Modeling the Effect of Macroeconomic Factors on Corporate Default and Credit Rating Transitions
by Figlewski, Frydman and Liang

Discussion by
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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

<table>
<thead>
<tr>
<th>$\alpha(t, x)$</th>
<th>$x_1$</th>
<th>$x_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t_1$</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>$t_2$</td>
<td>0.4</td>
<td>0.4</td>
</tr>
</tbody>
</table>

• 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

<table>
<thead>
<tr>
<th>$E(t, x)$</th>
<th>$x_1$</th>
<th>$x_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$t_1$</td>
<td>1000</td>
<td>100</td>
</tr>
<tr>
<td>$t_2$</td>
<td>100</td>
<td>1000</td>
</tr>
</tbody>
</table>
Overview

Summary

Why analyze ratings?

Omitted variables and 'anomalous results'

Non-parametric explorative analysis?

A few additional remarks

Conclusion

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

<table>
<thead>
<tr>
<th>$O(t, x)$</th>
<th>$x_1$</th>
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</thead>
<tbody>
<tr>
<td>$t_1$</td>
<td>200</td>
<td>20</td>
</tr>
<tr>
<td>$t_2$</td>
<td>40</td>
<td>400</td>
</tr>
</tbody>
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• ...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 transformed
- 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.

A few additional 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