



Organizational structure, risk-based capital requirements, and the sales of downgraded bonds



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ABSTRACT

Using bond downgrades as external shocks to life insurers' asset risk, we document several findings of the impact of organizational structure and risk factors on investment risk taking. First, we find that mutual insurers and widely-held stock insurers are more likely to sell downgraded bonds than are closely-held stock insurers. Second, we find evidence that insurers are less likely to sell downgraded bonds that remain in the same rating class than bonds downgraded to a lower rating class. The result implies that insurers sell downgraded bonds mainly because of additional capital charge is imposed, not because of downgrade itself. In other words, risk factors in risk-based capital regulation do matter on life insurers' investment risk taking. Finally, we find that life insurers might be reluctant to sell downgraded bonds at fire-sale prices during the 2008–2009 financial crisis.

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1. Introduction

This paper investigates the impact of organizational structure and risk factors in risk-based capital (RBC) requirements on selling downgraded bonds by life insurers. Bond downgrades provide a good opportunity to examine how life insurers react to an external shock to their asset risk. Selling a downgraded bond and holding the proceeds in cash or buying another bond with a better credit rating than the downgraded bond is a type of risk reduction.

The first purpose of this study is to analyze the relation between organizational structure and life insurers' investment risk taking on downgraded bonds. While the relation between organizational structure and underwriting risk taking in the property-liability insurance industry has been examined (e.g., Lamm-Tennant and Starks (1993); Kleffner and Doherty (1996); Mayers and Smith (2002); Ho et al. (2013)), to our best knowledge, there is no study on the relation between organizational structure and

investment risk taking (e.g., bond investing) in the life insurance industry.¹

We argue that mutual insurers are more likely to sell downgraded bonds than are stock insurers. When a bond held by an insurer gets downgraded, the insurer's asset risk increases because the default risk of the bond issuer increases. Mutual insurers are more likely to sell downgraded bonds to reduce risk and move back to the target risk level for two reasons. First, the expected bankruptcy costs of being away from the optimal risk level is higher for mutual insurers than stock insurers because mutual insurers cannot raise capital in the capital markets. The bankruptcy probability is higher when risk is higher and capital is not adjusted accordingly. Second, the agency cost for managers of mutual insurers related to the decision of keeping downgraded bonds is higher than the agency cost of stock insurers because managers of stock insurers in general have stocks and stock options which can mitigate the agency costs. Therefore, when facing a new exogenous

¹ The influence of organizational structure on firms' decisions continues to draw attention from the academic study. Some recent works in the general industry are: Mergers and acquisitions (Maksimovic and Phillips, 2013), CEO compensation (Cronqvist and Fahlenbrach, 2013; Edgerton, 2012), cash policy (Gao et al., 2013), and innovation (Bernstein, 2015). Topics in the banking industry include: Asset risk and default risk (Barry et al., 2011), performance and efficiency (Kontolaimou and Tsekouras, 2010; Servin et al., 2012), lending behavior (Ferri et al., 2014), and income smoothing (Bouvatier et al., 2014).

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shock of downgraded bonds, mutual insurers are more likely to sell downgraded bonds to go back to optimal risk level than stock insurers.

The comparison between widely-held and closely-held stock insurers is similar to the analysis between mutual and stock insurers. We propose that widely-held stock insurers are more likely to sell downgraded bonds than are closely-held stock insurers. From expected bankruptcy cost perspective, there may be no significant difference between widely-held and closely-held stock insurers because both types of insurers can raise capital through issuing stocks. From agency cost perspective, however, agency costs between managers and owners are higher for widely-held stock insurers than agency costs for closely-held stock insurers. Closely-held stockholders have more incentive to monitor their managers to mitigate agency costs than widely-held stockholders because closely-held stockholders have relatively higher percentage wealth invested in their companies than widely-held stockholders. Therefore, when facing a new exogenous shock of downgraded bonds, widely-held stock insurers are more likely to sell downgraded bonds to go back to optimal risk level than closed-held stock insurers. We investigate whether mutual insurers are more likely to sell downgraded bonds than are stock insurers and whether widely-held stock insurers are more likely to sell than are closely-held stock insurers.

The second purpose of this paper is to analyze the impact of risk factors in RBC regulation on investment risk taking. In addition, unlike the existing literature we investigate not only fallen-angel bonds but also non-fallen-angel bonds.² Ambrose et al. (2008) and Ellul et al. (2011) analyze bonds downgraded from investment-grade to speculative-grade (so called “fallen angels”). Ellul et al. (2011) also show how life insurers’ investment risk taking is affected by the RBC regulation.³ Ellul et al. (2011) use National Association of Insurance Commissioners (NAIC) RBC ratio and Street.com’s Risk-adjusted capital ratio 1 (RACR1) to measure an insurer’s financial soundness and find that for the period from 2001 to 2005 insurers that are relatively more financially-constrained by regulation are more likely to sell fallen-angel bonds. However, Ambrose et al. (2008) and Ellul et al. (2011) do not specifically examine the impact of risk factors. RBC reflects overall company risk which includes not only investment risk but also underwriting risk and other risks. But underwriting risk and other risks are not directly related to whether or not to sell downgraded bonds. We therefore use NAIC risk factors as a proxy to directly examine whether or not additional capital requirements from NAIC affect the sales of downgraded bonds.⁴

While the relation between risk taking and RBC ratio (capital level) is under debate, insurers definitely do not like a greater capital charge if a bond is downgraded to a lower class because holding capital is costly.⁵ The required capital of holding a corporate bond is computed as the product of the holding amount and the respective NAIC risk factor. The riskier the bond is, the higher the NAIC risk factor is imposed. For example, regulators currently impose the same 7.4% of book value of a B+-rated bond for capital

requirement purposes after that bond is downgraded from B+ to B-, but impose a 17.0% capital requirement after the bond is downgraded to CCC+. In this case, insurers have weaker incentive to sell such a bond downgraded from B+ to B- than a bond downgraded from B+ to CCC+.⁶

The final purpose of this study is to investigate risk taking during the financial crises. When a bond owned by an insurer is downgraded during the period of financial crisis, the insurer may not want to sell the downgraded bond at fire-sale price. The spread contribution from illiquidity increases dramatically with the onset of the recent subprime crisis (Dick-Nielsen et al., 2012). In addition, institutional investors with short horizons may need to sell their holdings in the short run and amplify the price drops (Cella et al., 2013). Life insurers, who are long-horizon investors, may wait to sell a downgraded bond until the price reverses back to normal levels.

The sample observations are comprised of life insurers’ detailed corporate bond holdings and matched with the downgrade records in the Mergent’s Fixed Investment Securities Database (FISD). The final sample consists of 161,997 observations over an 11-year period from 1999 to 2009. We summarize the results that are important to the literature below. First, we find mutual insurers and widely-held stock insurers are more likely to sell downgraded bonds than are closely-held stock insurers. Second, we find a statistically significantly negative relation between the probability of selling downgraded bonds and insurers’ RBC ratios. But the economic significance is marginal. A 10-percent better capitalized insurer is 1.03% less likely to sell a downgraded bond. Third, we find that a life insurer is more likely to sell a speculative-grade bond if a downgrade falls into a lower rating class.⁷ Finally, life insurers, as a whole, sold fewer downgraded bonds during the 2008–2009 financial crisis.

Our study complements the literature in several ways. First, we are the first to examine the impact of organizational structure on investment risk-taking behavior in the U.S. life insurance industry. Second, we are the first to provide evidence that life insurers are more likely to sell their holdings on speculative-grade bonds if a rating agency downgrades these bonds into a lower rating class. Prior studies investigate only investment-grade bonds downgraded to speculative-grade. Finally, our study is the first to find that life insurers sold fewer downgraded bonds during the 2008–2009 financial crisis. From the perspective of the regulators, it is important to know whether insurers behave differently between investment-grade and speculative-grade bonds, as well as between normal time and crisis time.

The remainder of the paper proceeds as follows. Section 2 presents our hypotheses. Section 3 briefly describes our data. Section 4 provides our empirical models and the results. Section 5 offers conclusions.

2. Hypotheses development

2.1. The organizational structure of a life insurer and the sale of a downgraded bond

Mutuals differ from stocks in both the agency problems faced and the ability to deal with agency problems (Fama and Jensen, 1983a; 1983b; Mayers and Smith, 1981). While agency costs of fixed claims (policyholders’ claims) are controlled by forming a mutual organization, the result is offset by less effective control over the owner-manager conflict. Since the cost of controlling

² Fallen-angel bonds are bonds downgraded from investment-grade to speculative-grade. Non-fallen-angel bonds are bonds remain as investment-grade or remain non-investment-grade in spite of downgrade.

³ Two recent papers are associated with RBC regulation but not risk taking. Ellul et al. (2015) document that fair value accounting motivates higher rates of selling of asset-backed securities among property & casualty insurers, whereas historical cost accounting for life insurers motivates them to hold downgraded asset-backed securities, selling corporate bonds instead. Merrill et al. (2012) show that insurers that became more capital-constrained because of operating losses and also recognized fair value losses sold comparable residential mortgage-backed securities at much lower prices than other insurers during the recent financial crisis.

⁴ RBC ratio is calculated based on the risk factors.

⁵ Please refer to Section 2.2 for the literature review on the relation between risk and capital.

⁶ Please see Table 1 for the details of credit ratings and the NAIC risk factors.

⁷ After a speculative-grade bond is downgraded, it is still in speculative grade. Prior literature investigates investment-grade bonds downgraded to speculative-grade.

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