Of Moody’s and Merton:
a structural model of bond rating transitions

Discussion of Michael Gordy and
Erik Heitfield’s paper by
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French Banking commission
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Objectives of the study:

-to elaborate a general model of stochastic rating transitions
-Statistically parsimonious to estimate
- and consistent with the stylised facts
-From which economic inferences could be extracted
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Baseline structural transition model:

- Default model: Merton style distance to default stochastic model conditional to a normally distributed systematic factor

- Rating assignment model: maps default distance into ratings using a partition of the distribution calibrated on empirical data

- Iteration of the migration process over the sample period

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Generalisation of the baseline model:

- Thick tailed distribution of distances to default (alpha stable distribution)

- Thick tailed distribution of distances to default with constant measurement error

- Thick tailed distribution of distances to default with grade varying measurement error (AR(1))
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Results obtained:

- Structural models produce good estimates of one year rating stability (same or adjacent rating)
- But give poor predictions of larger rating transition probabilities
- Best results are obtained with a grade varying error measurement model
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Comments:

- Structural models while easier to implement need stronger assumptions
- The idea of autocorrelated errors in the rating process is appealing
- But these models do not seem to capture all the expected features of the rating process
- WHY? Focus on the assumptions
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Comments:

-Liabilities are fixed in the Merton stochastic model

- But the issuer’s credit quality should also impact the net present value of its liabilities which means that liabilities are expected to vary over time

-estimated distances to default with fixed liabilities may be biaised
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Comments:

- Why use symmetric distributions?

-transitions thresholds should be sensitive to the skewness of the distribution

- Symmetric distributions are likely to overestimate upgrade probabilities and underestimate downgrade probabilities if the actual distribution is left skewed
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Comments:

- More clarification or investigation on the insensitivity to the distribution’s skewness
- Transition thresholds should be allowed some dynamics to account for the fact that rating changes may not be driven only by distance to default
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Comments:

- Some evidence suggest that rating criteria may vary with cycles
- Rating criteria may also vary with the grade (more scrutiny for lower grades than for investment grades)
- => further AR(Ch)
- => relax Markov assumption
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Conclusions :

- Encouraging results and promising area of research
- refine model specification
- => relax fixed liabilities assumption
- => check/relax symmetry assumption
- => relax Markov assumption
- => emphasise error modelling

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