DUSE3:

Leveraging XBRL reporting under a Solvency II regime for regulatory risk analytics for European Union Supervisors

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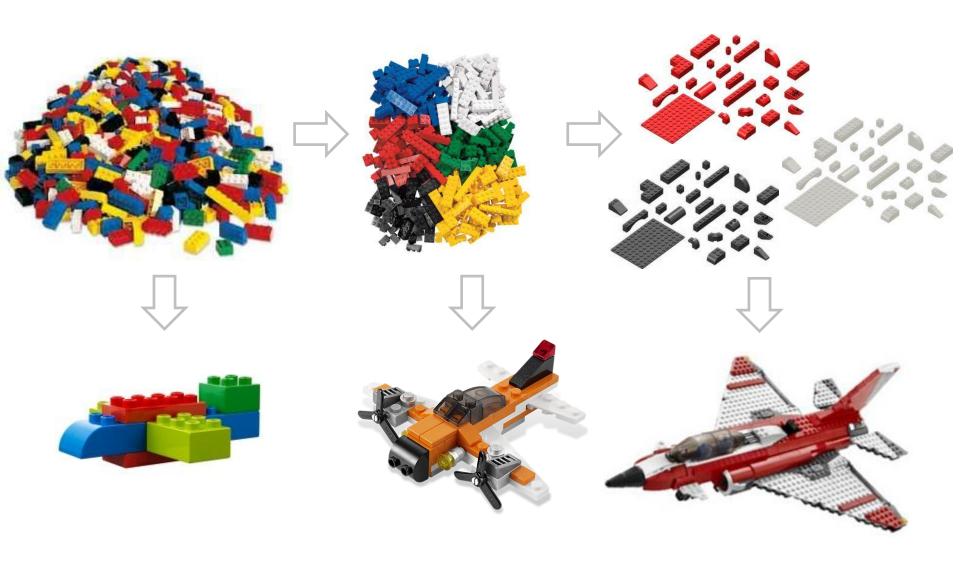
XBRL XXV

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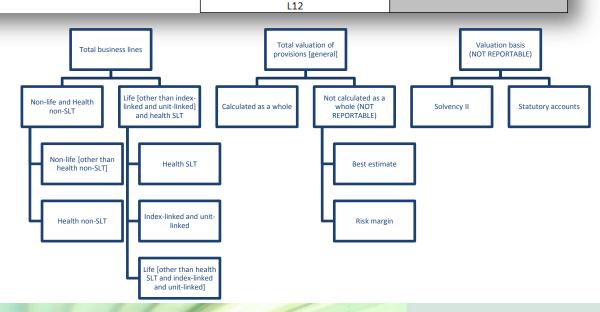
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Let's model a part of QRT template...

| _ | | |
|--|-------------------|--------------------------|
| Liabilities | Solvency II value | Statutory accounts value |
| Technical provisions, Non-life | | LS1A=LS1+LS4 |
| Technical provisions – non-life (excluding health) | L1=L1A+L2+L3 | LS1 |
| TP calculated as a whole | L1A | |
| Best Estimate | L2 | |
| Risk margin | L3 | |
| Technical provisions - health (similar to non-life) | L4=L4A+L5+L6 | LS4 |
| TP calculated as a whole | L4A | |
| Best Estimate | L5 | |
| Risk margin | L6 | |
| Technical provisions, Life, Excluding index-linked and unit-linked | | LS6F=LS6B+LS7 |
| Technical provisions - health (similar to life) | L6B=L6C+L6D+L6E | LS6B |
| TP calculated as a whole | L6C | |
| Best Estimate | L6D | |
| Risk margin | L6E | |
| Technical provisions – life (excluding health and index-linked and unit-linked | L7=L7A+L8+L9 | LS7 |
| TP calculated as a whole | L7A | |
| Best Estimate | L8 | |
| Risk margin | L9 | |
| Technical provisions – index-linked and unit-linked | L10=L10A+L11+L12 | LS10 |
| TP calculated as a whole | L10A | |
| Best Estimate | L11 | |
| Risk margin | L12 | |

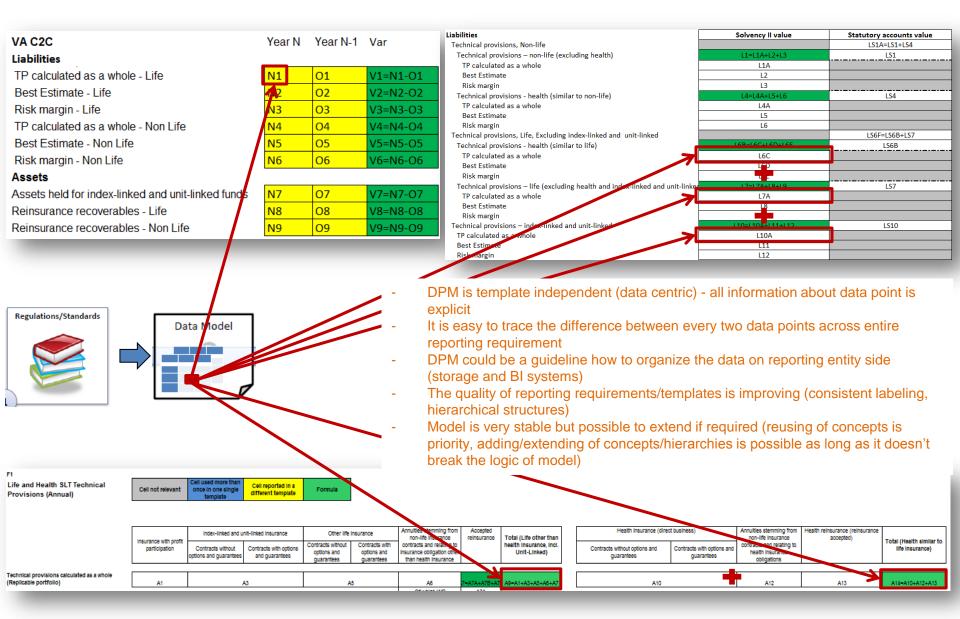
- Some options in modeling:
 - No dimension. All data points separate primary items
 - One dimension (Valuation basis)
 & 22 primary items
 - One primary item & three dimensions (DPM)
- What about additional/not explicit information: for example group vs. solo?





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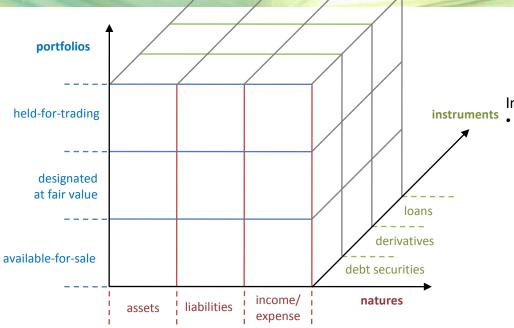




Almost everything is a perspective

Portfolio breakdown (purpose and measurement)

e.g. held for trading "acquired or incurred
 principally for the purpose of
 selling or repurchasing it in
 the near term"; includes
 different instruments:
 Derivatives, Loans, Debt
 securities, Equity
 instruments, ...



Instruments breakdown:

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e.g. debt instrument "contractual or written
assurance to repay a debt"; can
fall into different portfolios:
Held-for-trading, Designated at
fair value, Available for sale, ...

assets: property, resources, goods, etc that a company possesses and controls, e.g. financial instruments owned by a reporting entity that shall generate economic benefits in the future

Table 1.1. Assets

| Casl | and cash equivalents |
|------|--|
| Ca | sh on hand |
| De | mand deposits and cash equivalents |
| Fina | ncial assets held for trading |
| De | rivatives held for trading |
| Eq | uity instruments |
| De | bt securities |
| Lo | ans and advances |
| Fina | ncial assets designated at fair value through profit or loss |
| Eq | uity instruments |
| De | bt securities |
| 1 - | |

liabilities: sources of funding for company's assets and operations, e.g. financial instruments that have been issued by a reporting entity, thus represents an obligation that needs to be settled in the future by a transfer of some assets (such as cash) from the entity

Table 1.2. Liabilities

| De | rivatives held for trading |
|-----|---|
| Sh | ort positions |
| De | posits |
| De | bt securities issued |
| Ot | her financial liabilities |
| ina | ncial liabilities designated at fair value through profit or loss |
| De | posits |
| De | bt securities issued |
| Ot | her financial liabilities |
| | |
| | ncial liabilities measured at amortised cost |

income/gains or expenses/losses:

economic benefits that occurred during the period and originated from increase/decrease in value or result on sales/purchase of a given financial instrument

2. Consolidated Income Statement

| CONTINUING OP | ERATIONS |
|-------------------|---|
| Interest income | |
| Financial assets | held for trading [if accounted for separately] |
| Financial assets | designated at fair value through profit or loss [if |
| Available-for-sal | e financial assets |
| Loans and receiv | /ables |
| Held-to-maturity | investments |
| Derivatives - He | dge accounting, interest rate risk |
| Other assets | |
| (Interest expens | ses) |
| | es held for trading [if accounted for separately] es designated at fair value through profit or loss |
| | es measured at amortised cost) |







DATA POINT: Net carrying amount of not yet unimpaired but already past due (over 180 days) debt securities held, issued in EUR by MFIs located in EMU with original maturity under one year, measured at amortised cost and relating only to business activities conduced in Spain (local business).

| Base terms: |
|-------------------|
| Assets |
| Liabilities |
| Equity |
| Off-balance sheet |
| Exposures |

| Categories: |
|-------------------------|
| Total () |
| Cash |
| Loans |
| Debt securities |
| Equity instruments |
| Tangible and intangible |
| Other than () |

| Amount types: |
|-------------------------|
| Carrying amount |
| Gross carrying amount |
| (Specific allowances) |
| (Collective allowances) |

| Original currencies: |
|----------------------|
| All / Not-applicable |
| EUR |
| Other than EUR |

| Portfolios: | Impairment status | | |
|-----------------------------------|----------------------|--|--|
| Total () | All / Not-applicable | | |
| Fair value through profit or loss | Impaired | | |
| Amortised cost | Unimpaired | | |

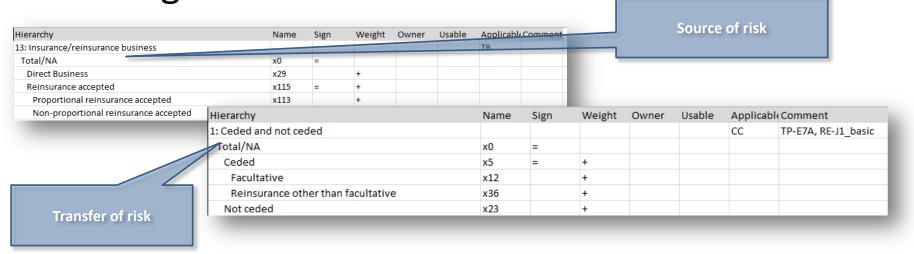
| into tised cost | o min pan ca | | | | |
|-----------------------------|-----------------|--|--|--|--|
| | | | | | |
| Base term: | Assets | | | | |
| Category: | Debt securities | | | | |
| Portfolio: | Amortised cost | | | | |
| Amount type: | Carrying amount | | | | |
| Impairment status: | Unimpaired | | | | |
| Past due period: | ≥ 180 days | | | | |
| Original currency: | EUR | | | | |
| Original maturity: | < 1 year | | | | |
| Counterparty sector: | MFIs | | | | |
| Counterparty residence: | EMU | | | | |
| Location of activity: | Spain | | | | |
| Location of activity: Spain | | | | | |

| All |
|--------------------------------|
| 0 days |
| < 180 days |
| ≥ 180 days |
| Original maturity: |
| All |
| < 1 year |
| ≥ 1 year < 2 year |
| ≥ 2 years |
| Counterparty sectors: |
| All / Not-applicable |
| MFIs |
| MMFs |
| MFIs other than MMFs |
| Central Administration |
| Other general government |
| Non-MFIs other than government |
| Counterparty residences: |
| All / Not-applicable |
| EMU () |
| Spain |
| Other than Spain in EMU () |
| Other than EMU () |
| Locations of activities: |
| All / Not-applicable |
| Spain |
| Other than Spain () |





Benefits of DPM for risk analysis (example 1) Tracing the insurance risk transfer



| Label | Code | Туре | Owner | Domain | Constrain |
|--------------------------|-----------------|------|--------|--------|-----------|
| Risk identification code | Typed dimension | RD | dim_RD | ID | |
| Reinsurance program code | Typed dimension | RE | dim_RE | ID | |
| Code reinsurer | Typed dimension | RF | dim_RF | ID | |
| Code broker | Typed dimension | CA | dim_CA | ID | |
| Code of SPV | Typed dimension | OV | dim_OV | ID _ | |
| | | | | | |

Identification of reinsurer

- This information combined with identification code of counterparties and lines of business can help to trace the risks
- There is a chance to build "risk transfer matrix" as a part of "early warning systems"





Benefits of DPM for risk analysis (example 2) Treatment of risk mitigation technics

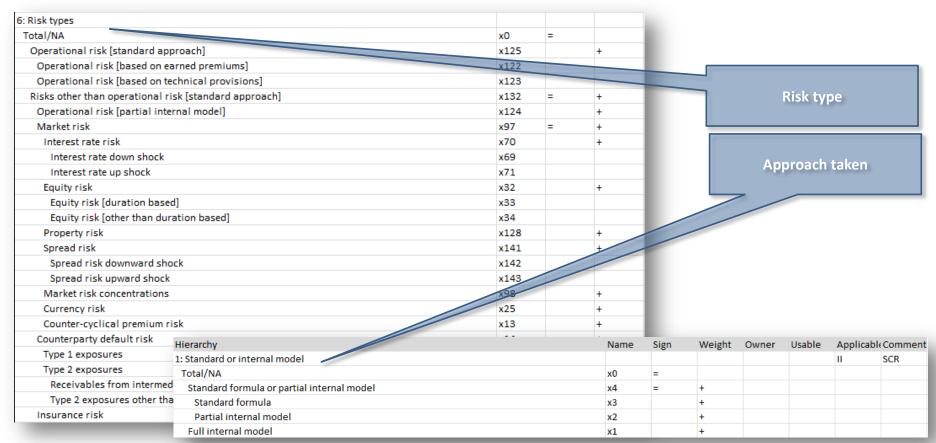
| Hierarchy 1 | | Sign | Weight | Owner | Usable | Applicable Comment | | |
|---|-----------|------|--------|-------|--------|--------------------|--------------------------------|--|
| 1: Treatment of risk mitigation | | | | | | IT | SCR-B3F | |
| After risk mitigation | x1 | = | | | | | | |
| After risk mitigation [risk mitigation cost for reinstalment premium and other than from finite reinsurance | x2 | = | + | | | | | |
| Before risk mitigation | x5 | = | + | | | | | |
| Risk mitigation effect other than from finite reinsurance and risk mitigation cost for reinstalment premi | x10 | = | - | | | | | |
| Risk mitigation effect other than from finite reinsurance | x9 | | + | | | | | |
| Risk mitigation cost for reinstalment premiums | х6 | | + | | | | | |
| Risk mitigation effect from finite reinsurance | x8 | | - | | | | | |
| 2: Treatment of risk mitigation | | | | | | IT | TP-F1, TP-E1, | |
| After risk mitigation | x1 | = | | | | | | |
| After risk mitigation effect | x3 | = | + | | | | | |
| Before risk mitigation | x5 | | + | | | | | |
| Risk mitigation effect | x7 | = | - | | | | | |
| Risk mitigation effect from finite reinsurance | x8 | | + | | | | | |
| Risk mitigation effect other than from finite reinsurance | x9 | | + | | | | | |
| Risk mitigation cost for reinstalment premiums | x6 | | - | | | | | |
| | | | | | | | SCR-B3A, SCR-B3B, SCR-B3C, SCR | |
| | | | | | | | B3D, SCR-B3E, SCR-B3G, MCR- | |
| 3: Treatment of risk mitigation | | | | | | IT | B4A, MCR-B4B | |
| After risk mitigation | x1 | = | | | | | | |
| After risk mitigation effect other than from finite reinsurance | x4 | = | + | | | | | |
| Before risk mitigation | x5 | | + | | | | | |
| Risk mitigation effect other than from finite reinsurance | x9 | | - | | | | | |
| Risk mitigation cost for reinstalment premiums | x6 | | - | | | | | |
| Risk mitigation effect from finite reinsurance | x8 | | - | | | | | |

- Comprehensive structure of risk mitigation technics
- Explicit information where (in which table) specific technics are applicable
- Possibility to query data independently from tables





Benefits of DPM for risk analysis (example 3) Hierarchical structure of types of risks

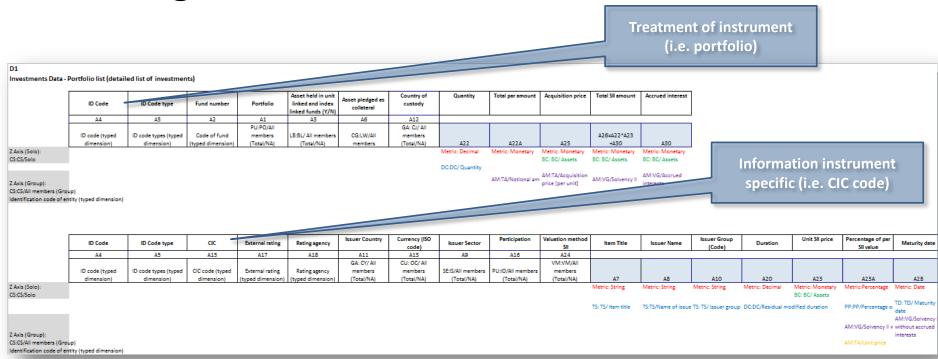


- There are more than 100 types of risks under Solvency II regime. DPM was used to organize this
 dictionary in hierarchical order
- This information shall be analyzed together with approaches taken by reporting entity to address those risks





Benefits of DPM for risk analysis (example 4) Defining relations between data sets



- Possibility to check the differences in definition of pieces of reportable information
- Verifying relation between data in single template (i.e. normalization procedure)





Benefits of DPM for risk analysis (example 5) Possibility to "slice and dice" data according to predefined criteria

| Hierarchy | Name | Sign | Weight | Owner | Usable | Applicable |
|--|------|------|--------|-------|--------|------------|
| 1: Solvency II own funds eligibility | | | | | | BE |
| Total/NA | x0 | = | | | | |
| Basic or ancillary own funds | x5 | = | + | | | |
| Basic own funds | х6 | | + | | | |
| Ancillary own funds | x2 | | + | | | |
| Items for which an amount was approved | x14 | | | | | |
| Items for which a method was approved | x13 | | | | | |
| Not basic nor ancillary own funds | x17 | | + | | | |

- Criteria are defined in hierarchies (subdomains) with mutually exclusive domain members (if not there is no summation between them)
- Similar domain members shall not exist in different domains (otherwise it would affect the quality of the DPM)





OLAP REPORTS

The OLAP (Online Analytical Processing) feature allows users to "slice and dice" data by creating tables and charts. Users can directly access multidimensional data and create an "explorer view" that best meets their needs.

It allows users to:

- create tables and graphs;
- filter, convert, and rank values;
- highlight cells according to specific conditions;
- control the design of the table/chart.

