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Regulation of credit rating agencies

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ABSTRACT

Financial regulators recognize certain credit rating agencies for regulatory purposes. However, it is often argued that credit rating agencies have an incentive to assign inflated ratings. This paper studies a repeated principal-agent problem in which a regulator approves credit rating agencies. Credit rating agencies may collude to assign inflated ratings. Yet we show that there exists an approval scheme which induces credit rating agencies to assign correct ratings.

1. Introduction

Financial regulators recognize certain credit rating agencies for regulatory purposes. The Securities and Exchange Commission (SEC), for instance, designates Nationally Recognized Statistical Rating Organizations (NRSROs) and uses the ratings of NRSROs to evaluate the amount of capital which financial institutions are required to hold.[1] In addition, many pension funds and other investors restrict their bond investments to bonds rated by a NRSRO.

However, it is often argued that credit rating agencies have an incentive to assign inflated ratings. Credit rating agencies assess the probability that issuers will default on their bonds. However, the major credit rating agencies are not paid by investors, but by issuers who are interested in high ratings. In addition, claiming that their ratings are independent expressions of opinion, credit rating agencies are immune to legal challenge. Lately, default rates of structured products, such as mortgage-backed securities and collateralized-debt obligations, have been much higher than their initial rating would suggest. As a result, credit rating agencies have been accused of assigning inflated ratings to structured products.

This paper studies a repeated principal-agent problem in which a regulator approves credit rating agencies. While credit rating agencies can observe an issuer's type, the regulator cannot. Credit rating agencies offer each issuer a rating and are paid by the issuers who demand a rating. The regulator cannot observe whether a credit rating agency assigns correct ratings. The regulator can only observe the default rate within a rating category for each credit rating agency. The default rate within a rating category does not only depend on whether a credit rating agency assigns correct ratings. The default rate can also be influenced by a common shock. Credit rating agencies may collude to offer inflated ratings. Yet we show that there exists an approval scheme which induces credit rating agencies to offer correct ratings.

The model shows that if credit rating agencies do not collude to offer inflated ratings, the regulator can filter out the common shock by evaluating the relative performance of credit rating agencies. If the credit rating agencies' discount factor is sufficiently high, the threat to deny approval in future periods can deter credit rating agencies from offering inflated ratings.

However, if all approved credit rating agencies collude to offer inflated ratings, the regulator cannot detect whether high default rates are due to collusion or the common shock. As a result, credit rating agencies may collude to offer inflated ratings.

The model shows that the regulator can prevent a collusive agreement to offer inflated ratings by providing an incentive to deviate. The model suggests that the regulator may reward a credit rating agency which deviates from such a collusive agreement by reducing the number of approved credit rating agencies in future periods.

The paper is related to the literature on relative performance evaluation first analyzed by Holmström (1982) and to the literature on collusion of certification intermediaries (e.g. Strausz,

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[1] See e.g. SEC (2003, 2007).

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2005; Peyrache and Quesada, 2007). Strausz (2005) and Peyrache and Quesada (2007) study incentives of a certification intermediary to collude with a seller of a product. Strausz (2005) derives conditions under which reputation enables certification intermediaries to resist capture and shows for instance that honest certification requires high prices and constitutes a natural monopoly. In contrast, Peyrache and Quesada (2007) focus on an equilibrium in which collusion may occur. They show that impatient intermediaries set lower prices in order to attract sellers with whom stakes for collusion are large. In contrast to our paper, Strausz (2005) and Peyrache and Quesada (2007) do not consider collusion between certification intermediaries. Strausz (2005) and Peyrache and Quesada (2007) moreover assume that buyers detect any collusion ex post. In our model, the regulator cannot observe whether a credit rating agency assigns correct ratings. The regulator can only observe the default rate within a rating category, which may be influenced by a common shock.

There is a growing theoretical literature on credit rating agencies.[2] For example, Mählmann (2008) studies implications of rating publication rights and finds that there exists an equilibrium with partial nondisclosure of low ratings. Skreta and Veldkamp (2008) study rating shopping. They show that when issuers can choose from several ratings which rating to disclose, product complexity can lead to rating inflation, even if credit rating agencies produce unbiased ratings. In contrast to our paper, Mählmann (2008) and Skreta and Veldkamp (2008) do not focus on credit rating agencies' conflict of interest. Bolton et al. (2008) and Mathis et al. (2008) study this conflict. Bolton et al. (2008) find that credit rating agencies may assign inflated ratings when there are many naive investors or when (exogenous) reputation costs are low. Mathis et al. (2008) model reputation costs endogenously. They find that a credit rating agency may assign inflated ratings when a large fraction of the credit rating agency's income stems from rating complex products. In contrast to our paper, Bolton et al. (2008) and Mathis et al. (2008) do not consider collusion between credit rating agencies.

The rest of the paper is organized as follows: Section 2 presents the model. Section 3 shows that there exists an approval scheme which induces all credit rating agencies to offer correct ratings. Section 4 concludes. Proofs are provided in the Appendix.

2. The model

Consider a model with a regulator, several credit rating agencies (CRAs), and many issuers. While CRAs can observe an issuer's type, the regulator cannot.

In period 0, the regulator chooses an approval scheme. The approval $w_i^t \in \{0,1\}$ of CRA i in period $t, t = 1,2,\ldots$, can be made contingent on the default rates which the regulator has observed previously. If the regulator approves CRA i in period t, $w_i^t = 1$. If the regulator does not approve CRA i in period t, $w_i^t = 0$. Let n^t denote the number of approved CRAs in period t ($n^t = \sum_i w_i^t$).

Each period $t, t = 1,2,\ldots$, consists of 3 stages. At stage 1, the regulator decides on the approval of CRAs according to the approval scheme. At stage 2, each CRA chooses a fee and offers a rating to each issuer. At stage 3, issuers decide whether and from which CRA to demand a rating. Fig. 1 illustrates the time structure in period $t, t = 1,2,\ldots$.

At the beginning of period $t, t = 1,2,\ldots$, a continuum of issuers enters. To simplify notation, its mass is normalized to 1. There are two types of issuers, A and B. If no shock occurs, type-A issuers have a low default probability d_A and type-B issuers have a high default probability d_B, where $0 < d_A < d_B < 1$. Let m denote the mass of type-A issuers, where $0 < m < 1$. In each period, issuers are uniformly located along the unit interval according to their type. Fig. 2 illustrates this. While CRAs can observe an issuer's type and an issuer's location on the unit interval, the regulator cannot.

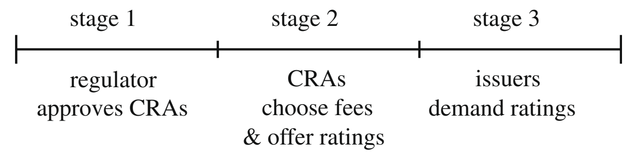

Fig. 1. Time structure in period $t, t = 1,2,\ldots$.

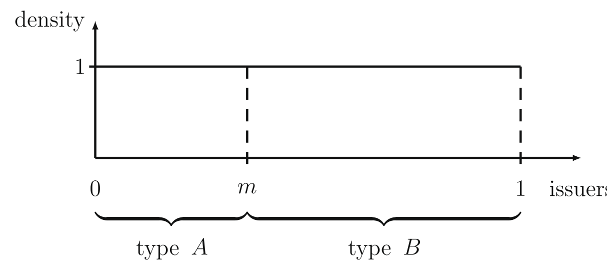

Fig. 2. Issuers are located along the unit interval according to their type.

At stage 1, the regulator decides on the approval $w_i^t \in \{0,1\}$ of CRA i according to the approval scheme. Approving a CRA for the first time generates approval costs c_A. Approval costs c_A may be interpreted as costs to establish a CRA. Let $z_i^t \in \{0,1\}$ denote whether the regulator approves CRA i for the first time in period t.

$$z_i^t = \begin{cases} 1 & \text{if } w_i^t = 1 \quad \text{and} \quad w_i^{t-1} = 0, \\ 0 & \text{otherwise.} \end{cases} \tag{1}$$

At stage 2, each CRA chooses a fee and offers a rating to each issuer. There are two rating categories, again $\mathscr{A}$ and $\mathscr{B}$. Rating category $\mathscr{A}$ indicates that an issuer is of type A and rating category $\mathscr{B}$ indicates that an issuer is of type B. CRA i chooses fee $f_i^t \in \mathbb{R}_0^+$ and rating threshold $a_i^t \in [0,1]$. CRA i offers issuers, who are located on or to the left of a_i^t on the unit interval, an $\mathscr{A}$ rating, and issuers, who are located to the right of a_i^t on the unit interval, a $\mathscr{B}$ rating. If $a_i^t = m$, CRA i offers all type-A issuers an $\mathscr{A}$ rating and all type-B issuers a $\mathscr{B}$ rating. If $a_i^t > m$, CRA i offers some issuers inflated ratings. Fig. 3 illustrates this. Issuers are uniformly located along the unit interval on the horizontal axis according to their type. m issuers are of type A. If $a_i^t > m$, CRA i offers type-B issuers an $\mathscr{A}$ rating. We assume that CRAs only publish a rating, if an issuer demands a rating.

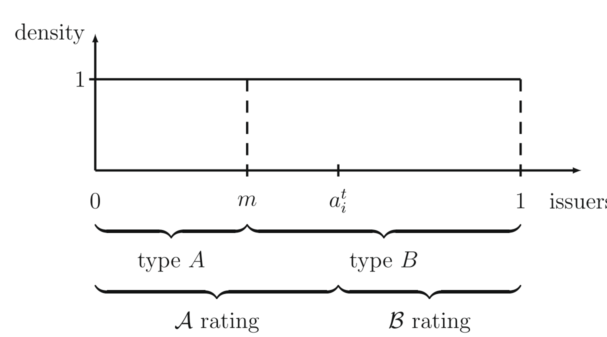

Fig. 3. If $a_i^t > m$, CRA i offers type-B issuers an $\mathscr{A}$ rating.

[2] There is also a large empirical literature on credit ratings. Some recent empirical papers study split ratings (Hyytinen and Pajarinen, 2008; Livingston et al., 2008) and unsolicited ratings (Behr and Güttler, 2008).