Journal of Banking & Finance 49 (2014) 100–112

Contents lists available at ScienceDirect

Journal of Banking & Finance

journal homepage: www.elsevier.com/locate/jbf

Credit rating dynamics and competition

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ARTICLE INFO

Article history:
Received 6 August 2013
Accepted 12 August 2014
Available online 26 August 2014

JEL classification:
D43
D82
G24
L15

Keywords:
Credit rating agencies
Ratings inflation
Evolutionary game theory

ABSTRACT

I analyze the market for credit ratings with competition between more than two rating agencies. How can honest rating behavior be achieved, and under which conditions can a new honest rating agency successfully invade a market with inflating incumbents? My model predicts cyclic dynamics if sophisticated investors have a high impact on agencies' reputation. In contrast, if trusting investors have the main impact, then the dynamics exhibits a saddle point rather than cycles. In this case, regulatory support for honest rating agencies is only needed for a limited time, but the effect is sustainable in the long run.

1. Introduction

In early February 2013, the U.S. Justice Department charged the largest credit rating agency (CRA), Standard & Poor's (S&P), with fraud and demanded US$5 billion in restitution, see Mattingly (2013). Not only S&P, but also its competitors are widely considered to have been a major contributor to the 2008 subprime mortgage crisis, accused of intentionally inflating ratings, i.e., giving good ratings to bad issues. This leads to the questions of how the complex interaction between credit rating agencies, issuers, and investors affects the quality and informativeness of credit ratings and how honest rating behavior can be achieved.

In this paper, I will analyze under which conditions rating agencies with negligible market shares can improve their positions. In particular, I will consider a new rating agency whose ethical standards and business practices differ from those of the incumbents. It will be particularly interesting to determine the conditions under which such an agency, which I term "honest" rather than "inflating", can successfully invade the market, even if it starts off with a tiny market share. I will also discuss under which conditions a regulatory intervention to support alternative agencies is likely to be successful.

As two shortcomings of existing theoretical models, I identify that they only consider competition in duopoly and usually neglect the dynamic properties of the market. The contribution of my paper is well motivated by quoting Bolton et al. (2012): "It would be of interest [...] to explore these issues more systematically in a fully general dynamic game, possibly with an infinite horizon. There is currently no model of oligopolistic competition over an infinite horizon in the CRA literature; indeed, there are very few such models in the industrial organization literature for obvious reasons of tractability." Therefore I develop a tractable framework using Evolutionary Game Theory, as previously applied by Friedman (1991) to similar economic settings, to analyze the interaction of CRAs over an infinite horizon in a competitive market with an arbitrary number of agencies. I model the CRAs' incentives to inform the investors honestly about the quality of investments rather than inflate ratings as an interplay with investors' sophistication level. These characteristics of CRAs and investors are similarly modeled in Bolton et al. (2012) and other papers.

As the main innovation I pursue on the modeling side, the methodology of Evolutionary Game Theory allows for an arbitrary number of market participants, as well as the analysis of whether new behavioral traits successfully enter an established market. The dynamic view is particularly important when the market does not immediately develop into a unique equilibrium, which happens in two situations: First, I will show how the market evolves in cycles for a situation in which a static game does not have any Nash equilibria in pure strategies. Second, for a situation with two Nash equilibria in pure strategies, the dynamics will explain the determinants for reaching one or the other.

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http://dx.doi.org/10.1016/j.jbankfin.2014.08.011
0378-4266/

Apart from the dynamic view, I contribute to the existing literature in two important ways. First, I do not only consider changes in CRA behavior, but I also allow the behavior of the investors to react on the characteristics of the CRA market they face. On the one hand, CRAs are more likely to inflate ratings for a high share of trusting investors, as the benefits from receiving more fees outweigh the possible reputation costs if caught inflating. On the other hand, investors will in turn change their behavior when they face a CRA market with an abundance of ratings inflation. As sophisticated investors usually perform better than trusting investors on such a market, the latter will either start leaving the market or learn to be more sophisticated as well. In my model, sophisticated investors have to spend costs for the monitoring of investment and ratings quality, whereas trusting investors save these costs but suffer when they happen to buy bad investments.

Second, I allow for the CRA reputation to be differently affected by the two investor clienteles. This extension crucially affects the resulting dynamics. It is motivated as follows. On the one hand, sophisticated investors are the more professional ones and those who have better access to the media, therefore it is possible that they cause more harm to the CRAs. On the other hand, trusting investors rely fully on the CRAs, as they have no other means to avoid bad investments, while sophisticated investors do their own analysis in addition. Therefore, when trusting investors experience default of investments they have believed in, they tend to be harmed by the CRAs to a larger degree and thus have a higher motivation to spread the news than sophisticated investors.

The results of my paper are as follows: I show that the interaction between the CRAs' and the investors' behavior can lead to different equilibria. Dependent on the economic trade-offs, either honest or inflating CRAs dominate in the end, while the population of investors ends up being either trusting or sophisticated. Apart from these pure strategy outcomes, there can be cyclic dynamics with the distribution shares in both populations periodically increasing and decreasing over time, if sophisticated investors have the main impact on CRAs' reputation. In contrast, if trusting investors have a high impact on CRAs' reputation, then the dynamics can exhibit a saddle point rather than cycles. In this case, a small perturbation of CRA and investor types can determine whether the outcome will be a sophisticated/inflating or a trusting/honest equilibrium. Honest rating agencies can be supported by regulatory measures. There are situations in which direct support for new, honest CRAs is only needed for a limited time, but the effect is sustainable in the long run. Other measures include affecting the CRAs' fee and compensation structures, as well as a centralized monitoring of ratings quality.

The welfare-maximizing first-best outcome in my model avoids either type of reputation costs as well as default of investments, as these are all deadweight losses to the system. Given that monitoring by CRAs is more efficient than monitoring by individual investors, the latter should also be avoided. Overall, the first-best outcome is therefore to have trusting investors and honest CRAs. The relevant friction is that CRAs cannot credibly commit to being honest. Ex post, they can therefore have an incentive to choose the inflating strategy. In turn, investors can find it optimal to spend monitoring effort to protect themselves against defaults. Moreover, to incentivize the CRAs to be honest, imposing the reputation costs can be necessary.

I extend the model analysis to a time-varying ex ante investment quality, for example considering higher average quality in times of economic booms. Apart from perturbations of CRA and investor types, I hereby also show that a change in the macroeconomic conditions can determine whether the resulting equilibrium is, for example, a sophisticated/inflating or a trusting/honest one. The exact outcome then depends on the speed of change of investment quality relative to the changes in the CRA and investor behavior.

The paper is structured as follows: In the remainder of Section 1, I present the institutional background and market structure, and I relate my research to the existing literature. Next, I introduce the modeling framework in Section 2. Then I present a simple two-player game between one investor and one CRA as a reference point in Section 3. On this basis, I extend the model to the evolutionary dynamics and present the corresponding results in Section 4. Then I provide empirical predictions in Section 5. In Section 6, I develop several policy recommendations. Section 7 concludes the paper.

1.1. Institutional background and market structure

Both in the United States and in the European Union, the market for credit ratings is served by a limited number of rating agencies that have the highest regulatory approval. In both regions the market is dominated by an even smaller group of only three agencies. This sets the background for the central question of my paper, namely under which conditions alternative rating agencies with negligible market shares can improve their positions.

In the U.S., there are ten approved CRAs, so-called Nationally Recognized Statistical Rating Organizations (NRSRO). First there were only Moody's and S&P, and since approximately 1997, Fitch has been there as the third agency. In the meantime, seven more agencies have been approved. Still, the three big CRAs (Fitch, Moody's and S&P) cover more than 94% of the U.S. market share measured as percentage of total NRSRO revenue in 2012, see SEC (2013).

In the European Union, the European Securities and Markets Authority (ESMA) is responsible for the registration and supervision of CRAs. 22 CRAs are registered with ESMA as of December 2013. The Eurosystem accepts six of them, namely Cerved, Creditreform, DBRS, Fitch, Moody's, and S&P, to be used by credit institutions to determine their risk weight exposures, see ECB (2014). Similarly to the U.S. situation, the combined 2012 market share of Fitch, Moody's, and S&P in the European Union amounts to 87%, see ESMA (2013).

The current market for credit ratings is dominated by the "issuer pays" business model. It was chosen over an earlier "investor pays" model due to information drain and difficulties in collecting sufficient fees. Stahl and Strausz (2011) suggest that the "issuer pays" business model might be superior to the "investor pays" model. They argue in a more general context that sellers (issuers) rather than buyers (investors) of an information-sensitive good should pay for certification (ratings). While sellers want to signal quality, buyers have to inspect quality, the former being both socially more desirable and generating higher rents to the certifier (CRA). However, the "issuer pays" model has an inherent conflict of interest: It can be profitable for the CRA to inflate ratings. Some smaller CRAs on the market apply the "investor pays" model. One of them, Egan-Jones Ratings Company (EJR), is even an NRSRO. Milidonis (2013) shows empirically for U.S. insurance ratings that changes in investor-paid (EJR) ratings can predict changes in ratings by issuer-paid rating agencies (Fitch and S&P). An investigation by the U.S. Securities and Exchange Commission (SEC) against EJR in 2012 shows that the "investor pays" model is not necessarily free from conflicts of interest either, see SEC (2012). More precisely, the SEC states: "EJR failed to enforce its policies to address conflicts of interest arising from employee ownership of securities, and allowed two analysts to participate in determining credit ratings for issuers whose securities they owned.".

In the present paper, I consider only the case of solicited credit ratings, i.e., that the CRA receives compensation for the rating. See, e.g., Fulghieri et al. (2014) for a discussion of unsolicited credit ratings, i.e., ratings produced as a service to the market without being