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Risk management in life insurance companies: Evidence from Taiwan



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ABSTRACT

The solvency issue of life insurance companies has become more important in recent years as business risks turn increasingly greater. This study examines the relationship among investing risk, underwriting risk, and the capital ratio during the post risk-based capital regulation period of 2004–2009 in Taiwan. In addition to the two-stage least square regression (2SLS), we also adopt the two-stage quantile regression (2SQR) to capture the effects of low capital (or risk) levels and high capital (or risk) levels. 2SLS do not fully explain the capital-risk relation. Contrary to previous evidence reported in the U.S., our findings in 2SQR model indicate that the relationship between capital and underwriting risk is positive, while the relationship between investing risk and capital shows a reverse pattern. Overall, the 2SQR provides stronger evidence than the 2SLS.

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1. Introduction

This is the first study to examine the interrelationships among capital, investing risk, and underwriting risk in the life insurance industry by using the two-stage quantile regression (2SQR) method. For the insurance sector, theoretical literature and academic studies in this area have focused mostly on

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the influence of the risk-based capital (RBC) regulatory instrument. The theoretical literature widely examines a variety of hypotheses predicting insurers' capital and risk-taking behavior, such as risk subsidies, transaction costs and regulatory costs. The first is the risk subsidy hypothesis that assumes a negative relation between risk and capital. This hypothesis implies that financial firms are prone to have more incentives to increase risks through exploiting the benefits of guaranty funds (Lee, Mayers, & Smith, 1997) since the guaranty charges are flat on premiums rather than being risk-based. The second is called the regulatory cost hypothesis and suggests a positive relation between risk and capital (Shrieves & Dahl, 1992). This hypothesis predicts that if the regulatory capital cost is high, then the financial firms may tend to take on more risk to balance the explicit and implicit costs of regulation. The third is represented as the transaction cost hypothesis and first introduced by Coase (1937) and further expanded by Williamson (1988), who contends that the level of transaction costs mostly determines the degree of vertical integration and capital structure.

Baranoff and Sager (2002) use the view of transaction costs to predict the relation between product risk and capital in the life insurance industry. They recognize that health insurance is the kernel of transaction costs, because it involves more contractual uncertainty than other product lines. When life insurers sell riskier products such as health insurance, they may increase their equity, rather than debt. Hence, the transaction cost hypothesis implies that risk and capital are positively related.

Similar to the theoretical literature, the empirical literature also produces contradictory conclusions, since each study may outline capital and risk decisions in its small set of financial firms, risk measures, and methods, depending on the study's characteristics. Table 1 shows several representative studies regarding risk-capital relationships. Among insurance studies, Cummins and Sommer (1996) address that the insurers increase their risk positions as capital levels increase in the property/casualty insurance market. Baranoff and Sager (2002, 2003) and Baranoff, Papadopoulos, and Sager (2007) show a positive relationship between capital and regulatory asset risk (or opportunity asset risk), supporting the regulatory cost hypothesis and the bankruptcy avoidance hypothesis. They also find a negative relationship between product risk and the capital ratio. In banking studies, Shrieves and Dahl (1992) find a positive relationship between capital and asset risk, revealing that banks that have increased their capital level have also raised their risk level. Their results support several hypotheses, including the unintended effect of minimum capital regulation, regulatory costs, as well as bankruptcy cost avoidance.

The opposite findings are encountered by Jacques and Nigro (1997), who post a negative relation between portfolio risk and capital among a large number of U.S. commercial banks. Several bank studies report that banks may take on more or less risk depending on their different capital positions. Calem and Rob (1999) argue that severely undercapitalized banks may bear greater risks than medium-sized capital banks as well as well-capitalized banks. Heid, Porath, and Stolz (2003), Jeitschko and Jeung (2007) and Jokipii and Milne (2011) note that, for well-capitalized banks, risk and capital level are positively related, while for undercapitalized banks, there is a negative relation between the two.

Both theoretical and empirical arguments raise some questions in terms of RBC requirements. For instance, how do life insurers react to capital requirements? Do they raise or reduce their risk-taking behavior? How do they react to different types of risk? As we know, the life insurance sector is a highly regulated industry, because insurers' insolvency brings about a negative impact upon the soundness and stability of the financial system. As Lee, Huang, and Yin (2013) note, the life insurance market, particularly the life insurance premium, plays a significant role in financial markets. When the regulators implement financial or economic policies, they must take account of the impacts of these policies on the insurance market. da Silva and Divino (2013) also warn that financial institutions' credit risks are pro-cyclical and default risks depend on structural features, and thus the regulator should set up a policy to promote financial stability and efficiently reduce fluctuations.

Life insurers in Taiwan have recently been increasingly exposed to greater risks, because of more competitors, expanding insurance interest losses, and the recent global financial crisis. To mitigate life insurers' excessive risk seeking, Taiwan has implemented the RBC requirements in its domestic insurance system since 2003. This mechanism may bring a substantially important impact on life insurers' capital decision and risk-taking behaviors. Since risk management in the insurance industry has become an important issue, investigating the relationships among investing risk, underwriting risk, and capital is crucial for regulators and life insurers in Taiwan.

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