

Topics in rating review

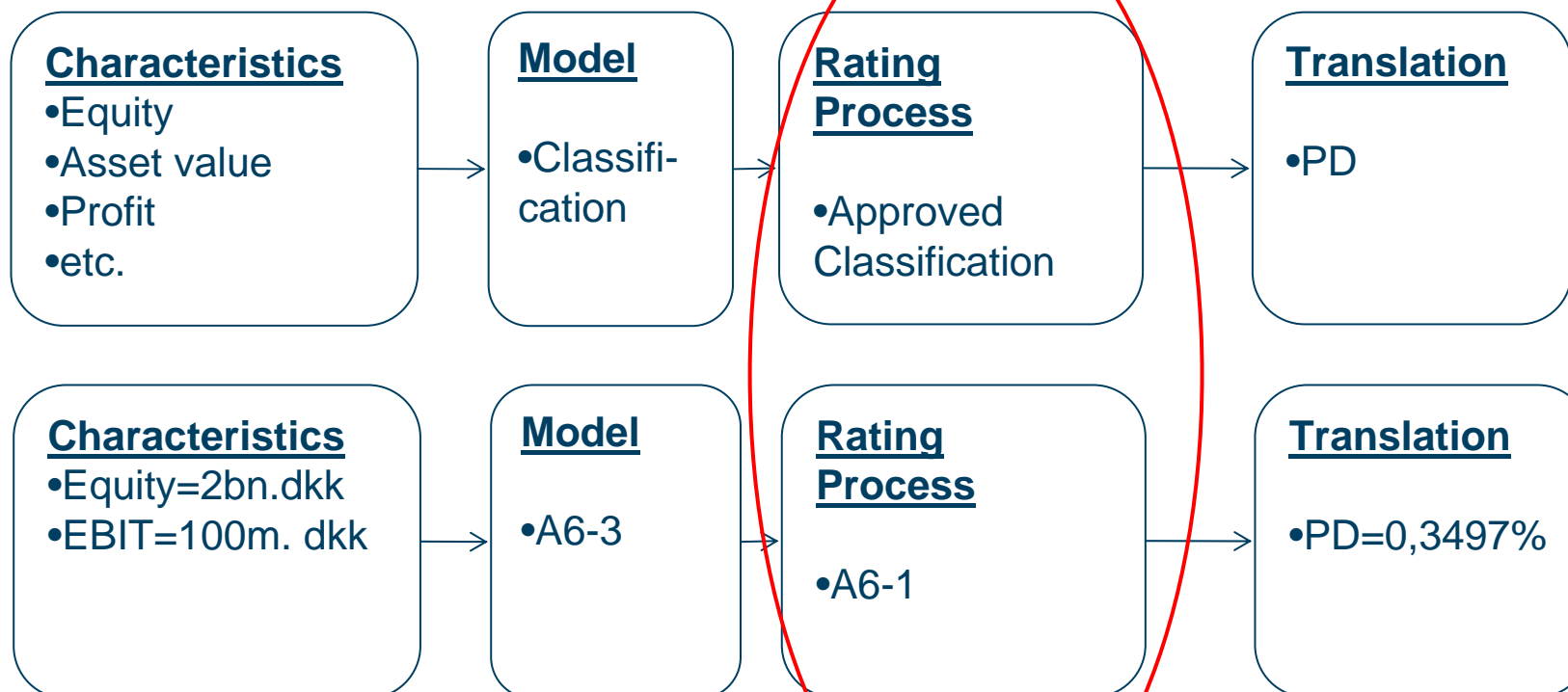
How to review the rating process

Eurobanking 2011

From Data to Classification

Manual yearly process

- Rating Models



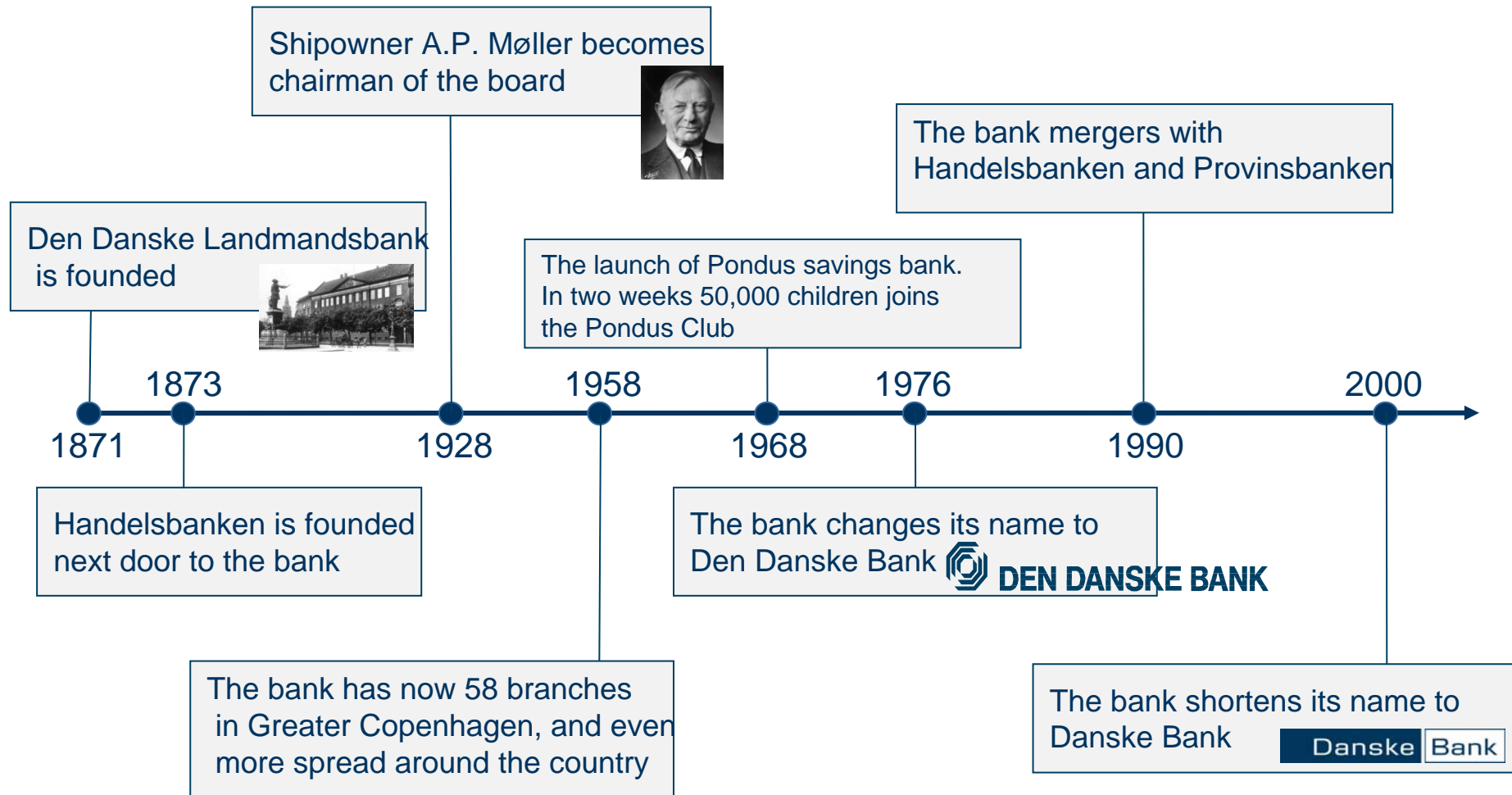
Rating Review

-what is a rating review?

A review of the manual rating process for large customers could include the following analyses:

- Use of rating models
- Assignment of qualitative characteristics
- Use of overrides
- Age of ratings
- Analysis of connection between model performance and rating age

The storyline of Danske Bank



Danske Bank is a strong Nordic franchise



5.0 million customers



2.4 million active Internet customers



670 branches in 15 countries*



21,522 full-time employees

Northern Bank Northern Ireland

Market position: Leader

Branches: 82

Market share: 19-30%

Market rank: 1-2

Loan growth (Y/Y): 1%

National Irish Bank Ireland

Market position: Challenger

Branches: 28

Market share: 3%

Market rank: 6

Loan growth (Y/Y): -8%

Fokus Bank Norway

Market position: Challenger

Branches: 41

Market share: 5%

Market rank: 3

Loan growth (Y/Y): 6%

Danske Bank Sweden

Market position: Challenger

Branches: 49

Market share: 6%

Market rank: 5

Loan growth (Y/Y): 15%

Danske Bank Denmark

Market position: Leader

Branches: 315

Market share: 24%

Market rank: 1

Loan growth (Y/Y): 0%

Sampo Bank Finland

Market position: Leader

Branches: 121

Market share: 12%

Market rank: 3

Loan growth (Y/Y): 0%

Sampo Pank Estonia

Market position: Challenger

Branches: 17

Market share: 10%

Market rank: 4

Loan growth (Y/Y):** -11%

Danske Banka Latvia

Market position: Challenger

Branches: 4

Market share: 2%

Market rank: 12

Loan growth (Y/Y):** -11%

Danske Bankas Lithuania

Market position: Challenger

Branches: 13

Market share: 7%

Market rank: 5

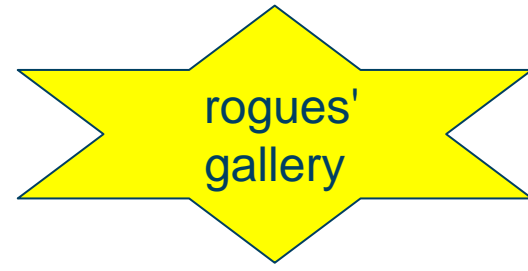
Loan growth (Y/Y):** -11%

* Excluding agricultural centres in Denmark.

** Loan growth represents total loan growth for Baltic countries.

Note: Market share represents market share of lending.

Model Performance



Credit Methods & Process



Model Performance



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Working area & responsibilities



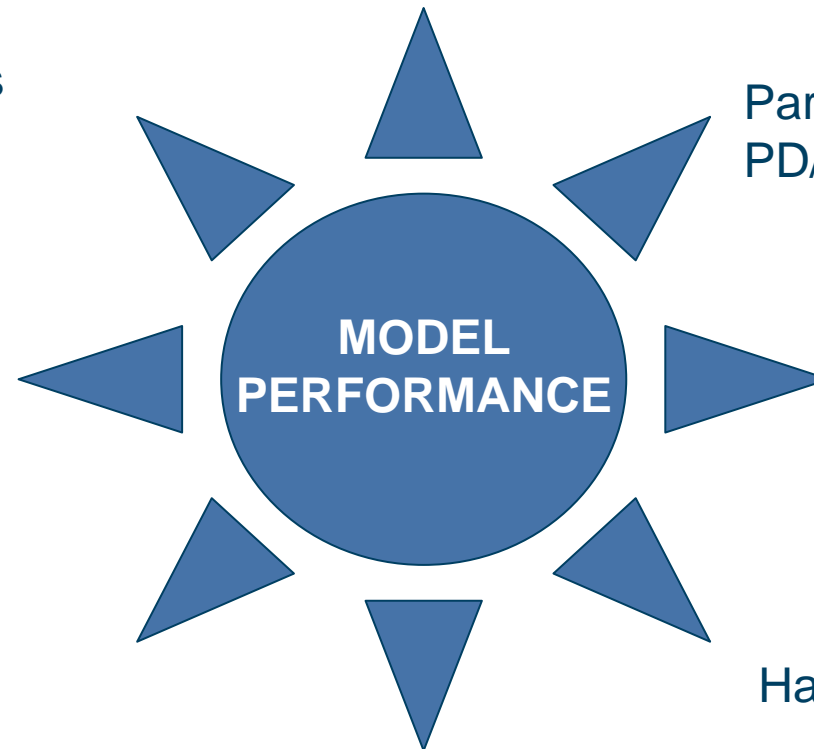
Quarterly

Safety Margins
& TTC PD

Asset Finance
Risk Reporting

PD Monitoring

FSA



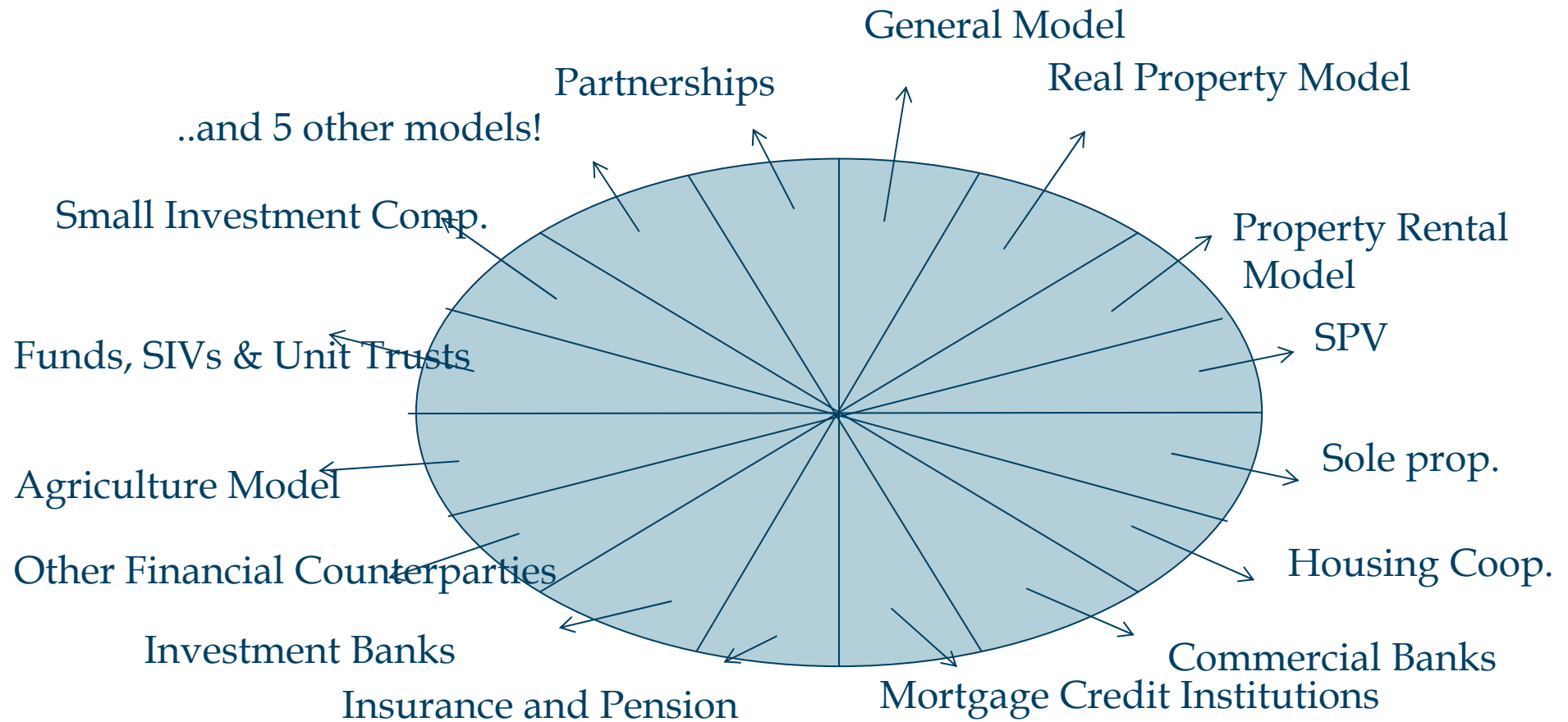
Yearly

Parameter Validation
PD/LGD/EAD

AVM Validation

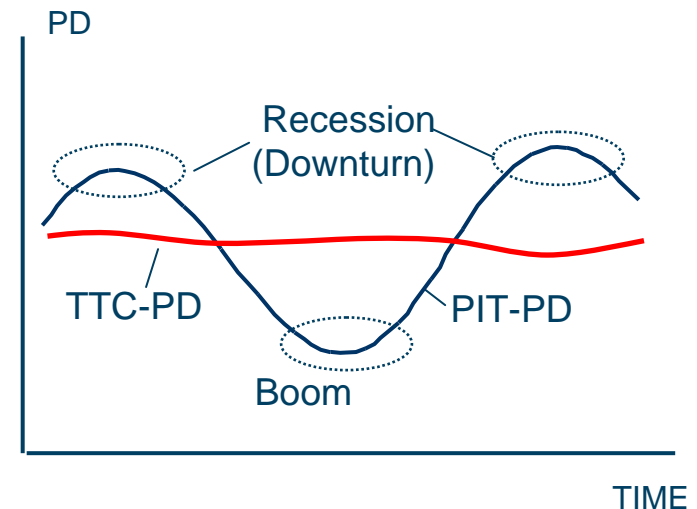
Haircut Validation

Rating Submodels



We operate with 3 types of parameters

- **PIT** (Point in time)-parameter varies with the business cycle.
 - PIT PD,LGD and CF enters EC-model.
- **TTC** (Through the cycle)-parameter is an average over an entire business cycle.
 - TTC-PD enters RWA calculation.
- **Downturn** parameter is the most conservative parameter observed and is estimated on recession data
 - Downturn LGD, CF enters RWA-calculation.



Age of ratings

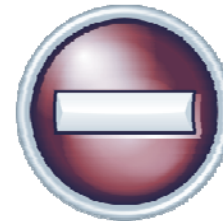
- Explanation by an example



Customer 'A' is rated in **January 2008**. Customer 'A' receives a good rating.



Customer 'A' is having a problem in **January 2009**. The rating ought to be changed, but the customer is for some reason not rerated!



Customer 'A' goes into default in **January 2010**. As the rating was not changed in 2009, 'A' still has a good rating. It looks like the model is not performing, but the problem is the use of the model – not the model itself!



The model is **wrongly rejected** by the validation team. **The right solution** should be to **change the model**.

Reviewing rating age

•Who are these customers?
•Why are the ratings so old?

- Fictional numbers

	Less than 3 months	Between 3 and 6 months	Between 6 and 9 months	Between 9 and 12 months	Between 12 and 15 months	Between 15 and 18 months	Between 18 and 24 months	Total
Denmark	34%	32%	20%	11%	2%	0.23%	0.00%	100%
Ireland	33%	22%	21%	17%	6%	0.00%	0.00%	100%
Luxembourg	52%	21%	14%	7%	7%	0.00%	0.00%	100%
Sweden	41%	27%	17%	10%	5%	0.27%	0.03%	100%
Norway	37%	26%	12%	19%	5%	0.00%	0.00%	100%
Northern Ireland	31%	22%	23%	16%	7%	0.41%	0.00%	100%
Sampo Bank	28%	44%	21%	6%	0%	0.00%	0.00%	100%
Total	34%	30%	20%	12%	3%	0.21%	0.00%	100%

Reviewing rating age - internal benchmarks

365 – 400 days	400 – 540 days	> 540 days	Unrated
< 7 %	< 3%	0 %	<2 %

	Unrated	Less than 365 days	Between 365 and 400 days	Between 400 and 540 days	Above 540 days
Office 1	1.1%	98%	0.8%	0.1%	0.00%
Office 2	0.2%	94%	3.6%	2.5%	0.00%
Office 3	0.0%	93%	6.9%	0.0%	0.00%
Office 4	3.2%	93%	1.9%	1.4%	0.00%
Office 5	1.4%	94%	4.0%	0.9%	0.03%
Office 6	0.5%	94%	3.4%	2.0%	0.00%
Office 7	0.1%	92%	4.3%	3.4%	0.00%
Office 8	0.6%	97%	1.5%	0.7%	0.00%
Office 9	0.6%	99%	0.3%	0.0%	0.00%
Total	1.5%	95%	2.3%	1.3%	0.00%

Reviewing rating age

- motivating the rating officers

- Comparing the rating offices – example

Time gap since rating	No.	Percent	Benchmark	Total portfolio	Rank	2009
Unrated customers	265	3.2%	2.0%	1.5%	9/9	-
Less than 365 days	7654	93.5%		94.9%	7/9	89.1%
Between 365 and 400 days	154	1.9%	7.0%	2.3%	4/9	4.4%
Between 400 and 540 days	117	1.4%	3.0%	1.3%	6/9	5.9%
Above 540 days	0	0.0%		0.0%	1/9	0.6%
Total	8190	100.0%		0.0%		

We have done the analysis for some years now. The effect is more frequent rerating in all offices

Reviewing rating age

- Analysing the consequence

We don't like customers to default here

	Less than 30 days	Between 30 and 60 days	Between 60 and 90 days	Between 90 and 120 days	Between 120 and 150 days	Between 150 and 180 days	Between 180 days and 1 year	Between 1 year and 1,5 year	Between 1,5 year and 2 year	Total
A1-1	0	0	0	0	0	0	0	2	0	2
A2-2	1	1	0	0	0	0	2	0	0	4
A2-3	0	0	0	0	1	0	0	0	0	5
A3-1	0	0	0	0	0	0	2	0	0	3
A3-2	0	0	0	0	0	0	0	1	0	6
A3-3	0	0	0	0	0	0	1	0	0	1
A4-1	0	0	0	0	0	0	0	0	0	2
A4-2	0	0	0	0	1	6	4	0	0	12
A4-3	0	0	0	0	0	0	1	0	0	1
A5-1	0	0	0	0	1	4	1	0	0	8
A5-2	1	0	0	0	3	6	3	0	0	9
A5-3	0	0	0	0	4	30	24	0	0	38
A6-1	0	0	0	0	0	0	13	3	0	16
A6-2	2	1	0	0	1	2	13	4	0	17
A6-3	5	1	0	0	8	8	57	37	0	71
A7-1	0	2	0	0	4	5	4	20	4	29
A7-2	0	1	0	0	1	4	4	22	1	23
A7-3	6	9	7	6	7	2	28	6	0	71
B1-1	30	22	14	24	17	16	93	23	0	241
B1-2	11	13	12	15	11	10	26	4	0	102
B1-3	15	15	12	8	10	6	21	2	0	89
B2-1	41	36	46	26	17	14	51	7	0	238
B2-2	62	69	63	41	28	22	50	2	0	337
B3-1	232	111	70	56	29	33	63	4	0	598
Total	406	290	245	196	143	131	509	132	5	2,057

There is a difference! It is easier to predict a default event occurring on a short time horizon!

Looking at the defaults

Reviewing rating age - conclusion

Customers are not rerated often – defaults occur in a random way. We are not able to do a proper backtest.



Frequent rerating is necessary if we want to measure model performance!



Using the correct rating model

- Explanation by an example



Frank is a farmer..

Frank is just used as an example. I do not know if he is a good farmer or even if he is one of our customers.

..but he is wrongly rated in a model for big cooperations. He seems to be a good cooperation and gets a good rating.

Based on his good rating Frank gets a large loan. The bank earns lots of money.

However, Frank is not a very good farmer and defaults. The bank loses everything. If Frank had been rated in the agricultural model the bank would never provided Frank with a big loan.

Using the correct rating model

- setting up the criteria

- We use rough criteria – it is the best we can do as we can not do manual checks on all the customers.

Model	Criteria
Agriculture model	Industrial code
Commercial banks	Customer group
Funds, SIVs and unit trusts	Industrial code
High Leverage Transactions	Rating owner
Housing Co-operatives	Industrial code
Investment banks	Customer group
Life and non-life insurers and pension funds	Customer group
Mortgage credit institutions	Customer group and industrial code
Non-profit undertakings	Customer group
Partnerships	Ownership code
Property rental model	Industrial code
Rating of countries, regions, counties and municipalities	Customer group
Real property model	Industrial code
Small investment companies	Industrial code
Sole proprietorship	Ownership code
Special Purpose Vehicles	Customer group
Subsidised housing organisations	Customer group

Using the correct rating model - analysing the outcome

- What are the numbers saying?

Model	Concordance	No Concordance	Percent concordance
Agriculture model	3,460	209	94.3%
Commercial banks	1,366	26	98.1%
Funds, SIVs and unit trusts	66	107	38.2%
High Leverage Transactions	2	4	33.3%
Housing co-operatives	1,072	40	96.4%
Investment banks	2	3	40.0%
Life and non-life insurers and pension funds	214	29	88.1%
Mortgage credit institutions	45	6	88.2%
Non-profit undertakings	495	514	49.1%
Partnerships	342	29	92.2%
Property rental model	2,526	197	92.8%
Rating of countries, regions, counties and municipalities	1,068	82	92.9%
Real property model	2,818	418	87.1%
Small investment companies	790	190	80.6%
Sole proprietorship	1,536	112	93.2%
Special Purpose Vehicles	158	5	96.9%
Subsidised housing organisations	324	10	97.0%
Total	16,284	1,981	89.2%

What is happening here???

Some numbers can *partly* be explained by a low number of customers!

As our criteria were crude we will (almost) never get 100 %!

Using the correct rating model - motivating the rating officers

- Comparing the rating offices – example

Model	Concordance	No concordance	Percent concordance	Total portfolio	Rank	2009
Agriculture model	1067	60	94.7%	94.3%	5/8	94.8%
Housing co-operatives	311	2	99.4%	96.4%	1/7	99.1%
Non-profit undertakings	275	199	58.0%	49.1%	3/7	58.7%
Partnerships	256	14	94.8%	92.2%	1/5	94.8%
Property rental model	326	41	88.8%	92.8%	7/8	-
Rating of countries, regions, counties and municipalities	86	1	98.9%	92.9%	3/8	92.5%
Real property model	597	90	86.9%	87.1%	5/8	80.5%
Small investment companies	632	103	86.0%	80.6%	4/6	84.1%
Sole proprietorship	691	23	96.8%	93.2%	1/5	96.6%
Subsidised housing organisations	180	0	100.0%	97.0%	1/5	100.0%
Total	4421	533	89.2%	89.2%	6/8	86.7%

A list of the no concordance customers is sent to the rating officers. If there are data errors these can be corrected. Again this process does an important difference.

Using the correct rating model

- investigating the cases where the correct model was not applied

- We will have to take a look at the wrongly placed customers
- Different possibilities:
 - -errors in our data
 - -criteria too crude – special circumstances apply
 - -wrong model is used



A more thorough analysis unveiled that only 2 % of customers were put into the wrong model. Thus in most cases the problem was either errors in the data or crude criteria.

Using the correct rating model

- conclusion

Customers are not rated in the correct model – ratings might not be correct. We are not able to measure pure model performance



Correct use of the models is necessary if we want to measure model performance!



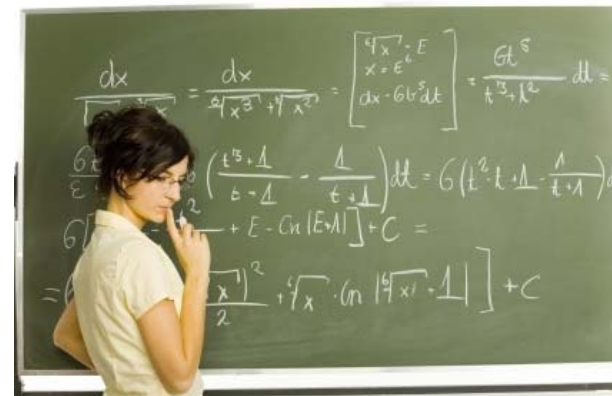
Comments, feedback or questions?



Learning points

- what have we learned

1. Review of rating models is just as important as the validation. If the models are used incorrectly the result of the validation could be misleading or wrong.
2. Think about which analyses are meaningful for your rating models and make them.
3. Find ways to motivate the rating officers in doing a better job
4. Have as much dialog with the rating officers as possible – after all they are the ones who use the models.



The end!

- Thank you for your attention

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