

elements



Rate Scenarios Package - Introduction

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1. Purpose of Document

The purpose of this document is to introduce the 'Rate Scenarios' package in the elements object model. This document will provide sufficient background to the business problem to explain and motivate the subsequent description of the model. It will also give an overview of the model, outlining the 'mental picture' that drove the development of the object model, and then summarize the key features of the model, as documented in UML.

The readers of these documents will be:

- Anyone assessing the usefulness of the elements object model for their purpose.
- People preparing to study the associated package in detail.
- Anyone who wants an outline picture of a particular package because it is used in another package.

2. Business Issues

The following issues are addressed by this package:

2.1. Why Do We Need Different Rates at Different Times?

Rates (FX Rates, Interest Rates, etc.) can have many sources and ways of being calculated - a rate used for End Of Day processing may have a source that is different and be calculated in a different way compared to a rate used during day time trading. A system that looks for an arbitrage opportunity may compare rates from different sources to see if there is a discrepancy that can be exploited.

2.2. How Do We Determine Which Rate and Source to Use?

We must have a way to specify which rate we require. For example, a trading screen could request the NLG/JPY exchange rate and an End-of-Day process may request the same rate, but the rate has been derived in a different manner. The model has to support this selection of different rates at various times.

3. Overview of the Conceptual Model

Some of the concepts introduced in this model are as follows.

3.1. Rate Managers

Rate Managers are the gateway for external systems to access Rates. A manager exists to provide rates for a particular reason (e.g. End-Of-Day Rate Manager, Trading F.X. Rate Manager, etc.) and gives access to the Rates that provide data for those functions. The client (e.g. a trading system) requiring a rate makes a request to the Rate Manager giving a set of parameters that define the rate required (e.g. Type = FX Rate, Currency Pair = USD/JPY). The Rate Manager finds the rate values and returns them to the client.

3.2. Rate Scenarios

The Rate Scenario holds a list of Rate Scenario Rules (see below) that define each rate in terms of its logical representation and how that rate is derived. The Rate Scenario is given the set of parameters that specify a rate and it selects the derivation method for that rate. E.g. It is given a rate specified by 'Type = FX Rate, Currency Pair = USD/JPY', it determines that the source is from the Reuters FX feed and returns the requested FX rate.

3.3. Parent Scenarios

Rate Scenarios can be structured to inherit rates from parent Scenarios. For example: A Rate Scenario only for the Emerging Markets with rate rules specific to those markets. If a rate for a currency in that market was requested then the Emerging Markets scenario would fill it, if a rate was requested for another currency then the Rate Scenario could forward the request to a parent Scenario.

3.4. Rate Rules

Rate Rules define the conditions for providing a rate to a requestor. A rate requestor may ask for a particular FX Cross Rate (e.g. USD/JPY) and the Rate Scenario will find the rate derivation method associated with that condition. There is a Rate Scenario Rule that holds a parameter containing the logical representation of a rate (e.g. Type = FX Rate, Currency Pair = USD/JPY) and its associated rate derivation method (e.g. USD/JPY Reuters FX Curve) for each rate known to the system. When a Rate Scenario is asked for a rate it scans its list of Rate Scenario Rules looking for one with a matching parameter and returns the derivation method when a match is found.

3.5. Logical Rate Parameter Deriver

This class is fully documented in the Basic Rates Package and has the task of matching the rate request from the Rate Manager with the Rate Scenario Rules held by the Rate Scenario.

3.6. Logical Rate Actual Parameter

This class is fully documented in the Basic Rates Package and has the task of holding the parameters that identify the rate.

4. Uses of the Object Model

A Rate Scenario Model for the Australian Market holds the rule:

| Logical Rate Actual Parameter | | Rate Derivation Specifier |
|-------------------------------|-----------------------|---------------------------|
| Type = FX Rate | CurrencyPair= AUD/USD | AUD-USD Reuters FX feed |

and a parent pointer to another Rate Scenario Model with these rules.

| Logical Rate Actual Parameter | | Rate Derivation Specifier |
|-------------------------------|-------------------------|---------------------------------|
| Type = Interest | Currency = NLG | NLG Yield Curve |
| Type = Interest | Currency = USD | USD-AFX Yield Curve |
| Type = FX Rate | CurrencyPair = USD/NLG | USD – NLG RR FX curve |
| Type = FX Rate | Currency Pair = AUD/NLG | Cross Curve – AUD/USD – USD/NLG |

A trading screen in the Australian market needs an AUD/NLG cross rate. It makes a call to the appropriate Rate Manager with a Logical Rate Actual Parameter = (TYPE = FX Rate, CurrencyPair = AUD/NLG). The Rate Manager then asks its Rate Scenario Model for the derivation Method for that Logical Rate Actual Parameter. The Rate Scenario Model checks each of its rules to see if it has a rule that matches the parameter (the rule checking is done by the Logical Rate Parameter Deriver). If the Scenario can't find a match then it goes to each of the Scenarios in its parent collection looking for a match.

In this example the Australian Market Rate Scenario Model doesn't have the AUD/NLG FX rate and forwards the request to its parent, which does have the rate and returns the derivation Method for 'Cross Curve – AUD/USD – USD/NLG'.

If the request was a Logical Rate Actual Parameter = (TYPE = FX Rate, CurrencyPair = AUD/USD) then the Australian Market Rate Scenario Model would have detected the match and returned the 'AUD-USD Reuters FX curve' Rate Derivation Specifier.