



*short term has no future*

**DEXIA**

## Had I known before ... the data challenge for an enterprise-wide Credit Risk management

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*\*The comments expressed here are those of the author and do not necessarily represent the view of DEXIA Group*

# Why this talk?

- IACPM panel (ING, JPMorgan, HSBC) on Portfolio Optimisation Systems
  - Pay more attention to data gathering issues
- Dexia experience on Basle2
  - Making a model is 85% data gathering, 15% modelling work



## Building an Enterprise-Wide Credit Database

 Using the DB for a Portfolio Management system

 Data issues for Basle2

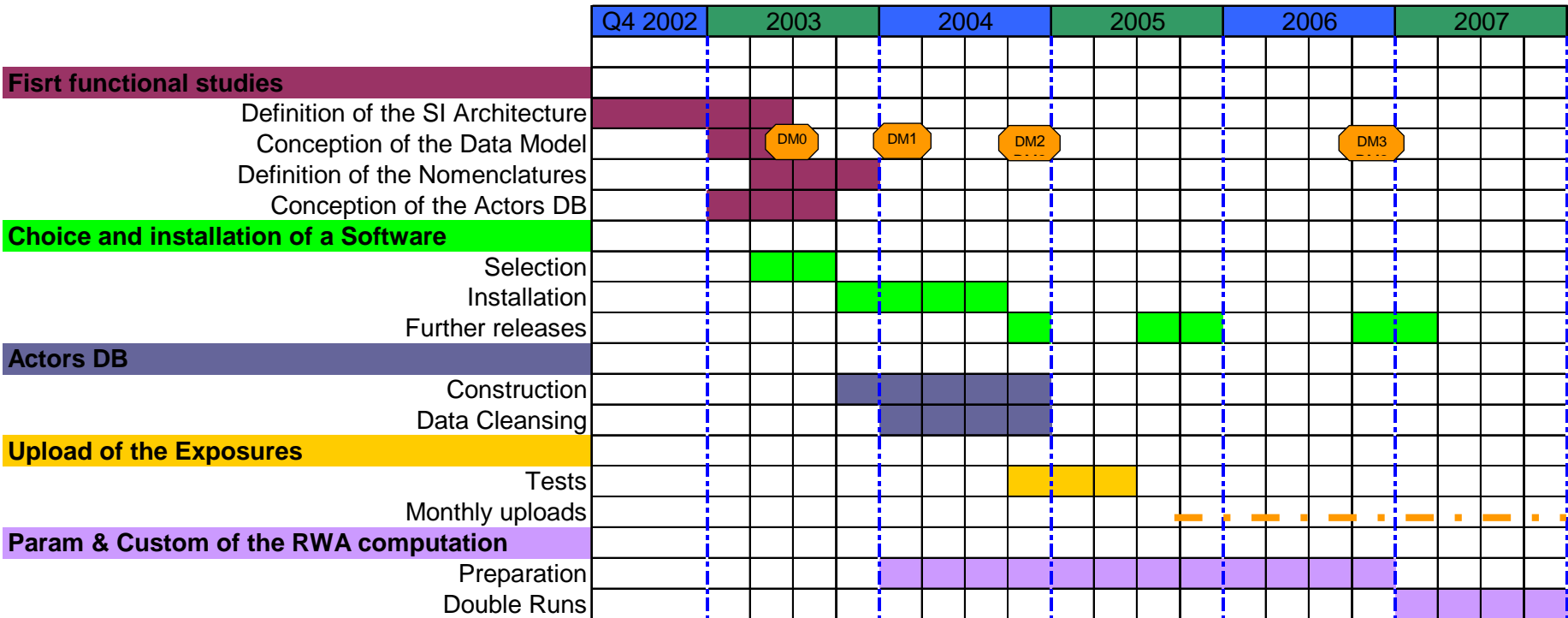
# What we achieved

- Situation in 2002:
  - Multinational Group
    - 4 main locations: Belgium, Lux, France, USA + subsidiaries
  - Active in:
    - Public Sector, Corporate, Project Finance, Retail, Credit Enhancement, Financial Markets, Insurance
- Heterogeneous systems by country & activity
  - No global Group view
- Dexia portfolio
  - > 1,5 mio contracts
  - total exposure > 900 bios Eur

# What we achieved

- Unique central database:
  - All exposures
  - All instruments
- First purpose: **Basle2** Capital computation
  - Then:
    - reporting,
    - portfolio management,
    - limits management
- The process started in **Q4 2002**
- It took an estimated **50000** man/days

# Time schedule



# Building the Data Model

- Maybe the most important step
  - Central coordination ...  
... local competences
  - Make it precise ...  
... but not too complex
  - Foresee it very complete ...  
... then negotiate
- It is about data fields but also
  - Processes
  - Nomenclatures

# Some nomenclatures

- N1: types of Actors (188)
- N28: Interest Rates (897)
- N44: SNI (169)
- N63: IFRS accounting type (11)
- N87: Products (598)
- N161: Business Units (313)

# Opening the pipelines

- Attention points
  - The data model is **complex**: very heavy work to justify, to convince, **to explain**
  - IT time schedules: **lengthy**, needs to be prepared in advanced
  - **No unique** solution:  
heterogeneous group  $\Rightarrow$  heterogeneous solutions
  - One constraint: **coherence with accounting**

- You want:
  - Uniqueness
  - Completeness
  - Ratings (for B2)
- Solution: **Specialized Credit Analysts Cells**
  - **Group-Wide responsibility** for their sector:
    - to give ratings
    - to maintain the Issuers DB
- Difficulties:
  - **Completeness**
  - Perimeter **boundaries**

- Permanent task
- Once the pipelines are in place, it can be difficult to maintain momentum
- Though, do not underestimate the impacts
- Important issue: how do you feed your DB?  
Incremental or Replacement?



Building an Enterprise-Wide Credit Database



**Using the DB for a Portfolio Management system**



Data issues for Basle2



# Using the DB for Credit VaR

- Dexia Credit VaR: à la **CreditMetrics**
- Monte-Carlo simulations: an Issuer can ...

- **default**: loss = LGD
- **downgrade**:  

$$\text{loss} = \text{MtM}(\text{Spread with New Rating}) - \text{MtM}(\text{Spread with Current Rating})$$

	1	2	3	5	7	10	15	30
AAA	2.7	3.2	3.9	5.6	9.1	12.4	29.7	29.1
AA+	4.0	4.5	5.4	8.2	14.3	20.2	32.1	36.5
AA	7.5	8.1	9.3	13.4	21.2	28.8	38.7	46.4
AA-	14.9	16.0	17.3	23.2	31.0	38.9	52.0	60.6
A+	25.9	27.5	29.1	36.8	43.8	50.5	68.4	76.9
A	39.9	41.8	43.6	52.4	59.1	63.4	82.8	92.2
A-	57.1	58.8	60.8	69.5	77.3	78.2	93.3	105.4
BBB+	81.5	82.7	84.5	91.9	101.0	98.5	110.2	123.5
BBB	118.2	118.6	119.6	124.6	133.9	128.3	147.0	155.7
BBB-	170.4	169.9	169.6	171.3	178.4	170.4	211.4	207.5
BB+	234.8	233.7	232.0	229.8	232.7	221.1	288.2	270.3
BB	306.1	305.4	303.2	297.0	294.0	275.5	356.3	332.1
BB-	379.9	381.1	379.7	369.7	359.7	329.3	399.8	383.4
B+	455.0	459.0	459.5	445.9	428.2	382.3	423.6	425.9
B	530.6	538.1	541.0	523.9	498.1	434.7	437.5	464.0
B-	887.3	887.7	864.4	781.9	695.2	571.5	451.3	502.1
CCC	1244.0	1237.3	1187.7	1039.8	892.3	708.2	475.1	544.6

- Likelihood of a default/downgrade is given by a transition matrix

	Aaa	Aa	A	Baa	Ba	B	Caa-C	Default
Aaa	91.89%	7.31%	0.77%	0.00%	0.03%	0.00%	0.00%	0.00%
Aa	1.06%	91.15%	7.46%	0.25%	0.08%	0.01%	0.00%	0.00%
A	0.05%	2.43%	91.91%	4.97%	0.48%	0.13%	0.02%	0.02%
Baa	0.05%	0.22%	5.37%	88.37%	4.86%	0.80%	0.14%	0.18%
Ba	0.01%	0.05%	0.48%	5.78%	84.90%	7.01%	0.54%	1.24%
B	0.01%	0.03%	0.13%	0.42%	6.65%	83.31%	3.20%	6.25%
Caa-C	0.00%	0.00%	0.01%	0.58%	1.76%	5.07%	67.59%	24.99%

# Using the DB for Credit VaR

- Factor model of correlation

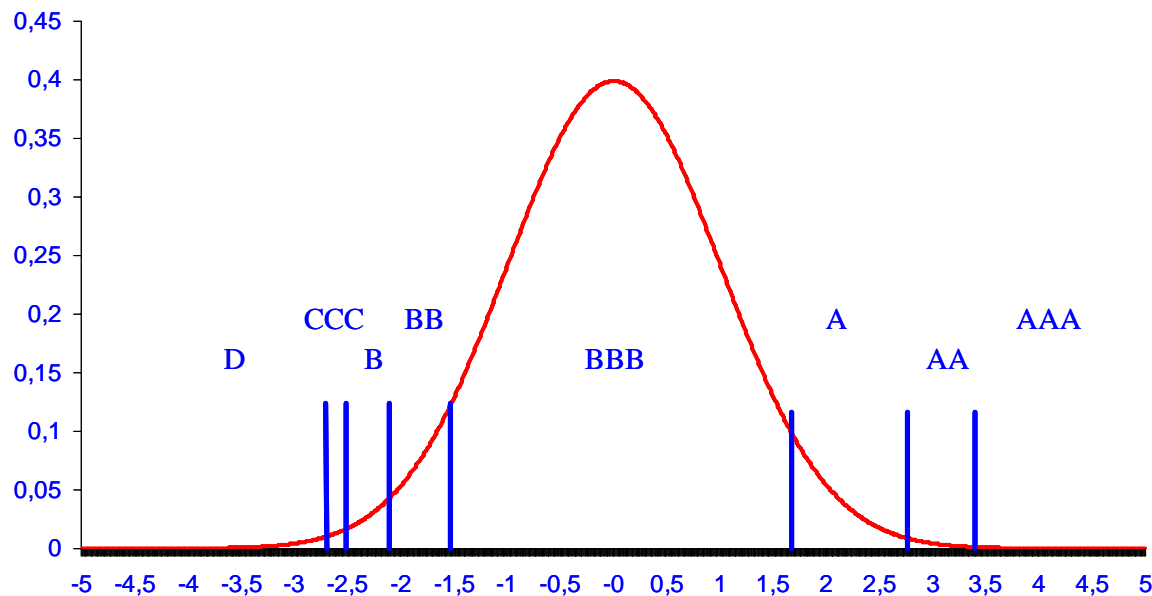
$$\lambda = \sum \alpha_i \lambda_i + \gamma \lambda_\varepsilon$$

Issuer Risk

Systemic Risk

- Sector
- Country

Idiosyncratic risk



- Central database is **available!** Yes but ...
- Basle2 needs are **not exactly in line** with Credit VaR
  - Precise description of the issues
  - Maturity after 5 years
  - Standard treatment: missing ratings
  - Industrial Sectors
  - Concentration effects
  - Treatment of the guarantees
  - LGD values
  - BBUs



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Using the DB for a Portfolio Management system



**Data issues for Basle2**

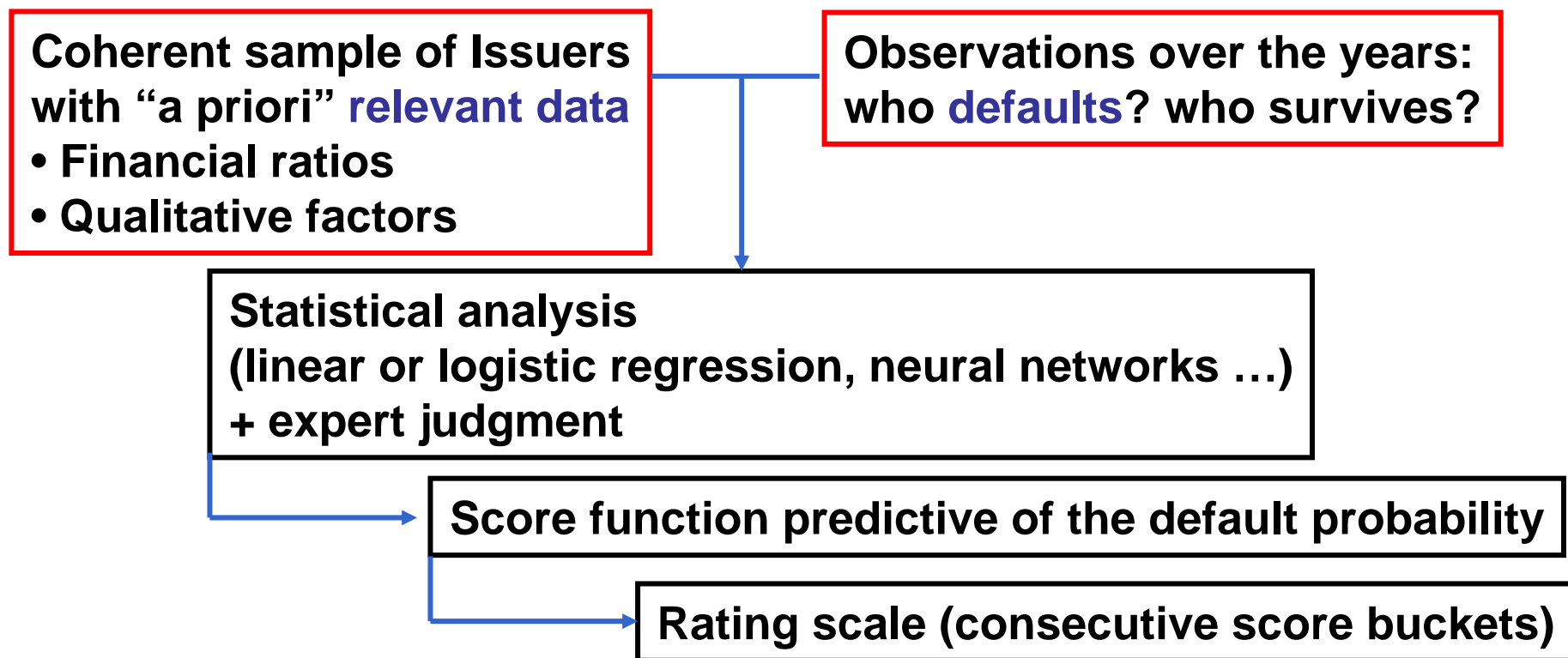


# Data issues for Basle2 modelling

- Do not think that Basle2 is finished when you get approved
  - New models
  - It took you **several years** to build your models, now the whole stock has to be backtested and maintained **each year**.

# Data issues for Basle2 modelling

- Building a **Rating System** (main approach)



- Example: Altman's Z-score

- Using the models
  - Analysts need the relevant ratios
  - Quality control audits the process
- Maintaining and backtesting the models
  - What to backtest?
    - Default rates
    - Transitions
    - LGD, CCF
    - Coherence with external references
    - Discriminative power
  - Globally / by Rating / by Sub-Sector / by Region / by Model Phase ...

# Data issues for Basle2 modelling

- Take care of the following
  - Financial ratios etc ....:
    - Often **external** sources
    - Automation would be better but **difficult to standardize** and to stabilize
  - Default / LGD information:
    - Huge work to build your database, manual work more than often
    - Though: **mistakes are not allowed** (if you do not want to redo your model)
      - ⇒ In case of doubt, try to **keep all the options open**
      - ⇒ Try to **involve the modellers** as soon as possible in the data collection process
  - Backtesting data
    - Can (must) be **automated**
    - **Central backtesting tool** is efficient but requires harmonized data

# Main conclusions ... if we were to redo it

- Central DB: major improvement
- ... having required a heavy workload and the cooperation of the whole Group
  - ⇒ strong motive (Basle2) necessary to launch the process and maintain momentum
  - Best to be as thorough as possible at first go
  - Take the time to define a good data model
  - Do not underestimate in your planning the complexity of having the data right
- Basle2
  - Here also, do not underestimate the importance of data gathering and its impact on your planning
  - Investing in automation is worth the pain: B2 is a long term commitment

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