



## Does one size fit all? Determinants of insurer capital structure around the globe <sup>☆</sup>



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### ABSTRACT

As financial markets become more global, the question arises whether any country specific considerations are still relevant for insurance companies' capital structure. This research examines this question with firm-level data across a broad range of countries including those in developing markets. What we find is that the optimal capital structure of insurance companies is not homogeneous across countries. We find that country-level factors explain a substantial fraction of the cross-sectional variation in insurance companies' capitalization levels. Our results add to the current policy discussion on global regulatory capital requirements. If insurer capital structure is not homogeneous across countries, a global capital standard – if desired – should take differences in the institutional environments across countries into account to avoid market distortions.

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## 1. Introduction

Since the International Association of Insurance Supervisors (IAIS) was established in 1994, insurance regulators and supervisors from over 140 countries have been working on promoting globally consistent supervision of the insurance industry. In the

aftermaths of the 2008–2009 financial crisis, the quest for consistency in supervision has gained significant momentum,<sup>1</sup> and on October 9, 2013 the IAIS announced that it is committed to develop a global insurance capital standard by 2016. This international momentum toward harmonizing regulatory capital requirements raises the question to what degree insurance companies' capitalization levels and capital structure decisions are driven by

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<sup>1</sup> The two most prominent initiatives in this context are the IAIS' role in identifying and developing policy measures for potentially systemically important global insurers, and the IAIS' project to develop a common framework for the supervision of internationally active insurance groups (ComFrame). Both the discussed policy measures dealing with global systemically important insurers (IAIS, 2012a) as well as the proposed framework for supervision of internationally active insurance groups (IAIS, 2012b) include a discussion on capital requirements. The ComFrame working draft released on July 2, 2012 explicitly states that the IAIS decided, "ComFrame shall develop a partially harmonized approach to group capital for solvency assessment purposes" (IAIS, 2012b, p. 8). On October 9, 2012, thirty-one associations of insurance companies representing about 87% of the insurance market globally established the Global Federation of Insurance Associations (GFIA). The goal of the GFIA is to represent insurance companies' views before international panels including the International Association of Insurance Supervisors.

country specific considerations. If country characteristics have a significant impact on insurance companies capital structure a certain degree of heterogeneity in the calibration of capital standards might be necessary to incorporate differences in the institutional environments across countries.

How firms choose their capital structure is one of the fundamental questions in financial economics. The literature addressing this research question examines, with few exceptions, the determinants of firms' capital structure choices with data from one country, usually the United States (see, e.g., Korajczyk and Levy, 2003; Flannery and Rangan, 2006; Frank and Goyal, 2009; Huang and Ritter, 2009; Cheng and Weiss, 2012). However, the transaction cost theory proposed by Coase (1937) and Williamson (1985) highlights that firms do not operate in a vacuum and suggests that firms' institutional environment impacts firms' optimal structure. Therefore, the main argument in our article is that the optimal capital structure of insurance companies is not homogenous across countries. Assuming the costs and benefits of holding capital differ across countries, the optimal capital structure of firms trading-off these costs and benefits should differ as well.

The goal of our research is threefold. First, we examine insurance companies' capital structure across a broad range of countries including those in developing markets. Second, we quantify the relative importance of country-level determinants compared with firm-level determinants in explaining firms' capital structure choices. Third, we explicitly examine specific country characteristics and to what extent these country-level factors moderate the relationship between a firm's characteristics and the firm's capital structure decisions.

Based on the prior literature (see, e.g., Sommer, 1996; Berry-Stölzle et al., 2013), we hypothesize the following country characteristics to impact firms' capital structure decisions: The ease of access to financial markets in a country, the costs associated with financial distress in the country, the level of property rights protection in the country, and the level of competition in the country's product markets. We expect that insurers hold more capital in countries with well-developed capital markets where it is relatively easy to raise external capital. We also expect insurers to hold more capital in countries with relatively high financial distress costs because holding capital is more valuable in those countries. Financial distress costs of insurance companies are especially high in countries where individuals are risk averse and willing to pay a substantial premium for policies of financially stable insurers. If the legal system in a country is unpredictable and hinders contract enforcement firms may be hesitant to hold much capital because such financial slack may lead to expectations of stakeholders to get their "piece of the pie" in the form of immediate payouts or excessively favorable contracts for goods and services. Thus, insurers' capitalization levels should be lower in countries with poorer property rights protection. Competition puts pressure on firms to produce their output as cost efficiently as possible. Since holding capital is costly, we expect firms in countries with higher levels of competition to utilize less capital in their production process.

To examine the relative importance of firm-level and country-level determinants of insurer capital structure, we perform a variance decomposition analysis. Since property-liability insurance companies and life insurance companies differ substantially with respect to their business model and, hence, their capital structure, we perform the analysis separately for these two sectors of the industry. Using data on 20,097 firm-year observations from property-liability insurers across 33 different countries and 13,624 firm-year observations from life insurers across 29 countries over the period 2000 through 2012, we find that time-invariant country characteristics (i.e. country fixed effects) account for roughly 60%

of the explained variation in insurance companies' capital structure, whereas the firm-level determinants proposed in the prior literature account for roughly 30%.<sup>2</sup>

We use a four step approach to examine the impact of specific country characteristics on insurance companies' capital structure. First, we perform a variance decomposition analysis based on regression models of insurers' capital structure on firm-specific explanatory variables and country characteristics. We do not just measure the direct impact of these characteristics, we also add interaction terms between the country characteristics and all firm-level determinants to our model specifications to capture potential indirect or moderating effects. Second, we calculate the overall marginal effect of the country characteristics on insurers' capital structure and compare the sign of the effect with the hypothesized relationship. Third, we estimate a dynamic partial adjustment model of insurance companies' capital structure. The variance decomposition analysis is basically a static analysis of variations in insurers' capital structure with a cross-sectional focus. There is substantial evidence in the literature that firms actively manage their capital structure over time (see, e.g., Graham and Harvey, 2001; Klein et al., 2002; Bancel and Mittoo, 2004; Flannery and Rangan, 2006; Huang and Ritter, 2009; Cheng and Weiss, 2012; Öztekin and Flannery, 2012; Fier et al., 2013). After capital shocks, however, firms' may not immediately return to their target capital structure due to transaction costs, firms' rather make partial adjustment that will restore their capital structure over time (Flannery and Rangan, 2006). To control for firms' capital adjustments over time and to focus more on time-series aspects in our assessment of the determinants of capital structure, we go beyond the static framework of the variance decomposition analysis and estimate a dynamic partial adjustment model with country fixed effects. Fourth, we calculate the percentage change in the predictive margins to determine the sign of the overall impact of country characteristics on firms' capital structure.

Overall, our results indicate that the ease of access to financial markets and the level of property rights protection in the country impact the capital structure of property-liability insurance companies. Our modeling approach captures both the direct and indirect impact of country characteristics and these indirect effects turn out to have a substantially stronger effect on variations in capital structure than the direct effects. We do not find evidence that the costs associated with financial distress and the level of competition in the country influence property-liability insurers capital structure decisions in a systematic and theory-consistent way. For life insurers, only the ease of access to financial markets seems to impact capital structure decisions as expected. Our results are stronger for the analysis with a cross-sectional focus and less pronounced for the partial adjustment model with a time-series focus, indicating that insurance companies' capital structure dynamics are relatively persistent over time and may not change instantaneously to reflect time-series variations in country characteristics.

We are only aware of one paper with a similar research focus. Gungoraydinoglu and Öztekin (2011) examine the relative importance of firm- and country-level determinants of corporate leverage for nonfinancial firms across 37 countries. They find that for nonfinancial firms firm-level factors explain about two-thirds of the (explained) variation in capital structure and country-level

<sup>2</sup> We follow the variance decomposition approach of Lemmon et al. (2008) and calculate the fraction of the model sum of squares attributable to a particular effect or variable. The adjusted *R*-square of the underlying regressions is roughly 40%. Therefore, country fixed effects explain approximately 20% of the overall variation in insurance companies' capital structure, and the firm-level determinants proposed in the literature explain approximately 10% of the overall variation.

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