



**Financial products Markup Language**

## **FpML - Risk Definitions Component Definitions**

## ***Version: 4.4***

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### **Document built**

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# Table Of Contents

1	Global Complex Types	9
1.1	AssetOrTermPointOrPricingStructureReference	10
1.1.1	Description:	10
1.1.2	Contents:	10
1.1.3	Used by:	10
1.1.4	Derived Types:	10
1.1.5	Figure:	10
1.1.6	Schema Fragment:	10
1.2	BasicAssetValuation	11
1.2.1	Description:	11
1.2.2	Contents:	11
1.2.3	Used by:	11
1.2.4	Derived Types:	11
1.2.5	Figure:	11
1.2.6	Schema Fragment:	11
1.3	DenominatorTerm	12
1.3.1	Description:	12
1.3.2	Contents:	12
1.3.3	Used by:	12
1.3.4	Derived Types:	12
1.3.5	Figure:	12
1.3.6	Schema Fragment:	12
1.4	DerivativeCalculationMethod	13
1.4.1	Description:	13
1.4.2	Contents:	13
1.4.3	Used by:	13
1.4.4	Derived Types:	13
1.4.5	Figure:	13
1.4.6	Schema Fragment:	13
1.5	DerivativeCalculationProcedure	14
1.5.1	Description:	14
1.5.2	Contents:	14
1.5.3	Used by:	14
1.5.4	Derived Types:	14
1.5.5	Figure:	14
1.5.6	Schema Fragment:	14
1.6	DerivativeFormula	15
1.6.1	Description:	15
1.6.2	Contents:	15
1.6.3	Used by:	15
1.6.4	Derived Types:	15
1.6.5	Figure:	15
1.6.6	Schema Fragment:	15
1.7	FormulaTerm	16
1.7.1	Description:	16
1.7.2	Contents:	16
1.7.3	Used by:	16
1.7.4	Derived Types:	16
1.7.5	Figure:	16
1.7.6	Schema Fragment:	16
1.8	GenericDimension	17
1.8.1	Description:	17
1.8.2	Contents:	17
1.8.3	Used by:	17
1.8.4	Derived Types:	17
1.8.5	Figure:	17
1.8.6	Schema Fragment:	17
1.9	InstrumentSet	18
1.9.1	Description:	18
1.9.2	Contents:	18

1.9.3	Used by:	18
1.9.4	Derived Types:	18
1.9.5	Figure:	18
1.9.6	Schema Fragment:	18
1.10	<b>Market</b>	19
1.10.1	Description:	19
1.10.2	Contents:	19
1.10.3	Used by:	19
1.10.4	Derived Types:	19
1.10.5	Figure:	19
1.10.6	Schema Fragment:	19
1.11	<b>MarketReference</b>	21
1.11.1	Description:	21
1.11.2	Contents:	21
1.11.3	Used by:	21
1.11.4	Derived Types:	21
1.11.5	Figure:	21
1.11.6	Schema Fragment:	21
1.12	<b>PerturbationType</b>	22
1.12.1	Description:	22
1.12.2	Contents:	22
1.12.3	Used by:	22
1.12.4	Derived Types:	22
1.12.5	Figure:	22
1.12.6	Schema Fragment:	22
1.13	<b>PositionId</b>	23
1.13.1	Description:	23
1.13.2	Contents:	23
1.13.3	Used by:	23
1.13.4	Derived Types:	23
1.13.5	Figure:	23
1.13.6	Schema Fragment:	23
1.14	<b>PricingDataPointCoordinate</b>	24
1.14.1	Description:	24
1.14.2	Contents:	24
1.14.3	Used by:	24
1.14.4	Derived Types:	24
1.14.5	Figure:	24
1.14.6	Schema Fragment:	24
1.15	<b>PricingDataPointCoordinateReference</b>	25
1.15.1	Description:	25
1.15.2	Contents:	25
1.15.3	Used by:	25
1.15.4	Derived Types:	25
1.15.5	Figure:	25
1.15.6	Schema Fragment:	25
1.16	<b>PricingInputReplacement</b>	26
1.16.1	Description:	26
1.16.2	Contents:	26
1.16.3	Used by:	26
1.16.4	Derived Types:	26
1.16.5	Figure:	26
1.16.6	Schema Fragment:	26
1.17	<b>PricingInputType</b>	27
1.17.1	Description:	27
1.17.2	Contents:	27
1.17.3	Used by:	27
1.17.4	Derived Types:	27
1.17.5	Figure:	27
1.17.6	Schema Fragment:	27
1.18	<b>PricingMethod</b>	28
1.18.1	Description:	28
1.18.2	Contents:	28
1.18.3	Used by:	28

1.18.4	Derived Types:	28
1.18.5	Figure:	28
1.18.6	Schema Fragment:	28
1.19	PricingParameterDerivative	29
1.19.1	Description:	29
1.19.2	Contents:	29
1.19.3	Used by:	29
1.19.4	Derived Types:	29
1.19.5	Figure:	29
1.19.6	Schema Fragment:	29
1.20	PricingParameterDerivativeReference	31
1.20.1	Description:	31
1.20.2	Contents:	31
1.20.3	Used by:	31
1.20.4	Derived Types:	31
1.20.5	Figure:	31
1.20.6	Schema Fragment:	31
1.21	PricingParameterShift	32
1.21.1	Description:	32
1.21.2	Contents:	32
1.21.3	Used by:	32
1.21.4	Derived Types:	32
1.21.5	Figure:	32
1.21.6	Schema Fragment:	32
1.22	PricingStructureValuation	33
1.22.1	Description:	33
1.22.2	Contents:	33
1.22.3	Used by:	33
1.22.4	Derived Types:	33
1.22.5	Figure:	33
1.22.6	Schema Fragment:	33
1.23	QuotedAssetSet	35
1.23.1	Description:	35
1.23.2	Contents:	35
1.23.3	Used by:	35
1.23.4	Derived Types:	35
1.23.5	Figure:	35
1.23.6	Schema Fragment:	35
1.24	SensitivityDefinition	36
1.24.1	Description:	36
1.24.2	Contents:	36
1.24.3	Used by:	36
1.24.4	Derived Types:	36
1.24.5	Figure:	36
1.24.6	Schema Fragment:	36
1.25	SensitivitySetDefinition	37
1.25.1	Description:	37
1.25.2	Contents:	37
1.25.3	Used by:	37
1.25.4	Derived Types:	37
1.25.5	Figure:	37
1.25.6	Schema Fragment:	37
1.26	TimeDimension	39
1.26.1	Description:	39
1.26.2	Contents:	39
1.26.3	Used by:	39
1.26.4	Derived Types:	39
1.26.5	Figure:	39
1.26.6	Schema Fragment:	39
1.27	Valuation	40
1.27.1	Description:	40
1.27.2	Contents:	40
1.27.3	Used by:	40
1.27.4	Derived Types:	40

1.27.5	Figure:	40
1.27.6	Schema Fragment:	40
1.28	ValuationReference	42
1.28.1	Description:	42
1.28.2	Contents:	42
1.28.3	Used by:	42
1.28.4	Derived Types:	42
1.28.5	Figure:	42
1.28.6	Schema Fragment:	42
1.29	ValuationScenario	43
1.29.1	Description:	43
1.29.2	Contents:	43
1.29.3	Used by:	43
1.29.4	Derived Types:	43
1.29.5	Figure:	43
1.29.6	Schema Fragment:	43
1.30	ValuationScenarioReference	45
1.30.1	Description:	45
1.30.2	Contents:	45
1.30.3	Used by:	45
1.30.4	Derived Types:	45
1.30.5	Figure:	45
1.30.6	Schema Fragment:	45
1.31	WeightedPartialDerivative	46
1.31.1	Description:	46
1.31.2	Contents:	46
1.31.3	Used by:	46
1.31.4	Derived Types:	46
1.31.5	Figure:	46
1.31.6	Schema Fragment:	46
2	Global Elements	47
2.1	market	48
2.1.1	Description:	48
2.1.2	Contents:	48
2.1.3	Used by:	48
2.1.4	Substituted by:	48
2.1.5	Figure:	48
2.1.6	Schema Fragment:	48
2.2	pricingStructure	49
2.2.1	Description:	49
2.2.2	Contents:	49
2.2.3	Used by:	49
2.2.4	Substituted by:	49
2.2.5	Figure:	49
2.2.6	Schema Fragment:	49
2.3	pricingStructureValuation	50
2.3.1	Description:	50
2.3.2	Contents:	50
2.3.3	Used by:	50
2.3.4	Substituted by:	50
2.3.5	Figure:	50
2.3.6	Schema Fragment:	50
3	Groups	51
3.1	AnalyticDerivativeParameters.model	52
3.1.1	Description:	52
3.1.2	Contents:	52
3.1.3	Used by:	52
3.1.4	Figure:	52
3.1.5	Schema Fragment:	52
3.2	ComputedDerivative.model	53
3.2.1	Description:	53
3.2.2	Contents:	53
3.2.3	Used by:	53
3.2.4	Figure:	53

3.2.5	Schema Fragment:	53
3.3	DerivativeCalculationParameters.model	54
3.3.1	Description:	54
3.3.2	Contents:	54
3.3.3	Used by:	54
3.3.4	Figure:	54
3.3.5	Schema Fragment:	54
3.4	FiniteDifferenceDerivativeParameters.model	55
3.4.1	Description:	55
3.4.2	Contents:	55
3.4.3	Used by:	55
3.4.4	Figure:	55
3.4.5	Schema Fragment:	55
3.5	PositionIdAndVersion.model	56
3.5.1	Description:	56
3.5.2	Contents:	56
3.5.3	Used by:	56
3.5.4	Figure:	56
3.5.5	Schema Fragment:	56
3.6	PricingCoordinateOrReference.model	57
3.6.1	Description:	57
3.6.2	Contents:	57
3.6.3	Used by:	57
3.6.4	Figure:	57
3.6.5	Schema Fragment:	57
3.7	PricingInputDates.model	58
3.7.1	Description:	58
3.7.2	Contents:	58
3.7.3	Used by:	58
3.7.4	Figure:	58
3.7.5	Schema Fragment:	58
3.8	PricingStructureIndex.model	60
3.8.1	Description:	60
3.8.2	Contents:	60
3.8.3	Used by:	60
3.8.4	Figure:	60
3.8.5	Schema Fragment:	60
3.9	SensitivityDescription.model	61
3.9.1	Description:	61
3.9.2	Contents:	61
3.9.3	Used by:	61
3.9.4	Figure:	61
3.9.5	Schema Fragment:	61
3.10	SubstitutionDerivativeParameters.model	62
3.10.1	Description:	62
3.10.2	Contents:	62
3.10.3	Used by:	62
3.10.4	Figure:	62
3.10.5	Schema Fragment:	62
4	Schema listing	63



## ***1 Global Complex Types***

## 1.1 AssetOrTermPointOrPricingStructureReference

### 1.1.1 Description:

Reference to an underlying asset, term point or pricing structure (yield curve).

### 1.1.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.1.3 Used by:

- Complex type: PricingParameterDerivative
- Complex type: PricingParameterShift

### 1.1.4 Derived Types:

### 1.1.5 Figure:

### 1.1.6 Schema Fragment:

```
<xsd:complexType name="AssetOrTermPointOrPricingStructureReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to an underlying asset, term point or pricing structure
      (yield curve).
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.2 BasicAssetValuation

### 1.2.1 Description:

A structure that holds a set of measures about an asset.

### 1.2.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Valuation)

- A valuation of an valuable object - an asset or a pricing input. This is an abstract type, used as a base for values of pricing structures such as yield curves as well as asset values.

**quote** (one or more occurrences; of the type BasicQuotation) One or more numerical measures relating to the asset, possibly together with sensitivities of that measure to pricing inputs

### 1.2.3 Used by:

- Complex type: QuotedAssetSet

### 1.2.4 Derived Types:

### 1.2.5 Figure:

### 1.2.6 Schema Fragment:

```
<xsd:complexType name="BasicAssetValuation">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A structure that holds a set of measures about an asset.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Valuation">
      <xsd:sequence>
        <xsd:element name="quote" type="BasicQuotation" maxOccurs="unbounded">
          <xsd:annotation>
            <xsd:documentation xml:lang="en">
              One or more numerical measures relating to the asset,
              possibly together with sensitivities of that measure to
              pricing inputs
            </xsd:documentation>
          </xsd:annotation>
        </xsd:element>
      </xsd:sequence>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.3 DenominatorTerm

### 1.3.1 Description:

The type defining a denominator term of the formula. Its value is (sum of weighted partials) ^ power.

### 1.3.2 Contents:

**weightedPartial** (exactly one occurrence; of the type WeightedPartialDerivative) A partial derivative multiplied by a weighting factor.

**power** (exactly one occurrence; of the type xsd:positiveInteger) The power to which this term is raised.

### 1.3.3 Used by:

- Complex type: DerivativeFormula

### 1.3.4 Derived Types:

### 1.3.5 Figure:

### 1.3.6 Schema Fragment:

```
<xsd:complexType name="DenominatorTerm">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The type defining a denominator term of the formula. Its value is
      (sum of weighted partials) ^ power.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="weightedPartial" type="WeightedPartialDerivative">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A partial derivative multiplied by a weighting factor.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="power" type="xsd:positiveInteger">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The power to which this term is raised.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.4 DerivativeCalculationMethod

### 1.4.1 Description:

The method by which a derivative is computed.

### 1.4.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type xsd:normalizedString)

•

### 1.4.3 Used by:

- Complex type: DerivativeCalculationProcedure

### 1.4.4 Derived Types:

### 1.4.5 Figure:

### 1.4.6 Schema Fragment:

```
<xsd:complexType name="DerivativeCalculationMethod">
  <xsd:annotation>
    <xsd:documentation source="http://www.FpML.org" xml:lang="en">
      The method by which a derivative is computed.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:normalizedString">
      <xsd:attribute name="derivativeCalculationMethodScheme" type="xsd:anyURI" default="http://www.FpML.org" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

## 1.5 DerivativeCalculationProcedure

### 1.5.1 Description:

A description of how a numerical derivative is computed.

### 1.5.2 Contents:

**method** (zero or one occurrence; of the type DerivativeCalculationMethod) The method by which a derivative is computed, e.g. analytic, numerical model, perturbation, etc.

### 1.5.3 Used by:

- Complex type: PricingParameterDerivative
- Complex type: SensitivitySetDefinition

### 1.5.4 Derived Types:

### 1.5.5 Figure:

### 1.5.6 Schema Fragment:

```
<xsd:complexType name="DerivativeCalculationProcedure">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A description of how a numerical derivative is computed.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="method" type="DerivativeCalculationMethod" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The method by which a derivative is computed, e.g. analytic,
          numerical model, perturbation, etc.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:group ref="DerivativeCalculationParameters.model" minOccurs="0"/>
  </xsd:sequence>
</xsd:complexType>
```

## 1.6 DerivativeFormula

### 1.6.1 Description:

A formula for computing a complex derivative from partial derivatives. Its value is the sum of the terms divided by the product of the denominator terms.

### 1.6.2 Contents:

**term** (exactly one occurrence; of the type FormulaTerm) A term of the formula. Its value is the product of the its coefficient and the referenced partial derivatives.

**denominatorTerm** (exactly one occurrence; of the type DenominatorTerm) A denominator term of the formula. Its value is (sum of weighted partials) ^ power.

### 1.6.3 Used by:

### 1.6.4 Derived Types:

### 1.6.5 Figure:

### 1.6.6 Schema Fragment:

```
<xsd:complexType name="DerivativeFormula">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A formula for computing a complex derivative from partial
      derivatives. Its value is the sum of the terms divided by the
      product of the denominator terms.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="term" type="FormulaTerm">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A term of the formula. Its value is the product of the its
          coefficient and the referenced partial derivatives.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="denominatorTerm" type="DenominatorTerm">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A denominator term of the formula. Its value is (sum of
          weighted partials) ^ power.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.7 FormulaTerm

### 1.7.1 Description:

A type defining a term of the formula. Its value is the product of the its coefficient and the referenced partial derivatives.

### 1.7.2 Contents:

**coefficient** (exactly one occurrence; of the type xsd:decimal) The coefficient by which this term is multiplied, typically 1 or -1.

**partialDerivativeReference** (one or more occurrences; of the type PricingParameterDerivativeReference) A reference to the partial derivative.

### 1.7.3 Used by:

- Complex type: DerivativeFormula

### 1.7.4 Derived Types:

### 1.7.5 Figure:

### 1.7.6 Schema Fragment:

```
<xsd:complexType name="FormulaTerm">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A type defining a term of the formula. Its value is the product
      of the its coefficient and the referenced partial derivatives.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="coefficient" type="xsd:decimal">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The coefficient by which this term is multiplied, typically 1
          or -1.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="partialDerivativeReference" type="PricingParameterDerivativeReference" n
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the partial derivative.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```



## 1.8 GenericDimension

### 1.8.1 Description:

A generic (user defined) dimension, e.g. for use in a correlation surface. e.g. a currency, stock, etc. This would take values like USD, GBP, JPY, or IBM, MSFT, etc.

### 1.8.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type xsd:string)

### • 1.8.3 Used by:

### 1.8.4 Derived Types:

### 1.8.5 Figure:

### 1.8.6 Schema Fragment:

```
<xsd:complexType name="GenericDimension">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A generic (user defined) dimension, e.g. for use in a correlation
      surface. e.g. a currency, stock, etc. This would take values like
      USD, GBP, JPY, or IBM, MSFT, etc.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="name" type="xsd:normalizedString" use="required">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            The name of the dimension. E.g.: "Currency", "Stock",
            "Issuer", etc.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:attribute>
      <xsd:attribute name="href" type="xsd:IDREF" ecore:reference="Asset">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            A reference to an instrument (e.g. currency) that this
            value represents.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:attribute>
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

## 1.9 InstrumentSet

### 1.9.1 Description:

A collection of instruments usable for quotation purposes. In future releases, quotable derivative assets may be added after the underlying asset.

### 1.9.2 Contents:

**underlyingAsset** (zero or more occurrences; of the type Asset) Define the underlying asset when it is a listed security.

### 1.9.3 Used by:

- Complex type: QuotedAssetSet

### 1.9.4 Derived Types:

### 1.9.5 Figure:

### 1.9.6 Schema Fragment:

```
<xsd:complexType name="InstrumentSet">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A collection of instruments usable for quotation purposes. In
      future releases, quotable derivative assets may be added after
      the underlying asset.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element ref="underlyingAsset" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of underlying assets (bonds, discount
          instruments, futures, etc.) that can be used as a basis for
          benchmark quotes.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.10 Market

### 1.10.1 Description:

A collection of pricing inputs.

### 1.10.2 Contents:

**name** (zero or one occurrence; of the type xsd:string) The name of the market, e.g. the USDLIBOR market. Used for description and understandability.

**benchmarkQuotes** (zero or one occurrence; of the type QuotedAssetSet) A collection of benchmark instruments and quotes used as inputs to the pricing models.

**pricingStructure** (zero or more occurrences; of the type PricingStructure)

**pricingStructureValuation** (zero or more occurrences; of the type PricingStructureValuation)

**benchmarkPricingMethod** (zero or more occurrences; of the type PricingMethod) The pricing structure used to quote a benchmark instrument.

### 1.10.3 Used by:

- Element: market

### 1.10.4 Derived Types:

### 1.10.5 Figure:

### 1.10.6 Schema Fragment:

```
<xsd:complexType name="Market">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A collection of pricing inputs.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the market, e.g. the USDLIBOR market. Used for
          description and understandability.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="benchmarkQuotes" type="QuotedAssetSet" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of benchmark instruments and quotes used as
          inputs to the pricing models.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="pricingStructure" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of pricing inputs (curves, volatility matrices,
          etc.) used to represent the market.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="pricingStructureValuation" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The values of the pricing structure used to represent the
          markets..
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="benchmarkPricingMethod" type="PricingMethod" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The pricing structure used to quote a benchmark instrument.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

```
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```

## 1.11 MarketReference

### 1.11.1 Description:

Reference to a market structure.

### 1.11.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.11.3 Used by:

- Complex type: DerivedValuationScenario
- Complex type: ValuationScenario

### 1.11.4 Derived Types:

### 1.11.5 Figure:

### 1.11.6 Schema Fragment:

```
<xsd:complexType name="MarketReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a market structure.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="Market"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.12 PerturbationType

### 1.12.1 Description:

The type of perturbation applied to compute a derivative perturbatively.

### 1.12.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type xsd:normalizedString)

•

### 1.12.3 Used by:

### 1.12.4 Derived Types:

### 1.12.5 Figure:

### 1.12.6 Schema Fragment:

```
<xsd:complexType name="PerturbationType">
  <xsd:annotation>
    <xsd:documentation source="http://www.FpML.org" xml:lang="en">
      The type of perturbation applied to compute a derivative
      perturbatively.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:normalizedString">
      <xsd:attribute name="perturbationTypeScheme" type="xsd:anyURI" default="http://www.fpml.org" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

## 1.13 PositionId

### 1.13.1 Description:

A unique identifier for the position. The id attribute is defined for intradocument referencing.

### 1.13.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type xsd:normalizedString)

•

### 1.13.3 Used by:

### 1.13.4 Derived Types:

### 1.13.5 Figure:

### 1.13.6 Schema Fragment:

```
<xsd:complexType name="PositionId">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A unique identifier for the position. The id attribute is defined
      for intradocument referencing.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:normalizedString">
      <xsd:attribute name="positionIdScheme" type="xsd:anyURI" />
      <xsd:attribute name="id" type="xsd:ID" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

## 1.14 PricingDataPointCoordinate

### 1.14.1 Description:

A set of index values that identify a pricing data point. For example: (strike = 17%, expiration = 6M, term = 1Y.

### 1.14.2 Contents:

Either

**term** (exactly one occurrence; of the type TimeDimension) A time dimension that represents the term of a financial instrument, e.g. of a zero-coupon bond on a curve, or of an underlying caplet or swap for an option.

Or

**expiration** (exactly one occurrence; of the type TimeDimension) A time dimension that represents the time to expiration of an option.

Or

**strike** (exactly one occurrence; of the type xsd:decimal) A numerical dimension that represents the strike rate or price of an option.

Or

**generic** (exactly one occurrence; of the type GenericDimension)

### 1.14.3 Used by:

### 1.14.4 Derived Types:

### 1.14.5 Figure:

### 1.14.6 Schema Fragment:

```
<xsd:complexType name="PricingDataPointCoordinate">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A set of index values that identify a pricing data point. For
      example: (strike = 17%, expiration = 6M, term = 1Y.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:group ref="PricingStructureIndex.model" maxOccurs="unbounded"/>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```



## 1.15 PricingDataPointCoordinateReference

### 1.15.1 Description:

Reference to a Pricing Data Point Coordinate.

### 1.15.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.15.3 Used by:

### 1.15.4 Derived Types:

### 1.15.5 Figure:

### 1.15.6 Schema Fragment:

```
<xsd:complexType name="PricingDataPointCoordinateReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a Pricing Data Point Coordinate.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="PricingDataPo
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.16 PricingInputReplacement

### 1.16.1 Description:

The substitution of a pricing input (e.g. curve) for another, used in generating prices and risks for valuation scenarios.

### 1.16.2 Contents:

**originalInputReference** (exactly one occurrence; of the type PricingStructureReference) A reference to the original value of the pricing input.

**replacementInputReference** (exactly one occurrence; of the type PricingStructureReference) A reference to the substitution to do.

### 1.16.3 Used by:

- Complex type: ValuationScenario

### 1.16.4 Derived Types:

### 1.16.5 Figure:

### 1.16.6 Schema Fragment:

```
<xsd:complexType name="PricingInputReplacement">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The substitution of a pricing input (e.g. curve) for another,
      used in generating prices and risks for valuation scenarios.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="originalInputReference" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the original value of the pricing input.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="replacementInputReference" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the substitution to do.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.17 PricingInputType

### 1.17.1 Description:

The type of pricing structure represented.

### 1.17.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type xsd:normalizedString)

- 

### 1.17.3 Used by:

- Complex type: SensitivitySetDefinition

### 1.17.4 Derived Types:

### 1.17.5 Figure:

### 1.17.6 Schema Fragment:

```
<xsd:complexType name="PricingInputType">
  <xsd:annotation>
    <xsd:documentation source="http://www.FpML.org" xml:lang="en">
      The type of pricing structure represented.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:normalizedString">
      <xsd:attribute name="pricingInputTypeScheme" type="xsd:anyURI" default="http://www.fpml.org" />
    </xsd:extension>
  </xsd:simpleContent>
</xsd:complexType>
```

## 1.18 PricingMethod

### 1.18.1 Description:

For an asset (e.g. a reference/benchmark asset), the pricing structure used to price it. Used, for example, to specify that the rateIndex "USD-LIBOR-Telerate" with term = 6M is priced using the "USD-LIBOR-Close" curve.

### 1.18.2 Contents:

**assetReference** (exactly one occurrence; of the type AnyAssetReference) The asset whose price is required.

**pricingInputReference** (exactly one occurrence; of the type PricingStructureReference) A reference to the pricing input used to value the asset.

### 1.18.3 Used by:

- Complex type: Market

### 1.18.4 Derived Types:

### 1.18.5 Figure:

### 1.18.6 Schema Fragment:

```
<xsd:complexType name="PricingMethod">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      For an asset (e.g. a reference/benchmark asset), the pricing
      structure used to price it. Used, for example, to specify that
      the rateIndex "USD-LIBOR-Telerate" with term = 6M is priced using
      the "USD-LIBOR-Close" curve.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="assetReference" type="AnyAssetReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The asset whose price is required.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="pricingInputReference" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the pricing input used to value the asset.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.19 PricingParameterDerivative

### 1.19.1 Description:

A definition of the mathematical derivative with respect to a specific pricing parameter.

### 1.19.2 Contents:

**description** (zero or one occurrence; of the type xsd:string) A description, if needed, of how the derivative is computed.

Either

**parameterReference** (zero or one occurrence; of the type AssetOrTermPointOrPricingStructureReference) A reference to the pricing input parameter to which the sensitivity is computed. If it is omitted, the derivative definition is generic, and applies to any input point in the valuation set.

Or

**inputDateReference** (one or more occurrences; of the type ValuationReference) Reference(s) to the pricing input dates that are shifted when the sensitivity is computed. Depending on the time advance method used, this list could vary. Used for describing time-advance derivatives (theta, carry, etc.)

**calculationProcedure** (zero or one occurrence; of the type DerivativeCalculationProcedure) The method by which a derivative is computed, e.g. analytic, numerical model, perturbation, etc., and the corresponding parameters

### 1.19.3 Used by:

### 1.19.4 Derived Types:

### 1.19.5 Figure:

### 1.19.6 Schema Fragment:

```
<xsd:complexType name="PricingParameterDerivative">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A definition of the mathematical derivative with respect to a
      specific pricing parameter.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A description, if needed, of how the derivative is computed.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:choice>
      <xsd:element name="parameterReference" type="AssetOrTermPointOrPricingStructureReference">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            A reference to the pricing input parameter to which the
            sensitivity is computed. If it is omitted, the derivative
            definition is generic, and applies to any input point in
            the valuation set.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="inputDateReference" type="ValuationReference" maxOccurs="unbounded">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            Reference(s) to the pricing input dates that are shifted
            when the sensitivity is computed. Depending on the time
            advance method used, this list could vary. Used for
            describing time-advance derivatives (theta, carry, etc.)
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:choice>
    <xsd:element name="calculationProcedure" type="DerivativeCalculationProcedure" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
```

```
        The method by which a derivative is computed, e.g. analytic,  
        numerical model, perturbation, etc., and the corresponding  
        parameters  
    </xsd:documentation>  
</xsd:annotation>  
</xsd:element>  
</xsd:sequence>  
<xsd:attribute name="id" type="xsd:ID"/>  
</xsd:complexType>
```

## 1.20 PricingParameterDerivativeReference

### 1.20.1 Description:

Reference to a partial derivative.

### 1.20.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.20.3 Used by:

- Complex type: FormulaTerm

### 1.20.4 Derived Types:

### 1.20.5 Figure:

### 1.20.6 Schema Fragment:

```
<xsd:complexType name="PricingParameterDerivativeReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a partial derivative.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="PricingParam
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.21 PricingParameterShift

### 1.21.1 Description:

A definition of a shift with respect to a specific pricing parameter.

### 1.21.2 Contents:

**parameterReference** (exactly one occurrence; of the type AssetOrTermPointOrPricingStructureReference)

**shift** (exactly one occurrence; of the type xsd:decimal) The size of the denominator, e.g. 0.0001 = 1 bp.

**shiftUnits** (zero or one occurrence; of the type PriceQuoteUnits) The units of the denominator, e.g. currency. If not present, use the units of the PricingInputReference.

### 1.21.3 Used by:

- Complex type: DerivedValuationScenario
- Complex type: ValuationScenario

### 1.21.4 Derived Types:

### 1.21.5 Figure:

### 1.21.6 Schema Fragment:

```
<xsd:complexType name="PricingParameterShift">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A definition of a shift with respect to a specific pricing
      parameter.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="parameterReference" type="AssetOrTermPointOrPricingStructureReference"/>
    <xsd:element name="shift" type="xsd:decimal">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The size of the denominator, e.g. 0.0001 = 1 bp.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="shiftUnits" type="PriceQuoteUnits" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The units of the denominator, e.g. currency. If not present,
          use the units of the PricingInputReference.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```



## 1.22 PricingStructureValuation

### 1.22.1 Description:

An abstract pricing structure valuation base type. Used as a base for values of pricing structures such as yield curves and volatility matrices. Derived from the "Valuation" type.

### 1.22.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Valuation)

- A valuation of an valuable object - an asset or a pricing input. This is an abstract type, used as a base for values of pricing structures such as yield curves as well as asset values.

**baseDate** (exactly one occurrence; of the type IdentifiedDate) The base date for which the structure applies, i.e. the curve date. Normally this will align with the valuation date.

**spotDate** (zero or one occurrence; of the type IdentifiedDate) The spot settlement date for which the structure applies, normally 0-2 days after the base date. The difference between the baseDate and the spotDate is termed the settlement lag, and is sometimes called "days to spot".

**inputDataDate** (zero or one occurrence; of the type IdentifiedDate) The date from which the input data used to construct the pricing input was obtained. Often the same as the baseDate, but sometimes the pricing input may be "rolled forward", in which input data from one date is used to generate a curve for a later date.

**endDate** (zero or one occurrence; of the type IdentifiedDate) The last date for which data is supplied in this pricing input.

**buildDateTime** (zero or one occurrence; of the type xsd:dateTime) The date and time when the pricing input was generated.

### 1.22.3 Used by:

- Element: pricingStructureValuation
- Complex type: CreditCurveValuation
- Complex type: DefaultProbabilityCurve
- Complex type: FxCurveValuation
- Complex type: VolatilityMatrix
- Complex type: YieldCurveValuation

### 1.22.4 Derived Types:

- Complex type: CreditCurveValuation
- Complex type: DefaultProbabilityCurve
- Complex type: FxCurveValuation
- Complex type: VolatilityMatrix
- Complex type: YieldCurveValuation

### 1.22.5 Figure:

### 1.22.6 Schema Fragment:

```
<xsd:complexType name="PricingStructureValuation">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      An abstract pricing structure valuation base type. Used as a base
      for values of pricing structures such as yield curves and
      volatility matrices. Derived from the "Valuation" type.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Valuation">
      <xsd:sequence>
        <xsd:group ref="PricingInputDates.model">
          <xsd:annotation>
            <xsd:documentation xml:lang="en">
              The relevant dates for a pricing structure - what is
```

```
        applies to, when it was built, etc.
    </xsd:documentation>
</xsd:annotation>
</xsd:group>
</xsd:sequence>
</xsd:extension>
</xsd:complexContent>
</xsd:complexType>
```

## 1.23 QuotedAssetSet

### 1.23.1 Description:

A collection of quoted assets.

### 1.23.2 Contents:

**instrumentSet** (zero or one occurrence; of the type InstrumentSet) A collection of instruments used as a basis for quotation.

**assetQuote** (zero or more occurrences; of the type BasicAssetValuation) A collection of valuations (quotes) for the assets needed in the set. Normally these quotes will be for the underlying assets listed above, but they don't necessarily have to be.

### 1.23.3 Used by:

- Complex type: FxRateSet
- Complex type: CreditCurveValuation
- Complex type: Market
- Complex type: YieldCurveValuation

### 1.23.4 Derived Types:

- Complex type: FxRateSet

### 1.23.5 Figure:

### 1.23.6 Schema Fragment:

```
<xsd:complexType name="QuotedAssetSet">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A collection of quoted assets.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="instrumentSet" type="InstrumentSet" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of instruments used as a basis for quotation.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="assetQuote" type="BasicAssetValuation" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of valuations (quotes) for the assets needed in
          the set. Normally these quotes will be for the underlying
          assets listed above, but they don't necessarily have to be.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## 1.24 SensitivityDefinition

### 1.24.1 Description:

A set of characteristics describing a sensitivity

### 1.24.2 Contents:

**name** (zero or one occurrence; of the type xsd:string) The name of the derivative, e.g. first derivative, Hessian, etc. Typically not required, but may be used to explain more complex derivative calculations.

**valuationScenarioReference** (zero or one occurrence; of the type ValuationScenarioReference) Reference to the valuation scenario to which this sensitivity definition applies. If the SensitivityDefinition occurs within a SensitivitySetDefinition, this is not required and normally not used. In this case, if it is supplied it overrides the valuationScenarioReference in the SensitivitySetDefinition.

### 1.24.3 Used by:

- Complex type: SensitivitySetDefinition

### 1.24.4 Derived Types:

### 1.24.5 Figure:

### 1.24.6 Schema Fragment:

```
<xsd:complexType name="SensitivityDefinition">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A set of characteristics describing a sensitivity
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the derivative, e.g. first derivative, Hessian,
          etc. Typically not required, but may be used to explain more
          complex derivative calculations.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          Reference to the valuation scenario to which this sensitivity
          definition applies. If the SensitivityDefinition occurs
          within a SensitivitySetDefinition, this is not required and
          normally not used. In this case, if it is supplied it
          overrides the valuationScenarioReference in the
          SensitivitySetDefinition.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:choice>
      <xsd:group ref="ComputedDerivative.model"/>
      <xsd:group ref="SensitivityDescription.model"/>
    </xsd:choice>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
```

## 1.25 SensitivitySetDefinition

### 1.25.1 Description:

A sensitivity report definition, consisting of a collection of sensitivity definitions.

### 1.25.2 Contents:

**name** (zero or one occurrence; of the type xsd:string) The name of the sensitivity set definition, e.g. "USDLIBOR curve sensitivities".

**sensitivityCharacteristics** (zero or one occurrence; of the type QuotationCharacteristics) The default characteristics of the quotation, e.g. type, units, etc.

**valuationScenarioReference** (zero or one occurrence; of the type ValuationScenarioReference) Reference to the valuation scenario to which this sensitivity definition applies, e.g. a reference to the EOD valuation scenario. If not supplied, this sensitivity set definition is generic to a variety of valuation scenarios.

**pricingInputType** (zero or one occurrence; of the type PricingInputType) The type of the pricing input to which the sensitivity is shown, e.g. a yield curve or volatility matrix.

**pricingInputReference** (zero or one occurrence; of the type PricingStructureReference) A reference to the pricing input to which the sensitivity is shown, e.g. a reference to a USDLIBOR yield curve.

**scale** (exactly one occurrence; of the type xsd:decimal) The size of the denominator, e.g. 0.0001 = 1 bp. For derivatives with respect to time, the default period is 1 day.

**sensitivityDefinition** (zero or more occurrences; of the type SensitivityDefinition) A set of sensitivity definitions. Either one per point reported, or one generic definition that applies to all points.

**calculationProcedure** (zero or one occurrence; of the type DerivativeCalculationProcedure) The method by which each derivative is computed, e.g. analytic, numerical model, perturbation, etc., and the corresponding parameters (eg. shift amounts).

### 1.25.3 Used by:

- Complex type: ValuationSet

### 1.25.4 Derived Types:

### 1.25.5 Figure:

### 1.25.6 Schema Fragment:

```
<xsd:complexType name="SensitivitySetDefinition">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A sensitivity report definition, consisting of a collection of
      sensitivity definitions.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the sensitivity set definition, e.g. "USDLIBOR
          curve sensitivities".
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="sensitivityCharacteristics" type="QuotationCharacteristics" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The default characteristics of the quotation, e.g. type,
          units, etc.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          Reference to the valuation scenario to which this sensitivity
          definition applies, e.g. a reference to the EOD valuation
          scenario. If not supplied, this sensitivity set definition is
```

```

        generic to a variety of valuation scenarios.
    </xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="pricingInputType" type="PricingInputType" minOccurs="0">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The type of the pricing input to which the sensitivity is
            shown, e.g. a yield curve or volatility matrix.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="pricingInputReference" type="PricingStructureReference" minOccurs="0">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A reference to the pricing input to which the sensitivity is
            shown, e.g. a reference to a USDLIBOR yield curve.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="scale" type="xsd:decimal">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The size of the denominator, e.g. 0.0001 = 1 bp. For
            derivatives with respect to time, the default period is 1
            day.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="sensitivityDefinition" type="SensitivityDefinition" minOccurs="0" maxOccurs="unbounded">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A set of sensitivity definitions. Either one per point
            reported, or one generic definition that applies to all
            points.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="calculationProcedure" type="DerivativeCalculationProcedure" minOccurs="0" maxOccurs="unbounded">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The method by which each derivative is computed, e.g.
            analytic, numerical model, perturbation, etc., and the
            corresponding parameters (eg. shift amounts).
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>

```

## 1.26 TimeDimension

### 1.26.1 Description:

The time dimensions of a term-structure. The user must supply either a tenor or a date or both.

### 1.26.2 Contents:

Either

**tenor** (exactly one occurrence; of the type Interval) The amount of time from the base date of the pricing input to the specified term point, e.g. 6M or 5Y.

### 1.26.3 Used by:

- Complex type: TermPoint

### 1.26.4 Derived Types:

### 1.26.5 Figure:

### 1.26.6 Schema Fragment:

```
<xsd:complexType name="TimeDimension">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The time dimensions of a term-structure. The user must supply
      either a tenor or a date or both.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:element name="tenor" type="Interval">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The amount of time from the base date of the pricing input to
          the specified term point, e.g. 6M or 5Y.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:sequence>
      <xsd:element name="date" type="xsd:date">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            The absolute date corresponding to this term point, for
            example January 3, 2005.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="tenor" type="Interval" minOccurs="0">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            The amount of time from the base date of the pricing input
            to the specified term point, e.g. 6M or 5Y.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
  </xsd:choice>
</xsd:complexType>
```

## 1.27 Valuation

### 1.27.1 Description:

A valuation of an valuable object - an asset or a pricing input. This is an abstract type, used as a base for values of pricing structures such as yield curves as well as asset values.

### 1.27.2 Contents:

**objectReference** (zero or one occurrence; of the type AnyAssetReference) A reference to the asset or pricing structure that this values.

**valuationScenarioReference** (zero or one occurrence; of the type ValuationScenarioReference) A reference to the valuation scenario used to calculate this valuation. If the Valuation occurs within a ValuationSet, this value is optional and is defaulted from the ValuationSet. If this value occurs in both places, the lower level value (i.e. the one here) overrides that in the higher (i.e. ValuationSet).

### 1.27.3 Used by:

- Complex type: AssetValuation
- Complex type: BasicAssetValuation
- Complex type: PricingStructureValuation

### 1.27.4 Derived Types:

- Complex type: AssetValuation
- Complex type: BasicAssetValuation
- Complex type: PricingStructureValuation

### 1.27.5 Figure:

### 1.27.6 Schema Fragment:

```
<xsd:complexType name="Valuation">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A valuation of an valuable object - an asset or a pricing input.
      This is an abstract type, used as a base for values of pricing
      structures such as yield curves as well as asset values.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="objectReference" type="AnyAssetReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the asset or pricing structure that this
          values.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the valuation scenario used to calculate this
          valuation. If the Valuation occurs within a ValuationSet,
          this value is optional and is defaulted from the
          ValuationSet. If this value occurs in both places, the lower
          level value (i.e. the one here) overrides that in the higher
          (i.e. ValuationSet).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
  <xsd:attribute name="definitionRef" type="xsd:IDREF" ecore:reference="ValuationScenario">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        An optional reference to the scenario that this valuation
        applies to.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:attribute>
</xsd:complexType>
```





## 1.28 ValuationReference

### 1.28.1 Description:

Reference to a Valuation or any derived structure such as PricingStructureValuation.

### 1.28.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.28.3 Used by:

- Complex type: PricingParameterDerivative

### 1.28.4 Derived Types:

### 1.28.5 Figure:

### 1.28.6 Schema Fragment:

```
<xsd:complexType name="ValuationReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a Valuation or any derived structure such as
      PricingStructureValuation.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="Valuation"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.29 ValuationScenario

### 1.29.1 Description:

A set of rules for generating a valuation.

### 1.29.2 Contents:

**name** (zero or one occurrence; of the type xsd:string) The (optional) name for this valuation scenario, used for understandability. For example "EOD Valuations".

**valuationDate** (exactly one occurrence; of the type IdentifiedDate) The date for which the assets are valued.

**marketReference** (zero or one occurrence; of the type MarketReference) A reference to the market environment used to price the asset.

**shift** (zero or more occurrences; of the type PricingParameterShift) A collection of shifts to be applied to market inputs prior to computation of the derivative.

**replacement** (zero or more occurrences; of the type PricingInputReplacement) A collection of shifts to be applied to market inputs prior to computation of the derivative.

### 1.29.3 Used by:

- Complex type: ValuationSet

### 1.29.4 Derived Types:

### 1.29.5 Figure:

### 1.29.6 Schema Fragment:

```
<xsd:complexType name="ValuationScenario">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A set of rules for generating a valuation.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The (optional) name for this valuation scenario, used for
          understandability. For example "EOD Valuations".
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationDate" type="IdentifiedDate">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The date for which the assets are valued.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="marketReference" type="MarketReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the market environment used to price the
          asset.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="shift" type="PricingParameterShift" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of shifts to be applied to market inputs prior
          to computation of the derivative.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="replacement" type="PricingInputReplacement" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of shifts to be applied to market inputs prior
          to computation of the derivative.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

```
        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:ID"/>
  </xsd:complexType>
```

## 1.30 ValuationScenarioReference

### 1.30.1 Description:

Reference to a valuation scenario.

### 1.30.2 Contents:

Inherited element(s): (This definition inherits the content defined by the type Reference)

- The abstract base class for all types which define intra-document pointers.

### 1.30.3 Used by:

- Complex type: DerivedValuationScenario
- Complex type: SensitivityDefinition
- Complex type: SensitivitySetDefinition
- Complex type: Valuation
- Complex type: ValuationSet

### 1.30.4 Derived Types:

### 1.30.5 Figure:

### 1.30.6 Schema Fragment:

```
<xsd:complexType name="ValuationScenarioReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a valuation scenario.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="ValuationScen
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
```

## 1.31 WeightedPartialDerivative

### 1.31.1 Description:

A partial derivative multiplied by a weighting factor.

### 1.31.2 Contents:

**partialDerivativeReference** (exactly one occurrence; of the type PricingStructureReference) A reference to a partial derivative defined in the ComputedDerivative.model, i.e. defined as part of this sensitivity definition.

**weight** (exactly one occurrence; of the type xsd:decimal) The weight factor to be applied to the partial derivative, e.g. 1 or -1, or some other scaling value.

### 1.31.3 Used by:

- Complex type: DenominatorTerm

### 1.31.4 Derived Types:

### 1.31.5 Figure:

### 1.31.6 Schema Fragment:

```
<xsd:complexType name="WeightedPartialDerivative">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A partial derivative multiplied by a weighting factor.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="partialDerivativeReference" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to a partial derivative defined in the
          ComputedDerivative.model, i.e. defined as part of this
          sensitivity definition.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="weight" type="xsd:decimal">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The weight factor to be applied to the partial derivative,
          e.g. 1 or -1, or some other scaling value.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
```

## ***2 Global Elements***

## 2.1 market

### 2.1.1 Description:

This is a global element used for creating global types. It holds Market information, e.g. curves, surfaces, quotes, etc.

### 2.1.2 Contents:

Element market is defined by the complex type Market

### 2.1.3 Used by:

- Complex type: RequestValuationReport
- Complex type: ValuationDocument
- Complex type: ValuationReport

### 2.1.4 Substituted by:

### 2.1.5 Figure:

### 2.1.6 Schema Fragment:

```
<xsd:element name="market" type="Market">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      This is a global element used for creating global types. It holds
      Market information, e.g. curves, surfaces, quotes, etc.
    </xsd:documentation>
  </xsd:annotation>
</xsd:element>
```



## **2.2 pricingStructure**

### **2.2.1 Description:**

### **2.2.2 Contents:**

Element pricingStructure is defined by the complex type PricingStructure

### **2.2.3 Used by:**

- Complex type: Market

### **2.2.4 Substituted by:**

- Element: creditCurve
- Element: fxCurve
- Element: volatilityRepresentation
- Element: yieldCurve

### **2.2.5 Figure:**

### **2.2.6 Schema Fragment:**

```
<xsd:element name="pricingStructure" type="PricingStructure" abstract="true"/>
```

## 2.3 pricingStructureValuation

### 2.3.1 Description:

### 2.3.2 Contents:

Element pricingStructureValuation is defined by the complex type PricingStructureValuation

### 2.3.3 Used by:

- Complex type: Market

### 2.3.4 Substituted by:

- Element: creditCurveValuation
- Element: fxCurveValuation
- Element: volatilityMatrixValuation
- Element: yieldCurveValuation

### 2.3.5 Figure:

### 2.3.6 Schema Fragment:

```
<xsd:element name="pricingStructureValuation" type="PricingStructureValuation" abstract="true"/>
```

**3 Groups**

## 3.1 AnalyticDerivativeParameters.model

### 3.1.1 Description:

Parameters used in the computation of a derivative using analytical (closed form formula) techniques.

### 3.1.2 Contents:

**derivativeFormula** (zero or one occurrence; of the type xsd:string) The formula used to compute the derivative (perhaps could be updated to use the Formula type in EQS.).

### 3.1.3 Used by:

### 3.1.4 Figure:

### 3.1.5 Schema Fragment:

```
<xsd:group name="AnalyticDerivativeParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative using
      analytical (closed form formula) techniques.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="derivativeFormula" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The formula used to compute the derivative (perhaps could be
          updated to use the Formula type in EQS.).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
```

## 3.2 ComputedDerivative.model

### 3.2.1 Description:

A group describing a derivative as combination of partial derivatives.

### 3.2.2 Contents:

**partialDerivative** (one or more occurrences; of the type PricingParameterDerivative) A partial derivative of the measure with respect to an input.

**formula** (zero or one occurrence; of the type DerivativeFormula) A formula defining how to compute the derivative from the partial derivatives. If absent, the derivative is just the product of the partial derivatives. Normally only required for more higher-order derivatives, e.g. Hessians.

### 3.2.3 Used by:

- Complex type: SensitivityDefinition

### 3.2.4 Figure:

### 3.2.5 Schema Fragment:

```
<xsd:group name="ComputedDerivative.model">
  <xsd:annotation>
    <xsd:documentation source="http://www.FpML.org" xml:lang="en">
      A group describing a derivative as combination of partial
      derivatives.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="partialDerivative" type="PricingParameterDerivative" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A partial derivative of the measure with respect to an input.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="formula" type="DerivativeFormula" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A formula defining how to compute the derivative from the
          partial derivatives. If absent, the derivative is just the
          product of the partial derivatives. Normally only required
          for more higher-order derivatives, e.g. Hessians.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
```

## 3.3 DerivativeCalculationParameters.model

### 3.3.1 Description:

Parameters used in the computation of a derivative.

### 3.3.2 Contents:

### 3.3.3 Used by:

- Complex type: DerivativeCalculationProcedure

### 3.3.4 Figure:

### 3.3.5 Schema Fragment:

```
<xsd:group name="DerivativeCalculationParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:group ref="FiniteDifferenceDerivativeParameters.model"/>
    <xsd:group ref="AnalyticDerivativeParameters.model"/>
    <xsd:group ref="SubstitutionDerivativeParameters.model"/>
  </xsd:choice>
</xsd:group>
```

## 3.4 FiniteDifferenceDerivativeParameters.model

### 3.4.1 Description:

Parameters used in the computation of a derivative using numerical (finite difference) techniques.

### 3.4.2 Contents:

**perturbationAmount** (zero or one occurrence; of the type xsd:decimal) The size and direction of the perturbation used to compute the derivative, e.g. 0.0001 = 1 bp.

**averaged** (exactly one occurrence; of the type xsd:boolean) The value is calculated by perturbing by the perturbationAmount and then the negative of the perturbationAmount and then averaging the two values (i.e. the value is half of the difference between perturbing up and perturbing down).

**perturbationType** (zero or one occurrence; of the type PerturbationType) The type of perturbation, if any, used to compute the derivative (Absolute vs Relative).

### 3.4.3 Used by:

### 3.4.4 Figure:

### 3.4.5 Schema Fragment:

```
<xsd:group name="FiniteDifferenceDerivativeParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative using
      numerical (finite difference) techniques.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="perturbationAmount" type="xsd:decimal" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The size and direction of the perturbation used to compute
          the derivative, e.g. 0.0001 = 1 bp.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="averaged" type="xsd:boolean">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The value is calculated by perturbing by the
          perturbationAmount and then the negative of the
          perturbationAmount and then averaging the two values (i.e.
          the value is half of the difference between perturbing up and
          perturbing down).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="perturbationType" type="PerturbationType" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The type of perturbation, if any, used to compute the
          derivative (Absolute vs Relative).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
```

## 3.5 PositionIdAndVersion.model

### 3.5.1 Description:

A model group that includes a position ID and an optional version.

### 3.5.2 Contents:

**positionId** (exactly one occurrence; of the type PositionId) A version-independent identifier for the position, possibly based on trade identifier.

**version** (zero or one occurrence; of the type xsd:positiveInteger) A version identifier. Version identifiers must be ascending, i.e. higher numbers imply newer versions. There is no requirement that version identifiers for a position be sequential or small, so for example timestamp-based version identifiers could be used.

### 3.5.3 Used by:

- Complex type: AssertedPosition
- Complex type: Position
- Complex type: PositionProposedMatch
- Complex type: PositionReference
- Complex type: RequestedPositions
- Complex type: UnprocessedPosition

### 3.5.4 Figure:

### 3.5.5 Schema Fragment:

```
<xsd:group name="PositionIdAndVersion.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A model group that includes a position ID and an optional
      version.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="positionId" type="PositionId">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A version-independent identifier for the position, possibly
          based on trade identifier.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="version" type="xsd:positiveInteger" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A version identifier. Version identifiers must be ascending,
          i.e. higher numbers imply newer versions. There is no
          requirement that version identifiers for a position be
          sequential or small, so for example timestamp-based version
          identifiers could be used.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
```



## 3.6 PricingCoordinateOrReference.model

### 3.6.1 Description:

A pricing structure coordinate, or a reference to one. This can be used to either directly define a coordinate or reference an existing coordinate.

### 3.6.2 Contents:

Either

**coordinate** (exactly one occurrence; of the type PricingDataPointCoordinate) An explicit, filled in data point coordinate. This might specify expiration, strike, etc.

Or

**coordinateReference** (exactly one occurrence; of the type PricingDataPointCoordinateReference) A reference to a pricing data point coordinate within this document.

### 3.6.3 Used by:

- Complex type: PricingStructurePoint

### 3.6.4 Figure:

### 3.6.5 Schema Fragment:

```
<xsd:group name="PricingCoordinateOrReference.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A pricing structure coordinate, or a reference to one. This can
      be used to either directly define a coordinate or reference an
      existing coordinate.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:element name="coordinate" type="PricingDataPointCoordinate">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          An explicit, filled in data point coordinate. This might
          specify expiration, strike, etc.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="coordinateReference" type="PricingDataPointCoordinateReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to a pricing data point coordinate within this
          document.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:choice>
</xsd:group>
```

## 3.7 PricingInputDates.model

### 3.7.1 Description:

The dates that might be relevant for a pricing input, e.g. what valuation date it applies to, when it was built, when the data comes from, etc..

### 3.7.2 Contents:

**baseDate** (exactly one occurrence; of the type IdentifiedDate) The base date for which the structure applies, i.e. the curve date. Normally this will align with the valuation date.

**spotDate** (zero or one occurrence; of the type IdentifiedDate) The spot settlement date for which the structure applies, normally 0-2 days after the base date. The difference between the baseDate and the spotDate is termed the settlement lag, and is sometimes called "days to spot".

**inputDataDate** (zero or one occurrence; of the type IdentifiedDate) The date from which the input data used to construct the pricing input was obtained. Often the same as the baseDate, but sometimes the pricing input may be "rolled forward", in which input data from one date is used to generate a curve for a later date.

**endDate** (zero or one occurrence; of the type IdentifiedDate) The last date for which data is supplied in this pricing input.

**buildDateTime** (zero or one occurrence; of the type xsd:dateTime) The date and time when the pricing input was generated.

### 3.7.3 Used by:

- Complex type: PricingStructureValuation

### 3.7.4 Figure:

### 3.7.5 Schema Fragment:

```
<xsd:group name="PricingInputDates.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The dates that might be relevant for a pricing input, e.g. what
      valuation date it applies to, when it was built, when the data
      comes from, etc..
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="baseDate" type="IdentifiedDate">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The base date for which the structure applies, i.e. the curve
          date. Normally this will align with the valuation date.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="spotDate" type="IdentifiedDate" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The spot settlement date for which the structure applies,
          normally 0-2 days after the base date. The difference between
          the baseDate and the spotDate is termed the settlement lag,
          and is sometimes called "days to spot".
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="inputDataDate" type="IdentifiedDate" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The date from which the input data used to construct the
          pricing input was obtained. Often the same as the baseDate,
          but sometimes the pricing input may be "rolled forward", in
          which input data from one date is used to generate a curve
          for a later date.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="endDate" type="IdentifiedDate" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The last date for which data is supplied in this pricing
```

```
        input.  
        </xsd:documentation>  
    </xsd:annotation>  
</xsd:element>  
<xsd:element name="buildDateTime" type="xsd:dateTime" minOccurs="0">  
    <xsd:annotation>  
        <xsd:documentation xml:lang="en">  
            The date and time when the pricing input was generated.  
        </xsd:documentation>  
    </xsd:annotation>  
</xsd:element>  
</xsd:sequence>  
</xsd:group>
```

## 3.8 PricingStructureIndex.model

### 3.8.1 Description:

The index (an ordinate) of a pricing structure. The index expresses how far along a particular dimension (e.g. time, strike, etc.) a point is located.

### 3.8.2 Contents:

Either

**term** (exactly one occurrence; of the type TimeDimension) A time dimension that represents the term of a financial instrument, e.g. of a zero-coupon bond on a curve, or of an underlying caplet or swap for an option.

Or

**expiration** (exactly one occurrence; of the type TimeDimension) A time dimension that represents the time to expiration of an option.

Or

**strike** (exactly one occurrence; of the type xsd:decimal) A numerical dimension that represents the strike rate or price of an option.

Or

**generic** (exactly one occurrence; of the type GenericDimension)

### 3.8.3 Used by:

- Complex type: PricingDataPointCoordinate

### 3.8.4 Figure:

### 3.8.5 Schema Fragment:

```
<xsd:group name="PricingStructureIndex.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The index (an ordinate) of a pricing structure. The index
      expresses how far along a particular dimension (e.g. time,
      strike, etc.) a point is located.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:element name="term" type="TimeDimension">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A time dimension that represents the term of a financial
          instrument, e.g. of a zero-coupon bond on a curve, or of an
          underlying caplet or swap for an option.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="expiration" type="TimeDimension">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A time dimension that represents the time to expiration of an
          option.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="strike" type="xsd:decimal">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A numerical dimension that represents the strike rate or
          price of an option.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="generic" type="GenericDimension"/>
  </xsd:choice>
</xsd:group>
```

## 3.9 SensitivityDescription.model

### 3.9.1 Description:

A group describing a specific sensitivity without an explicit reference to the market data input point.

### 3.9.2 Contents:

Either

**term** (exactly one occurrence; of the type TimeDimension) The time dimension of the sensitivity point (tenor and/or date)

### 3.9.3 Used by:

- Complex type: SensitivityDefinition

### 3.9.4 Figure:

### 3.9.5 Schema Fragment:

```
<xsd:group name="SensitivityDescription.model">
  <xsd:annotation>
    <xsd:documentation source="http://www.FpML.org" xml:lang="en">
      A group describing a specific sensitivity without an explicit
      reference to the market data input point.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:element name="term" type="TimeDimension">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The time dimension of the sensitivity point (tenor and/or
          date)
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:group ref="PricingCoordinateOrReference.model" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The input coordinates, or references to them (e.g.
          expiration, strike, tenor).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:group>
  </xsd:choice>
</xsd:group>
```

## 3.10 SubstitutionDerivativeParameters.model

### 3.10.1 Description:

Parameters used in the computation of a derivative by substituting a supplied market environment.

### 3.10.2 Contents:

**replacementMarketInput** (exactly one occurrence; of the type PricingStructureReference) A reference to the replacement version of the market input, e.g. a bumped yield curve.

### 3.10.3 Used by:

### 3.10.4 Figure:

### 3.10.5 Schema Fragment:

```
<xsd:group name="SubstitutionDerivativeParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative by
      substituting a supplied market environment.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="replacementMarketInput" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the replacement version of the market input,
          e.g. a bumped yield curve.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
```

## 4 Schema listing

```
<xsd:schema ecore:nsPrefix="fpml" ecore:package="org.fpml" ecore:documentRoot="FpML" targetNameSpace="http://www.FpML.org">
  <xsd:include schemaLocation="fpml-doc-4-4.xsd"/>
  <xsd:include schemaLocation="fpml-asset-4-4.xsd"/>
  <xsd:complexType name="AssetOrTermPointOrPricingStructureReference">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        Reference to an underlying asset, term point or pricing
        structure (yield curve).
      </xsd:documentation>
    </xsd:annotation>
    <xsd:complexContent>
      <xsd:extension base="Reference">
        <xsd:attribute name="href" type="xsd:IDREF" use="required"/>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="BasicAssetValuation">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A structure that holds a set of measures about an asset.
      </xsd:documentation>
    </xsd:annotation>
    <xsd:complexContent>
      <xsd:extension base="Valuation">
        <xsd:sequence>
          <xsd:element name="quote" type="BasicQuotation" maxOccurs="unbounded">
            <xsd:annotation>
              <xsd:documentation xml:lang="en">
                One or more numerical measures relating to the asset,
                possibly together with sensitivities of that measure to
                pricing inputs
              </xsd:documentation>
            </xsd:annotation>
          </xsd:element>
        </xsd:sequence>
      </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="DenominatorTerm">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        The type defining a denominator term of the formula. Its value
        is (sum of weighted partials) ^ power.
      </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
      <xsd:element name="weightedPartial" type="WeightedPartialDerivative">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            A partial derivative multiplied by a weighting factor.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="power" type="xsd:positiveInteger">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            The power to which this term is raised.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="DerivativeCalculationMethod">
    <xsd:annotation>
      <xsd:documentation source="http://www.FpML.org" xml:lang="en">
        The method by which a derivative is computed.
      </xsd:documentation>
    </xsd:annotation>
    <xsd:simpleContent>
      <xsd:extension base="xsd:normalizedString">
        <xsd:attribute name="derivativeCalculationMethodScheme" type="xsd:anyURI" default="http://www.FpML.org/derivativeCalculationMethodScheme"/>
      </xsd:extension>
    </xsd:simpleContent>
  </xsd:complexType>
  <xsd:complexType name="DerivativeCalculationProcedure">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A description of how a numerical derivative is computed.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:complexType>
</xsd:schema>
```

```

</xsd:annotation>
<xsd:sequence>
  <xsd:element name="method" type="DerivativeCalculationMethod" minOccurs="0">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        The method by which a derivative is computed, e.g.
        analytic, numerical model, perturbation, etc.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
  <xsd:group ref="DerivativeCalculationParameters.model" minOccurs="0"/>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="DerivativeFormula">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A formula for computing a complex derivative from partial
      derivatives. Its value is the sum of the terms divided by the
      product of the denominator terms.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="term" type="FormulaTerm">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A term of the formula. Its value is the product of the its
          coefficient and the referenced partial derivatives.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="denominatorTerm" type="DenominatorTerm">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A denominator term of the formula. Its value is (sum of
          weighted partials) ^ power.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="FormulaTerm">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A type defining a term of the formula. Its value is the product
      of the its coefficient and the referenced partial derivatives.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="coefficient" type="xsd:decimal">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The coefficient by which this term is multiplied, typically
          1 or -1.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="partialDerivativeReference" type="PricingParameterDerivativeReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the partial derivative.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="GenericDimension">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A generic (user defined) dimension, e.g. for use in a
      correlation surface. e.g. a currency, stock, etc. This would
      take values like USD, GBP, JPY, or IBM, MSFT, etc.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:string">
      <xsd:attribute name="name" type="xsd:normalizedString" use="required">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            The name of the dimension. E.g.: "Currency", "Stock",
            "Issuer", etc.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:attribute>
    </xsd:extension>
  </xsd:simpleContent>

```



```

    <xsd:attribute name="href" type="xsd:IDREF" ecore:reference="Asset">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to an instrument (e.g. currency) that this
          value represents.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:attribute>
  </xsd:extension>
</xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="InstrumentSet">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A collection of instruments usable for quotation purposes. In
      future releases, quotable derivative assets may be added after
      the underlying asset.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element ref="underlyingAsset" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of underlying assets (bonds, discount
          instruments, futures, etc.) that can be used as a basis for
          benchmark quotes.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="Market">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A collection of pricing inputs.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the market, e.g. the USDLIBOR market. Used for
          description and understandability.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="benchmarkQuotes" type="QuotedAssetSet" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of benchmark instruments and quotes used as
          inputs to the pricing models.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="pricingStructure" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A collection of pricing inputs (curves, volatility
          matrices, etc.) used to represent the market.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="pricingStructureValuation" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The values of the pricing structure used to represent the
          markets..
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="benchmarkPricingMethod" type="PricingMethod" minOccurs="0" maxOccurs="unbounded">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The pricing structure used to quote a benchmark instrument.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="MarketReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">

```

```

        Reference to a market structure.
    </xsd:documentation>
</xsd:annotation>
<xsd:complexContent>
    <xsd:extension base="Reference">
        <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="Market"/>
    </xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PerturbationType">
    <xsd:annotation>
        <xsd:documentation source="http://www.FpML.org" xml:lang="en">
            The type of perturbation applied to compute a derivative
            perturbatively.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:simpleContent>
        <xsd:extension base="xsd:normalizedString">
            <xsd:attribute name="perturbationTypeScheme" type="xsd:anyURI" default="http://www.fpm1
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="PositionId">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A unique identifier for the position. The id attribute is
            defined for intradocument referencing.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:simpleContent>
        <xsd:extension base="xsd:normalizedString">
            <xsd:attribute name="positionIdScheme" type="xsd:anyURI"/>
            <xsd:attribute name="id" type="xsd:ID"/>
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="PricingInputReplacement">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The substitution of a pricing input (e.g. curve) for another,
            used in generating prices and risks for valuation scenarios.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="originalInputReference" type="PricingStructureReference">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A reference to the original value of the pricing input.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="replacementInputReference" type="PricingStructureReference">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A reference to the substitution to do.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="PricingInputType">
    <xsd:annotation>
        <xsd:documentation source="http://www.FpML.org" xml:lang="en">
            The type of pricing structure represented.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:simpleContent>
        <xsd:extension base="xsd:normalizedString">
            <xsd:attribute name="pricingInputTypeScheme" type="xsd:anyURI" default="http://www.fpm1
        </xsd:extension>
    </xsd:simpleContent>
</xsd:complexType>
<xsd:complexType name="PricingDataPointCoordinate">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A set of index values that identify a pricing data point. For
            example: (strike = 17%, expiration = 6M, term = 1Y.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:group ref="PricingStructureIndex.model" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:ID"/>

```

```

</xsd:complexType>
<xsd:complexType name="PricingDataPointCoordinateReference">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Reference to a Pricing Data Point Coordinate.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:complexContent>
    <xsd:extension base="Reference">
      <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="PricingDataPointCoordinateReference"/>
    </xsd:extension>
  </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PricingMethod">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      For an asset (e.g. a reference/benchmark asset), the pricing structure used to price it. Used, for example, to specify that the rateIndex "USD-LIBOR-Telerate" with term = 6M is priced using the "USD-LIBOR-Close" curve.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="assetReference" type="AnyAssetReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The asset whose price is required.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="pricingInputReference" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the pricing input used to value the asset.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="PricingParameterDerivative">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A definition of the mathematical derivative with respect to a specific pricing parameter.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="description" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A description, if needed, of how the derivative is computed.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:choice>
      <xsd:element name="parameterReference" type="AssetOrTermPointOrPricingStructureReference">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            A reference to the pricing input parameter to which the sensitivity is computed. If it is omitted, the derivative definition is generic, and applies to any input point in the valuation set.
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
      <xsd:element name="inputDateReference" type="ValuationReference" maxOccurs="unbounded">
        <xsd:annotation>
          <xsd:documentation xml:lang="en">
            Reference(s) to the pricing input dates that are shifted when the sensitivity is computed. Depending on the time advance method used, this list could vary. Used for describing time-advance derivatives (theta, carry, etc.)
          </xsd:documentation>
        </xsd:annotation>
      </xsd:element>
    </xsd:choice>
    <xsd:element name="calculationProcedure" type="DerivativeCalculationProcedure" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The method by which a derivative is computed, e.g. analytic, numerical model, perturbation, etc., and the corresponding parameters
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>

```

```

        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="PricingParameterDerivativeReference">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            Reference to a partial derivative.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:complexContent>
        <xsd:extension base="Reference">
            <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="PricingPara
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="PricingParameterShift">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A definition of a shift with respect to a specific pricing
            parameter.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="parameterReference" type="AssetOrTermPointOrPricingStructureReference
        <xsd:element name="shift" type="xsd:decimal">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The size of the denominator, e.g. 0.0001 = 1 bp.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="shiftUnits" type="PriceQuoteUnits" minOccurs="0">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The units of the denominator, e.g. currency. If not
                    present, use the units of the PricingInputReference.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="PricingStructureValuation">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            An abstract pricing structure valuation base type. Used as a
            base for values of pricing structures such as yield curves and
            volatility matrices. Derived from the "Valuation" type.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:complexContent>
        <xsd:extension base="Valuation">
            <xsd:sequence>
                <xsd:group ref="PricingInputDates.model">
                    <xsd:annotation>
                        <xsd:documentation xml:lang="en">
                            The relevant dates for a pricing structure - what is
                            applies to, when it was built, etc.
                        </xsd:documentation>
                    </xsd:annotation>
                </xsd:group>
            </xsd:sequence>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="QuotedAssetSet">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A collection of quoted assets.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="instrumentSet" type="InstrumentSet" minOccurs="0">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A collection of instruments used as a basis for quotation.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="assetQuote" type="BasicAssetValuation" minOccurs="0" maxOccurs="unbound

```

```

    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A collection of valuations (quotes) for the assets needed
        in the set. Normally these quotes will be for the
        underlying assets listed above, but they don't necessarily
        have to be.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
</xsd:sequence>
</xsd:complexType>
<xsd:complexType name="SensitivityDefinition">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A set of characteristics describing a sensitivity
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the derivative, e.g. first derivative, Hessian,
          etc. Typically not required, but may be used to explain
          more complex derivative calculations.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          Reference to the valuation scenario to which this
          sensitivity definition applies. If the
          SensitivityDefinition occurs within a
          SensitivitySetDefinition, this is not required and normally
          not used. In this case, if it is supplied it overrides the
          valuationScenarioReference in the SensitivitySetDefinition.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:choice>
      <xsd:group ref="ComputedDerivative.model"/>
      <xsd:group ref="SensitivityDescription.model"/>
    </xsd:choice>
  </xsd:sequence>
  <xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="SensitivitySetDefinition">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A sensitivity report definition, consisting of a collection of
      sensitivity definitions.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The name of the sensitivity set definition, e.g. "USDLIBOR
          curve sensitivities".
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="sensitivityCharacteristics" type="QuotationCharacteristics" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The default characteristics of the quotation, e.g. type,
          units, etc.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          Reference to the valuation scenario to which this
          sensitivity definition applies, e.g. a reference to the EOD
          valuation scenario. If not supplied, this sensitivity set
          definition is generic to a variety of valuation scenarios.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="pricingInputType" type="PricingInputType" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">

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        The type of the pricing input to which the sensitivity is
        shown, e.g. a yield curve or volatility matrix.
    </xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="pricingInputReference" type="PricingStructureReference" minOccurs="0" maxOccurs="1">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A reference to the pricing input to which the sensitivity
            is shown, e.g. a reference to a USDLIBOR yield curve.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="scale" type="xsd:decimal">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The size of the denominator, e.g. 0.0001 = 1 bp. For
            derivatives with respect to time, the default period is 1
            day.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="sensitivityDefinition" type="SensitivityDefinition" minOccurs="0" maxOccurs="1">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A set of sensitivity definitions. Either one per point
            reported, or one generic definition that applies to all
            points.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="calculationProcedure" type="DerivativeCalculationProcedure" minOccurs="0" maxOccurs="1">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The method by which each derivative is computed, e.g.
            analytic, numerical model, perturbation, etc., and the
            corresponding parameters (eg. shift amounts).
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="TimeDimension">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The time dimensions of a term-structure. The user must supply
            either a tenor or a date or both.
        </xsd:documentation>
    </xsd:annotation>
</xsd:choice>
    <xsd:element name="tenor" type="Interval">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                The amount of time from the base date of the pricing input
                to the specified term point, e.g. 6M or 5Y.
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
    <xsd:sequence>
        <xsd:element name="date" type="xsd:date">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The absolute date corresponding to this term point, for
                    example January 3, 2005.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="tenor" type="Interval" minOccurs="0">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The amount of time from the base date of the pricing
                    input to the specified term point, e.g. 6M or 5Y.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
</xsd:choice>
</xsd:complexType>
<xsd:complexType name="Valuation">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A valuation of an valuable object - an asset or a pricing

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        input. This is an abstract type, used as a base for values of
        pricing structures such as yield curves as well as asset
        values.
    </xsd:documentation>
</xsd:annotation>
<xsd:sequence>
    <xsd:element name="objectReference" type="AnyAssetReference" minOccurs="0">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                A reference to the asset or pricing structure that this
                values.
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationScenarioReference" type="ValuationScenarioReference" minOccurs="0">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                A reference to the valuation scenario used to calculate
                this valuation. If the Valuation occurs within a
                ValuationSet, this value is optional and is defaulted from
                the ValuationSet. If this value occurs in both places, the
                lower level value (i.e. the one here) overrides that in the
                higher (i.e. ValuationSet).
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
<xsd:attribute name="definitionRef" type="xsd:IDREF" ecore:reference="ValuationScenario">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            An optional reference to the scenario that this valuation
            applies to.
        </xsd:documentation>
    </xsd:annotation>
</xsd:attribute>
</xsd:complexType>
<xsd:complexType name="ValuationReference">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            Reference to a Valuation or any derived structure such as
            PricingStructureValuation.
        </xsd:documentation>
    </xsd:annotation>
<xsd:complexContent>
    <xsd:extension base="Reference">
        <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="Valuation"/>
    </xsd:extension>
</xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="ValuationScenario">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A set of rules for generating a valuation.
        </xsd:documentation>
    </xsd:annotation>
<xsd:sequence>
    <xsd:element name="name" type="xsd:string" minOccurs="0">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                The (optional) name for this valuation scenario, used for
                understandability. For example "EOD Valuations".
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
    <xsd:element name="valuationDate" type="IdentifiedDate">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                The date for which the assets are valued.
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
    <xsd:element name="marketReference" type="MarketReference" minOccurs="0">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">
                A reference to the market environment used to price the
                asset.
            </xsd:documentation>
        </xsd:annotation>
    </xsd:element>
    <xsd:element name="shift" type="PricingParameterShift" minOccurs="0" maxOccurs="unbounded">
        <xsd:annotation>
            <xsd:documentation xml:lang="en">

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        A collection of shifts to be applied to market inputs prior
        to computation of the derivative.
    </xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="replacement" type="PricingInputReplacement" minOccurs="0" maxOccurs="1">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A collection of shifts to be applied to market inputs prior
            to computation of the derivative.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
</xsd:sequence>
<xsd:attribute name="id" type="xsd:ID"/>
</xsd:complexType>
<xsd:complexType name="ValuationScenarioReference">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            Reference to a valuation scenario.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:complexContent>
        <xsd:extension base="Reference">
            <xsd:attribute name="href" type="xsd:IDREF" use="required" ecore:reference="ValuationScenarioReference"/>
        </xsd:extension>
    </xsd:complexContent>
</xsd:complexType>
<xsd:complexType name="WeightedPartialDerivative">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            A partial derivative multiplied by a weighting factor.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="partialDerivativeReference" type="PricingStructureReference">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A reference to a partial derivative defined in the
                    ComputedDerivative.model, i.e. defined as part of this
                    sensitivity definition.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="weight" type="xsd:decimal">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The weight factor to be applied to the partial derivative,
                    e.g. 1 or -1, or some other scaling value.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
</xsd:complexType>
<xsd:element name="market" type="Market">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            This is a global element used for creating global types. It
            holds Market information, e.g. curves, surfaces, quotes, etc.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="pricingStructure" type="PricingStructure" abstract="true"/>
<xsd:element name="pricingStructureValuation" type="PricingStructureValuation" abstract="true"/>
<xsd:group name="AnalyticDerivativeParameters.model">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            Parameters used in the computation of a derivative using
            analytical (closed form formula) techniques.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:sequence>
        <xsd:element name="derivativeFormula" type="xsd:string" minOccurs="0">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The formula used to compute the derivative (perhaps could
                    be updated to use the Formula type in EQS.).
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
    </xsd:sequence>
</xsd:group>
<xsd:group name="ComputedDerivative.model">

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<xsd:annotation>
  <xsd:documentation source="http://www.FpML.org" xml:lang="en">
    A group describing a derivative as combination of partial
    derivatives.
  </xsd:documentation>
</xsd:annotation>
<xsd:sequence>
  <xsd:element name="partialDerivative" type="PricingParameterDerivative" maxOccurs="unbound">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A partial derivative of the measure with respect to an
        input.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
  <xsd:element name="formula" type="DerivativeFormula" minOccurs="0">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A formula defining how to compute the derivative from the
        partial derivatives. If absent, the derivative is just the
        product of the partial derivatives. Normally only required
        for more higher-order derivatives, e.g. Hessians.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
</xsd:sequence>
</xsd:group>
<xsd:group name="DerivativeCalculationParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:group ref="FiniteDifferenceDerivativeParameters.model"/>
    <xsd:group ref="AnalyticDerivativeParameters.model"/>
    <xsd:group ref="SubstitutionDerivativeParameters.model"/>
  </xsd:choice>
</xsd:group>
<xsd:group name="FiniteDifferenceDerivativeParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative using
      numerical (finite difference) techniques.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="perturbationAmount" type="xsd:decimal" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The size and direction of the perturbation used to compute
          the derivative, e.g. 0.0001 = 1 bp.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="averaged" type="xsd:boolean">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The value is calculated by perturbing by the
          perturbationAmount and then the negative of the
          perturbationAmount and then averaging the two values (i.e.
          the value is half of the difference between perturbing up
          and perturbing down).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="perturbationType" type="PerturbationType" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The type of perturbation, if any, used to compute the
          derivative (Absolute vs Relative).
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
<xsd:group name="PositionIdAndVersion.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A model group that includes a position ID and an optional
      version.
    </xsd:documentation>
  </xsd:annotation>
</xsd:group>

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<xsd:sequence>
  <xsd:element name="positionId" type="PositionId">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A version-independent identifier for the position, possibly
        based on trade identifier.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
  <xsd:element name="version" type="xsd:positiveInteger" minOccurs="0">
    <xsd:annotation>
      <xsd:documentation xml:lang="en">
        A version identifier. Version identifiers must be
        ascending, i.e. higher numbers imply newer versions. There
        is no requirement that version identifiers for a position
        be sequential or small, so for example timestamp-based
        version identifiers could be used.
      </xsd:documentation>
    </xsd:annotation>
  </xsd:element>
</xsd:sequence>
</xsd:group>
<xsd:group name="PricingCoordinateOrReference.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      A pricing structure coordinate, or a reference to one. This can
      be used to either directly define a coordinate or reference an
      existing coordinate.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:choice>
    <xsd:element name="coordinate" type="PricingDataPointCoordinate">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          An explicit, filled in data point coordinate. This might
          specify expiration, strike, etc.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="coordinateReference" type="PricingDataPointCoordinateReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to a pricing data point coordinate within this
          document.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:choice>
</xsd:group>
<xsd:group name="PricingInputDates.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      The dates that might be relevant for a pricing input, e.g. what
      valuation date it applies to, when it was built, when the data
      comes from, etc..
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="baseDate" type="IdentifiedDate">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The base date for which the structure applies, i.e. the
          curve date. Normally this will align with the valuation
          date.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="spotDate" type="IdentifiedDate" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The spot settlement date for which the structure applies,
          normally 0-2 days after the base date. The difference
          between the baseDate and the spotDate is termed the
          settlement lag, and is sometimes called "days to spot".
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="inputDataDate" type="IdentifiedDate" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          The date from which the input data used to construct the
          pricing input was obtained. Often the same as the baseDate,
          but sometimes the pricing input may be "rolled forward", in

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        which input data from one date is used to generate a curve
        for a later date.
    </xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="endDate" type="IdentifiedDate" minOccurs="0">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The last date for which data is supplied in this pricing
            input.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
<xsd:element name="buildDateTime" type="xsd:dateTime" minOccurs="0">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The date and time when the pricing input was generated.
        </xsd:documentation>
    </xsd:annotation>
</xsd:element>
</xsd:sequence>
</xsd:group>
<xsd:group name="PricingStructureIndex.model">
    <xsd:annotation>
        <xsd:documentation xml:lang="en">
            The index (an ordinate) of a pricing structure. The index
            expresses how far along a particular dimension (e.g. time,
            strike, etc.) a point is located.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:choice>
        <xsd:element name="term" type="TimeDimension">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A time dimension that represents the term of a financial
                    instrument, e.g. of a zero-coupon bond on a curve, or of an
                    underlying caplet or swap for an option.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="expiration" type="TimeDimension">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A time dimension that represents the time to expiration of
                    an option.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="strike" type="xsd:decimal">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    A numerical dimension that represents the strike rate or
                    price of an option.
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:element name="generic" type="GenericDimension"/>
    </xsd:choice>
</xsd:group>
<xsd:group name="SensitivityDescription.model">
    <xsd:annotation>
        <xsd:documentation source="http://www.FpML.org" xml:lang="en">
            A group describing a specific sensitivity without an explicit
            reference to the market data input point.
        </xsd:documentation>
    </xsd:annotation>
    <xsd:choice>
        <xsd:element name="term" type="TimeDimension">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The time dimension of the sensitivity point (tenor and/or
                    date)
                </xsd:documentation>
            </xsd:annotation>
        </xsd:element>
        <xsd:group ref="PricingCoordinateOrReference.model" maxOccurs="unbounded">
            <xsd:annotation>
                <xsd:documentation xml:lang="en">
                    The input coordinates, or references to them (e.g.
                    expiration, strike, tenor).
                </xsd:documentation>
            </xsd:annotation>
        </xsd:group>
    </xsd:choice>
</xsd:group>

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</xsd:choice>
</xsd:group>
<xsd:group name="SubstitutionDerivativeParameters.model">
  <xsd:annotation>
    <xsd:documentation xml:lang="en">
      Parameters used in the computation of a derivative by
      substituting a supplied market environment.
    </xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element name="replacementMarketInput" type="PricingStructureReference">
      <xsd:annotation>
        <xsd:documentation xml:lang="en">
          A reference to the replacement version of the market input,
          e.g. a bumped yield curve.
        </xsd:documentation>
      </xsd:annotation>
    </xsd:element>
  </xsd:sequence>
</xsd:group>
</xsd:schema>
```