The Credit Ratings Game

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The Subprime Crisis

- Dollar value of originations of subprime mortgages rose from $65 billion in 1995 to $600 billion in 2006
- Moody’s profits tripled between 2002 and 2006, with profit margins of 50%
- Income from rating structured deals amounted to 50% of CRA total income
- Extreme complexity of ABS, CDOs (Gorton, 2009)
Key Elements of the Credit Rating Industry

Issuer pays, and payments may influence ratings:

- Fees are renegotiated with regular clients.
- Analytical managers participated in fee discussions with issuers and staff discussed fees and market share (SEC).
- CRAs offer related consulting services, such as pre-rating assessments.
- Possible conflicts of interest.

Issuers shop for ratings:

- Rating agencies are only paid if the credit rating is issued.
- "What the market doesn’t know is who’s seen certain transactions but wasn’t hired to rate those deals" - Brian Clarkson, president and COO (until July 2008), Moody’s.
Agencies’ models are not precise:
- Errors have been detected (and abused as in ABACUS)
- Agencies do not perform due diligence on issuer data

Large barriers to entry exist:
- SEC prohibited entry by creating NRSRO (Nationally Recognized Statistically Rating Organization) designation

Reputation plays a role in decisionmaking:
- Agencies state that their business is dependent on market confidence
Motivation

- Understand the conflicts of interest characteristic of credit rating agencies
- Consider the efficiency issues
- Derive the pros and cons of three different plans to reform the industry
This paper

- We incorporate these elements in a model of how Credit Ratings Agencies (CRAs) manage conflicts of interest and we examine proposed regulations of the industry.

- Our findings:
  - For the same information revelation strategy duopoly is less efficient than monopoly in terms of both total ex-ante surplus and consumer surplus.
  - More precise information increases current payoffs, but also increases the probability of getting caught.
  - The most efficient solution is to change to a system of upfront fees, automatic disclosure of ratings, and oversight on analytical standards.
Roadmap

- Literature Review
- Monopoly
- Duopoly
- Welfare
- Regulation
- Conclusion
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<th>Related Literature</th>
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<td>Certification intermediaries: Biglaiser (1993)</td>
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<td>Sobel (1985), Benabou and Laroque (1992) communication strategies</td>
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<td>Certification intermediaries with exogenous lying costs: Bolton, Freixas, and Shapiro (2007)</td>
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<td>Shopping: Skreta and Veldkamp (2008), Sangiorgi et al. (2010)</td>
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The Model

- Three players: Issuer, Credit Rating Agency, Investors
- An Investment: ex-ante is of type $g$ with probability $\frac{1}{2}$, $b$ otherwise
  \[
  \text{Prob (} g \text{ defaults)}=0, \text{Prob (} b \text{ defaults)}=p
  \]
- Returns $R$ when not defaulting, $r$ when defaulting
- CRA gets a private signal $\theta \in \{g, b\}$ about the true state $\omega$:
  \[
  \Pr(\theta = g \mid \omega = g) = \Pr(\theta = b \mid \omega = b) = e
  \]
  \[
  \Pr(\theta = g \mid \omega = b) = \Pr(\theta = b \mid \omega = g) = 1 - e
  \]
e measures the precision of the signal (known)
- Fees can be set conditional on report of CRA: $\phi^m$, where $m = G, B$. 
Investment technology
Signalling strategy: bad state of nature
After observing the report, the issuer can purchase it, or refuse to purchase it (shopping).

Once the rating is announced (or not), the issuer sets a uniform price $T$.

Investors can be sophisticated $(1 - \alpha)$ or naive $(\alpha)$.

We assume exogenous reputation costs: in the event of a default after a good rating, investors find out whether the CRA lied and punish by withdrawing their business.

Discounted sum of future profits $= \rho$.

Assumption A0: There is a tiny amount of uncertainty on the part of the CRA about the actual value of $\rho$, i.e. $\rho \in [\tilde{\rho} - \varepsilon, \tilde{\rho} + \varepsilon]$ such that $\varepsilon \to 0$. This uncertainty is resolved when the CRA receives its signal.
Investors are risk neutral and purchase 0, 1 or 2 units.

Reservation utility: $u$ on the first unit and $U$ on the second unit, where $U > u$.

Cutoff $p^*$ is defined by the indifference condition:

$$(1 - p^*)R + p^*r = U.$$  

Also:

(A1) $(1 - p)R + pr > u$

(A2) $(1 - e)p < p^*$

(A3) \( \frac{p}{2} > p^* \)
Timing

1. The CRA posts its fee of $\phi^m$, where $m = G, B$.
2. The issuer asks for the signal to be retrieved or not.
3. Given a request by the issuer, the CRA receives the signal and then makes a report of $m = G$ or $m = B$,
4. The issuer observes the report and decides whether to buy and distribute it or not. The issuer then sets a price $T$ for a unit of the investment.
5. Investors observe the price $T$ and the CRA rating if there is any and decide how much of the investment to purchase.
6. The return is realized.
Notation

\[ V^0 = \text{Value of the investment absent any (credible) information} \]
\[ V^G = \text{Value of the investment if } g \text{ is obtained and truthfully announced } G = g \]
\[ V^B = \text{Value of the investment if } b \text{ is obtained and truthfully announced } B = b \]
Information Regimes

Lemma

For a given set of fees $\phi^m$, the CRA’s reporting strategy is:

1. For $\phi^G - \phi^B > \epsilon \rho$, the CRA always reports “G”
2. For $0 < \phi^G - \phi^B < \epsilon \rho$, the CRA reports the truth, relaying its signal perfectly.
3. For $\phi^G - \phi^B < 0$, the CRA always reports “B”

Lemma

The issuer never buys a $m = B$ report. This implies that the CRA’s actual reporting strategy is:

1. For $\phi^G > \epsilon \rho$, the CRA always reports $m = G$, and
2. For $0 < \phi^G < \epsilon \rho$, the CRA reports the truth, relaying its signal perfectly.
Proposition

There are two equilibria of the fee setting game:

1. If $\alpha 2V^G - V^0 > \epsilon p \rho$, the CRA sets $\phi^G = \alpha 2V^G - V^0$, always reports $m = G$, and has profits

$$\alpha 2V^G - V^0 + (1 - \frac{ep}{2})\rho,$$

2. If $\alpha 2V^G - V^0 < \epsilon p \rho$, the CRA sets

$$\phi^G = \min [2V^G + \max [\alpha V^0, V^B] - 2V^0, \epsilon p \rho],$$

reports truthfully, and has profits

$$\frac{1}{2} \min [2V^G + \max [\alpha V^0, V^B] - 2V^0, \epsilon p \rho] + \rho.$$
The cutoff $\alpha 2V^G - V^0 - \epsilon p \rho$ determines which information regime prevails

- Low reputation costs or many naive investors make overstating more likely
- Low $p$ makes overstating more likely. This could be related to the business cycle.
- Higher precision means higher current profits, but more likely to get caught
- In truthtelling, fees are bounded above by expected reputation costs
Two CRAs

- Game has same structure, fees are posted simultaneously
- Define $V^{GG}$, $V^{BB}$
- Extra assumption:
  \[(A4) \quad \alpha 2V^G - V^0 > 2(V^{GG} - V^G)\]
- The discounted sum of future profits for each CRA not caught lying is $\rho^D$
- Information regimes are the same as before
Proposition

The Nash equilibrium of the fee setting subgame is:

1. If $\alpha 2(1 - V^G) > \varepsilon p^D$, both CRAs always report $G$.
2. If $\alpha 2(1 - V^G) < \varepsilon p^D$, both CRAs report truthfully, and
   
   1. If $\alpha \in \left[ \frac{3V^0}{2V^G}, 1 \right]$, the issuer hires both CRAs.
   2. If $\alpha \in \left[ \frac{V^0}{2V^G}, \frac{3V^0}{2V^G} \right)$, the issuer only hires one CRA and $\phi_k^R = \phi_k^I = 0$, $k = 1, 2$. 
Results - Two CRAs vs. One CRA

The cutoff $\alpha 2(V^{GG} - V^{G}) - epD$ determines which regime the CRAs are in

- Current payoffs are larger with one CRA, but so are future costs if $\rho \geq \rho^D$
Proposition

A truth-telling duopoly (when both CRAs are hired) is less efficient than a truth-telling monopoly.

- Moreover, TS is the same in monopoly or duopoly when the CRA(s) always report $G$.
- Proposition is the same for Investor Surplus. IS is strictly larger in monopoly when the CRA(s) always report $G$. 
Issuers must pay CRAs upfront (not conditional on the report)

With one or two CRAs: selects the truthlessly regime of the model

Eliminating shopping from the Cuomo plan

Two CRAs: Issuer only purchases one report and CRA fees are zero.
Investor’s pay system disappeared because of free-riding problem in the early 1970s.

It could be re-established through taxation (of investors or issuers).

If this prohibited shopping, it could be as good as the Cuomo plan without shopping.

However, there are additional regulatory costs: choosing the optimal tax, monitoring CRA performance and choosing how many CRAs are active.
If precision $e$ is chosen by the CRA after receiving payments and is non-contractible, the CRAs would choose the minimum precision in all three regulatory plans. Therefore, these plans would need oversight of minimum analytical standards.
The Credit Ratings Game

Bolton, Freixas, and Shapiro

Introduction

Monopoly CRA

Duopoly

Welfare

Regulation

Regulatory reform

Conclusions

Regulatory reform

Dodd Frank Act Committee

• More independent directors for CRAs, penalties and Internal firewalls reduce conflicts of interest
• The Franken amendment also addresses shopping

Global Financial Stability 10 Recommendations

• Improve market discipline by improving information
Conclusions

- Higher profits, more naive investors and lower reputation costs foster inflation rating
- One CRA can be better than two in terms of TS and IS due to shopping
- Prohibiting shopping from Cuomo plan is optimal, but need to monitor analytical quality
- Restructuring reduces surplus