"Noise" in Ratings: Not Entirely Random

Author:

Dr. Puneet Prakash [1]
Assistant Professor
Department of Finance, Insurance, and Real Estate
Virginia Commonwealth University

[1] Corresponding Author: Address: VCU School of Business, Rom 3147, 1015 Floyd Avenue, Richmond, VA – 23284. Phone: 804-828-7180 (W). Email: pprakash@vcu.edu

Abstract

"Noise" in Ratings: Not Entirely Random

I investigate the informational accuracy as opposed to informational content of credit ratings over time. The study presents an empirical analysis of the classification errors. Results suggest that greater the credit risk in the economy, the higher is the error rate. Of all binary classifications tested, classification error for dichotomous class of investment vs. non-investment grade issuers is best explained by the economy-wide credit risk distribution. I conclude there is more "noise" in the assignment of ratings at exactly the time when there is more uncertainty regarding the credit risk of firms in the economy – i.e., during a credit crisis.

1. Introduction

In this paper I study the informational accuracy of ratings. Rating agencies assign firms of different risk type to separate risk classes (usually a letter grade) which reflects the true underlying probability of default. However, this classification is not perfect and raters make errors in their assignments. So a low risk firm can be assigned a high letter grade and vice-versa. Consequently, conditional upon the true type of the firm, say, high risk (H) or low risk (L), the probability that a H-type is assigned a lower letter grade B ($p_{B|H}$) is less than one. Similarly, the probability that an L-type is assigned a high letter grade A ($p_{A|L}$) is also less than one. Given that the classification system is not perfect, there are bound to be classification errors. This study examines errors in classification over time as a function the underlying distribution of the credit risk in the economy. I find that the riskiness of the underlying economy-wide credit risk distribution has considerable explanatory power for the classification errors. When I test for errors in the binary classification of investment vs. non-investment grade, the explanatory power of underlying economy – wide credit risk reaches a maximum. This leads me to conclude that when there is higher uncertainty regarding credit risk, the distinction between investment versus non-investment grade is least clear-cut. In light of Boot, Milbourn and

2

Schmeits (2006) argument that when firm is of medium credit quality then the role of a credit rating agency (CRA) as a monitor is more important in ruling out bad equilibrium outcomes, the empirical findings in this paper suggest that over the period of 1986-2000, correct classification of medium quality firms declined. The study also finds that over the period of study, the econometric model used for ratings is able to distinguish firms at the ends of rating spectrum (AAA and CCC respectively) from the medium quality firms better.

This study examines the classification errors of S&P ratings over time in a conceptual framework of Lizzeri (1999) while borrowing some elements from Boot et al (2006) and the management science literature (Nerkar and Paruchuri (2005); Paruchuri *et al* (2006)).Lizzeri (1999) focuses on the information provider role of the rating agency while Boot et al. (2006) focus on the monitoring role that rating intermediaries perform after the issuance of a rating. However, while Lizzeri (1999) argues that a CRA manipulates information in a way so as to capture all informational rents and even allows for a possibility that the probability of getting a specific class rating is actually independent of the true type of the firm, I rule out that possibility to begin with. In essence, I assume that $p_{B|H}$ and $p_{A|L}$ do not equal p_B and p_A respectively.

The structure of the paper is as follows. In section 2, I discuss the conceptual framework for analysis, both theoretical and empirical. Section 3 discusses the hypothesis, data and methodology. The empirical results obtained from the model are then discussed in section 4 and section 5 concludes.

Bibliography

Altman, E., 1989. Measuring corporate bond mortality and performance. Journal of Finance 44, 909-922.

Blume, M., Lim, F., MacKinlay, C., 1998. The declining credit quality of U.S. corporate debt. Myth or reality? Journal of Finance 53, 1389 – 1413.

Boot, A., Milbourn, T., Schmeits, A., 2006. Credit ratings as coordinating mechanisms. The Review of Financial Studies 19, 81-118.

Campbell, J., Lo, A., MacKinlay, A., 1997. The Econometrics of Financial Markets. Princeton University Press.

Cummins, J., Grace M., Phillips R., 1999. Regulatory solvency prediction in property liability insurance. Risk based capital, audit ratios and cash flow simulation. The Journal of Risk and Insurance 66, 417-458.

De, S., Kale, J., Shahrur, H., 2003. Information in bond ratings and the demand for rating services. Unpublished working paper, Georgia State University.

Delianedis, G and Geske R ,1999. Credit risk and risk neutral default probabilities. Information about rating migrations and defaults. Unpublished working paper. The Anderson School, UCLA.

Dimson, E , 1979. Risk measurement when shares are subject to infrequent trading. Journal of Financial Economics 7, 197-226.

Doherty, N., Phillips, R., 2002. Keeping up with the joneses. Changing rating standards and the buildup of capital by U.S. property – liability insurers. Journal of Financial Services Research, 55-78.

Ederington, L., 1985. Classification models and bond ratings. Financial Review 20, 237-261.

Fama, E., French, K., 1997. Industry costs of equity. Journal of Financial Economics 43, 153-193.

Graham, J., Harvey, C., 2001. The theory and practice of corporate finance: evidence from the field. Journal of Financial Economics 60, 187-243.

Greene, W., 2003. Econometric Analysis. MacMillan, New York.

Hillegeist, S., Keating, E., Cram, D., Lundstedt .G, 2004. Assessing the probability of bankruptcy. Review of Accounting Studies 9, 3-54.

Hosmer, D. Jr., Lemeshow, S., 2000. Applied Logistic Regression, 2nd Edition. John Wiley and Sons Inc., New York.

Jorion, P., Liu, Z., Shi, C., 2005. Informational effects of regulation FD: evidence from rating agencies. Journal of Financial Economics 76, 309-330.

Kaplan, R., Urwitz, G., 1979. Statistical models of bond ratings. A methodological enquiry. Journal of Business 52, 231 – 261.

Kisgen, D., 2006. Credit ratings and capital structure. Journal of Finance 61, 1035-1072.

Lizzeri, A., 1999. Information revelation and certification intermediaries. RAND Journal of Economics 30, 214-231.

Loviscek, A., Crowley, F., 1990. What is in a municipal bond rating? The Financial Review 25, 25-53.

Merton, R., 1974. On the pricing of corporate debt. The risk structure of interest rates. Journal of Finance 29, 449-470.

Millon, M., and Thakor, A., 1985. Moral hazard and information sharing. A model of financial information gathering agencies. Journal of Finance 40, 1402-1422.

Nayak, S., 2001. Explaining the time variation in bond ratings. Do bond rating agencies follow any definite rating standard? Unpublished working paper, Yale School of Management.

Nerkar, A. and Paruchuri, S. (2005). Evolution of R&D capabilities: The role of knowledge networks within a firm. Management Science, 51, 771-785.

Opler, T., Pinkowitz, L., Stulz, R., Williamson, R., 1999. The determinants and implications of corporate cash holdings. Journal of Financial Economics 52, 3-46.

Partnoy, F., 1999. The Siskel and Ebert of Financial Markets: Two Thumbs Down For Credit Rating Agencies. Washington University Law Quarterly 77, 619-712.

Paruchuri, S., Nerkar, A., and Hambrick, D.C. (2006). Acquisition Integration and Productivity Losses in the Technical Core: Disruption of Inventors in Acquired Companies. Organization Science, 17, 545-562.

Ramakrishnan, R., Thakor, A., 1984. Information reliability and a theory of financial intermediation. Review of Economic Studies 51, 415-432.

Ronn, E., Verma, A., 1986. Pricing risk adjusted deposit insurance. An option based model. The Journal of Finance 41, 871-895.

Stein, R., 2005. The relationship between default prediction and lending profits: Integrating ROC analysis and loan pricing. Journal of Banking and Finance 29, 1213-1236.

White, L., 2002. The Credit Rating Industry: An Industrial Organization Analysis. In: Levich, R., Majnoni, G., Reinhart, C. (Eds.), Ratings, Rating Agencies And The Global Financial System. Kluwer Academic Publishers, chapter 2.