ActiveViam

FRTB

Input File Formats

4.0

Contents

1 Input Files

This document contains the file formats for the CSV files that can be used by clients as input to the ActivePivot FRTB Accelerator Reference Implementation, for SA, IMA, and IMA Summary.

Sample input files are included in the source distribution. These files are loaded during testing of the reference implementation and provide examples of each of the file types.

1.1 What each page shows

For each input file, the format for each row (or record) is shown, followed by a table defining all the fields in a record.

1.2 File name patterns

The ActiveViam FRTB solution uses glob patterns with the (*) asterisk wildcard character to identify the relevant file names for each category of input file. So you can add characters before and after the listed names, such as timestamps or ID numbers.

For example, the pattern **/FXData*.csv matches all CSV files with names beginning with the string "FXData" in any subdirectory.

In this guide, the File Pattern Match section for each of the input files specifies the glob pattern used. However, the glob prefix is omitted as it is now injected automatically.

You can customize the glob patterns in frtb-data-load.properties.

1.2.1 This chapter describes the following:

- *Common and Booking Files*
- *Core Configuration Files*
- *CRIF Files*
- *SA Input File Formats*

2 Common and Booking Files

These files are shared between IMA, IMA Summary and SA:

- *Book Parent Child*
- *FX Rates*
- *Legal Entity Attributes*
- *Legal Entity Parent Child*
- *Trade Attributes*

2.1 Book Parent Child

This file provides a description of the organisation's book structure, using a parent/child relationship, including identification and description of desks.

This Book Parent Child file type is identified using the pattern: ****/BookParentChild*.csv** (as specified by `book.parent-child.file-pattern`). This file is loaded using the **BookParentChild** topic.

Field	Key	Null	FieldType	Description	Example
Name	Y	N	String	Name of the node in the Book/Desk hierarchy.	

Field	Key	Null	FieldType	Description	Example
Parent	N	Y	String	Name of the parent node (or null if there is no parent).	
FRTBDesk	N	Y	'Y' or 'N'	This is set to 'Y' if this node is a desk for the purposes of FRTB. If so, then 'FRTBApproach' and 'PLA Zone' are populated – otherwise they are empty.	
Category	N	Y	String	Optional category for the node (and all Descendant nodes).	
FRTBApproach	N	Y	'SA' or 'IMA'	For FRTB desks, this field indicates which model (i.e. approach) should be used for calculating the Risk Charge (either 'SA' or 'IMA'). If not an FRTB desk, this field is empty.	
PLA Zone	N	Y	'R', 'A', or 'G'	For FRTB desks, this field indicates which zone the desk falls into according to the PLA test metrics [MAR32.42]. If not an FRTB desk, this field is empty.	
IRT Desk	N	Y	'Y' or 'N'	Indicates whether the desk is an Internal Risk Transfer (IRT) desk. ACR is calculated separately for desks flagged as IRT.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

2.1.1 Flattened Hierarchy

After this file is loaded into the datastore, a datastore listener will trigger some further processing that will flatten the hierarchy.

The tree is walked and each node is assigned a level in the **BookHierarchy** hierarchy. The leaf nodes of the tree become the books in the **Book** hierarchy, and each trade is mapped to a book.

It is expected that every path from the top nodes to the leaf nodes will pass through exactly one desk. This way the Desk, FRTB Approach (SA/IMA), PLA Zone (R/A/G or "N/A"), and IRT flag (Y/N) can be set for each leaf node.

2.2 FX Rates

This file provides FX spot rates used for currency conversion.

This FX Rates file type is identified using the pattern: ****/FXData*.csv** (as specified by `fx.data.file-pattern`). This file is loaded using the **FXRates** topic.

Field	Key	Null	FieldType	Description	Example
BaseCurrency	Y	N	String	The left side of the currency pair.	
CounterCurrency	Y	N	String	The right side of the currency pair	
Rate	N	N	Double	Forex rate between the two currencies.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

2.2.1 FXHistorical Topic

The FXHistorical topic has the same file format as FXData.csv. The difference is the file location.

- When loading the FXRates topic, the as-of date is provided in the scope and the file will be loaded from the corresponding directory.
- When loading the FXHistorical topic, no as-of date is provided in the scope and all FXData.csv files from the historical directory are loaded.

2.3 FX Conversion Formula

Input values are converted into the same currency according to this formula:

$$Value_{\text{target currency}} = Value_{\text{input currency}} \cdot FxRate$$

2.4 FxRate Lookup

The $FxRate$ for converting the input currency value into the target currency value is obtained based on the data in the FX Rates data store.

1. In most cases, the algorithm will simply look up the rate based on these key fields: AsOfDate, BaseCcy, CounterCcy. Initially the algorithm searches for the rate that has AsOfDate, input currency, target currency in the key fields. See the Direct Lookup example below.

2. If the rate was not found, the algorithm will try the indirect lookup - search rate by AsOfDate, target currency, input currency and take the reciprocal of the rate if found.

3. If the rate is still not found at this stage, the algorithm will compute the rate using the FX crosses via the "CommonCcy" configured in the application properties (`fx-rates.common-currency` in the `risk.properties`):

4. Search for the rate from CommonCcy to input currency, let this result be referred to as "baseCcyComponent"

5. Search for the rate from commonCcy to the target currency, let this result be referred to as "counterCcyComponent"

6. Compute the FxRate as counterCcyComponent divided by baseCcyComponent. See the FX Crosses example below.

2.4.1 Direct Lookup Example

- Let's imagine we want the values expressed in CHF.
- The delivered risk for a position is 100 EUR: 100 is the risk value in units of input currency EUR.
- The delivered FxRates for the business date:

AsOfDate	BaseCcy	CounterCcy	FxRate
2019-01-01	EUR	CHF	1.0794

The risk in CHF will be displayed as 107.94 = 100 x 1.0794.

2.4.2 FX Crosses Example

- Let's imagine we wish to see the values expressed in CHF.
- The delivered risk for a position is 100 KZT: 100 is the risk value in units of input currency KZT.
- The common currency is set to EUR, and the fx crosses will use EUR as the common currency.
- The relevant FxRates for the business date:

AsOfDate	BaseCcy	CounterCcy	FxRate
2019-01-01	EUR	CHF	1.0794
2019-01-01	EUR	KZT	370.0427

With CHF as the target currency, the rate applicable to KZT exposure is computed as follows:

- baseCcyComponent = EUR/KZT = 370.0427
- counterCcyComponent = EUR/CHF = 1.0794

The KZT/CHF rate is computed as 1.0794/370.0427 = 0.002916961.

Hence, the risk in CHF will be displayed as 0.2916961 = 100 x 0.002916961.

2.5 Legal Entity Attributes

This file contains a description of the legal entities.

This Legal Entity Attributes file type is identified using the pattern: ****/LegalEntityAttributes*.csv** (as specified by `legal-entity.attributes.file-pattern`). This file is loaded using the **LegalEntityAttributes** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	
LegalEntity	Y	N	String	The Legal Entity being described.	

Field	Key	Null	FieldType	Description	Example
NettingSet	N	N	String	The Netting Set that this Legal Entity belongs to. Capital Charges can be calculated independently for netting set.	

2.6 Legal Entity Parent Child

This file provides a description of the Group's Legal Entity structure, using a parent/child relationship.

This Legal Entity Parent Child file type is identified using the pattern: ****/LegalEntityParentChild*.csv** (as specified by `legal-entity.parent-child.file-pattern`). This file is loaded using the **LegalEntityParentChild** topic.

Field	Key	Null	FieldType	Description	Example
Name	Y	N	String	Name of the Legal Entity.	
Parent	N	Y	String	Name of the parent Legal Entity (or null if there is no parent).	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

2.6.1 Flattened Hierarchy

After this file is loaded into the datastore, a DLC Topic will trigger some further processing that will flatten the hierarchy.

14

The tree is walked and each node is assigned a level in the **LegalEntityHierarchy** hierarchy. The leaf nodes of the tree become the legal entities in the **LegalEntity** hierarchy, and each trade is mapped to a legal entity.

2.7 Trade Attributes

This file describes the trade, including book and legal entity, notional and prevent value. Fields are applicable to all components except where indicated.

This Trade Attributes file type is identified using the pattern: ****/{Trade_Attributes,SA_Trades}*.csv** (as specified by `trade.attributes.sa.trades.file-pattern`). This file is loaded using the **Trade_Attributes** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date[YYYY-MM-DD]	Timestamp (at close of business) for the data.	
TradeId	Y	N	String	If coming from multiple systems may need to prepend source system to the id for uniqueness.	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc. –
Book	N	N	String	The book to map the trade to (must match the node in the Book Hierarchy).	
Legal Entity	N	N	String	Legal Entity to map the trade to (must match the node in the Legal Entity Hierarchy).	
Notional	N	Y	Double	Notional of trade/position (used for RRAO). *Use of this field for DRC is deprecated*	
NotionalCcy	N	Y	String	Currency of notional. Required whenever notional is provided.	

Field	Key	Null	FieldType	Description	Example
PresentValue	N	Y	Double	*Use of this field for DRC and Curvature present value is deprecated*	
PVCcy	N	Y	String	Currency of present value. Required whenever present value is provided.	
ResidualRisk	N	Y	'Y' or 'N'	Applicable to RRAO only Indicates trade/position subject to residual risk add-on.	
ExoticUnderlying	N	Y	'Y' or 'N'	Applicable to RRAO only If yes and residual risk, risk weight = 1% otherwise if residual risk, weight = .1%.	
OtherResidualRiskType	N	Y	String	Applicable to RRAO only Optional data - valid if ExoticUnderlying = 'N'. Suggested valid values are "GAP", "CORRELATION",'BEHAVIORIAL", "OTHER".	
TradeDate	N	Y	Date[YYYY-MM-DD]	The date on which the trade took place	
Sensitivity Scale Category	N	Y	String	The category to use for scaling the SBM sensitivities. This matches the categories in the Sensitivity Scaling configuration file. If unused, or the category doesn't match, no scaling is applied.	Business Day 1

Field	Key	Null	FieldType	Description	Example
RRAO Category	N	Y	String	This field is used as a key for modifying RRAO attributes. It is used for the overrides as part of the multi-jurisdictional support; it is not used directly in calculations.	

2.7.1 RRAO Trades

If the ResidualRisk flag is set, then a row is added to the **TradeBase** store. This row becomes a fact in the SA cube and is used for RRAO calculations.

2.7.2 Stores

The contents of this file are split between the (common) **TradeMapping** store which maps a trade to book and legal entity (and contains the TradeDate), and the (SA-only) **SATradeDescription** store which contains SA-specific details of the trade, including Notional, PV, and RRAO details.

3 Core Configuration Files

The following parameters files are used in the ActiveViam FRTB solution calculations:

- Commodity_BucketRiskWeights
- Commodity_IntraBucketCorrelations
- CSR_BucketsRiskWeights_NONSEC
- CSR_BucketsRiskWeights_SECCTP
- CSR_BucketsRiskWeights_SECNONCTP
- CSRNS_Bucket_Correlations
- Default_Risk_Weights
- EQTY_BucketsRiskWeights
- ERBA_Risk_Weight
- FRTBParameters
- FX_Risk_Weight_Overrides
- FX_Special_Crosses
- GIRR_Correlation_Overrides
- GIRR_Delta_Weightings
- GIRR_Major_Currency
- Instrument_LGD
- LiquidityHorizons

- Obligor_Risk_Weights
- Option_Residual_Maturity_Vertices
- ParameterSet
- Sensitivity_Scaling
- Vega_Liquidity_Horizons
- Vertices

4 CRIF Files

The Accelerator natively uses the *SBM Sensitivity* and *SA DRC Trade Level* input files to load sensitivity information. Alternatively, you can use CRIF (Common Risk Interchange Format) to replace the native sensitivity input files.

The native formats, however, offer enhanced support and features such as:

- multi-jurisdiction support: CRIF files must be created for a specific jurisdiction, native files can be used for multiple jurisdictions.
- support for dividing FX CVR by 1.5 (MAR 21.98)
- reusing Delta sensitivities for Curvature "delta stripping"

CRIF input files should be created according to the standard ISDA CRIF. For details on how to become a licensed CRIF user, contact ISDA at analytics@isda.org.

When using CRIF, unsupported variants aren't loaded into the cube. Unsupported variants include Vega Variant 2, Curvature Variants 1a,1b,2a and DRC Variant 2.

20

5 SA Input File Formats

This section describes our own input file formats used for the Standardized Approach. These can be used as an alternative to the *CRIF format*.

- *Bucket Files*
- *DRC Trade Level Files*
- *Overrides*
- *SBM Sensitivity-specific Files*

21

6 Bucket Files

- *Commodity Buckets*
- *CSR non-Sec Bucket Descriptions*
- *CSR non-Sec Buckets*
- *CSR Sec CTP Bucket Descriptions*
- *CSR Sec CTP Buckets*
- *CSR Sec non-CTP Bucket Descriptions*
- *CSR Sec non-CTP Buckets*
- *Equity Bucket Descriptions*
- *Equity Buckets*

6.1 Commodity Buckets

This file provides a mapping from Commodity to Commodity Bucket.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the Bucket field, it is filled from this Commodity Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This Commodity Buckets file type is identified using the pattern: ****/Commodity_Buckets*.csv** (as specified by `commodity.buckets.file-pattern`). This file is loaded using the **CommodityBuckets** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	Bucket number (1 – 11)	
UnderlyingCommodity	Y	N	String	Underlying commodity from sensitivities file	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.2 CSR non-Sec Bucket Descriptions

This file provides a description of CSR non-Sec buckets, including canonical values for Credit Rating and Sector.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the rating and/or sector fields, they can be filled from this CSR non-Sec Bucket Descriptions file. To take advantage of this, the bucket description file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR non-Sec Bucket Descriptions file type is identified using the pattern: ****/CSR_Bucket_Description_NONSEC*.csv** (as specified by `csr.bucket.description.non-sec.file-pattern`). This file is loaded using the **CSR_BUCKET_DESCRIPTION_NONSEC** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	Y	N	String	Bucket number(1 – 18)	
RatingCategory	N	N	String	Logical group of ratings	
SectorCategory	N	N	String	Logical group of sectors	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.3 CSR non-Sec Buckets

This file provides a mapping from Credit Quality and Sector to CSR non-Sec bucket.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the Bucket field, it is filled in from this CSR non-Sec Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR non-Sec Buckets file type is identified using the pattern: ****/CSR_Bucket_NONSEC*.csv** (as specified by `csr.bucket.non-sec.file-pattern`). This file is loaded using the **CSR_BUCKET_NONSEC** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	Bucket number (1 – 16)	
CreditQuality	Y	N	String	Must match "CSRQuality" in sensitivities file	
Sector	Y	N	String	Must match "CSRSector" in sensitivities file	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.4 CSR Sec CTP Bucket Descriptions

This file provides a description of CSR Sec CTP buckets, including canonical values for Credit Rating and Sector.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the rating and/or sector fields, they can be filled from this CSR Sec CTP Bucket Descriptions file. To take advantage of this, the bucket description file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR Sec CTP Bucket Descriptions file type is identified using the pattern: ****/CSR_Bucket_Description_SECCTP*.csv** (as specified by

`csr.bucket.description.sec-ctp.file-pattern`). This file is loaded using the **CSR_BUCKET_DESCRIPTION_SECCTP** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	Y	N	String	Bucket number(1 – 16)	
RatingCategory	N	N	String	Logical group of ratings	
SectorCategory	N	N	String	Logical group of sectors	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.5 CSR Sec CTP Buckets

This file provides a mapping from Credit Quality and Sector to CSR Sec CTP bucket.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the Bucket field, it is filled in from this CSR Sec CTP Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR Sec CTP Buckets file type is identified using the pattern: ****/CSR_Bucket_SECCTP*.csv** (as specified by `csr.bucket.sec-ctp.file-pattern`). This file is loaded using the **CSR_BUCKET_SECCTP** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	Bucket number (1 – 16)	
CreditQuality	Y	N	String	Must match "CSRQuality" in sensitivities file	
Sector	Y	N	String	Must match "CSRSector" in sensitivities file	

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.6 CSR Sec non-CTP Bucket Descriptions

This file provides a description of CSR Sec non-CTP buckets, including canonical values for Credit Rating and Sector.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the rating and/or sector fields, they can be filled from this CSR Sec non-CTP Bucket Descriptions file. To take advantage of this, the bucket description file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR Sec non-CTP Bucket Descriptions file type is identified using the pattern: ****/CSR_Bucket_Description_SECNONCTP*.csv** (as specified by `csr.bucket.description.sec-non-ctp.file-pattern`). This file is loaded using the **CSR_BUCKET_DESCRIPTION_SECNONCTP** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	Y	N	String	Bucket number(1 – 25)	
RatingCategory	N	N	String	Logical group of ratings	
SectorCategory	N	N	String	Logical group of sectors	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.7 CSR Sec non-CTP Buckets

This file provides a mapping from Credit Quality and Sector to CSR Sec non-CTP bucket.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the Bucket field, it is filled in from this CSR Sec non-CTP Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This CSR Sec non-CTP Buckets file type is identified using the pattern: ****/CSR_Bucket_SECNONCTP*.csv** (as specified by `csr.bucket.sec-non-ctp.file-pattern`). This file is loaded using the **CSR_BUCKET_SECNONCTP** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	Bucket number(1 – 25)	
CreditQuality	Y	N	String	Must match "CSRQuality" in sensitivities file	
Sector	Y	N	String	Must match "CSRSector" in sensitivities file	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.8 Equity Bucket Descriptions

This file provides a description of Equity buckets, including canonical values for Sector. It is used to populate the market cap, economy, and sector fields of the equity(underlying) description during the ETL.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the market cap, economy, and/or sector fields, they can be filled from this Equity Bucket Descriptions file. To take advantage of this, the bucket description file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

27

This Equity Bucket Descriptions file type is identified using the pattern: ****/Equity_Bucket_Description*.csv** (as specified by `equity.bucket-description.file-pattern`). This file is loaded using the **EQUITY_BUCKET_DESCRIPTION** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	Y	N	String	Bucket number(1 – 13)	
Market Cap Category	N	N	String	Market Cap for the bucket	Large, Small, Other
Economy Category	N	N	String	Economy for the Bucket	Advanced, Emerging, Other
Sector Category	N	N	String	Sector for the Bucket	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

6.9 Equity Buckets

This file provides a mapping from Market Cap, Issuer Economy, and Issuer Sector to Equity Bucket.

When the SBM sensitivity files (*Curvature*, *Delta*, or *Vega*) omit the Bucket field, it is filled in from this Equity Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the Curvature, Delta, or Vega file.

This Equity Buckets file type is identified using the pattern: ****/Equity_Buckets*.csv** (as specified by `equity.buckets.file-pattern`). This file is loaded using the **EquityBuckets** topic.

Field	Key	Null	FieldType	Description	Example
MarketCap	Y	N	String	Value must be "Large","Small"or "Other" and must match sensitivities file	
IssuerEconomy	Y	N	String	Value must be "Emerging economy","Advanced economy", or "Other" and must match sensitivities file	
IssuerSector	Y	N	String	Must match "EquitySector" of sensitivities file	
Bucket	N	N	String	Bucket number (1 – 13)	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

7 DRC Trade Level Files

- *DRC Buckets*
- *DRC Seniority Description*
- *DRC Trade Level (SA)*

7.1 DRC Buckets

This file provides a mapping from Region and Asset Class to DRC Sec non-CTP Bucket.

When the DRC Trade Level files omit the Bucket field for DRC Sec non-CTP, it is filled from this DRC Buckets file. To take advantage of this, the buckets file must be loaded before (or at the same time as) the DRC trade-level file.

This DRC Buckets file type is identified using the pattern: ****/DRC_Bucket_SECNONCTP*.csv** (as specified by `drc.bucket.sec-non-ctp.file-pattern`). This file is loaded using the **DrcSecNonCtpBuckets** topic.

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	The DRC Bucket	
Region	Y	N	String	Region for Bucket (BCBS 457, MAR22.31 (2)(b)). Values must match DRC trades file.	

Field	Key	Null	FieldType	Description	Example
AssetClass	Y	N	String	Asset class for Bucket (BCBS 457, MAR22.31 (2)(b)). Values must match DRC trades file.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

7.2 DRC Seniority Description

The DRC Seniority Description file provides a ranking of seniorities that can be used when calculating the DRC non-Sec net JTD.

This DRC Seniority Description file type is identified using the pattern: ****/Seniority_Description*.csv** (as specified by `seniority.description.file-pattern`). This file is loaded using the **SeniorityDescription** topic.

Field	Key	Null	FieldType	Description	Example
Seniority	Y	N	String	Seniority of the exposure (matches values for DRC non-Sec rows in the DRC trade level file)	
Ranking	N	N	String	Integer value, represents the ranking to be used in determining whether it's possible to net long vs short JTD. Lower values for more senior exposure; higher values for more junior exposure; highest value for equity.	

31

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

7.3 DRC Trade Level (SA)

This file defines fields for Jump to Default Risk for non-Sec and Sec non-CTP, including instrument description. Fields are applicable to all components except where indicated.

This DRC Trade Level (SA) file type is identified using the pattern: ****/DRC_Trade_*.csv** (as specified by `drc.trade.file-pattern`). This file is loaded using the **DRC** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	2018-06-29
TradeId	Y	N	String	If coming from multiple systems may need to prepend source system to the id for uniqueness	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc.
RiskClass	Y	N	String	"DRC non-Sec" or "DRC Sec non-CTP"	DRC Sec CTP
RiskFactor	Y	Y	String	An identifier for the combination of the obligor/tranche (underlying), seniority (DRC non-Sec), and maturity. If omitted, it will be generated in the ETL.	

Field	Key	Null	FieldType	Description	Example
ObligorCategory	N	N	String	Applicable to DRC non-Sec only Obligor Category/Bucket (BCBS 457, [MAR22.22]). Any values allowed	corporates
InstrumentType	N	N	String	Applicable to DRC non-Sec only Instrument type for LGD (BCBS 457, [MAR22.12]). "equity", "junior debt", "senior debt", or "covered bond")	senior debt
Seniority	N	N	String	Seniority of the exposure. For DRC non-Sec, this matches values in seniority description file. For DRC Sec non-CTP, this is "senior" or not for calculating the SEC-ERBA risk-weights.	Senior
Direction	N	N	String	'long' or 'short'	Long
Maturity	N	Y	String	Maturity of the trade	"1D", "2W", "12M", "1Y", or date "YYYY-MM-DD"
Rating	N	N	String	Credit Quality Category: For non-Sec, see BCBS 457, [MAR22.24]. For Sec non-CTP, see BCBS 374, paras 66-68.	BBB
Notional	N	Y	Double	(Optional) This is used to compute GrossJTD for non-Sec when not provided. This is an optional override for the 'Notional' in the Trade Attributes file. *Note*: the use of Notional in the Trade Attributes for DRC is deprecated.	

Field	Key	Null	FieldType	Description	Example
MarketValue	N	Y	Double	Applicable to DRC non-Sec only (Optional) This is used to compute GrossJTD for Sec non-CTP when not provided. This is an optional override for the 'PresentValue' in the Trade Attributes file. *Note:* the use of PresentValue in the Trade Attributes for DRC is deprecated.	
GrossJTD	N	Y	String	(Optional) Gross JTD value; providing this value skips the calculation (using market value and notional)	
Ccy	N	Y	String	Currency code of Gross JTD, Notional, or MarketValue. Required if GrossJTD, Notional or MarketValue provided.	USD
Underlying	N	N	String	The id of the obligor or tranche.	CDX.NA.HY Series 37 10%-15%
Region	N	Y	String	Applicable to DRC Sec non-CTP only Region for Bucket (BCBS 457, MAR22.31(b)). Values must match DRC Buckets file.	
AssetClass	N	Y	String	Applicable to DRC Sec non-CTP only Asset class for Bucket (BCBS 457, MAR22.31(b)). Values must match DRC Buckets file.	

Field	Key	Null	FieldType	Description	Example
Attachment	N	Y	Double	DRC Sec non-CTP Attachment, DRC Sec CTP Attachment. The start of the tranche or empty Attachment point (Decimal values are expected).	0.10
Detachment	N	Y	Double	DRC Sec non-CTP Detachment, DRC Sec CTP Detachment. The end of the tranche or empty Detachment point (Decimal values are expected).	0.15
RecoveryRates	N	Y	Double	Applicable to IMA only Not used for SA.	
RecoveryValues	N	Y	Double	Applicable to IMA only Not used for SA.	
Rating type	N	Y	String	The rating type used when looking up SEC-ERBA risk-weights (and when applying flooring logic).	STC
Risk Weight	N	Y	Double	Override the risk-weight by obligor (DRC non-Sec) or tranche (DRC Sec non-CTP)	SEC-SA risk-weight for DRC Sec non-CTP
Adjustment	N	Y	Double	Adjustment to make when calculating GrossJTD. This adjustment is only applied if sa.drc.adjustment.apply=true, by default this is set to false and this field is not used. The currency the adjustment is expressed in is given by the existing Gross JTD currency field.	

35

Field	Key	Null	FieldType	Description	Example
Bucket	N	N	String	The bucket used for the DRC computation, mandatory for *DRC Sec CTP* (BCBS 457,MAR22.40)	CDX.NA.HY
Zero Risk-Weight	N	Y	Y/N flag	Flag indicating if the exposure (RiskFactor) qualifies for a zero risk-weight Default = N	

This file is also used in the IMA, see *DRC trade level (IMA)*

The Accelerator uses this input file alongside the *SBM Sensitivity files* to load sensitivity information.

The native formats offer enhanced support and features such as multiple jurisdictions, and better reporting. However, you can use *CRIF* (Common Risk Interchange Format) as an alternative to the native sensitivity input files. CRIF input files should be created according to the standard ISDA CRIF. For details on how to become a licensed CRIF user, contact ISDA at analytics@isda.org.

8 Overrides

- *Legal Entity Imports*
- *Obligor Overrides*
- *Risk-Factor Description Overrides*
- *RRAO Overrides*
- *Tranche Overrides*
- *Underlying Description Overrides*

8.1 Legal Entity Imports

This file is used to import pre-calculated Capital Charge values at the legal entity level, for use in reporting.

This Legal Entity Imports file type is identified using the pattern: ****/LegalEntityImports*.csv** (as specified by `legal-entity.imports.file-pattern`). This file is loaded using the **LegalEntityImports** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	
ParameterSet	Y	N	String	The Parameter Set for which the imported values are calculated	CRR2
CubeMeasure	Y	N	String	The name of the measure whose value is being imported.	"GIRR Delta Risk Charge High"
LegalEntity	Y	N	String	The Legal Entity to assign the imported, pre-calculated values to.	
Value	N	N	Double	The pre-calculated value to import.	
Ccy	N	N	String	The currency that Value is expressed in.	USD

8.2 Obligor Overrides

This file provides the overrides for SA DRC non-Sec obligor descriptions.

This Obligor Overrides file type is identified using the pattern: ****/Obligor_Overrides*.csv** (as specified by `drc.obligor.overrides.file-pattern`). This file is loaded using the **ObligorOverrides** topic.

Field	Key	Null	FieldType	Description	Example
Obligor	Y	N	String	The name of the obligor to override. Matches the "Underlying" column in the *DRC Trade Level* file	
RiskClass	Y	N	String	Set to "DRC non-Sec".	"DRC non-Sec"
Parameter Set	Y	N	String	The parameter set for which the override applies.	CRR2
ObligorCategory	N	Y	String	Obligor Category/Bucket [MAR22.22]. Replaces the Obligor Category in the *DRC Trade Level* file.	
Rating	N	Y	String	Credit Quality Category [MAR22.24]. Replaces the Rating in the *DRC Trade Level* file.	
Risk Weight	N	Y	Double	Override the risk-weight for this obligor, instead of looking up the risk-weight by rating. Replaces the Risk Weight in the *DRC Trade Level* file.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

8.3 Risk-Factor Description Overrides

This file provides the overrides for SA DRC non-Sec Exposure Descriptions.

This Risk-Factor Description Overrides file type is identified using the pattern: ****/RiskFactor_Desc_Overrides*.csv** (as specified by `risk-factor-desc.overrides.file-pattern`). This file is loaded using the **RickFactorDescriptionOverrides** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	
Risk Factor	Y	N	String	The name of the SA DRC non-Sec exposure to override.	
RiskClass	Y	N	String	Defines the risk class for the risk-factor.	"DRC non-Sec"
Risk Measure	Y	N	String	Defines the risk measure for the risk-factor.	"DRC"
Parameter Set	Y	N	String	The parameter set for which the override applies.	CRR2
Risk Factor Type	N	Y	String	Reserved for future use.	
CommodityLocation	N	Y	String	Reserved for future use.	
Seniority	N	Y	String	Reserved for future use.	
Maturity	N	Y	String	Reserved for future use.	
Zero Risk Weight	N	Y	Y/N	Flag indicating if the exposure qualifies for a zero risk-weight.	"Y", "N"

8.4 RRAO Overrides

This file provides the overrides for RRAO category descriptions.

This RRAO Overrides file type is identified using the pattern: ****/RRAO_Overrides*.csv** (as specified by `rrao.overrides.file-pattern`). This file is loaded using the **RRAOOverrides** topic.

Field	Key	Null	FieldType	Description	Example
RRAOCategory	Y	N	String	The name of the RRAO Category to override. Matches the "RRAOCategory" column in the *Trade Attributes* file	
RiskClass	Y	N	String	Set to "RRAO".	"RRAO"
Parameter Set	Y	N	String	The parameter set for which the override applies.	CRR2
ResidualRisk	N	Y	'Y' or 'N'	Indicates category subject to residual risk add-on. Replaces the ResidualRisk in the *Trade Attributes* file.	
ExoticUnderlying	N	Y	'Y' or 'N'	If yes and residual risk, risk weight = 1% otherwise if residual risk, weight = .1%. Replaces the ExoticUnderlying in the *Trade Attributes* file.	
OtherResidualRiskType	N	Y	String	Replaces the OtherResidualRiskType in the *Trade Attributes* file.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

8.5 Tranche Overrides

This file provides the overrides for SA DRC Sec non-CTP tranche descriptions.

This Tranche Overrides file type is identified using the pattern: ****/Tranche_Overrides*.csv** (as specified by `drc.tranche.overrides.file-pattern`). This file is loaded using the **TrancheOverrides** topic.

Field	Key	Null	FieldType	Description	Example
Tranche	Y	N	String	The name of the tranche to override. Matches the "Underlying" column in the *DRC Trade Level* file	
RiskClass	Y	N	String	Set to "DRC Sec non-CTP".	"DRC Sec non-CTP"
Parameter Set	Y	N	String	The parameter set for which the override applies.	CRR2
Bucket	N	Y	String	Tranche Bucket [MAR22.31].	
Seniority	N	Y	String	Seniority of the exposure. This is "senior" or not for calculating the SEC-ERBA risk-weights. Replaces the Seniority in the *DRC Trade Level* file.	senior
Rating	N	Y	String	The rating used when looking up SEC-ERBA risk-weights. Replaces the Rating in the *DRC Trade Level* file.	

42

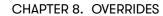| Field	Key	Null	FieldType	Description	Example
Rating type	N	Y	String	The rating type used when looking up SEC-ERBA risk-weights (and when applying flooring logic). Replaces the Rating Type in the *DRC Trade Level* file.	STC
Region	N	Y	String	Region for Bucket (MAR22.31(b)). Replaces the Region in the *DRC Trade Level* file.	
AssetClass	N	Y	String	Asset class for Bucket (MAR22.31(b)). Replaces the AssetClass in the *DRC Trade Level* file.	
Attachment	N	Y	Double	Attachment point (Decimal values are expected). Replaces the Attachment in the *DRC Trade Level* file.	
Detachment	N	Y	Double	Detachment point (Decimal values are expected). Replaces the Detachment in the *DRC Trade Level* file.	
Risk Weight	N	Y	Double	Override the risk-weight for this obligor, instead of looking up the risk-weight by rating. Replaces the Risk Weight in the *DRC Trade Level* file.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

8.6 Underlying Description Overrides

This file provides the overrides for SBM Underlying Descriptions.

This Underlying Description Overrides file type is identified using the pattern: ****/Underlying_Desc_Overrides*.csv** (as specified by `underlying-desc.overrides.file-pattern`). This file is loaded using the **UnderlyingDescriptionOverrides** topic.

Field	Key	Null	FieldType	Description	Example
Underlying	Y	N	String	The name of the underlying to override. Matches the "Underlying" column in the *Delta*, *Vega*, and *Curvature* files. • CSR non-Sec: Name of credit issuer. • CSR Sec CTP: The name underlying the securitisation. • CSR Sec non-CTP: Name of the asset pool and tranche. • Equity: Name of equity issuer. • Commodity: Name of Commodity.	
RiskClass	Y	N	String	Defines the risk class for the underlying.	"CSR non-Sec", "CSR Sec non-CTP", "CSR Sec CTP", "Equity", "Commodity"
Parameter Set	Y	N	String	The parameter set for which the override applies.	CRR2

Field	Key	Null	FieldType	Description	Example
Bucket	N	Y	String	Bucket number. Replaces the Bucket in the *Delta*, *Vega*, and *Curvature* files.	
CSRQuality	N	Y	String	CSR only The Issuer or Tranche credit quality. Replaces the CSRQuality in the *Delta*, *Vega*, and *Curvature* files.	IG, HY, NR
CSRSector	N	Y	String	CSR only The issuer or securitisation sector. Replaces the CSRSector in the *Delta*, *Vega*, and *Curvature* files.	For CSR non-Sec and CSR Sec CTP, example values: 'Sovereign', 'Financials', 'Tech' 'Covered Bonds', 'Other' For CSR Sec non-CTP, example values: 'RMBS-Prime', 'RMBS-Mid-Prime', 'RMBS-Sub-Prime', 'CMBS', 'ABS-Auto', 'Other'
CSRRating	N	Y	String	CSR non-Sec only Set to "high" for covered bonds with rating AA- or above; otherwise set to "low" or leave blank. Replaces the CSRRating in the *Delta*, *Vega*, and *Curvature* files.	"high", "low"
EquityMarketCap	N	Y	String	Equity only The equity issuer market cap. Replaces the EquityMarketCap in the *Delta*, *Vega*, and *Curvature* files.	'Large' , 'Small', 'Other'

Field	Key	Null	FieldType	Description	Example
EquityEconomy	N	Y	String	Equity only The equity issuer economy. Replaces the EquityEconomy in the *Delta*, *Vega*, and *Curvature* files.	'Emerging', 'Advanced', 'Other'
EquitySector	N	Y	String	Equity only The equity sector. Replaces the EquitySector in the *Delta*, *Vega*, and *Curvature* files.	Example values are: "CSG" "Telecommunications-Industrials" "Basic Materials" "Financials" "Other"
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

46

9 SBM Sensitivity-specific Files

The FRTB Accelerator uses the following SBM Sensitivity input files natively to load sensitivity information, in addition to the *SA DRC Trade Level* input file:

- *Curvature*
- *Delta*
- *Vega*

The native formats offer enhanced support and features such as multiple jurisdictions, and better reporting. However, you can use [CRIF](/input-files/crif.html) (Common Risk Interchange Format) as an alternative to the native sensitivity input files. CRIF input files should be created according to the standard ISDA CRIF. For details on how to become a licensed CRIF user, contact ISDA at analytics@isda.org.

9.1 Curvature

This file defines the Curvature shocked prices, including a description of the risk factor. Full details on each risk factor are explained in the relevant section of the **FRTB Interpretation and Implementation guide:**

- Commodity
- CSR non-Sec
- CSR Sec CTP
- CSR Sec non-CTP

- Equity
- FX
- GIRR

Field	Key	Null	FieldType	RiskClass	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'		Timestamp (at close of business) for the data.	
TradeId	Y	N	String		If coming from multiple systems may need to prepend source system to the id for uniqueness	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc.
RiskClass	Y	N	String		Defines the risk class that the delta data represents. For each risk class the string is the risk class name	"GIRR", "CSR non-Sec", "CSR Sec non-CTP", "CSR Sec CTP", "Equity", "Commodity", "FX"
RiskFactor	Y	Y	String		Risk factor name. It is expected that the risk factor name encompasses the definition of the risk factor per the FRTB specification ([MAR21.3] to [MAR21.14]). If not provided, it will be generated from the 'Underlying' column. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	

Field	Key	Null	FieldType	RiskClass	Description	Example
				GIRR	The currency and equals the bucket.	"USD", "EUR"
				CSR non-Sec	Name of issuer credit spread curve.	"APPLE", "GOOGLE"
				CSR Sec CTP	Name of issuer credit spread curve.	
				CSR Sec non-CTP	Name of issuer tranche.	
				Equity	Name of equity issuer.	
				Commodity	Name of Commodity.	"Brent", "WTI"
				FX	A currency pair (the exchange rate used in the calculation of the sensitivity). If omitted, it is generated from the underlying and FXCounterCurrency.	
Shift_Up_PV	N	N	Double		Valuation resulting from parallel shocks up	
Shift_Down_PV	N	N	Double		Valuation resulting from parallel shocks down	
CurvatureCcy	N	N	String		Currency of PV values	
RiskWeight	N	Y	Double		The risk weight used in the shifted PV values. If field is null, it is assumed to be the value expected in the calculations (at query time).	

Field	Key	Null	FieldType	RiskClass	Description	Example
PVApplied	N	N	String with set values		Boolean 'Y' or 'N' to indicate if PV has been removed from sensitivities or not. Default value = 'N'	
(unused)	N	Y	String		Field is ignored.	
GIRR Ccy	N	Y	String		GIRR only This is the currency of the curve and equals the bucket.	
Underlying	N	N	String		Represents the primary component of the risk factor. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	(Can be null) Not used in calculations, but will populate Underlying field in cube.	
				CSR non-Sec	Name of credit issuer.	"APPLE", "GOOGLE"
				CSR Sec CTP	The name underlying the securitisation.	
				CSR Sec non-CTP	Name of the asset pool and tranche.	
				Equity	Name of equity issuer.	
				Commodity	Name of Commodity.	"Brent", "WTI"

Field	Key	Null	FieldType	RiskClass	Description	Example
				FX	The left-hand side of the risk-factor currency pair.	
CSRQuality	N	Y	String		CSR only The Issuer or Tranche credit quality Values must match corresponding buckets file	IG, HY, NR
CSRSector	N	Y	String		CSR only The issuer or securitisation sector Values must match corresponding buckets file	For CSR non-Sec and CSR Sec CTP, example values: 'Sovereign','Financials','Tech' 'Covered Bonds', 'Other' For CSR Sec non-CTP, example values: 'RMBS-Prime', 'RMBS-Mid-Prime', 'RMBS-Sub-Prime', 'CMBS', 'ABS-Auto', 'Other'
(unused)	N	Y	String		Field is ignored.	
EquityEconomy	N	Y	String		Equity only The equity issuer economy. Values must match the equity buckets file.	'Emerging Market', 'Advanced Economy', 'Other'

Field	Key	Null	FieldType	RiskClass	Description	Example
EquityMarketCap	N	Y	String		Equity only The equity issuer market cap. Values must match the equity buckets file.	'Large' , 'Small', 'Other'
EquitySector	N	Y	String		Equity only Needed for Vega bucket Value can be anything but must match the buckets file	Example values are "CSG" "Telecommunications-Industrials" "Basic Materials" "Financials" "Other"
CmtyLocation	N	Y	String		Commodity only Commodity delivery location	"Le Havre", "Oklahoma"
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
FXCounterCurrency	N	Y	String		FX only. The counter currency of the risk-factor currency pair. This should be set to the "reporting currency" or the "base currency" if the base currency approach is being used.	

Field	Key	Null	FieldType	RiskClass	Description	Example
FXDividerEligibity	N	Y	String		FX only Y/N flag indicating whether the divider specified in [MAR21.98] can be applied. • Y: The trade does not reference the "reporting currency" (or "base currency" if the base currency approach is being used). • N: The trade references the "reporting currency" (or "base currency" if the base currency approach is being used).	
CSRRating	N	Y	String		CSR non-Sec only Set to "high" for covered bonds (bucket 8) with rating AA- or above; otherwise set to "low" or leave blank	"high", "low"
Bucket	N	Y	String		Bucket for underlying.	

Field	Key	Null	FieldType	RiskClass	Description	Example
PresentValue	N	Y	Double		The (unshocked) Present Value of the instrument. This is an optional override for the 'PresentValue' in the Trade Attributes file. *Note:* the use of PresentValue in the Trade Attributes for Curvature is deprecated.	

9.1.1 Normalization

The contents of this file are normalized and loaded into four stores during the ETL. For each row:

- A description of the "underlying" is generated and added to the **UnderlyingDescription** store. This description is shared with Delta and Vega.
- A description of the risk-factor is generated and added to the **RiskFactorDescription** store.
- The sensitivities are added to the **Curvature** store.
- A row is added to the **TradeBase** store, to insert a new fact into the cube.

9.1.2 Filling missing data

When the bucket field is omitted, it is filled from the Commodity, CSR, and Equities bucket files (as appropriate). To take advantage of this, the bucket files must be loaded before (or at the same time as) the Curvature file.

When the bucket field is provided, some of the fields describing the underlying become optional. For CSR and Equities, these fields can be populated from previously loaded bucket description files.

Risk Class	Optional Fields When Bucket Provided	Bucket File	Bucket Description File
CSR non-Sec	CSRQuality, CSRSector	*CSR non-Sec Buckets*	*CSR non-Sec Bucket Descriptions*
CSR Sec non-CTP	CSRQuality, CSRSector	*CSR Sec non-CTP Buckets*	*CSR Sec non-CTP Bucket Descriptions*
CSR Sec CTP	CSRQuality, CSRSector	*CSR Sec CTP Buckets*	*CSR Sec CTP Bucket Descriptions*
Equity	EquityEconomy, EquityMarketCap, EquitySector	*Equity Buckets*	*Equity Bucket Descriptions*
Commodity		*Commodity Buckets*	

Note: The bucket is not sufficient to populate the CSRRating field for CSR non-Sec.

9.2 Delta

This file defines the Delta sensitivities, including a description of the risk factor. Full details on each risk factor are explained in the relevant section of the **FRTB Interpretation and Implementation guide:**

- Commodity
- CSR non-Sec
- CSR Sec CTP
- CSR Sec non-CTP
- Equity
- FX
- GIRR

Field	Key	Null	FieldType	RiskClass	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'		Timestamp (at close of business) for the data.	
TradeId	Y	N	String		If coming from multiple systems may need to prepend source system to the id for uniqueness	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc.
DeltaCcy	N	N	String		Currency of the Delta sensitivities provided	
DeltaSensitivities	N	N	Double Array or Double, separated by semicolons		Single value or vector of delta sensitivities.	
				GIRR	Vector	
				Commodity	Vector	
				CSR non-Sec	Vector	
				CSR Sec CTP	Vector	
				CSR Sec non-CTP	Vector	
				Equity	Single value	
				FX	Single value	

Field	Key	Null	FieldType	RiskClass	Description	Example
RiskClass	Y	N	String		Defines the risk class that the delta data represents. For each risk class the string is the risk class name	"GIRR", "CSR non-Sec", "CSR Sec non-CTP", "CSR Sec CTP", "Equity", "Commodity", "FX"
SensitivityDates	N	Y	String Array or String with set format, separated by semicolons		GIRR, CSR, and Commodities only Vector of dates that correspond to the Delta sensitivities. If dates are not provided, Delta Sensitivities are assumed to map to prescribed vertices. The following do not use dates: FX and Equity sensitivites; GIRR cross-currency basis and inflation curves.	GIRR and Commodity: "0.25;0.5;1;2;3;5;10;15;20" CSR: "0.5;1;3;5;10"

Field	Key	Null	FieldType	RiskClass	Description	Example
RiskFactor	Y	Y	String		Risk factor name. It is expected that the risk factor name encompasses the definition of the risk factor per the FRTB specification ([MAR21.3] to [MAR21.14]), up to the sensitivity dates; this name is shared by all sensitivity dates. If not provided, it will be generated from the 'Underlying' column. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	Name of underlying curve (e.g. UsdLibor3m). If not provided, then it is copied from Underlying.	
				CSR non-Sec	Name of issuer credit spread curve plus basis (Bond or CDS). If not provided, then it is calculated as (Underlying + Type).	"APPLE BOND", "GOOGLE CDS"
				CSR Sec CTP	Name of issuer credit spread curve plus basis (Bond or CDS). If not provided, then it is calculated as (Underlying + Type).	

58

Field	Key	Null	FieldType	RiskClass	Description	Example
				CSR Sec non-CTP	Name of issuer tranche, credit spread curve. If not provided, then it is calculated as (Underlying + Type).	
				Equity	Name of equity plus type (spot or repo). If not provided, then it is calculated as (Underlying + Type).	"IBM SPOT"
				Commodity	Unique commodity name should include commodity name and delivery location. If not provided, then it is calculated as (Underlying + Location).	"Brent Le Havre", "WTI Oklahoma"
				FX	A currency pair (the exchange rate used in the calculation of the sensitivity). If omitted, it is generated from the underlying and FXCounterCurrency.	
Type	N	Y	String		Type of underlying risk factor or GIRR curve. Needed for some risk classes. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	Defines type of underlying curve.	"Yield", "Basis", "Inflation"

Field	Key	Null	FieldType	RiskClass	Description	Example
				CSR non-Sec	Defines basis of CSR.	"BOND", "CDS"
				CSR Sec CTP	Defines basis of CSR.	
				CSR Sec non-CTP	Defines basis of CSR Equity.	
				Equity	Equity type.	"Spot" or "Repo"
GIRR Ccy	N	Y	String		GIRR only This is the currency of the curve and equals the bucket.	
Underlying	N	N	String		Represents the primary component of the risk factor. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	Name of curve.	
				CSR non-Sec	Name of credit issuer.	"APPLE", "GOOGLE"
				CSR Sec CTP	The name underlying the securitisation.	
				CSR Sec non-CTP	Name of the asset pool and tranche.	
				Equity	Name of equity issuer.	
				Commodity	Name of Commodity.	"Brent", "WTI"
				FX	The left-hand side of the risk-factor currency pair.	

Field	Key	Null	FieldType	RiskClass	Description	Example
CSRQuality	N	Y	String		CSR only The Issuer or Tranche credit quality Values must match corresponding buckets file	IG, HY, NR
CSRSector	N	Y	String		CSR only The issuer or securitisation sector Values must match corresponding buckets file	For CSR non-Sec and CSR Sec CTP, example values: 'Sovereign', 'Financials', 'Tech' 'Covered Bonds', 'Other' For CSR Sec non-CTP, example values: 'RMBS-Prime', 'RMBS-Mid-Prime', 'RMBS-Sub-Prime', 'CMBS', 'ABS-Auto', 'Other'
(unused)	N	Y	String		Field is ignored.	
EquityEconomy	N	Y	String		Equity only The equity issuer economy. Values must match the equity buckets file.	'Emerging Market', 'Advanced Economy', 'Other'

Field	Key	Null	FieldType	RiskClass	Description	Example
EquityMarketCap	N	Y	String		Equity only The equity issuer market cap. Values must match the equity buckets file.	'Large' , 'Small', 'Other'
EquitySector	N	Y	String		Equity only Needed for Vega bucket Value can be anything but must match the buckets file	Example values are: "CSG" "Telecommunications-Industrials" "Basic Materials" "Financials" "Other"
CmtyLocation	N	Y	String		Commodity only Commodity delivery location	"Le Havre", "Oklahoma"
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
FXCounterCurrency	N	Y	String		FX only. The counter currency of the risk-factor currency pair. This should be set to the "reporting currency" or the "base currency" if the base currency approach is being used.	

Field	Key	Null	FieldType	RiskClass	Description	Example
Optionality	N	Y	'Y' or 'N'		(Optional) Indicates whether the instrument has optionality (See BCBS 457 [MAR21.2]). • 'Y' for instruments with optionality (and hence with Vega and Curvature risk) • 'N' for trades without optionality (with no Vega and Curvature risk).	
CSRRating	N	Y	String		CSR non-Sec only Set to "high" for covered bonds (bucket 8) with rating AA- or above; otherwise set to "low" or leave blank	"high", "low"
FxComplexDelta	N	Y	String		FX only Set to "N" to enable automatic translations of the sensitivities for different reporting currencies. Otherwise set to "Y" or leave blank to turn off such translations.	

Field	Key	Null	FieldType	RiskClass	Description	Example
FxOtherCcy	N	Y	String		FX only If the sensitivity to a currency pair has been split prior to entering the ActiveViam FRTB solution, this field can be used to add the other half of the pair.	
FXDividerEligibility	N	Y	String		FX only Y/N flag indicating whether the divider specified in [MAR21.98] can be applied. • Y: The trade does not reference the "reporting currency" (or "base currency" if the base currency approach is being used). • N: The trade references the "reporting currency" (or "base currency" if the base currency approach is being used).	
Bucket	N	Y	String		Bucket for underlying.	

9.2.1 Normalization

The contents of this file are normalized and loaded into four stores during the ETL. For each row:

- A description of the "underlying" is generated and added to the **UnderlyingDescription** store. This description is shared with Vega and Curvature.
- A description of the risk-factor is generated and added to the **RiskFactorDescription** store.
- The sensitivities are added to the **Delta** store.
- A row is added to the **TradeBase** store, to insert a new fact into the cube.

9.2.2 Filling missing data

When the bucket field is omitted, it is filled from the Commodity, CSR, and Equities bucket files (as appropriate). To take advantage of this, the bucket files must be loaded before (or at the same time as) the Delta file.

When the bucket field is provided, some of the fields describing the underlying become optional. For CSR and Equities, these fields can be populated from previously loaded bucket description files.

Risk Class	Optional Fields When Bucket Provided	Bucket File	Bucket Description File
CSR non-Sec	CSRQuality, CSRSector	*CSR non-Sec Buckets*	*CSR non-Sec Bucket Descriptions*
CSR Sec non-CTP	CSRQuality, CSRSector	*CSR Sec non-CTP Buckets*	*CSR Sec non-CTP Bucket Descriptions*
CSR Sec CTP	CSRQuality, CSRSector	*CSR Sec CTP Buckets*	*CSR Sec CTP Bucket Descriptions*
Equity	EquityEconomy, EquityMarketCap, EquitySector	*Equity Buckets*	*Equity Bucket Descriptions*
Commodity		*Commodity Buckets*	

Note: The bucket is not sufficient to populate the CSRRating field for CSR non-Sec.

9.3 Vega

This file defines the Vega sensitivities, including a description of the risk factor. Full details on each risk factor are explained in the relevant section of the **FRTB Interpretation and Implementation guide:**

- Commodity
- CSR non-Sec
- CSR Sec CTP
- CSR Sec non-CTP
- Equity
- FX
- GIRR

Field	Key	Null	FieldType	RiskClass	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'		Timestamp (at close of business) for the data.	
TradeId	Y	N	String		If coming from multiple systems may need to prepend source system to the id for uniqueness	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc.

Field	Key	Null	FieldType	RiskClass	Description	Example
RiskClass	Y	N	String		Defines the risk class that the delta data represents. For each risk class the string is the risk class name	"GIRR", "CSR non-Sec", "CSR Sec non-CTP", "CSR Sec CTP", "Equity", "Commodity", "FX"
OptionMaturity	N	Y	String Array, separated by semicolons		Vega sensitivities are mapped to the vertex of maturity (expiry) dates of the options. If dates are not provided, the Vega sensitivities are assumed to map to prescribed vertices.	"0.5;1;3;5;10", "6M;1Y"
UnderlyingMaturity	N	Y	String Array, separated by semicolons		Valid for GIRR Only. Represents the residual maturity of the underlying of the option. Vega sensitivity is further mapped to the vertices of underlying points along the risk free curve. If dates are not provided, the Vega sensitivities are assumed to map to prescribed vertices.	"0.5;1;3;5;10"

Field	Key	Null	FieldType	RiskClass	Description	Example
VegaSensitivities	N	N	Double Array, separated by semicolons		Sensitivity values For all risk classes, if OptionMaturity is empty the sensitivities must map exactly to the sensitivity dates specified in the FRTB specification (5 values) or 5 (values) x (5 values) for GIRR. For GIRR, this is a 2-dimensional array where the first few values represent the underlying residual maturities for the first option maturity date	
VegaCcy	N	N	String		Currency of the Vega sensitivities	
RiskFactor	Y	Y	String		Risk factor name. It is expected that the risk factor name encompasses the definition of the risk factor per the FRTB specification ([MAR21.3] to [MAR21.14]), up to the maturities; this name is shared by all maturities. If not provided, it will be generated from the 'Underlying' column. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	

Field	Key	Null	FieldType	RiskClass	Description	Example
				GIRR	Name of underlying curve (e.g. UsdLibor3m).	
				CSR non-Sec	Name of issuer credit spread curve plus basis (Bond or CDS). If not provided, then it is calculated as (Underlying + Type).	"APPLE BOND", "GOOGLE CDS"
				CSR Sec CTP	Name of issuer credit spread curve plus basis (Bond or CDS). If not provided, then it is calculated as (Underlying + Type).	
				CSR Sec non-CTP	Name of issuer tranche, credit spread curve. If not provided, then it is calculated as (Underlying + Type).	
				Equity	Name of equity issuer. If not provided, then it is copied from Underlying.	
				Commodity	Unique commodity name should include commodity name and delivery location. If not provided, then it is calculated as (Underlying + Location).	"Brent Le Havre", "WTI Oklahoma"
				FX	A currency pair (the exchange rate used in the calculation of the sensitivity). If omitted, it is generated from the underlying.	

Field	Key	Null	FieldType	RiskClass	Description	Example
Type	N	Y	String		CSR risk-factor type, or GIRR curve type. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	Type of underlying GIRR curve.	
				CSR non-Sec	Defines basis of CSR.	"BOND", "CDS"
				CSR Sec CTP	Defines basis of CSR.	
				CSR Sec non-CTP	Defines basis of CSR.	
GIRR Ccy	N	Y	String		GIRR only This is the currency of the curve and equals the bucket.	
Underlying	N	N	String		Represents the primary component of the risk factor. For details on each risk factor, see the relevant section in the *FRTB Interpretation and Implementation guide*.	
				GIRR	Name of curve (may be the same as risk factor).	
				CSR non-Sec	Name of credit issuer.	"APPLE", "GOOGLE"

Field	Key	Null	FieldType	RiskClass	Description	Example
				CSR Sec CTP	The name underlying the securitisation.	
				CSR Sec non-CTP	Name of the asset pool and tranche.	
				Equity	Name of equity issuer.	
				Commodity	Name of Commodity.	"Brent", "WTI"
				FX	The risk-factor currency pair.	
CSRQuality	N	Y	String		CSR only The Issuer or Tranche credit quality Values must match corresponding buckets file	IG, HY, NR

Field	Key	Null	FieldType	RiskClass	Description	Example
CSRSector	N	Y	String		CSR only The issuer or securitisation sector Values must match corresponding buckets file	For CSR non-Sec and CSR Sec CTP, example values: 'Sovereign', 'Financials', 'Tech' 'Covered Bonds', 'Other' For CSR Sec non-CTP, example values: 'RMBS-Prime', 'RMBS-Mid-Prime', 'RMBS-Sub-Prime', 'CMBS', 'ABS-Auto', 'Other'
(unused)	N	Y	String		Field is ignored.	
EquityEconomy	N	Y	String		Equity only The equity issuer economy. Values must match the equity buckets file.	'Emerging Market', 'Advanced Economy', 'Other'
EquityMarketCap	N	Y	String		Equity only The equity issuer market cap. Values must match the equity buckets file.	'Large' , 'Small', 'Other'

Field	Key	Null	FieldType	RiskClass	Description	Example
EquitySector	N	Y	String		Equity only Valid for Equity only - needed for Vega bucket Value can be anything but must match the buckets file	Example values are "CSG" "Telecommunications-Industrials" "Basic Materials" "Financials" "Other"
CmtyLocation	N	Y	String		Commodity only Commodity delivery location	"Le Havre", "Oklahoma"
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
(unused)	N	Y	String		Field is ignored.	
FXCounterCurrency	N	Y	String		Field is ignored.	
Bucket	N	Y	String		Bucket for underlying.	

9.3.1 Normalization

The contents of this file are normalized and loaded into four stores during the ETL. For each row:

- A description of the "underlying" is generated and added to the **UnderlyingDescription** store. This description is shared with Delta and Curvature.
- A description of the risk-factor is generated and added to the **RiskFactorDescription** store.
- The sensitivities are added to the **Vega** store.

- A row is added to the **TradeBase** store, to insert a new fact into the cube.

9.3.2 Filling missing data

When the bucket field is omitted, it is filled from the Commodity, CSR, and Equities bucket files (as appropriate). To take advantage of this, the bucket files must be loaded before (or at the same time as) the Vega file.

When the bucket field is provided, some of the fields describing the underlying become optional. For CSR and Equities, these fields can be populated from previously loaded bucket description files.

Risk Class	Optional Fields When Bucket Provided	Bucket File	Bucket Description File
CSR non-Sec	CSRQuality, CSRSector	*CSR non-Sec Buckets*	*CSR non-Sec Bucket Descriptions*
CSR Sec non-CTP	CSRQuality, CSRSector	*CSR Sec non-CTP Buckets*	*CSR Sec non-CTP Bucket Descriptions*
CSR Sec CTP	CSRQuality, CSRSector	*CSR Sec CTP Buckets*	*CSR Sec CTP Bucket Descriptions*
Equity	EquityEconomy, EquityMarketCap, EquitySector	*Equity Buckets*	*Equity Bucket Descriptions*
Commodity		*Commodity Buckets*	

10 IMA Input Files

This section describes the input file formats used for the Internal Models Approach.

- *Capital Charge Calculation Input Files*
- *P&L Attribution Tests and Backtesting File Formats*

11 Capital Charge Calculation Input Files

- *DRC Input Files*
- *IMCC and SES Input Files*

12 DRC Input Files

- *DRC Non Linear Recovery Trade*
- *DRC Scenario Count*
- *DRC Scenarios*
- *DRC Summary (IMA)*
- *DRC Trade Level (IMA)*

12.1 DRC Non Linear Recovery Trade

This file contains the P&L values of trades and DRC risk-factors for different scenarios.

This DRC Non Linear Recovery Trade file type is identified using the pattern: ****/DRC_NonLinear_Recovery_*.csv** (as specified by `drc.non-linear.recovery.file-pattern`). This file is loaded using the **DRC_NONLINEAR_RECOVERY** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	
TradeId	Y	N	String	Trade Identifier	

Field	Key	Null	FieldType	Description	Example
ObligorId	Y	Y	String	Identifier of the Obligor	
Seniority	Y	Y	String	Indication of the Seniority level the recovery rate applies to. This will be used to look up the Recovery rate in the DRC scenario file.	
Ccy	N	N	String	The currency of the P&L values	
ScenarioIds	N	N	Vector of Integers	List of Scenario ids which include the trade as defaulting. Scenarios are numbered from 1 to the scenario count (inclusive).	
PnL	N	N	Vector of Double	The P&L values corresponding to the Scenario ids. The first entry corresponds to scenario id 1.	

12.2 DRC Scenario Count

This file contains a single entry which is the number of IMA DRC scenarios for the date

This DRC Scenario Count file type is identified using the pattern: ****/DRC_SCENARIO_COUNT*.csv** (as specified by `drc.scenario.count.file-pattern`). This file is loaded using the **DRC_SCENARIO_COUNT** topic.

Field	Key	Null	FieldType	Description	Example
Count	N	N	Integer	The number of scenarios. Scenarios are numbered from 1 to this count (inclusive).	

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

12.3 DRC Scenarios

This file describes the recovery rates for DRC risk-factors and trades using a linear recovery approach.

This DRC Scenarios file type is identified using the pattern: ****/DRC_LINEAR_SCENARIOS*.csv** (as specified by `drc.linear.scenarios.file-pattern`). This file is loaded using the **DRCScenarios** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	
ScenarioId	Y	N	Integer	The numerical id of the scenario. Scenarios are numbered from 1 to the scenario count (inclusive).	
ObligorId	Y	N	String	The identifier of the Obligor, which will match the obligor in the trade file.	
Seniority	Y	N	String	An indication of the Seniority level of the obligor that the recovery rates are applicable for.	

Field	Key	Null	FieldType	Description	Example
ScenarioRecoveryRate	N	N	Double	A value between 0 and 1 representing the amount of the Notional recovered from the defaulted Obligor in the given scenario.	
DefaultDate	N	N	Date 'YYYY-MM-DD'	Default date for the scenario.	

12.4 DRC Summary (IMA)

This file contains the historical summary data for the IMA DRC calculations. This is the IMA DRC P&L vectors at the book and legal entity level.

This DRC Summary (IMA) file type is identified using the pattern: ****/IMA_DRC_Summary*.csv** (as specified by `ima.drc.summary.file-pattern`). This file is loaded using the **DRCIMASummaryBase** topic.

Field	Key	Null	FieldType	Description	Example
Book	Y	N	String	Book Identifier	Book A
Legal Entity	Y	N	String	Legal Entity Identifier	ActiveBank UK
Currency	N	N	String	The currency of the P&L values	USD
Scenario Ids	N	Y	Vector of Integer	In case of sparse vector representation this shows the list of non-null values. The first element is 1.	1;4;825

Field	Key	Null	FieldType	Description	Example
PnL	N	N	Vector of Double	The P&L values. If the previous field is not null, the representation is sparse and the values are set at the pre-defined position ids (starting from 1). Or else it's a simple standard double vector.	-9381655.00; -3289452.15; -3410423.25
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	2020-06-05

12.5 DRC Trade Level (IMA)

This file describes the recovery rates for the IMA DRC trades using a linear approach.

This DRC Trade Level (IMA) file type is identified using the pattern: ****/DRC_Trade_*.csv** (as specified by `drc.trade.file-pattern`). This file is loaded using the **DRC** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	2018-06-29
TradeId	Y	N	String	If coming from multiple systems may need to prepend source system to the id for uniqueness	"IR_IRSWAP_LIBOR3M", "EQ_12345677", etc.
RiskClass			String	Applicable to SA only Not used for IMA	

Field	Key	Null	FieldType	Description	Example
ObligorId	Y	N	String	ID of the Obligor. For IMA, must match ObligorId in DRC Scenarios file.	
ObligorCategory			String	Applicable to SA only Not used for IMA.	
InstrumentType			String	Applicable to SA only Not used for IMA	
Seniority	N	N	String	Seniority of the exposure. For IMA, must match Seniority in DRC Scenarios file.	Senior
Direction			String	Applicable to SA only Not used for IMA	
Maturity	N	Y	String	Maturity of the trade	"1D", "2W", "12M", "1Y", or date "YYYY-MM-DD"
Rating			String	Applicable to SA only Not used for IMA	
Notional			Double	Applicable to SA only Not used for IMA	
MarketValue			Double	Applicable to SA only Not used for IMA	
GrossJTD			String	Applicable to SA only Not used for IMA	
Ccy	N	N	String	Currency code for 'RecoveryValues'.	USD
Tranche			String	Applicable to SA only Not used for IMA	
Region			String	Applicable to SA only Not used for IMA	
AssetClass			String	Applicable to SA only Not used for IMA	
Attachment			Double	Applicable to SA only Not used for IMA	
Detachment			Double	Applicable to SA only Not used for IMA	

Field	Key	Null	FieldType	Description	Example
RecoveryRates	N	N	Vector of doubles	Recovery Rate for the Obligor in the given scenario. Note: If linear scenarios approach is used, then this field must contain a vector of generic recovery rates (for example, 0;0.5;1) for linear interpolation of simulated PL (see RecoveryValues field) based on simulated recovery rates (see linear scenarios file).	
RecoveryValues	N	N	Vector of doubles	Recovery Values corresponding to the Recovery Rate. Note: If linear scenarios approach is used, then this field must contain a vector of jump-to-recovery values, corresponding to the RecoveryRates vector.	
Type	N	N	String	DRC Sec non-CTP Rating Type, DRC Sec CTP Rating Type; Rating type: STC / non-STC STC stands for Simple Transparent Comparable	STC
RiskWeight	N	N	Double	Applicable to SA only Not used for IMA	
Adjustment	N	N	Double	Applicable to SA only Not used for IMA	
Bucket	N	N	String	Applicable to SA only Not used for IMA	
Zero Risk Weight	N	N	String	Applicable to SA only Not used for IMA	

This file is also used in the SA, see *DRC trade level (SA)*

13 IMCC and SES Input Files

- *Expected Shortfall PL Trade*
- *IMA PL Scenarios*
- *IMA Summary*
- *Multiplier*
- *Risk Factors*

13.1 Expected Shortfall PL Trade

This file contains input fields for various risk scenarios, liquidity horizons and risk classes, used to calculate the Expected shortfall.

For summary data used to calculate the historical averages, see *IMA Summary*.

This Expected Shortfall PL Trade file type is identified using the pattern: ****/IMA_*_Trades*.csv** (as specified by `ima.trades.file-pattern`). This file is loaded using the **IMA_Trades** topic.

Field	Key	Null	FieldType	Description	Example
DataSet	Y	Y	String	The data set to which the entry belongs. The following different values are possible: • "Full Set Current": data for the last 12 months • "Reduced Set Stressed": data with the reduced set of risk factors for the 12-month stress period • "Reduced Set Current": data with the reduced set of risk factors for the last 12 months Note: For non-modellable risk-factors, this value should be blank.	
TradeId	Y	N	String	The trade Id	
RiskFactor	Y	Y	String	The risk factor Note: This is required for non-modellable risk-factors, but may be blank for modellable risk-factors.	

Field	Key	Null	FieldType	Description	Example
RiskClass	Y	N	String	The risk class, which will be one of the following: • GIRR • CSR • Equity • Commodity • FX • allin Note: For non-modellable, non-idiosyncratic risk-factors, this value should be blank.	
LiquidityHorizon	Y	Y	Integer	The Liquidity Horizon in days: 10, 20, 40, 60, or 120 Note: For non-modellable risk-factors, this value should be blank (though it may be set to 10 without causing any problems). The ETL will ensure that there are no gaps in the liquidity horizon. If there is a gap in the file, the ETL will copy the liquidity horizon from the next highest P&L vector. For example, if a liquidity horizon of 40 is supplied, but 20 and 10 are not included, then the gap-filling will copy the P&L vector from the liquidity horizon of 40 to 20 and 10.	

Field	Key	Null	FieldType	Description	Example
Currency	N	N	String	The currency in which the PnL vector is expressed.	
PnL	N	N	Double	The PnL vector for 12 months' worth of data - there is one value per day, which needs to be computed for a liquidity horizon of 10 days in the risk engine - the values are separated by a semi-colon. This is effectively an extra PnL vector Liquidity Horizon column to use as the reference into the new PnL Vector store. This new column will be copied from the existing Liquidity Horizon column for lines in the input files where PnL vectors exist. Then once the file is loaded (or transaction complete), a second pass will fill in the gaps by adding facts with missing Liquidity Horizons and existing PnL vectors. The advantage gained from this is that 'Liquidity Horizon gaps' do not need to be filled any more.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

13.2 IMA PL Scenarios

This file contains input fields indicating the various PL scenarios corresponding to the Expected Shortfall PL Trade Input file.

This IMA PL Scenarios file type is identified using the pattern: ****/IMA_Scenarios*.csv** (as specified by `ima.scenarios.file-pattern`). This file is loaded using the **Scenarios** topic.

Field	Key	Null	FieldType	Description	Example
DataSet	Y	N	String	Exactly the same as for 'Dataset' as defined for the TradeInputs file.	
Index	N	N	Integer	The index in the vector representing the PnL - the first element has index 0.	
Scenario	Y	N	String	The string representing the scenario corresponding to the index - for this reason, it is expected that the value of 'Scenario' should be distinct for each line in the input file.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

13.3 IMA Summary

This file contains input fields for various risk scenarios, liquidity horizons and risk classes, used to calculate the Expected shortfall.

This file is similar to the *Expected Shortfall PL Trade* file, but with these differences:

- Loaded into the IMA Summary cube
- Does not contain trade-level data
- Intended for the historical averages

This IMA Summary file type is identified using the pattern: ****/IMA_Summary*.csv** (as specified by `ima.summary.file-pattern`). This file is loaded using the **IMA_Summary** topic.

Field	Key	Null	FieldType	Description	Example
DataSet	Y	Y	String	The data set to which the entry belongs. The following different values are possible: • "Full Set Current": data for the last 12 months • "Reduced Set Stressed": data with the reduced set of risk factors for the 12-month stress period • "Reduced Set Current": data with the reduced set of risk factors for the last 12 months Note: For non-modellable risk-factors, this value should be blank.	
Book	Y	N	String	The book Id	
LegalEntity	Y	N	String	The legal entity Id	

Field	Key	Null	FieldType	Description	Example
RiskFactor	Y	Y	String	The risk factor Note: This is required for non-modellable risk-factors, but may be blank for modellable risk-factors.	
RiskClass	Y	N	String	The risk class, which will be one of the following: • GIRR • CSR • Equity • Commodity • FX • allin Note: For non-modellable, non-idiosyncratic risk-factors, this value should be blank.	

91

Field	Key	Null	FieldType	Description	Example
LiquidityHorizon	Y	Y	Integer	The Liquidity Horizon in days: 10, 20, 40, 60, or 120 Note: For non-modellable risk-factors, this value should be blank (though it may be set to 10 without causing any problems). The ETL will ensure that there are no gaps in the liquidity horizon. If there is a gap in the file, the ETL will copy the liquidity horizon from the next highest P&L vector. For example, if a liquidity horizon of 40 is supplied, but 20 and 10 are not included, then the gap-filling will copy the P&L vector from the liquidity horizon of 40 to 20 and 10.	
Currency	N	N	String	The currency in which the PnL vector is expressed.	

Field	Key	Null	FieldType	Description	Example
PnL	N	N	Double	The PnL vector for 12 months' worth of data - there is one value per day, which needs to be computed for a liquidity horizon of 10 days in the risk engine - the values are separated by a semi-colon. This is effectively an extra PnL vector Liquidity Horizon column to use as the reference into the new PnL Vector store. This new column will be copied from the existing Liquidity Horizon column for lines in the input files where PnL vectors exist. Then once the file is loaded (or transaction complete), a second pass will fill in the gaps by adding facts with missing Liquidity Horizons and existing PnL vectors. The advantage gained from this is that 'Liquidity Horizon gaps' do not need to be filled any more.	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

13.4 Multiplier

Backtesting dependent multiplier (see [MAR32.9]).

This Multiplier file type is identified using the pattern: ****/Multiplier.csv** (as specified by `multiplier.file-pattern`). This file is loaded using the **IMAMultiplier** topic.

Field	Key	Null	FieldType	Description	Example
NumExceptions	Y	N	Integer	The number of exceptions encountered in the backtesting of the bank's daily VaR.	
Multiplier	N	N	Double	The multiplier used in the calculation of the aggregated charge associated with approved desks (see [MAR33.41] and [MAR33.42]).	
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

13.5 Risk Factors

This file describes the IMA risk-factors.

This Risk Factors file type is identified using the pattern: ****/IMARiskFactors*.csv** (as specified by `ima.risk-factors.file-pattern`). This file is loaded using the **IMARiskFactors** topic.

Field	Key	Null	FieldType	Description	Example
RiskFactor	Y	Y	String	The risk factor – the values must be the same as in the 'RiskFactor' field of the Expected Shortfall PL file. It is optional for modellable risk-factors and required for non-modellable risk-factors.	
RiskClass	Y	N	String	The risk class, which will be one of the following: • GIRR, • CSR, • Equity, • Commodity, • FX, • allin Note: For non-modellable, non-idiosyncratic trades, this value should be blank.	
NMRF	N	Y	'Y' or 'N'	NMRF stands for 'Non-Modellable Risk Factor' – it is a flag set to 'N' for modellable risk factors and 'Y' for non-modellable risk factors.	
Idiosyncratic	N	Y	'Y' or 'N'	Indicates whether or not the Non Modellable Risk Factor is Idiosyncratic	
(unused)	N	Y		Field is ignored.	

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	Timestamp (at close of business) for the data.	

13.5.1 IMARiskFactorsHistorical Topic

The IMARiskFactorsHistorical topic has the same file format as IMARiskFactors.csv. The difference is the file location.

- When loading the IMARiskFactors topic, the as-of date is provided in the scope and the file will be loaded from the corresponding directory.
- When loading the IMARiskFactorsHistorical topic, no as-of date is provided in the scope and all IMARiskFactors.csv files from the historical directory are loaded.

Modellable risk-factors do not need to be listed in this file. However, non-modellable risk-factors need to have the NMRF flag set.

14 P&L Attribution Tests and Backtesting File Formats

The following three subsections describe the content of the input files for the PL Summary Cube (a single input file called the PL Summary file) and the PL Granular Cube (two input files called the PL VaR Vector file and the PL VaR Scenario file). Each sub-section provides descriptions of the formats of the required input files.

- *PL Summary*
- *PL Summary Scenarios*
- *PL VaR Scenario*
- *PL VaR Vector*

14.1 PL Summary

The desk-level P&L and VaR values. The P&L values represent the EOD valuations. The VaR values are the prediction for the next day.

This PL Summary file type is identified using the pattern: ****/PL_Summary*.csv** (as specified by `pl.summary.file-pattern`). This file is loaded using the **PLSummary** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	The as-of date (T-1). Timestamp (at close of business) for the data	
Book	Y	N	String	The Book	
Legal Entity	Y	N	String	The Legal Entity	
Ccy	Y	N	String	The currency of P&L and VaR values	
Actual PL	N	N	Double	The Actual P&L value	
Hypothetical PL	N	N	Double	The Hypothetical P&L value	
Theoretical PL	N	N	Double	The Risk-Theoretical P&L value	
PnL	N	N	Vector	VaR P&L Vector values	

14.2 PL Summary Scenarios

This file describes the scenarios in the P&L vector used in PL Summary Cube for the VaR backtesting

This PL Summary Scenarios file type is identified using the pattern: ****/PLSummary_Scenarios*.csv** (as specified by `pl.summary.scenarios.file-pattern`). This file is loaded using the **PLSummaryScenarios** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	The as-of date (T-1). Timestamp (at close of business) for the data.	

Field	Key	Null	FieldType	Description	Example
Index	N	N	Unsigned Integer	The index of the VaR scenario (within the VaR P&L vector)	
Scenario	Y	N	String	The name of the VaR scenario	

14.3 PL VaR Scenario

This file describes the scenarios in the P&L vector used in trade level PL Cube for the VaR backtesting.

This PL VaR Scenario file type is identified using the pattern: ****/PL_VaR_Scenario*.csv** (as specified by `pl.var.scenario.file-pattern`). This file is loaded using the **VaRPLScenarios** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date 'YYYY-MM-DD'	The as-of date (T-1). Timestamp (at close of business) for the data.	
Index	N	N	Unsigned Integer	The index of the VaR scenario (within the VaR P&L vector)	
Scenario	Y	N	String	The name of the VaR scenario	

14.4 PL VaR Vector

This file contains the trade-level P&L values used to calculate the VaR for backtesting.

This PL VaR Vector file type is identified using the pattern: ****/PL_VaR_Vector*.csv** (as specified by `pl.var.vector.file-pattern`). This file is loaded using the **IMAVaRPL** topic.

Field	Key	Null	FieldType	Description	Example
AsOfDate	Y	N	Date['YYYY-MM-DD']	The as-of date (T-1). Timestamp (at close of business) for the data.	
TradeId	Y	N	String	The Trade Id	
Ccy	N	N	String	The currency of VaR P&L Vector values.	
Actual PL	N	N	Double	The Actual P&L value	
Hypothetical PL	N	N	Double	The Hypothetical P&L value	
Theoretical PL	N	N	Double	The Risk-Theoretical P&L value	
PnL	N	N	Vector	VaR P&L Vector values	

100