Modeling the Effect of Macroeconomic Factors on Corporate Default and Credit Rating Transitions

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Overview

- Summary
- Why look at rating transitions?
- The omission of firm specific, non-rating related information
- Detecting patterns: Advantages of non-parametric approaches
- A few additional remarks
- Concluding remarks

Summary of paper

- Studies the intensity of three types of transitions
  - Downgrade from investment grade to speculative grade
  - Upgrade from speculative grade to investment grade
  - Default
- Does a Cox regression with covariates in three broad classes
  - General macroeconomic conditions (including rate of change in conditions)
  - Rating history of each firm
  - Financial market conditions (interest rates, spread, stock return, overall default rate)
- The authors do *not* use company specific information such as distance-to-default or accounting variables

Summary of paper

- The paper confirms facts about rating history known from earlier studies
  - Rank ordering of ratings works: Higher rating, smaller default intensity
  - Many non-Markov effects, i.e. current rating is not a 'sufficient statistic' for future evolution
  - Time in state, direction of previous move, time since first rating etc. matter
- Financial market conditions: Aggregate previous years default rate has a positive effect on default but spreads on Baa - Treasury do not survive when added to rating related information
- (Signs of) Estimates of macro and spread variables are in general sensitive to choice of subperiods the inclusion/exclusion of other regressors
- Most promising is GDP growth
- Rating-related effects are much more stable

Why analyze ratings?

- Understanding rating agency behavior (drift, through-the cycle, stickiness etc.)
- Analyzing performance (rank ordering, information content)
- Illustrating techniques for the benefit of risk managers using internal rating systems
- Supporting analysis of financial claims with rating triggers
- The paper seeks to establish 'stylized facts' on macro dependence but could perhaps benefit from a more specific agenda related to the issues above and some clearer implications

Omission of other firm specific variables than rating

- The paper does not include key accounting ratios, leverage etc.
- In the analysis of 'internal rating history' dependence, this is a reasonable choice
- More problematic for default analysis: Here the agency behavior is not the key issue
- Omitted variables make it hard to seek explanations for seemingly anomalous effects
- If, for example, firms take on more leverage following 'good times', could this explain the positive default intensity response to increases in SP500?
- If ratings do not react (or do not fully react) to the increased leverage, there will be no way of detecting this effect

A stylized explanation of a possible 'spurious' effect

- A highly stylized example of what can go wrong
- Consider an additive intensity structure

$\alpha(t,x)$	x_1	x_2
t_1	0.2	0.2
t_2	0.4	0.4

- The intensity is constant in the x direction, but increases by 0.2 between t_1 and t_2.
- If we observe the following number of firms

$E(t,x)$	x_1	x_2
t_1	1000	100
t_2	100	1000

- If we imagine that the intensities 'come true' so that we observe

$O(t,x)$	x_1	x_2
t_1	200	20
t_2	40	400

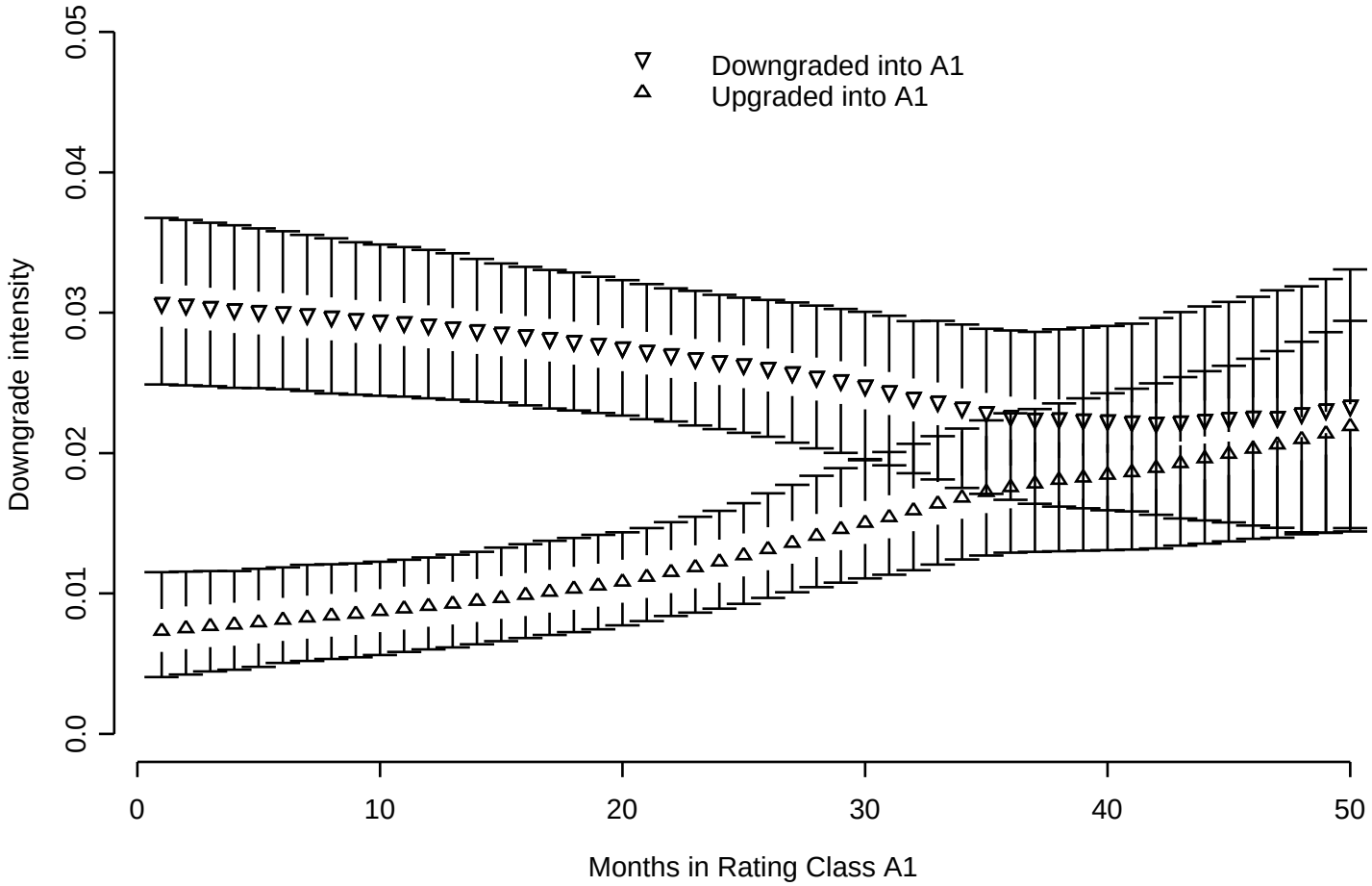
- ...then our estimate of the intensity depending on x if we disregard the $t-$variable, is

$$\alpha(x_1) = \frac{240}{1100} \quad \alpha(x_2) = \frac{420}{1100}$$

Two very different numbers that really arise from the exposure pattern and the $t-$dependence!

Non-parametric exploration

- The paper looks at Cox regressions and interprets parameters
- Some covariates are transfomed
- Smoothing techniques have advantages in the explorative stages
- Can provide pictures which are often at least as informative



The graph displays rating intensity as a function of time in state for A1-rated firms stratified according to the direction firms came into A1

Source: Fledelius, Lando , Nielsen (2004)

A few additonal remarks

- Some worries on cause and effect
  - Corporate bond spreads
  - Unemployment
- The use of aggregate default data or downgrade data. Evidence of contagion?
- Slope of interest rate curve instead of two levels?

Conclusion

- Interesting and ambitious attempt of capturing more macro effects
- Confirms and adds to findings on rating history effects
- Exactly what the lesson is on the macro variables is more difficult to assess
- Possible to better explain some of the 'anomalous responses'?
- In the wider perspective, we are still unsure of the robustness of the role of the macro-related variables