



# Market structure and rating strategies in credit rating markets – A dynamic model with matching of heterogeneous bond issuers and rating agencies



Thomas Fischer

TU Darmstadt, Bleichstr. 2, 64283 Darmstadt, Germany

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## ABSTRACT

This paper investigates the impact of rating agencies in a market with asymmetric information. In particular, the role of credit rating agencies as an intermediary between investors and bond issuers is discussed. We model this setting in a dynamic framework in which both rating agencies and bond issuers are of heterogeneous quality. Rating agencies can apply costly research technology to reveal the fundamental nature of bond issuers and engage in rating smoothing. We show that rating smoothing can compensate for low research quality, even though it is accompanied by a quality deterioration in the rating market and market clustering. Moreover, low-quality bond issuers have a general tendency to match with low-quality rating agencies. If investors place a strong emphasis on the reputation of rating agencies, rating markets also tend to be strongly clustered.

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## 1. Introduction

Recent years have seen an increased interest in the credit rating industry market. The agencies' failure in rating securities during the subprime crisis but also their role in the sovereign debt crisis in Europe led to a critical discussion of this industry not only in academic literature but especially in public media. This critical discussion was directed at their very capital: their reputation. The credit rating industry is a special service acting mainly as an intermediary between two parties who consider entering into a contract in the presence of information asymmetries. Bond issuers hire rating agencies to signal good quality to an investor in order to place their bonds in the market. One key factor in this setting is that the rating issuer is eventually paid by the vendor of the product rather than the potential acquirer, resulting in potential conflict of interest.

We develop an abstract theoretical model and discuss this under the premise of a market for credit ratings. In our model, we have three groups of agents: a single representative investor and heterogeneous bond issuers and rating agencies. While bond

issuers differ in their fundamental quality, rating agencies can be distinguished by their use of different rating strategies. To capture the effects of reputation, we apply a dynamic setting. Accounting for the effect of heterogeneity not only enables us to investigate market structure, but also to show matching between agents from different groups contingent on their underlying features. Rating agencies concretely differ in the precision of their research technology and the smoothing of their rating results. To our best knowledge both dynamics and matching between heterogeneous bond issuers and rating agencies have not been addressed in the existing theoretical literature.

The key findings of the model are that perfect research technology is not optimal since its marginal costs exceed its marginal utility. Therefore, ratings are always noisy approximations of the bond's true nature. To address the problem of noisy ratings, rating agencies can engage in costless rating smoothing (as opposed to costly research technology aimed at revealing the fundamental value). This however leads to a *race to the bottom*, in which bond issuers are no longer willed to invest in good rating agencies also resulting in overpricing. Our simulation results suggest very clustered markets for strong smoothing. Furthermore, we show that low-quality bond issuers tend to match with low-quality rating

E-mail address: [fischer@vwl.tu-darmstadt.de](mailto:fischer@vwl.tu-darmstadt.de)

agencies and in general hold a small number of ratings. A higher weight on the reputation of rating agencies leads to more market clustering and increases the retained information resulting in underpricing of bonds, especially for medium-quality bond issuers.

The remainder of this paper is organized as follows: in [Section 2](#) we present a literature overview on the problems of credit rating agencies. [Section 3](#) presents our stylized model and provides some first insights into the working of the rating industry. A more detailed analysis based upon both closed-form solutions further enriched by numerical simulations, especially regarding the effect of the different levers of rating agencies (research technology vs. rating smoothing), is presented in [Section 4](#). Finally, [Section 5](#) wraps up.

## 2. Literature overview

In this section, we want to present the main problems associated with the credit rating industry and their underlying causes. Furthermore, we want to provide an overview of the literature which deals with these problems (mostly from a theoretical perspective) and classify our own contribution in this context.

The credit rating agency (CRA) market received wide-spread interest in the media as well as in academic literature after the outbreak of the subprime crisis. The complex securities which were subject to large default rates mostly exhibited a good rating history, casting doubts on the ability of CRA to assess risks. In this context, the oligopolistic market structure also became the focus of attention. In fact, the market is dominated by three players only: Standards & Poor's (S&P), Moody's and (the smaller) Fitch. Moreover, the market's high profit rates for the existing entities provoked severe criticism, especially considering the erroneous nature of their service.

To comprehend the rating market, one can look at the three key actors: investors, bond issuers, and the intermediary rating agencies. Rating agencies are of importance due to information asymmetries in financial markets. Investors rely on the superior assessment ability of rating agencies to decide upon default risk and thereby whether to invest in a product issued by a certain bond issuer. CRA play an important role in the Anglo-Saxon market-based system rather than in the German or Japanese bank-based financial system in which a direct relation between lender and issuers exists and the screening procedure is not outsourced to a professional external entity ([Mählmann, 2008](#)). This might also explain why the most important firms in the rating business are based in the USA. In the past, investors paid rating agencies in order to receive a rating. However, in the early 1970s this *investor paid* business model of the CRA changed into an *issuer paid* model, in which the costs of the rating are borne by the issuer. This fact is attributed to the low cost of photo-copying, allowing for a widespread distribution of the CRA's products ([White, 2010](#)).<sup>1</sup> A bond issuer chooses to be rated in order to *stand on the shoulder of giants*, i.e. replacing their own low (especially for unknown and small entities) reputation by sending a signal from a well-known highly reputable organization.<sup>2</sup> [Kashyap and Kovrijnykh \(2013\)](#) compare different payment models from a welfare point of view. In particular, they find that issuer payment (in contrast to investor payment) leads to fewer ratings and less informative markets, since CRA apply lower

rating effort. Reputation plays a key role in the market for ratings, yet this reputation is a rather abstract concept. CRA emphasize that their judgments are only statements of opinion (similar to the opinion of a movie or a restaurant critic) and thereby not legally contestable.

One important factor contributing to the structure of the business is the legal framework. In the USA, CRA have to hold the status of a Nationally Recognized Statistical Ratings Organization (NRSRO) in order to receive a market license. Following several mergers, this led to a decrease in their number, leaving only three main competitors, although new firms have been admitted recently ([Bolton et al., 2012](#)). Moreover, the verdicts of CRA are included in regulation, generally implying lower compliance costs (e.g. lower capital or collateral requirements) for highly rated securities. In a theoretical framework, [Opp et al. \(2013\)](#) show that this can contribute to a high number of rated entities with high (i.e. inflated) ratings. In their theoretical framework, this scenario is further emphasized for complex securities (e.g. Collateralized Debt Obligation in the subprime crisis), in booms resulting in a procyclical rating, and around the important investment-grade/junk threshold.

Parts of the theoretical literature argue that the weak competition in this market, which leads to a more or less monopolistic structure, is counterbeneficial. In a theoretical framework, [Lizzeri \(1999\)](#) argues that a monopolistic rating agency will withhold information and will only ensure a minimum standard. Furthermore, he shows that besides not contributing significantly to the diffusion of information in the market, a rating agency will capture the large fraction of the rents from the rating process. Therefore, this result is closely related to the seminal work by [Grossman and Stiglitz \(1980\)](#), stating that, in equilibrium, the cost of producing information (here: the cost of the rating) equals its benefits. [Mariano \(2012\)](#), relying on a theoretical rationale, contends that, in a monopolistic environment, the CRA withholds private noisy information and thereby merely confirms publicly available information and consensus. In contrast, [Lizzeri \(1999\)](#) shows that in a competitive market all information is revealed. In another theoretical work, [Boom \(2001\)](#) argues that, in a monopolistic market, there is an over-supply of ratings. The monopolistic CRA can set its fee such that only the rated firms can place their bonds in the market. This is especially welfare-decreasing if the firms would have been financed without the presence of a rating agency. [Strausz \(2005\)](#) even argues that the certification industry, due to economics of scale and price competition, constitutes a natural monopoly. Moreover, the monopolistic structure is inherent to this market since there are natural barriers to entering the market. A newcomer in the market has no reputation at all. This puts him at a disadvantage against any existing market participant, even if the existent participants do not have a downright high reputation ([Jeon and Lovo, 2011](#)).

These results suggest that a competitive framework would be desirable for the CRA market. However, the literature ([Becker and Milbourn, 2011](#); [Bolton et al., 2012](#); [Stolper, 2009](#) amongst others) argues that this does not have to be the case, since increased competition can be accompanied by rating inflation or at least lower rating deflation ([Mariano, 2012](#)).<sup>3</sup> As stated in [Kashyap and Kovrijnykh \(2013\)](#), stronger competition also results in lower fees, which in turn is followed by a lower screening effort by CRA and therefore less informative markets. To address this problem the Cuomo-plan<sup>4</sup> requires payment for the rating before

<sup>1</sup> A similar behavior can now be observed in the entertainment industry (pop-music, films, etc.). The emergence of new technology (i.e. high-speed internet) led to a wide and easy distribution of the products, lowering customer's willingness to pay. The industry now faces the serious problem of defining a new sustainable business model.

<sup>2</sup> This key idea leads to the fact that the market for rating agencies is always smaller than the market for the bond issuers. In the context of the model about to be presented this implies  $I > J$ .

<sup>3</sup> The theoretical rationale for the deflation is that – in contrast to rating inflation – deflation can be self-fulfilling since low rated projects are not financed and thereby fail.

<sup>4</sup> It is named after the agreement between the New York State Attorney General Andre Cuomo and the three main CRA.

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