	$1.00	$1.00	$1.00	$1.00	$1.00

(Version: Actual; Time Period)

and also all other rates (Foreign Currency A to Foreign Currency B):

Transaction Currency	Currency	FX Measure	201201	201202	201203	201204
EUR	EUR	Actual Rate Balance	$1.00	$1.00	$1.00	$1.00
		Actual Rate PnL	$1.00	$1.00	$1.00	$1.00
		Business Plan Rate	$1.00	$1.00	$1.00	$1.00
	GBP	Actual Rate Balance	$0.82	$0.83	$0.83	$0.82
		Actual Rate PnL	$0.83	$0.82	$0.83	$0.83
		Business Plan Rate	$0.00	$0.00	$0.00	$0.00
	USD	Actual Rate Balance	$1.35	$1.38	$1.38	$1.39
		Actual Rate PnL	$1.38	$1.35	$1.38	$1.38
		Business Plan Rate	$0.00	$0.00	$0.00	$0.00

(Version: Actual; Time Period)

are derived via triangulation within the TM FX model:

```
SKIPCHECK;

#region Triangulation on USD
[] = C: 0;
[{'Actual','Forecast','Plan'}] = N:
    IF (!Transaction Currency @= !Reporting Currency,
    1,
    Continue);
[{'Actual','Forecast','Plan'},'Reporting Currency':'USD'] = N: stet;
[{'Actual','Forecast','Plan'}] = N:
    DB('FX', !Transaction Currency, 'USD', !Version, !Time Period, !FX Measure)
    * 1 \ DB('FX', !Reporting Currency, 'USD', !Version, !Time Period, !FX Measure);
#endregion

Feeders;
[{'Actual','Forecast','Plan'},'Reporting Currency':'USD'] => ['All Non-US Currencies'];
```

2.3.2   FX translation in Cube(s)

Example Rules:

```
[{'Actual','Forecast','…'}]=N:
        IF(!Transaction Currency @= !Reporting Currency ,
                ['Transaction Currency'],
                ['Transaction Currency']
                *DB('FX', !Transaction Currency, !Currency, !Version, !Time Period, '<FX Type>'));
['Act @ BP Rate'] = N:
        ['Actual','Transaction Currency']
        * DB('FX', !Transaction Currency, !Currency, 'Actual', !Time Period, 'Business Plan Rate');
['Act @ Prior Month Rate'] = N:
        ['Actual','Transaction Currency']
        * DB('FX', !Transaction Currency, !Currency, !Version,
                ATTRS ('Time Period',!Time Period,'Prior Calendar Period'), '<FX Type>'));
```