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THE ROLES OF INDUSTRY IDIOSYNCRASY, COST EFFICIENCY, AND RISK IN INTERNATIONALIZATION: EVIDENCE FROM THE INSURANCE INDUSTRY

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The roles of industry idiosyncrasy, cost efficiency, and risk in internationalization: Evidence from the insurance industry

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Abstract

A central matter of dispute in the internationalization literature is the existence and shape of a systematic relationship between the degree of internationalization and firm performance (I-P relationship). Considering the global insurance industry, we show that the I-P relationship depends on the industry's idiosyncrasies and on the geographical scope of internationalization. The life insurance industry's idiosyncrasies lead to relatively high liability of foreignness that compromise cost efficiency, and relatively low risk reduction benefits of globalization. Therefore, we observe an overall negative impact of globalization on life insurers' performance. However, the nonlife insurance industry's idiosyncrasies render this relationship insignificant.

Keywords:

Industry Dependency; Liability of Foreignness; Risk Reduction; Data Envelopment Analysis; Financial Services

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1. Introduction

Internationalization[1] has dramatically increased in both manufacturing and service industries (Capar & Kotabe, 2003), aside from a persistent domestic asset bias (Heathcote & Perry, 2013). Academic research on internationalization has concurrently increased over the past decades (Hitt, Tihanyi, Miller, & Connelly, 2006; Knight & Liesch, 2016) with two major empirical questions: (1) antecedents of internationalization, explaining why firms decide to internationalize as well as what types of firms and environments are more prone to internationalization (see, e.g., Liu, Li, & Xue, 2011); and (2) the impact of internationalization on firm performance, also referred to as the internationalization–performance (I-P) relationship (see, e.g., Chen & Tan, 2012). The focus of this paper is on the latter, for which the empirical evidence is inconsistent, raising more questions than answers (Glaum & Oesterle, 2007; Hennart, 2007). Among the many explanations for this inconsistency, two can be found in industry dependency (Capar & Kotabe, 2003; Contractor, Kundu, & Hsu, 2003) and regionalization theory (Rugman & Verbeke, 2004, 2007). We present evidence of the industry dependency of I-P relationships for two industries that appear to be very close: life and nonlife insurance. We explain the difference in the I-P relationships by industry idiosyncrasies in terms of liabilities of foreignness (Zaheer, 1995) and risk reduction effects of internationalization (Rugman, 1976; Elango, 2010).[2] Our analysis of globalization strategies also fits into the third stage of the three-stage I-P paradigm (Contractor et al., 2003; Oh & Contractor, 2014), where the I-P relationship is predicted to be S shaped.

Insurance provides a persuasive context to analyze internationalization strategies and their impact on performance because regulatory changes in the 1990s in many economies and innovation in IT and global communication led to a wide variety of corporate strategic changes and, consequently, variation in the degree of internationalization (Sadhak, 2005; Klarner & Raisch, 2013).[3] Moreover, specific potential costs and benefits of internationalization make

[1] Studies using labels such as internationalization, globalization, geographical diversification, international diversification, international expansion, and multinationality usually refer to the same strategic management construct (Hitt, Tihanyi, Miller, & Connelly, 2006). In this paper, we use two terms as internationalization and globalization. Globalization refers to the inter-regional internationalization (Rugman & Verbeke, 2004), whereas internationalization covers both intra- and inter-regional cross-border multinationality.

[2] We note that internationalization may also increase the risk of a firm (Hahn, Bunyaratavej, & Doh, 2011; Oh & Li, 2015). These risks include the corruption, the absence of governance, and the uneven application of laws (Metters, 2008). Sometimes, the lack of familiarity with the foreign environment translates into elevated levels of risk-related costs to the firm (Hahn et al., 2011). Hejazi and Santor (2010) emphasized the increased operational risk due to internationalization in financial services.

[3] For example, in 1994, the European insurance markets were deregulated to create a single market, which led to a wave of acquisitions and geographical expansion across borders in the late 1990s.

insurance a particularly interesting field. Potential benefits of risk-pooling provide arguments in favor of international diversification. The intangible nature of insurance products may be a double-edged sword because, on the one hand, costs of storage and transportation are nonexistent while, on the other hand, innovations can easily be copied. The highly regulated nature of most insurance markets may create entry barriers, thereby limiting the internationalization options and increasing costs. Finally, the size and function of the global insurance industry underscores its economic importance, with USD 4.6 trillion in premium volume and USD 27 trillion in managed assets, approximately 12% of global financial assets, in 2013 (Swiss Re, 2014). The insurance industry constitutes a reliable source of capital and risk transfer capacities for the global economy, making the industry relevant outside of its market domain. The motivation to study the industry dependency of internationalization in particular in the insurance industry is also driven by the existence of its two sub-industries: life and nonlife insurance.

We contribute to the internationalization literature in the following aspects. (1) We empirically support the industry dependency hypothesis in I-P relationships by constructing a unique two-sample empirical design based on the life and the nonlife insurance industries. (2) We conceptually and empirically answer why the I-P relationship is industry dependent in that both life and nonlife insurance exhibit industry idiosyncrasies in terms of their liabilities of foreignness (captured by cost efficiency) and their risk reduction effects of internationalization. (3) We provide the first piece of evidence regarding the I-P relationship for the life insurance industry, in which we support the prediction of regionalization theory in the sense that globalization strategies have a negative impact on firm performance. (4) We introduce a data envelopment analysis (DEA) frontier efficiency measurement into I-P relationship studies to enrich the toolkit of performance measurements and emphasize an alternative direction for analyzing the potential impact of internationalization that is the cost efficiency.

Our findings show that the impact of globalization on firm performance is negative for the life insurance industry and insignificant for the nonlife insurance industry. We rationalize this difference in the I-P relationship by life insurers exhibiting a higher liability of foreignness and thus lower cost efficiency as opposed to nonlife insurers; moreover, life insurers benefit less from the risk reduction effects of globalization than nonlife insurers. In this regard, our work contributes to the ongoing discussion regarding I-P mediators (Wagner, 2004; Hitt et al., 2006). The results suggest that future internationalization studies should carefully examine the industry idiosyncrasies when using multiple industry samples and should be careful to

generalize results across industries. The results also suggest that managers should adopt different internationalization strategies and regulators should employ different regulatory policies for industries that appear to be very close, but exhibit idiosyncrasies affecting the I-P relationship.

The remainder of this paper is organized as follows. We first review the internationalization literature and then develop our hypotheses. We describe our samples, variables, and empirical models, followed by results and robustness tests. We end the paper with conclusions and managerial implications.

2. Literature review and hypothesis development

2.1. Literature on internationalization–performance relationship

Internationalization has become an increasingly important strategic option available to firms seeking sustainable competitive advantages. However, the liability of foreignness [4] is a considerable disadvantage that results in extra costs of internationalization (Zaheer, 1995; Nachum & Zaheer, 2005). Early internationalization theory demonstrates the tradeoff between potential benefits and costs of internationalization (Hymer, 1976). Potential benefits of internationalization are economies of scale and scope (Kogut, 1985), expanded market opportunities (Kim, Hwang, & Burgers, 1989), access to inexpensive and idiosyncratic resources (Porter, 1990), international knowledge (Ghoshal, 1987; Kobrin, 1991), efficient resource allocation (Kobrin, 1991), and risk diversification (Ghoshal, 1987; Kim, Hwang, & Burgers, 1993). The liability of foreignness lies with the increased complexities of coordination, governance, and operation among diverse operating units (Hitt, Hoskisson, & Kim, 1997; Capar & Kotabe, 2003), which results in extra costs of internationalization. These costs and complexities may result from the physical distance, logistic difficulties, the cultural and linguistic distance, regulatory barriers, and currency fluctuations,[5] among others (Sundaram & Black, 1992; Capar & Kotabe, 2003; Yamao & Sekiguchi, 2015). Ultimately, it is an empirical task to weigh the potential benefits and costs of internationalization and identify its impact on firm performance under different settings.

A large number of empirical studies examining the relationship between the degree of

[4] The inherent disadvantage foreign firms experience because of their non-native status.

[5] Insurance markets, in particular, benefit from domestic currency assets in terms of asset liability matching, that is, matching cash flows of expected insurance benefit or claim payments with cash flows from assets in the same currency (Kouwenberg, 2001).

internationalization (DOI) and firm performance have emerged in the past 45 years. However, the results are mixed and inconclusive (Hitt et al., 2006; Hennart, 2007). Vernon (1971) presented an early sample covering 80% of American manufacturers' overseas assets at the time and documented a positive I-P relationship. Many subsequent studies have supported the linear and positive I-P relationship (e.g., Grant, 1987; Gomes & Ramaswamy, 1999). A positive I-P relationship is expected because multinational firms may possess ownership-specific, location-specific, and internationalization advantages (known as eclectic or OLI paradigm), which can be exploited profitably across national borders (Dunning, 1980, 1993; Rugman, 2010). Several studies have also provided evidence of a negative I-P relationship. For example, Kumar (1984) documented a lower profit rate for international firms in the UK; Gedajlovic and Shapiro (1998) found a negative I-P relationship for some American and German firms. The concept of an internationalization threshold—that is, the DOI at which the costs of internationalization exceed its benefits—is used to explain the negative I-P relationship (Hitt et al., 1997; Gomes & Ramaswamy, 1999). Beyond a certain DOI, multinational companies may have expanded to peripheral and/or unfamiliar markets and have become too complex internally, leading to a faster increase in coordination and governance costs relative to incremental revenues from further expansion.[6] Thus, an overall inverted U-shaped I-P relationship is expected, whereas low DOIs positively impact performance and high DOIs negatively impact performance (Hitt et al., 1997). In the 21st century, a new S-shaped I-P relationship has arisen in the literature to reconcile previous models. The S-shaped 3-stage model allows for an initial negative relationship at low DOIs, a subsequent positive relationship at intermediate DOIs, and a negative relationship at high DOIs when over-internationalization occurs (Contractor et al., 2003; Lu & Beamish, 2004). The right tail of the S-shaped relationship corresponds to the inverted U shape.[7] A few syntheses and meta-analyses have sought to reconcile the mixed empirical results, but have yielded different conclusions. Hitt et al. (2006) favored the inverted U shape; Hennart (2007) argued for no systemic relationship;

[6] Firms over-internationalize themselves because (1) firms rarely continuously monitor their pace of internationalization and thus simply do not become aware in time when they are overextended (Contractor et al., 2003); and (2) some firms may deliberately over-internationalize for long-term strategy reasons, even though it is detrimental to medium-run returns (Hennart, 2007).

[7] In stage 1, a firm seeks expansion in familiar and proximate markets. The learning and local adaptation costs are likely to exceed the incremental benefits. In stage 2, the DOI increases to establish scale economies, reputation, and diversification benefits (i.e., reduce risk or business volatility). In stage 3, the lack of knowledge of distant markets and the complexity in a large organization may again turn the cost–benefit balance, resulting in a negative internationalization impact on firm performance (Outreville, 2010).

Contractor (2007) supported the S shape; and Bausch and Krist (2007) and Kirca et al. (2011) deduced a positive relationship based on meta-analyses.

Two conceptual contributions, among many others,[8] explain the mixed empirical evidence. The regionalization theory differentiates intra- and inter-regional internationalization (regionalization versus globalization), an additional geographical dimension to the low versus high DOI (Rugman & Verbeke, 2004, 2007; Qian, Khoury, Peng, & Qian, 2010). Rugman and Verbeke (2004, 2007) suggested that the liability of inter-regional foreignness is higher than the liability of intra-regional foreignness due to high learning costs, limited transferability of knowledge, high risk of operations, and increased physical and cultural distance, among others. Qian et al. (2010) argued that intra- versus inter-regional internationalization presents a contrast to the more classical arguments that performance outcomes are bound by DOI. A greater degree of intra-regional internationalization may positively correlate with firm performance; however, the relationship between the degree of inter-regional internationalization and performance should exhibit an inverted U shape.[9] Thus, globalization is more likely to have a negative impact on firm performance than regionalization. Oh and Contractor (2014) imposed Rugman and Verbeke's (2004, 2007) geographical perspective on Contractor et al.'s (2003) S-shaped three-stage paradigm. They proposed that the intra-regional internationalization encompasses stages 1 and 2 (i.e., at low and medium DOIs); the inter-regional internationalization encompasses stage 3 (i.e., at high DOIs); and putting together all three stages comprises both intra- and inter-regional internationalization. They supported the regionalization theory with evidence showing that inter-regional internationalization generates a more negative impact on firm performance than intra-regional internationalization.

Another conceptual explanation, the industry dependency hypothesis, differentiates service and manufacturing firms (Capar & Kotabe, 2003; Contractor et al., 2003). Service firms have some idiosyncrasies that should result in different I-P relationships as opposed to manufacturing

[8] We acknowledge that the I-P relationship may be contingent on many other factors, such as product diversification (Oh & Contractor, 2014), organizational type and structure (Yiu, 2011), earliness of internationalization (Zhou & Wu, 2014), and early or later phase of internationalization. We control for some of the observable factors and implicitly control for unobservable factors via the firm fixed effects.

[9] The line between inter- and intra-region is typically defined at the continent level. For example, Rugman and Verbeke (2004, 2007) considered the most relevant regions as three "broad triads": North America (NAFTA), Europe (EU), and Asia. Qian et al. (2010) defined four regions: Africa, Asia and the Pacific, Europe, and the Americas. However, the empirical evidence is limited on whether and to what extent multinational firms are actually structured in the way the "broad triad" concept suggests (e.g., using regional divisions) and whether they have higher homogeneity in business practices within a region than across regions (Oh & Li, 2015).

firms (Capar & Kotabe, 2003). First, the nature of service business is mostly intangible[10] (Berthon, Pitt, Katsikeas, & Berthon, 1999); second, the production and consumption of many services occur simultaneously (Habib & Victor, 1991); third, services usually require a more local presence (i.e., foreign direct investment) than the manufacturing of exportable products (Boddewyn, Halbrich, & Perry, 1986); fourth, services may have to be adapted more extensively than manufactured products due to customers' linguistic and cultural differences (Patterson & Cicic, 1995). These idiosyncrasies of service firms increase their liability of foreignness. Some other idiosyncrasies may generate additional benefits. For example, knowledge learning worldwide may improve competitiveness (i.e., economies of geographical scope). Service firms can also achieve economies of scale by centralizing upstream value chain activities and by performing activities at locations that provide the lowest cost (Capar & Kotabe, 2003). Moreover, the nonexistence of shipping and storage costs is an advantage for globalization. Katrishen and Scordis (1998) presented the first piece of evidence on economies of scale for multinational service firms with an insurance sample. Multinational insurers achieve economies of scale only up to a certain point of DOI and then suffer diseconomies. They point out that internationalization is not as great an advantage for service firms as it is for those manufacturing firms concerning economies of scale.

Contractor et al. (2003) further distinguished between knowledge-based (e.g., financial services, consulting, marketing) and capital-intensive (e.g., air transport, shipping, hotels, restaurants) service firms. Knowledge-based service firms have some idiosyncrasies that should result in a different I-P relationship from capital-intensive service firms (Contractor et al., 2003). First, knowledge-based service firms have a lower burden of tangible asset investments; thus, they are less likely to commit "irreversible resources" to foreign markets. Second, knowledge-based service firms have clients already established abroad and, thus, can easily adopt "follow the client" strategies. Third, knowledge-based service firms possibly exhibit greater global standardization, thereby lowering the liability of foreignness (Contractor et al., 2003). These idiosyncrasies suggest that knowledge-based service firms are easier to internationalize than capital-intensive firms. Thus, knowledge-based service firms as opposed to capital-intensive service firms are also more prone to rush foreign market expansion and over-expand, leading to poor performance (Petersen, Petersen, & Sharma, 2002; Contractor et al., 2003). Therefore, Contractor et al. (2003) hypothesized and demonstrated an S-shaped I-P

[10] A service firm is an organization that provides an intangible item that also requires some interaction between the buyer and the seller (Berthon et al., 1999).

relationship for knowledge-based service firms.

Following this industry dependency rationale, Hitt, Bierman, Uhlenbruck, and Shimizu (2006) investigated professional service firms (e.g., law firms, consulting firms), a sub-category of knowledge-based service firms. The idiosyncrasies of professional service firms lie with the universally applicable knowledge[11] and the slow expansion following existing clients, which enable professional service firms to enjoy positive I-P relationships. Financial services are another important sub-category of knowledge-based service firms. Outreville (2010) investigated the world's largest financial groups to confirm Contractor et al.'s (2003) S-shaped I-P relationship.

A few empirical papers have gone further down the path of industry dependency, looking at sub-industries in financial services. Hejazi and Santor (2010) investigated the Canadian banking industry and documented a positive I-P relationship. Ma and Elango (2008) investigated the American nonlife insurance industry. They found that nonlife insurers focusing on specific lines of business benefit from internationalization, but internationalization reduces returns if the insurer already has a diversified product range. Outreville (2012) investigated the world's largest reinsurance groups and documented an overall positive but slightly S-shaped curvy I-P relationship in terms of underwriting performance.

In summary, at different DOIs, the shape of the I-P relationship is likely to be different (Contractor et al., 2003). At the same DOI, the I-P relationship is contingent on where the firm internationalizes (the geographical scope of internationalization) and on the industry to which the firm belongs. The impact of intra-regional internationalization is more positive than inter-regional internationalization (Qian et al., 2010). Some industries with certain idiosyncrasies may have lower liabilities of foreignness but higher risk reduction benefits than others; thus, internationalization in such industries is expected to generate a more positive (or less negative) impact on performance (Capar & Kotabe, 2003; Elango, 2010).

2.2. Hypothesis development

We test three hypotheses for each of the two industries: life and nonlife insurance. This setup is particularly designed to reveal the role of industry idiosyncrasy in the I-P relationship and

[11] Recent studies have advanced the understanding of the global integration process in professional service firms. Breunig, Kvalshaugen, and Hydle (2014) pointed out the importance of the balance between global integration and local responsiveness in professional service firms; Boussebaa (2015) documented the center-subsidiary tension in the process of global integration. Both studies suggested that the global integration is not zero-cost.

two potential mediating factors: cost efficiency and risk. We focus on the inter-regional aspect of internationalization (i.e., globalization) because globalization is a controversial topic in general (Qian et al., 2010; Oh & Contractor, 2014) and particularly so in the insurance industry due to the large cultural, economic, regulatory, and legal differences across regions. The cultural and economic differences across regions are much more significant than those within regions; whereas Europe, North America, Australia, and New Zealand are mostly mature and developed insurance markets, Asia, Africa, and Latin America are largely emerging and developing markets. The regulatory and legal gaps are also more pronounced across regions. European insurance markets are regulated under a unified scheme; Canada and the US have similar regulations, as do Australia and New Zealand (ANZ). The decision to focus on inter-regional internationalization is also driven by the fact that the premium distribution at the country level is not available in existing insurance databases. Consistent with the regionalization theory, we expect the liability of foreignness to be higher with globalization as opposed to regionalization in the insurance industry and, thus, the relationship between globalization and performance is negative (Rugman & Verbeke, 2004; Oh & Contractor, 2014).[12]

The insurance industry provides a unique context to investigate the industry dependency of I-P relationships with its two sub-industries—life and nonlife insurance—operated by separate legal entities in most countries. We compare the idiosyncrasies of the life and nonlife insurance industries and demonstrate their different nature in terms of the liability of foreignness, risk reduction effects of internationalization, and the consequential I-P relationships (see Table 1).

We find that nonlife insurance exhibits lower liability of foreignness in all cost components. First, life insurance is a credence good with a long contract duration, which can be lifelong for the whole life and annuity (i.e., pension) coverage. Premiums are paid upfront or in early periods of the contract, and the benefits are paid after a substantial time delay. Nonlife insurance contracts usually last only one year. Thus, it is more difficult for foreign players to operate life insurance in another region than to operate nonlife insurance because of the potential trust issue with local customers. They are concerned about the insurer being reachable to pay contractual benefits after decades. Second, life insurers are subject to stricter regulations

[12] Deng and Elyasiani (2008) investigated the American banking industry and showed that an increased distance between a banking holding company and its branches is associated with firm value reduction, implying a negative impact of inter-regional geographic diversification.

than nonlife insurers due to the long-term nature of insurance policies, which requires more protection for the policyholders.[13] Thus, the entry barrier for the life insurance industry is usually higher than it is for the nonlife insurance industry in many countries. China, for example, requires foreign life insurers to establish joint ventures with local firms, whereas nonlife insurers and other financial services are allowed to establish wholly owned subsidiaries and/or branches. This joint venture barrier imposed by the regulator constitutes an additional liability of foreignness for foreign life insurers. The regulation for life insurance is expected to be stricter also because life insurers are usually more leveraged than nonlife insurers and, thus, more vulnerable to systemic risks (Cummins & Weiss, 2014). Third, national cultures have a stronger impact on life insurance consumption than on nonlife insurance consumption (Chui & Kwok, 2008; 2009). For example, Hempel (1998) emphasized that multinational firms as life insurers' clients must consider the national culture when they design employee benefit programs for employees in different countries. Thus, foreign life insurers have the additional liability of foreignness to compensate for the cultural advantages of domestic life insurers.[14] Fourth, some country-specific institutional settings have a stronger influence on life insurance than on nonlife insurance. For example, the pre-existence of social security and/or inheritance tax systems may result in different demand patterns for life insurance (Kunreuther & Michel-Kerjan, 2015). This issue is less relevant for nonlife insurance demands. Such country-specific institutional settings limit the transferability of underwriting know-how in life insurance and require more extensive product adaptation to the local markets. The idiosyncrasies of the two insurance industries should result in a higher liability of foreignness for life as opposed to nonlife insurance.

The risk reduction effects of globalization are expected to be lower in the life than in the nonlife insurance industry.[15] Insurance is the business of managing risks. Insurers are not only exposed

[13] We note that the regulated nature of insurance may also serve as a demand for internationalization. Jiméneza, Luis-Ricob, and Benito-Osorioc (2014) argued that prior experience in internationalization may particularly benefit the firms in regulated industry when they consider further internationalization.

[14] It has been shown that cultural distance negatively influences new product development and increases the difficulty of applying international operations' management strategies (Parente, Baack, & Hahn, 2011). A few empirical studies have also supported culture's influence on the I-P relationship. For example, Chen and Tan (2012) empirically showed that Chinese listed firms have a greater benefit if they internationalize within the Greater China region than if they internationalize in other regions.

[15] We note that internationalization is a double-edged sword to firm risk. Some firms consider international diversification as one way to reduce risk (Rugman, 1976; Kim et al., 1993; Elango, 2010); some firms may be involved with even higher risks due to internationalization (Reeb, Kwok, & Baek, 1998; Hejazi & Santor, 2010). Other research has argued that the risk reduction effects of internationalization are insignificant (Reuer & Leiblein, 2000; Eckert & Trautnitz, 2010). One explanation for the different impact of internationalization on firm risk lies with the industry dependency (Elango, 2010) and the industry idiosyncrasies.

to "common risks," such as credit, operational, market, and financial risks, as other industries are, but also actively assume and manage insurance risks (i.e., underwriting risks). Thus, unlike other industries, internationalization benefits insurers by diversifying insurance risks, smoothing out cross-location underwriting results, and thereby reducing the volatility of overall performance because insurance risks in various countries are not perfectly correlated (Ma & Elango, 2008; Outreville, 2012). In other words, large multinational insurers benefit from the advantage of spreading risks (Dunning, 1989). However, the risk reduction benefits of internationalization may be more prominent in the nonlife than in the life insurance industry because the risk portfolios are more predictable in life insurance than in nonlife insurance. Nonlife insurers exhibit a higher exposition to natural catastrophic risks generating inter-regional diversification benefits, whereas the catastrophic epidemics and accidental death events that influence life insurers rarely occurred in the past century.

Table 1

Idiosyncrasies of life and nonlife insurance industries

	Life	Nonlife	Literature
Panel A: Cost components of internationalization (liability of foreignness)			
Credence good	Long Term	Short Term	Rejda & McNamara (2013); Cummins & Weiss (2014)
Regulation	High	Low	
Culture influence	Strong	Weak	Hempel (1998); Chui & Kwok (2008, 2009)
Local adaptation	High	Low	
Panel B: Benefit components of internationalization			
Risk Reduction	Weak	Strong	Ma & Elango (2008); Kunreuther & Michel-Kerjan (2013)

We empirically verify that industry idiosyncrasies indeed result in different liabilities of foreignness and risk reduction effects for life and nonlife insurance. We thus introduce cost efficiency to capture the liability of foreignness and the return standard deviation to capture firm risk, and analyze their relation to globalization.[16] Based on the regionalization theory and the industry dependency hypothesis, we phrase our three hypotheses separately for life and nonlife insurance, as shown in Table 2. Although we do not hypothesize an (inverted) U- or S-shaped I-P relationship, our empirical tests include the square term of our globalization

[16] We acknowledge that, in addition to cost efficiency and firm risk, other potential mediating factors to the I-P relationship exist, such as innovation, learning, organizational characteristics, organizational structure, debt, product diversification, and top management team experience and diversity (Hitt et al., 2006). We implicitly control for those via firm fixed effects in our empirical analyses.

measures (Outreville, 2010), which allows for an identification of complex I-P relationships.[17]

[17] As previously mentioned, we do not hypothesize an inverted U- or S-shaped I-P relationship because our measurement of globalization starts at the inter-regional internationalization and, thus, does not capture the left tail of an S-shaped relationship (Oh & Contractor, 2014). This is also the reason that the cubic term is not necessary, as the right tail of an S-shaped curve corresponds to the inverted U shape.

Table 2

Hypotheses

Hypothesis 1: Globalization and firm performance	
H1A	*The impact of globalization on firm performance is negative for life insurance*
H1B	*The impact of globalization on firm performance is insignificant for nonlife insurance*
Hypothesis 2: Globalization and firm cost efficiency	
H2A	*The impact of globalization on firm cost efficiency is negative for life insurance*
H2B	*The impact of globalization on firm cost efficiency is insignificant for nonlife insurance*
Hypothesis 3: Globalization and firm risk	
H3A	*The impact of globalization on firm risk is insignificant for life insurance*
H3B	*The impact of globalization on firm risk is negative for nonlife insurance*

Both the internationalization and the insurance literature have shown that cost efficiency and firm risk drive firm performance. In the internationalization literature, Wagner (2004) demonstrated that cost efficiency is an important mediator between internationalization and firm-level financial performance based on a sample of stock quoted German firms. According to his conceptual framework, the DOI influences cost efficiency and cost efficiency drives firm performance. Empirically, Wagner (2004) found that cost efficiency is gained from low to medium DOIs but that high DOIs adversely affect cost efficiency. In the insurance literature, Greene and Segal (2004) showed that cost efficiency drives insurers' profitability. The literature is consistent with the intuition in that the returns are defined as revenues minus costs. Thus, cost efficiency should be able to predict and explain the cost component of a firm's performance.

The mediating effects of cost efficiency may be more prominent in the life as opposed to the nonlife insurance industry. Greene and Segal (2004) decomposed life insurance profitability into two attributors—operating activities and financial activities—and argued that operations are critical because life insurers' financial investment gains are limited due to investment risk considerations. This argument is particularly pronounced in today's low interest rate environment. Furthermore, the life insurance industry is highly competitive, and few financial innovations can be patented and protected from competitors' reproduction. Consequently, an insurer's success depends on its ability to manage costs, among other factors. Therefore, we expect cost efficiency to explain a significant portion of life insurers' performance variation. The role of cost efficiency in the nonlife business has not yet been documented in the literature. However, considering that—contrary to life insurance—nonlife insurance has a greater emphasis on product innovation and underwriting profit, relying less on investment returns, we expect cost efficiency to play a less important role for nonlife insurers. Thus, the different I-P relationship in the life as opposed to the nonlife insurance industry may also partially be driven

by differences in the strength of the mediating effect of cost efficiency. The liability of foreignness more heavily affects the returns of life insurers via cost efficiency.

Hitt et al. (2006) argued that firm risk is an important mediator between internationalization and firm performance. Dunning (1989) and Katrishen and Scordis (1998) asserted a particular relevance of risk spreading benefits to the performance of the insurance industry. The risk of an insurance company significantly affects the policyholders' willingness to pay (Wakker, Thaler, & Tversky, 1997) considering that insurance is a credence good. Moreover, financial services in general are a heavily regulated industry, and firm risk is partially influenced by the regulations in each country. Such regulatory differences result in different risks and returns, which must be accounted for. According to Hejazi and Santor (2010), internationalization risk must be better accounted for, because simply a positive I-P relationship may only indicate that an increase in performance has paid off in terms of internationalization costs without being sufficient to compensate for increased risk. The same logic applies to the risk reduction effects of internationalization—namely, any performance analysis must account for changes in risk. Thus, almost all of the I-P relationship studies in financial services have used risk-adjusted measures of firm performance (see, e.g., Ma & Elango, 2008; Hejazi & Santor, 2010; Outreville, 2010, 2012).

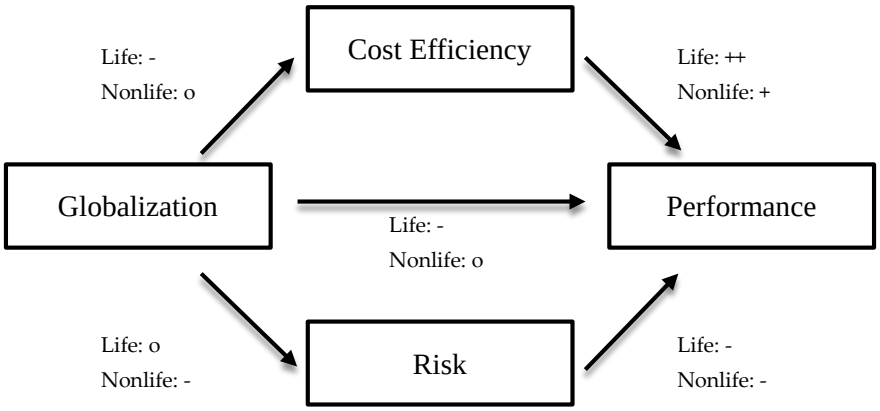

Figure 1 Conceptual framework

Figure 1 summarizes our conceptual framework. The arrows indicate the direction of impact, whereas "+" indicates a positive impact, "-" indicates a negative impact, and "o" indicates that the impact is insignificant. In the life insurance industry, the globalization strategy significantly increases the liability of foreignness and reduces cost efficiency, but does not significantly reduce the risk, resulting in an overall negative impact on risk-adjusted performance. In the nonlife insurance industry, the globalization strategy significantly reduces firm's risk but does not

significantly endanger cost efficiency; the risk reduction benefits offset the liability of foreignness, resulting in an overall non-negative impact on risk-adjusted performance. Cost efficiency and firm risk are two mediators between globalization and performance, among others. Moreover, cost efficiency may play a more important role in life insurers' performance than in nonlife insurers'.

3. Data and methodology

3.1. Sample and summary statistics

We use the Non-US Best's Insurance Reports (A. M. Best, 2003–2013), which are a comprehensive source for information on insurance companies widely used in international business research (Katrishen & Scordis, 1998; Oetzel & Banerjee, 2008; Elango, 2009). We exclude composite insurers offering both life and nonlife insurance.[18] We only include insurers' operating companies and, thus, exclude entities such as branches, special purpose vehicles, captives, and firms that operate insurance as a minor business (e.g., banks, manufacturers, and healthcare providers).

We trim insurers' key ratios at the 1st and 99th percentiles for life and nonlife insurers separately in order to reduce the potential bias driven by extreme values (Barth, 2000; Kanagaretnam, Lim, & Lobo, 2011).[19] The key ratios are those used in the later DEA and regression analyses: return on assets (ROA), return on equity (ROE), life benefits ratio (benefits paid divided by net premiums written), nonlife loss ratio (loss incurred divided by net premiums earned), leverage ratio (total liabilities divided by total capital and surplus), liquidity ratio (liquidity assets divided by total liabilities), premium retention ratio (inverse reinsurance ratio, net premiums written divided by gross premiums written), and yearly real asset growth. The complete dataset contains 1,350 life insurers with 8,560 firm-year observations and 2,449

[18] Life insurers underwrite life, annuity, and health insurance. Nonlife insurers underwrite property and casualty insurance; some also underwrite health insurance.

[19] Outliers are present in the A. M. Best dataset because of startups that do not yet underwrite business and runoff insurers that are not comparable to and not in competition with regular insurers (Biener, Eling, & Jia, 2015). We alternatively trim the key ratios at the 0.5^{th} and 99.5^{th} percentiles and the 2^{nd} and 98^{th} percentiles. The different trimming methods are consistent in results and do not change our conclusions. The results are available from the authors upon requests.

nonlife insurers with 15,852 firm-year observations.[20] The 2012 dataset covers 55% of global life premiums and 59% of global nonlife premiums outside North America[21] (Swiss Re, 2014).

The Best's Insurance Reports capture insurers' internationalization through the regional distribution of gross premiums written (i.e., Europe, Latin America, North America, Australia and New Zealand, Asia, Africa, and the rest of the world).[22] Due to different disclosure requirements in different economies, our sample is limited to those firms reporting their premium geographical distribution to A. M. Best. Thus, our final sample is an unbalanced panel consisting of 350 life insurers with 1,690 firm-year observations and 625 nonlife insurers with 3,112 firm-year observations. As shown in Appendix A, our sample covers 11 years, from 2003 to 2013, and insurers domiciled in the three major regions (i.e., Europe, Asia, and Oceania).

Over 80% of firm-year observations in our sample are from the member states of the European Union (EU), where the cross-border barriers have been minimized to build a single insurance market since the Life and Non-Life Third Insurance Directives from 1994. It is a controversial question to determine whether EU insurers' sales in other EU member states should be considered as foreign or domestic sales. This paper does not aim to study the geographical diversification among states within one market,[23] but to investigate the internationalization in a broader geographical scope (i.e., inter-regional globalization), where significant differences emerge in terms of regulation and culture. Thus, internationalization is measured at the inter-

[20] Missing values are present in the A. M. Best dataset. We impute these missing values using predicted values from an empirical model based on observed data (Mahajan & Toh, 2014; Greve, Biemann, & Ruigrok, 2015). We alternatively exclude observations with missing values, and the results are consistent with our conclusions. The results are available from the authors upon requests. This procedure is only applied for our core models (ROA analyses), but not for the robustness tests (ROE and other analyses). Less than 10% of our sample contains imputed values.

[21] The non-US version of A. M. Best data covers insurance companies domiciled outside the US and Canada. We are not able to additionally include the US and Canadian insurers because the Canadian insurers do not report their geographical premium distribution to A. M. Best; the US insurers' geographical premium reports to A. M. Best are inconsistent with the geographical premium distribution in the non-US version in terms of accounting standards and are not based on the continental level. We also tried to manually collect the information to enlarge our dataset, but were unsuccessful. Oetzel and Banerjee (2008) noted the incompleteness of the A. M. Best dataset in many countries, yet they argue that it still remains the most comprehensive dataset available for the insurance industry. Furthermore, our investigation focuses on global firms, which are less affected by the incompleteness than other applications incorporating smaller local firms as well.

[22] According to A. M. Best, "rest of the world" is "a catch all for where a company reports perhaps key countries or country they do business in and then group the rest together as 'rest of the world.'" We consider the rest of the world to be one standalone region; if an insurer reports sales in two regions and groups all other operations in the rest of the world, we then assume that the insurer operates in three regions.

[23] Biener, Eling, and Wirfs (2015) shed light on the cross-states expansion within the European market.

region level instead of a cross-country level.[24]

Table 3 reports summary statistics. All sample selection procedures are the same for life and nonlife insurers. Within our sample, 51 life insurers (15%) with 226 firm-year observations (13%) and 158 nonlife insurers (25%) with 664 firm-year observations (21%) are globalized (i.e., operating in more than one region). It is necessary to keep both the globalized and non-globalized firms in the sample because we are interested in both questions of whether globalization makes a difference at all and how sensitive the impact is to the degree of globalization.[25] We conduct robustness tests with only globalized firms (i.e., 51 life insurers and 158 nonlife insurers), the results of which confirm our conclusions (see Section 4.4). Not surprisingly, various firm characteristics differ between our sample insurers and those outside of our sample. We address this issue by conducting robustness tests, where we assume all out-of-sample insurers to be not globalized (i.e., operating only in the home region). The results of this test are also confirm our conclusions (see Section 4.4).

[24] With our sample, it is not optimal to calculate the entropy measure using country-level sales, which mixes the inter-regional globalization with cross-states expansion within the EU single insurance market.

[25] It would be a different case if the entropy measure starts at the country level. In that case, entropy 0 means no internationalization at all and, thus, is outside the scope of DOI. In our case, even if the globalization entropy equals 0, the firm may also be internationalized, although probably to a low degree (Oh & Contractor, 2014) and focus on its home region; thus, comparing zero entropy with positive entropy is meaningful.

Table 3 Summary statistics

Sample		Life				Nonlife			
Panel A: Globalization	Unit	N	Mean	Std. Dev.	Median	N	Mean	Std. Dev.	Median
Global (1 if operates in two or more regions)	Dummy	1,690	0.13	0.34	0	3,122	0.21	0.41	0
Globalization (entropy)	1	1,690	0.022	0.093	0	3,122	0.100	0.24	0
GlobalHHI (Herfindahl index)	1	1,690	0.013	0.058	0	3,122	0.060	0.15	0
Panel B: Profitability									
ROA	1	1,690	0.0036	0.036	0.0038	3,122	0.027	0.056	0.025
Risk-adjusted ROA	1	1,690	57.3	111.7	21.9	3,122	14.1	14.4	10.1
ROE	1	1,675[b]	0.043	0.25	0.071	3,102[b]	0.085	0.17	0.089
Risk-adjusted ROE	1	1,665[b]	19.0	20.6	11.8	3,086[b]	21.6	20.3	16.5
Panel C: Cost Efficiency Scores									
Cost efficiency (bootstrap & regional frontiers)	1	1,690	0.61	0.24	0.65	3,122	0.36	0.20	0.32
Cost efficiency (bootstrap & global frontier)	1	1,690	0.55	0.25	0.59	3,122	0.30	0.18	0.27
Panel D: Input Quantities									
Labor (approximate number of employees)	1	1,690	7,322.6	19,241.5	795.8	3,122	1,665.3	4,367.7	264.2
Equity capital (capital and surplus) [a]	1,000	1,690	560,934.4	1,421,948.8	144,629.5	3,122	25,8945.9	697,843.4	69,664.1
Debt capital (total liabilities) [a]	1,000	1,690	7,816,192.7	14,596,629.6	2,246,057.6	3,122	766,887.5	2,212,921.2	165,977.7
Panel E: Input Prices									
Labor price (Wage) [a]	1	1,690	60,915.4	30,270.0	72,684.8	3,122	70,592.0	25,223.6	73,897.8
Equity price (MSCI yearly returns)	1	1,690	0.10	0.074	0.089	3,122	0.089	0.062	0.083
Debt price (IMF long-term govt. bond rates)	1	1,690	0.043	0.019	0.040	3,122	0.040	0.019	0.039
Panel F: Output Quantities									
Benefits paid plus reserve changes [a, c]	1,000	1,690	1,675,474.9	4,458,823.1	420,359.4	3,122	425,727.0	41,051.5	425,727.0
Total invested assets [a]	1,000	1,690	7,628,162.7	14,174,676.7	2,193,999.5	3,122	1,762,579.0	158,435.5	1762,579.0
Panel G: Other Firm- and Country-Specific Characteristics									
Total assets [a]	1,000	1,690	8,377,127.1	15,679,565.3	2,519,659.4	3,122	1,025,833.3	2,762,494.1	261,129.3
Real asset growth	1	1,690	0.17	0.34	0.10	3,122	0.092	0.24	0.059
Premium retention ratio (inverse reinsurance ratio)	1	1,690	0.92	0.16	0.99	3,122	0.77	0.25	0.86
Leverage ratio	1	1,690	21.0	25.8	14.2	3,122	3.22	3.18	2.39
Liquidity ratio	1	1,690	1.00	0.86	0.98	3,122	1.51	3.08	0.94
Number of lines of business (LOB)	1	1,690	2.05	1.60	1	3,122	3.51	3.40	2
Life/Nonlife insurance density	1,000	1,690	2.46	1.53	2.80	3,122	0.96	0.40	1.00
Real GDP growth	1	1,690	0.023	0.038	0.018	3,122	0.015	0.030	0.017

Notes:

[a] In USD and inflation adjusted for 2013.

[b] The smaller number of observations is due to missing values in respective firm-years.

3.2. Variable constructs

We measure an insurer's degree of globalization by its inter-regional sales entropy as follows:

$$globalization_{i,t} = \sum_{j=1}^{7} share_{i,t,j} \times \ln(\frac{1}{share_{i,t,j}}),$$

whereas $share_{i,t,j}$ represents the portion of gross premiums written by firm i in year t from region j to firm i's total gross premiums written in year t. The entropy measure based on firms' sales across markets is widely used in international business studies (see, e.g., Hitt et al., 1997; Nielson & Nielson, 2011). Alternatively, we use the Herfindahl index, *globalHHI* (see e.g., Cummins, Tennyson, & Weiss, 1999; Elango, 2009) as a robustness test (see Section 4.4) as follows:

$$globalHHI_{i,t} = 1 - \sum_{j=1}^{7} share_{i,j,t}^2.$$

Almost all of the I-P relationship studies in financial services use risk-adjusted measurements for firm performance (see, e.g., Ma & Elango, 2008; Hejazi & Santor, 2010; Outreville, 2010, 2012) and we follow this practice. First, we shift all the performance indicators (ROA, ROE) by adding their respective minimum values to ensure that all values are positive (Ma & Elango, 2008).[26] Then, we divide the shifted performance indicators by their standard deviations over years (Elango, Ma, & Pope, 2008; Outreville, 2010) as follows:

$$risk\ adjusted\ ROA_{i,t} = \frac{ROA_{i,t}+0.3}{std.dev.ROA_i},$$

$$risk\ adjusted\ ROE_{i,t} = \frac{ROE_{i,t}+1.7}{std.dev.ROE_i},$$

We measure an insurer's risk by its overall business volatility, that is the standard deviation of a firm's performance indicator over all available years (Lamm-Tennant & Starks, 1993; Elango, 2010; Eling & Marek, 2014). A minimum of five years of performance indicators is required to calculate the standard deviations (Pasiouras & Gaganis, 2013). Alternatively, we conduct robustness tests using (1) risk-adjusted returns without shifting the negative return values; (2) a five-year rolling window moving standard deviations to adjust the returns; (3) risk-adjusted returns on net premiums written. The results of these tests confirm our conclusions (see Section 4.4).

[26] The calculation of risk-adjusted ROA requires a positive ROA value to keep the risk adjustments for all observations in the same direction. Otherwise, the adjustments for negative and positive ROA may have different effects, particularly when the standard deviations vary across firms.

We follow the standard procedure of DEA analyses in the insurance industry (Eling & Luhnen, 2010; Cummins & Weiss, 2013) to measure an insurer's cost efficiency by their relative cost efficiency (CE) scores, which is widely used in insurance management studies[27] but remains evolutionary in international business research. Bunyaratavej, Hahn, and Doh (2008) present a country-level DEA analysis to examine the attractiveness of host countries for services offshoring. We are the first to introduce a DEA cost efficiency measure at firm-level to explain the I-P relationship. For the DEA analysis we assume constant returns to scales (CRS) to estimate cost frontiers separately for life and nonlife insurers, for each year between 2003 and 2013 and for each of the three regions Continental Europe, UK and Ireland, and Others (including Asia, Africa, ANZ, and Offshore). One important assumption of DEA efficiency estimates is that firms are employing similar technologies. The assumption that all insurers employ similar technologies worldwide is strong. Therefore, we group insurers in our sample into three regions according to their domiciliary countries. The region categories to estimate DEA efficiency frontiers differ from the premium distribution regions that we use in the I-P relationship context. This is because we consider the operational similarities and the balance of observations in each region in the DEA context (Biener, Eling, & Jia, 2015), whereas the premium distribution regions are based on the triad concept with considerations of regionalization vs. globalization (Rugman & Verbeke, 2004, 2007). Cost efficiency estimates relative to a single global frontier are used as a robustness test, and the results of this test are consistent with our conclusions (see Section 4.4). DEA cost efficiencies are the representation of firms' distances to the best-practice efficient frontiers and are bounded between 0 and 1 (Shephard, 1970). The best-practice frontier is defined by firms that use the minimum amount of inputs to produce certain amount of outputs. Bootstrapped bias-corrected efficiency scores are used to account for the sensitivity of efficiency measures to sampling variation (Simar & Wilson, 2000).

The inputs, outputs, and prices used to obtain the CE scores follow the common practice of DEA analyses in insurance (Eling & Luhnen, 2010; Cummins & Weiss, 2013). We use three input quantities: labor (i.e., approximated number of employees), equity capital (i.e., capital and surplus, in real values in 2013), and debt capital (i.e., total liabilities, in real values in 2013). Labor is approximated by operating expenses divided by the annual wage for the insurance

[27] A detailed discussion about the DEA methodology in the insurance industry can be found in Eling and Luhnen (2010) and Cummins and Weiss (2013). Here we only briefly summarize the key steps, inputs, and outputs.

sector in respective country-years. We use annual wages (in real values in 2013) for the insurance sector in respective country-years as the price for labor. The wage information is obtained from the ILO Main Statistics and October Inquiry databases.[28] We use the 10-year rolling window moving averages of yearly rates of total returns of Morgan Stanley Capital International (MSCI) indices in the respective countries as the price for equity capital.[29] We use the two-year rolling window averages of International Monetary Fund (IMF) long-term government bond yearly interest rates in respective countries as the price for debt capital.[30] The long-term government bond rates are used to match the long duration of life insurers' liabilities. The MSCI indices and IMF interest rates are obtained from the Thomson DataStream database.

We use two output quantities, net benefits paid plus net reserve changes and total invested assets (both in real values in 2013). The two outputs represent life insurers' two major functions—risk pooling and financial intermediation, respectively. The benefits paid plus reserve changes are suitable for life insurance, as reserves reflect the accumulation of unpaid cash values (Cummins & Weiss, 2013). Premiums (instead of benefits paid) are sometimes applied as an output. The rationale for using premiums is that they represent the business volume generated by insurers. However, Yuengert (1993) notes that the premiums represent price times the quantity of outputs rather than output quantity only. The net benefits paid plus net reserve changes (NBPNRC) could exhibit negative values; therefore, we follow the standard DEA practice of shifting all values by adding the minimum NBPNRC (Cook & Zhu, 2014).

In addition to DEA inputs and outputs, the Panel G of Table 3 presents the following firm specific characters: firm size in terms of total assets, yearly real asset growth, premium retention ratio (i.e., inverse reinsurance ratio), leverage ratio, liquidity ratio, and the level of product diversification (i.e., number of lines of business written by the insurer). Three country-specific characteristics are presented: life and nonlife insurance density (i.e., life/nonlife

[28] To impute missing wages, we adjust the nearest available data point of ILO annual wage to the previous or later years by using changes in general price levels represented by the consumer price indices (CPI).

[29] To impute missing values and replace negative values, we use the rolling window two-year averages of realized country-average ROEs in respective country-years (see Cummins & Weiss, 2013, for a discussion of capital price proxies). We use two-year moving average values because we only have the data that date back to 2002. We use country-average ROEs because many firms may have negative ROEs due to the volatile nature of the insurance business. Less than 10% of our sample is affected by this procedure.

[30] To impute missing interest rates, we use the IMF central bank policy rate or deposit rate in respective country-years.

insurance premiums per capita) to capture the maturity level of firms' home markets, and real GDP growth, to capture the economic environment in firms' home markets. As shown in the summary statistics, our sample has a great variety to cover both small and large, both high and low growth, both single-line and multi-line firms, and both developing and developed markets.

3.3. Empirical models

We test Hypotheses 1, 2, and 3 based on Equations (1), (2), and (3), respectively. We conduct firm-year fixed effects regressions (i.e., least squares dummy variables [LSDV]) with Equations (1) and (2), subject to log-likelihood ratio tests and Hausman tests[31]. We conduct OLS regressions with country-fixed effects with Equation (3). We deviate from the panel model here, as we only have a cross-sectional dataset considering the dependent variable—the standard deviation of returns—as equal for one firm across all years.[32] The equations are specified as follows:

$$Risk\ adjusted\ returns_{i,t} = \beta_0 + \beta_1 Globalization_{i,t} + \beta_2 Globalization_{i,t}^2 + \beta_3 Globalization_{i,t} \times Life_i + \beta_4 Globalization_{i,t}^2 \times Life_i + \beta_5 X_{i,t} + \beta_6 Year_t + \beta_7 Firm_i + \varepsilon_{i,t} \quad (1)$$

$$Cost\ efficiency_{i,t} = \beta_0 + \beta_1 Globalization_{i,t} + \beta_2 Globalization_{i,t}^2 + \beta_3 Globalization_{i,t} \times Life_i + \beta_4 Globalization_{i,t}^2 \times Life_i + \beta_5 X_{i,t} + \beta_6 Year_t + \beta_7 Firm_i + \varepsilon_{i,t} \quad (2)$$

$$Risk_i = \beta_0 + \beta_1 Globalization_{i,t} + \beta_2 Globalization_{i,t}^2 + \beta_3 Globalization_{i,t} \times Life_i + \beta_4 Globalization_{i,t}^2 \times Life_i + \beta_5 X_{i,t} + \beta_6 Country_i + \beta_7 Life_i + \varepsilon_i \quad (3)$$

Life is a dummy variable, with 1 indicating a life insurer and 0 a nonlife insurer. *Life* does not appear in Equations (1) and (2) as a standalone term because the firm fixed effects model do not allow any time-invariant independent variables.[33] Moreover, we separately test our hypotheses with the life and nonlife insurer subsamples. The primary explanatory variables,

[31] Alternatively, we use random effects models as a robustness test, the results of which confirm our conclusions (see Section 4.4).

[32] As an alternative that also allows for some time variation, we perform robustness test using the rolling-window five-year moving standard deviations of returns as the measurement of firm risk; the results confirm our conclusions (see Section 4.4).

[33] We are not able to include some time-invariant independent variables, such as the firm organizational type (mutual versus stock) and/or organizational structure (group versus single). Yiu (2011) showed that certain organizational structures (e.g., business group) facilitate the internationalization process via their unique attributes, including internal market, inward linkages, and institutional support.

globalization and its square term, are included in the core models and we present the estimations with only the linear term in robustness test[34] (see Section 4.4). The globalization entropy and the size variables are centered to avoid multicollinearity with their squared terms. The variance inflation factors in our core models fall below 5 for all equations, suggesting no multicollinearity issues. We consider the potential autocorrelation issue in our panel sample and, thus, present the heteroscedasticity and autocorrelation-consistent (i.e., Newey-West) standard errors in a robustness test (see Section 4.4).

We control for the following firm- and country-specific characteristics: $X_{i,t}$ including level of product diversification (i.e., number of lines of business), firm size (i.e., natural logarithm of firm assets in real values), growth (i.e., yearly real asset growth), premium retention ratio (i.e., inverse reinsurance ratio), leverage ratio, liquidity ratio, life or nonlife insurance density, and real GDP growth. Other firm- and country-specific factors may influence the I-P relationships, such as firm culture, the management team's international experience, R&D strength, and competition in the home market (Carpenter & Fredrickson, 2001; Wan & Hoskisson, 2003), which we are not able to control for due to data limitations. However, we implicitly account for these factors by either firm or country fixed effects. We also use the year fixed effects to capture the performance and efficiency dynamics over time, where applicable.

With Equation (2), we show two alternative models—Tobit and truncated regressions with upper limits at 1—following the common practice of DEA second-stage analyses (Commins & Weiss, 2013; Cook & Zhu, 2014). We also show a specification by applying the bootstrap procedure with 2,000 replications to further account for heteroscedasticity in DEA second-stage regressions (Simar & Wilson, 2007).

4. Results

4.1. Hypothesis 1

Table 4 reports the estimation results of Equation (1). The full sample results in Columns 1 and 2 show that the impact of globalization on risk-adjusted performance is negative for life insurers and insignificant for nonlife insurers. This is indicated by the significant and negative coefficients of the interaction term between the globalization entropy and the life dummy and

[34] The linear and squared terms of globalization entropy are introduced into the model in a step-by-step manner (Outreville, 2010). We do not use the cubic term of globalization because (1) our sample captures the inter-regional aspect of internationalization, which is already at the high DOI in the three-stage I-P paradigm (Oh & Contractor, 2014) and thus the right tail of the S shaped I-P relationship corresponds to the inverted U shape; (2) the cubic term generates serious multicollinearity with its first- and second-order terms.

the insignificant coefficients of globalization entropy. These results are confirmed by the subsample estimations for life and nonlife insurers separately, as shown in Columns 3 through 6. The results directly support hypotheses 1A and 1B and, thus, the prediction of the industry dependency hypothesis of the I-P relationship in life and nonlife insurance (Capar & Kotabe, 2003; Contractor et al., 2003).

Table 4 Estimation of equation (1)

	(1)	(2)	(3)	(4)	(5)	(6)
Samples	Full sample		Life sample		Nonlife sample	
Variables	R.A.ROA	R.A.ROE	R.A.ROA	R.A.ROE	R.A.ROA	R.A.ROE
Globalization_entropy_c	0.126	0.0320	-1.286**	-1.306**	0.0503	0.0482
	(0.253)	(0.262)	(0.581)	(0.590)	(0.255)	(0.265)
Globalization_entropy_c2	0.260	0.313	-0.648	-1.424	-0.295	-0.181
	(0.501)	(0.543)	(2.334)	(2.338)	(0.581)	(0.633)
Globalization_entropy_c*life	-1.463*	-1.698**				
	(0.806)	(0.804)				
Globalization_entropy_c2*life	0.0397	-0.979				
	(2.375)	(2.454)				
LnAsset_c	0.297***	0.385***	0.258***	0.376***	0.300***	0.366***
	(0.0646)	(0.0663)	(0.0801)	(0.0850)	(0.0864)	(0.0908)
LnAsset_c2	-0.00889	-0.00612	-0.0163	0.00161	-0.0269	-0.0347*
	(0.0150)	(0.0163)	(0.0224)	(0.0227)	(0.0169)	(0.0200)
Real asset growth	0.0471	0.0378	-0.149	-0.139	0.284***	0.225**
	(0.0732)	(0.0796)	(0.0997)	(0.120)	(0.103)	(0.104)
Premium retention ratio	0.348	0.0730	-0.577*	-0.528	0.697**	0.291
(inverse reinsurance ratio)	(0.243)	(0.248)	(0.342)	(0.341)	(0.299)	(0.320)
Leverage ratio	-0.0159***	-0.0136***	-0.0115***	-0.0119***	-0.165***	-0.0946***
	(0.00309)	(0.00347)	(0.00255)	(0.00320)	(0.0202)	(0.0260)
Liquidity ratio	0.0567***	0.0426***	0.205***	0.184***	0.0395***	0.0311***
	(0.0172)	(0.0141)	(0.0563)	(0.0516)	(0.0119)	(0.0110)
Insurance density	0.0481	0.0533	0.0208	0.0181	0.335	0.358*
	(0.0386)	(0.0448)	(0.0397)	(0.0490)	(0.203)	(0.215)
Real GDP growth	-0.0268**	-0.0226*	-0.0214	-0.0136	-0.0290*	-0.0297*
	(0.0123)	(0.0125)	(0.0178)	(0.0187)	(0.0155)	(0.0161)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE/Constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,751	1,690	1,665	3,122	3,086
No. of firms	975	962	350	344	625	618
R^2	0.125	0.121	0.211	0.200	0.159	0.120

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at the 10%, 5%, and 1% levels, respectively.

The results are also consistent with the prediction of regionalization theory in the sense that globalization does not have a positive impact on the performance of the insurance industry (Rugman & Verbeke, 2004). This empirical finding is in line with Qian et al.'s (2010) and Oh and Contractor's (2014) finding for US-based multinational firms in the sense that inter-regional over-diversification (i.e., globalization) decreases returns. The negative I-P pattern in the life insurance industry and the flat pattern in the nonlife insurance industry fit well into the

right tail of an inverted U- or S-shaped relationship because firms internationalizing inter-regionally usually exhibit the highest DOIs (Oh & Contractor, 2014). In this sense, our results are consistent with the S-shaped I-P relationship found for the world's largest financial groups (Outreville, 2010) and the world's largest reinsurance groups (Outreville, 2012). We are not able to confirm the contingency of the I-P relationship on product diversification (Ma & Elango, 2008) as the non-US dataset does not contain the premium distribution among lines of business; thus, it is difficult to construct the interaction between globalization and product diversification.

4.2. Hypothesis 2

Table 5 reports the estimation results of Equation (2). The full sample results in Columns 1 through 4 show that the impact of globalization on cost efficiency is negative though nonlinear for life insurers, as opposed to nonlife insurers. This is indicated by the coefficients of the interaction term between the square of globalization entropy and the life dummy. Columns 4 through 9 of Table 5 confirm the different globalization-CE relationships for life and nonlife insurance based on their respective subsamples. An inverted U-shaped relationship exists between the degree of globalization and cost efficiency in the life insurance industry; however, the cost efficiency gains from zero to a low degree of globalization have a much smaller scale and are less significant than the efficiency losses at medium to high degrees of globalization. For nonlife insurers, the impact of globalization on cost efficiency is insignificant. The results are in line with our hypotheses 2A and 2B.

Moreover, we test whether cost efficiency can explain a significant part of the variation in risk-adjusted returns in the insurance industries (Green & Segal, 2004) and whether the mediating effects of cost efficiency in the I-P relationship (Wagner, 2004) are industry dependent (i.e., weaker for nonlife insurers than life insurers). The results in Table 6 show positive and significant coefficients between cost efficiency and risk-adjusted returns in the life insurance industry. For nonlife insurance, this relationship only holds for risk-adjusted ROA and has a much smaller scale than that for life insurance.[35] The results confirm our conceptual framework in Figure 1 in the sense that cost efficiency is an important driver of risk-adjusted performance. The results also confirm the industry's dependency in the mediating effects of cost efficiency,

[35] To address the concerns on simultaneity and endogeneity of cost efficiency to risk-adjusted returns, we conduct 2SLS regression with the net premiums written per person as the instrument variable, the results of which confirm our conclusions and are available from the authors upon requests. The NPWPP is a good instrument because it measures the operational efficiency of an insurer and only affects profitability through cost efficiency; thus, it is less related to the error term.

which is stronger in life than in nonlife insurance industry.

Table 5 Estimation of equation (2)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Samples	Full Sample				Life Sample				Nonlife Sample			
Models	LSDV	LSDV[a]	Truncated	Tobit	LSDV	LSDV[a]	Truncated	Tobit	LSDV	LSDV[a]	Truncated	Tobit
Globalization_entropy_c	0.0132	0.0132	0.0149	0.0132	0.125*	0.125	0.135*	0.125*	0.0381*	0.0381	0.0382*	0.0381*
	(0.0265)	[0.0296]	(0.0265)	(0.0264)	(0.0728)	[0.0791]	(0.0785)	(0.0721)	(0.0225)	[0.0233]	(0.0223)	(0.0223)
Globalization_entropy_c2	0.0350	0.0350	0.0341	0.0350	-0.572**	-0.572*	-0.634**	-0.572**	-0.0514	-0.0514	-0.0515	-0.0514
	(0.0517)	[0.0521]	(0.0517)	(0.0515)	(0.273)	[0.306]	(0.293)	(0.271)	(0.0508)	[0.0548]	(0.0505)	(0.0505)
Globalization_entropy_c*life	-0.0857	-0.0857	-0.0964	-0.0857								
	(0.111)	[0.151]	(0.115)	(0.110)								
Globalization_entropy_c2	-0.712**	-0.712*	-0.756**	-0.712**								
*life	(0.353)	[0.409]	(0.370)	(0.351)								
LnAsset_c	0.0320***	0.0320***	0.0329***	0.0320***	0.0420**	0.0420**	0.0442**	0.0420**	0.00561	0.00561	0.00570	0.00561
	(0.0117)	[0.0117]	(0.0121)	(0.0116)	(0.0166)	[0.0170]	(0.0179)	(0.0165)	(0.0123)	[0.0139]	(0.0123)	(0.0123)
LnAsset_c2	0.00503*	0.00503*	0.00512*	0.00503*	0.00771*	0.00771*	0.00915*	0.00771*	-0.00701***	-0.00701**	-0.00703***	-0.00701***
	(0.00267)	[0.00256]	(0.00283)	(0.00266)	(0.00420)	[0.00429]	(0.00492)	(0.00417)	(0.00247)	[0.00286]	(0.00245)	(0.00245)
Real asset growth	-0.00802	-0.00802	-0.00820	-0.00802	-0.0505***	-0.0505***	-0.0517***	-0.0505***	0.0489***	0.0489***	0.0488***	0.0489***
	(0.0113)	[0.0119]	(0.0114)	(0.0112)	(0.0151)	[0.0145]	(0.0158)	(0.0150)	(0.0121)	[0.0118]	(0.0121)	(0.0121)
Premium retention ratio	0.126***	0.126***	0.126***	0.126***	0.321***	0.321***	0.327***	0.321***	0.0190	0.0190	0.0190	0.0190
(inverse reinsurance ratio)	(0.0375)	[0.0387]	(0.0376)	(0.0374)	(0.0573)	[0.0554]	(0.0578)	(0.0568)	(0.0319)	[0.0343]	(0.0318)	(0.0317)
Leverage ratio	0.000545	0.000545	0.000827	0.000545	0.000299	0.000299	0.000556	0.000299	-0.00255	-0.00255	-0.00256	-0.00255
	(0.000441)	[0.000448]	(0.000549)	(0.000439)	(0.000420)	[0.000464]	(0.000537)	(0.000417)	(0.00253)	[0.00259]	(0.00252)	(0.00252)
Liquidity ratio	0.00391	0.00391	0.00396	0.00391	0.0362***	0.0362*	0.0369***	0.0362***	0.00113	0.00113	0.00114	0.00113
	(0.00326)	[0.00440]	(0.00326)	(0.00325)	(0.00940)	[0.0218]	(0.0113)	(0.00932)	(0.00270)	[0.00389]	(0.00269)	(0.00268)
Insurance density	-	-	-	-	-0.00511	-0.00511	-0.00455	-0.00511	-0.163***	-0.163***	-0.165***	-0.163***
	0.0239***	0.0239***	0.0267***	0.0239***								
	(0.00584)	[0.00611]	(0.00637)	(0.00582)	(0.00604)	[0.00592]	(0.00667)	(0.00599)	(0.0292)	[0.0308]	(0.0294)	(0.0290)
Real GDP growth	-0.923***	-0.923***	-0.944***	-0.923***	-1.717***	-1.717***	-1.832***	-1.717***	-0.281*	-0.281*	-0.281*	-0.281*
	(0.166)	[0.167]	(0.170)	(0.165)	(0.284)	[0.285]	(0.299)	(0.281)	(0.152)	[0.150]	(0.152)	(0.151)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE/Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,812	4,812	4,812	1,690	1,690	1,690	1,690	3,122	3,122	3,122	3,122
No. of firms	975	975	975	975	350	350	350	350	625	625	625	625
R^2/Log-pseudo likelihood	0.134	0.134	4,691.8	4,598.9	0.213	0.213	1,602.4	1,500.5	0.249	0.249	3,447.3	3,444.5

Notes: The dependent variable is cost efficiency. The clustered robust standard errors are provided in parentheses, and the bootstrapping standard errors are provided in brackets. *, **, and *** indicate that the coefficients significantly differ from 0 at the 10%, 5%, and 1% levels, respectively.
a. Columns 2, 6, and 10 present the results with bootstrapping standard errors. Columns 1, 5, and 9 are with clustered robust standard errors.

Table 6 Correlation between cost efficiency and risk-adjusted performance

	(1)	(2)	(4)	(5)	(7)	(8)
Samples	Full Sample		Life Sample		Nonlife Sample	
Variables	R.A.ROA	R.A.ROE	R.A.ROA	R.A.ROE	R.A.ROA	R.A.ROE
Cost efficiency	0.597***	0.472**	1.326***	1.177***	0.433**	0.355
	(0.212)	(0.220)	(0.238)	(0.230)	(0.220)	(0.234)
Cost efficiency*life	0.702**	0.729**				
	(0.305)	(0.315)				
Globalization_entropy_c	0.124	0.0295	-1.452**	-1.456**	0.0338	0.0344
	(0.249)	(0.259)	(0.608)	(0.614)	(0.253)	(0.264)
Globalization_entropy_c2	0.221	0.278	0.110	-0.740	-0.273	-0.162
	(0.496)	(0.542)	(2.378)	(2.351)	(0.578)	(0.630)
Globalization_entropy_c*life	-1.352[a]	-1.590*				
	(0.844)	(0.810)				
Globalization_entropy_c2*life	1.041	-0.0247				
	(2.506)	(2.541)				
LnAsset_c	0.260***	0.355***	0.202**	0.332***	0.297***	0.363***
	(0.0628)	(0.0642)	(0.0794)	(0.0843)	(0.0871)	(0.0911)
LnAsset_c2	-0.0158	-0.0123	-0.0265	-0.00785	-0.0238	-0.0322
	(0.0144)	(0.0157)	(0.0220)	(0.0225)	(0.0171)	(0.0202)
Real asset growth	0.0726	0.0622	-0.0821	-0.0783	0.263**	0.207*
	(0.0711)	(0.0786)	(0.0942)	(0.116)	(0.103)	(0.105)
Premium retention ratio	0.193	-0.0641	-1.003***	-0.903***	0.688**	0.287
(inverse reinsurance ratio)	(0.247)	(0.252)	(0.338)	(0.339)	(0.301)	(0.320)
Leverage ratio	-0.0165***	-0.0145***	-0.0119***	-0.0126***	-0.164***	-0.0935***
	(0.00310)	(0.00354)	(0.00252)	(0.00325)	(0.0206)	(0.0264)
Liquidity ratio	0.0526***	0.0389***	0.157***	0.142***	0.0390***	0.0307***
	(0.0154)	(0.0126)	(0.0550)	(0.0500)	(0.0115)	(0.0107)
Insurance density	0.0714*	0.0747	0.0276	0.0245	0.405**	0.415*
	(0.0397)	(0.0457)	(0.0390)	(0.0489)	(0.202)	(0.212)
Real GDP growth	-0.0170	-0.0139	0.138	0.635	-0.0278*	-0.0287*
	(0.0123)	(0.0124)	(1.725)	(1.785)	(0.0156)	(0.0161)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE/Constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,751	1,690	1,665	3,122	3,086
No. of firms	975	962	350	344	625	618
R^2	0.138	0.131	0.240	0.220	0.160	0.121

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at the 10%, 5%, and 1% levels, respectively.
a. P-values equal 0.11.

In summary, the DEA cost efficiency measure captures the industry's idiosyncrasies in the liability of foreignness and, thus, explains a significant part (although not all) of the industry dependency in the I-P relationship. This is a novel finding as cost efficiency measures have not yet been examined in this context. Moreover, we show that industry dependency does not only hold for the relationship between internationalization and cost efficiency, but also for the effectiveness of cost efficiency's mediating effects (i.e., the relationship between cost efficiency and performance).

4.3. Hypothesis 3

Table 7 reports the estimation results from Equation (3). The full sample results in Columns 1 and 2 show that life insurers have lower return volatility than nonlife insurers, as indicated by the negative coefficients of the life dummy variable. This observation supports the argument that life risk portfolios are more predictable than nonlife risk portfolios due to the smaller natural catastrophe exposure. The negative coefficients of the globalization entropy measure in Columns 1 and 2 indicate that globalization reduces risk for nonlife insurers, and the positive coefficients of the interaction term between the globalization entropy and the life dummy indicate that the risk reduction effects for life insurers are weaker than those for nonlife insurers or even non-existent. The subsample results in Columns 3 through 6 confirm that the risk reduction effect of globalization is insignificant for life insurers but significant for nonlife insurers. These results directly support our hypotheses 3A and 3B and, thus, the industry dependency hypothesis in the internationalization–risk relationship (Elango, 2010) in the sense that internationalization may reduce firm risk, but this impact is dependent on the industry. By our variable construct, risk-adjusted returns fully capture the risk reduction effects.

In summary, our empirical evidence supports the hypotheses listed in Table 2 and the conceptual framework in Figure 1. The risk-adjusted performance of life insurers is negatively influenced by globalization and more so compared to nonlife insurers because of lower cost efficiency and minimal risk reduction effects. The empirical evidence well represents the industry idiosyncrasies of life and nonlife insurance presented in Table 1, where life insurance is expected to exhibit higher liabilities of foreignness as opposed to nonlife insurance because life insurance policies have longer contract durations and are more regulated, more influenced by culture, and more locally customized. Our empirical evidence also explains the significant disparate DOIs in the life and nonlife insurance industries, where nonlife insurers are, on average, more globalized (with an average entropy of 0.100) than life insurers (with an average entropy of 0.022), subject to a mean comparison *t*-test.

Table 7 Estimation of equation (3)

	Full Sample		Life Sample		Nonlife Sample	
Variables	Std. Dev. ROA	Std. Dev. ROE	Std. Dev. ROA	Std. Dev. ROE	Std. Dev. ROA	Std. Dev. ROE
Globalization_entropy_c	-0.00807**	-0.0222*	-0.00518	-0.0308	-0.00781**	-0.0221*
	(0.00321)	(0.0135)	(0.00965)	(0.0572)	(0.00339)	(0.0115)
Globalization_entropy_c2	-0.0114	-0.0329	0.0161	0.149	-0.0109	-0.0229
	(0.00708)	(0.0310)	(0.0435)	(0.244)	(0.00716)	(0.0270)
Life	-0.0191***	-0.0254				
	(0.00550)	(0.0309)				
Globalization_entropy_c*life	0.0218**	0.0298				
	(0.0109)	(0.0875)				
Globalization_entropy_c2*life	0.0674	0.250				
	(0.0439)	(0.265)				
LnAsset_c	-0.00331***	0.00597***	-0.00222***	0.00870*	-0.00392***	-0.00340*
	(0.000436)	(0.00219)	(0.000640)	(0.00449)	(0.000611)	(0.00201)
LnAsset_c2	0.000570***	-7.80e-05	0.000392	-0.000751	0.000487**	0.000233
	(0.000134)	(0.000665)	(0.000254)	(0.00163)	(0.000222)	(0.000746)
Real asset growth	0.00128	0.00640	0.00340*	0.0102	0.000899	-0.00330
	(0.00138)	(0.00657)	(0.00196)	(0.0103)	(0.00187)	(0.00645)
Premium retention ratio	0.0153***	0.0610***	-0.0121*	0.0443	0.0199***	0.0837***
(inverse reinsurance ratio)	(0.00352)	(0.0125)	(0.00624)	(0.0325)	(0.00406)	(0.0128)
Leverage ratio	-0.000139***	0.000365*	-0.000130**	0.000112	-0.00117***	0.00856***
	(5.19e-05)	(0.000208)	(5.61e-05)	(0.000219)	(0.000231)	(0.00118)
Liquidity ratio	0.000781*	-0.00454***	-1.08e-05	-0.0158***	0.000645	-0.00293***
	(0.000399)	(0.00154)	(0.00161)	(0.00600)	(0.000408)	(0.000975)
Insurance density	0.00269***	0.00430	0.00233***	-0.00476	0.00559**	0.00906
	(0.00103)	(0.00520)	(0.000536)	(0.00406)	(0.00283)	(0.0115)
Real GDP growth	-7.15e-05	-0.000168	-0.0248	0.0660	0.000254**	0.000230
	(0.000103)	(0.000462)	(0.0155)	(0.0852)	(0.000128)	(0.000474)
Mean of ROA, ROE over years [a]	-0.0686*	-0.329***	-0.251***	-0.531***	-0.0821*	-0.222***
	(0.0367)	(0.0381)	(0.0885)	(0.0679)	(0.0423)	(0.0392)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes
Country FE/Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE	No	No	No	No	No	No
Observations	4,812	4,779	1,690	1,678	3,122	3,101
No. of firms	975	962	350	344	625	618
R^2	0.409	0.305	0.457	0.415	0.381	0.313

Notes: The clustered robust standard errors are provided in parentheses. *, **, and *** indicate that the coefficients significantly differ from 0 at the 10%, 5%, and 1% levels, respectively.
a. The relationship between the mean of a performance indicator and its standard deviation can be explained as follows: The high standard deviations are driven by a few poorly performing insurers, which have high benefit ratios and low ROAs/ROEs. The distributions of ROE and ROA are skewed to the left.

4.4. Robustness tests

To test the robustness of our findings, we conduct the following nine robustness tests. The results are listed in Appendices B.1 through B.9 and are consistent with our conclusions, unless otherwise discussed. First, we use the complete dataset by assuming that all insurers that do not report their premium geographical distribution to A. M. Best are not globalized (i.e., they

only operate in the home region with an entropy of 0). Second, we use a sub-sample containing only globalized firms (51 life insurers and 158 nonlife insurers); these firms operate in more than one region, with an entropy > 0. Third, we use an alternative globalization measure—namely, the globalization Herfindahl index (globalHHI) (Elango et al., 2008). Fourth, we use three alternative performance measurements: risk-adjusted returns without shifting the negative return values to positive (R.A.ROA2, and R.A.ROE2); rolling window five-year moving standard deviations to adjust the returns (R.A.ROA3 and R.A.ROE3); and risk adjusted net premiums written (R.A.ROP). Fifth, we use the rolling window five-year moving standard deviations (S.D.ROA3 and S.D.ROE3) as the measurement of risk and re-estimate of Equation (3). The industry dependency of risk reduction effects remains significant when using the ROA measurement but becomes insignificant if using the ROE measurement. Sixth, we use estimated cost efficiency based on one global frontier to replace that based on regional frontiers. Seventh, we show the results with only linear term of globalization measurement. Unsurprisingly, the nonlinear relationship existed in globalization-CE relationship cannot be captured with the linear model but all the linear relationships found in our core models are confirmed. Eighth, to further account for the potential autocorrelation, we present results for all panel models with the heteroscedasticity and autocorrelation-consistent standard errors (Newey-West standard errors). Ninth, we use firm random effects models to replace the firm-fixed effects models wherever applicable.

5. Conclusions and managerial implications

We contribute to the understanding of industry dependency in internationalization-performance (I-P) relationships (Capar & Kotabe, 2003; Contractor et al., 2003). We identify five industry idiosyncrasies for the life and the nonlife insurance industries generating differences in liabilities of foreignness, risk reduction effects, and thus I-P relationships (see Table 1 and Figure 1). Moreover, we construct an innovative two-sample empirical design to empirically verify that the liability of foreignness is higher and risk reduction benefits are lower for the life insurance industry; thus, the overall impact of globalization on the life insurance industry is negative—and more so compared to the nonlife insurance industry. We introduce the DEA cost efficiency measure into the I-P relationship, which effectively captures the differences in liabilities of foreignness and, thus, partly explains differences in I-P relationships.

We demonstrate that industry dependency in I-P relationships is driven by industry idiosyncrasies that can be empirically captured and thus increase the outcome predictability of an internationalization strategy. We also demonstrate that the internationalization-related

industry idiosyncrasies exist in a much broader scope than earlier studies suggest. We show that industry dependency exists not only between manufacturing and service firms (Capar & Kotabe, 2003) and between knowledge-based and capital-intensive firms (Contractor et al., 2003), but also between two industries that appear to be very close—namely, the life and nonlife insurance industries. Thus, the criteria for generalizing I-P relationships from one industry to another should not be based on the distance of two industries, but on the existence of internationalization-related industry idiosyncrasies. For example, we would expect different I-P relationships in commercial and investment banking, because investment banking may benefit more from international risk diversification (such as nonlife insurance); while commercial banking may benefit less from internationalization as it is heavily influenced by local culture and local regulation (such as life insurance). Our finding calls for future industry-specific research on internationalization strategies, particularly in service industries, which remain in the evolutionary stage (Capar & Kotabe, 2003).

We also contribute to the ongoing discussions on regionalization and globalization theory (Rugman & Verbeke, 2004; Oh & Contractor, 2014). We empirically show that the impact of globalization in the life (nonlife) insurance industry is negative (insignificant), which is driven by a sharply decreasing (flat) relationship between cost efficiency and the degree of globalization and by the unrealized (significant) risk reduction benefits of globalization. Our evidence echoes the conceptual arguments that globalization is in general less favorable than regionalization due to significantly increased differences in culture, economic, regulatory, and legal environment when going beyond home regions. Our identified I-P relationship effectively represents the right tail of the three-stage paradigm (Oh & Contractor, 2014).

We contribute to the insurance literature in the sense that this is the first work to analyze the I-P relationship in the life insurance industry, where we challenge the conventional wisdom that internationalization (geographical diversification) is in general beneficial for insurance companies due to risk diversification effects. To the contrary, the expected benefits of risk diversification are difficult to realize and liabilities of foreignness can easily endanger cost efficiency in the life insurance industry.

Our findings have important managerial implications. Managers need to be cautious when replicating the internationalization strategies of another industry, although they appear to be very close; the strategic decision, however, should be based on the examination of industry idiosyncrasies. Life insurers need to be careful when considering globalization strategies or expanding their business to other regions. The expected risk reduction benefits of globalization

are difficult to materialize, and liabilities of foreignness can easily endanger cost efficiency due to the complexity of globalization. For already globalized life insurers, local expertise may play an important role in sales given that products, regulations, and market conditions largely differ across countries. Similar management considerations are recommended to industries other than life insurance, where similar idiosyncrasies appear, such as credence good, local regulation, culture influence, product adaptation to the local environment, and low risk reduction benefits.

Our findings may also be valuable to regulators and policymakers. We suggest that different policies should be implemented for life and nonlife insurers. One example of such different policies is that, in China, foreign life insurers are required to establish joint ventures with local firms to operate in the Chinese market, whereas nonlife insurers are allowed to establish wholly owned subsidiaries and/or branches. As a result, the regulator adopts stricter internationalization rules for life insurers than for nonlife insurers. Future research may compare wholly owned subsidiaries with joint ventures to determine whether this regulatory policy can be justified.

A limitation of this research is the lack of control over nonmarket factors (e.g., regulation, government), which have been shown to be important in international business studies (Doh & Lucea, 2013). Moreover, our analysis may not be able to capture the time dynamics and long-term benefits of globalization due to data limitations. For example, a life insurer may want to expand to an emerging market to diversify its longevity risk, which cannot be captured by our 11-year analysis. Yet these long-term considerations are important for explaining why firms keep internationalizing even when the returns seem to be negative (Hennart, 2007). Finally, although we know cost efficiency and firm risk are two aspects that industry idiosyncrasies affect, we are not able to say how much of the industry-dependent I-P relationship these two aspects can explain; other aspects (e.g., revenue efficiency) may also be an important factor to explain industry dependency as one of the goals of internationalization lies with new business revenues.

Appendix A

Sample distribution by country and year

Country[a]	Life	Nonlife	Year	Life	Nonlife
Belgium	58	169	2003	98	147
China	199	105	2004	105	163
Denmark	121	290	2005	125	193
France	230	375	2006	116	201
India	74	33	2007	148	294
Ireland	232	339	2008	139	321
Italy	161	84	2009	200	398
Luxembourg	49	9	2010	219	423
Netherlands	87	224	2011	213	397
Other	43	102	2012	201	357
Pakistan	5	56	2013	126	228
Portugal	31	51	Total	1,690	3,122
Saudi Arabia	N.A.	48			
Sweden	44	196			
Switzerland	36	146			
United Arab Emirates	N.A.	29			
United Kingdom	320	849			
Total	1,690	3,122			

Notes: N.A. represents not available. The category of Other includes 18 countries (Bahrain, Norway, Bermuda, Spain, Malta, Croatia, Qatar, Australia, South Africa, Austria, Malaysia, Hong Kong, New Zealand, Slovenia, Taiwan, Thailand, Estonia, and Bulgaria). Our conclusions are not affected by the inclusion or exclusion of these countries.

a. Some important European markets are not included in our sample (e.g., Germany) because the insurers in these markets do not report their premium distributions to A. M. Best.

Appendix B Robustness tests

Appendix B.1 Complete dataset

	Full sample					Life sample					Nonlife sample				
Variables	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE
Globalization_entropy_c	0.000108	-0.114	0.00593	-0.00898***	-0.0305***	-0.914*	-0.982*	-0.0254	0.00158	-0.0289	-0.0561	-0.117	0.0215	-0.0114***	-0.0344***
	(0.154)	(0.155)	(0.0155)	(0.00266)	(0.0114)	(0.517)	(0.509)	(0.0466)	(0.00793)	(0.0526)	(0.140)	(0.146)	(0.0133)	(0.00271)	(0.00973)
Globalization_entropy_c2	0.361	0.516	0.0436	-0.00715	-0.0145	0.455	-0.663	-0.494**	-0.0227	-0.138	0.135	0.283	0.00211	-0.00469	-0.00345
	(0.425)	(0.431)	(0.0427)	(0.00675)	(0.0314)	(1.951)	(2.019)	(0.248)	(0.0453)	(0.229)	(0.432)	(0.454)	(0.0389)	(0.00676)	(0.0275)
Globalization_entropy_c*life	-0.576	-0.862*	-0.165**	0.0137	-0.0384										
	(0.444)	(0.514)	(0.0784)	(0.0104)	(0.0632)										
Globalization_entropy_c2*life	0.421	-0.848	-0.597*	0.0193	-0.0869										
	(1.904)	(1.974)	(0.315)	(0.0480)	(0.247)										
LnAsset_c	0.160***	0.259***	0.0499***	-0.00360***	0.000643	0.213***	0.305***	0.0624***	-0.00349***	0.00111	0.175***	0.232***	0.0240***	-0.00329***	-0.00415***
	(0.0339)	(0.0314)	(0.00495)	(0.000219)	(0.000990)	(0.0482)	(0.0430)	(0.00790)	(0.000303)	(0.00208)	(0.0433)	(0.0458)	(0.00502)	(0.000316)	(0.000992)
LnAsset_c2	-0.0121*	-0.00938	0.00259***	0.000245***	-0.00110***	-0.0448***	-0.0367***	-9.71e-05	0.000355***	-0.00196***	-0.0100	-0.00918	-0.00111	0.000115	-0.000727**
	(0.00687)	(0.00657)	(0.000839)	(6.06e-05)	(0.000272)	(0.00886)	(0.00810)	(0.00147)	(8.62e-05)	(0.000502)	(0.0100)	(0.0102)	(0.00105)	(9.87e-05)	(0.000341)
Real asset growth	0.0628*	0.0620*	-0.0185***	0.00380***	0.0145***	-0.0993*	-0.0699	-0.0455***	0.00481***	0.0185***	0.274***	0.230***	0.0106**	0.00432***	0.00274
	(0.0360)	(0.0367)	(0.00448)	(0.000713)	(0.00329)	(0.0533)	(0.0539)	(0.00733)	(0.00108)	(0.00618)	(0.0475)	(0.0497)	(0.00466)	(0.000888)	(0.00280)
Premium retention ratio	0.252**	0.187*	0.0757***	0.0127***	0.0345***	-0.223	-0.140	0.249***	-0.00551	0.00490	0.268**	0.217	0.0243	0.0143***	0.0443***
(inverse reinsurance ratio)	(0.112)	(0.113)	(0.0169)	(0.00183)	(0.00672)	(0.197)	(0.190)	(0.0412)	(0.00353)	(0.0194)	(0.131)	(0.136)	(0.0159)	(0.00213)	(0.00684)
Leverage ratio	-0.0116***	-0.00204	0.000851***	-0.000135***	0.000147	-0.00905***	-0.000829	0.000836***	-9.43e-05***	0.000175	-0.172***	-0.0991***	-0.00170*	-0.00112***	0.00898***
	(0.00214)	(0.00160)	(0.000201)	(1.66e-05)	(0.000111)	(0.00183)	(0.00153)	(0.000181)	(1.61e-05)	(0.000132)	(0.00968)	(0.0110)	(0.000960)	(0.000171)	(0.000678)
Liquidity ratio	0.0439***	0.0241***	0.00327**	0.000327	-0.00525***	0.0716***	0.0568**	0.00308	0.000626	-0.00864***	0.0245***	0.0134*	0.00276**	0.000162	-0.00347***
	(0.0102)	(0.00824)	(0.00138)	(0.000229)	(0.000698)	(0.0276)	(0.0264)	(0.00841)	(0.000736)	(0.00278)	(0.00930)	(0.00809)	(0.00118)	(0.000237)	(0.000491)
Insurance density	0.0412	0.0263	-0.00898**	0.00134**	0.0104***	-0.00601	-0.0360	-0.0106***	0.00204***	0.00212	0.208**	0.235**	-0.0275**	0.00712***	0.0104**
	(0.0264)	(0.0279)	(0.00392)	(0.000583)	(0.00302)	(0.0278)	(0.0302)	(0.00401)	(0.000448)	(0.00282)	(0.0910)	(0.0955)	(0.0112)	(0.00163)	(0.00522)
Real GDP growth	-0.000861	0.00367	-0.00280***	-6.56e-05*	-0.000216	-0.00862	-0.00281	-0.00613***	-5.76e-05	-0.000193	-0.000559	0.00274	-0.00183***	6.75e-06	3.97e-05
	(0.00451)	(0.00451)	(0.000479)	(3.35e-05)	(0.000148)	(0.00724)	(0.00746)	(0.000950)	(4.59e-05)	(0.000285)	(0.00540)	(0.00555)	(0.000474)	(4.26e-05)	(0.000153)
Mean of ROA, ROE over				-0.0981***	-0.264***				-0.159***	-0.374***				-0.117***	-0.197***
years				(0.0155)	(0.0202)				(0.0323)	(0.0363)				(0.0183)	(0.0217)
Life				-0.0115**	0.00345										
				(0.00561)	(0.0308)										
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Country FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Observations	24,412	24,121	24,412	24,412	24,250	8,560	8,456	8,560	8,560	8,506	15,852	15,665	15,852	15,852	15,744
No. of firms	3,782	3,735	3,782	3,782	3,736	1,350	1,332	1,350	1,350	1,333	2,449	2,419	2,449	2,449	2,419
R^2	0.061	0.060	0.107	0.379	0.211	0.079	0.075	0.125	0.501	0.311	0.111	0.079	0.168	0.290	0.249

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.2 Subsample with only globalized firm-years

	Full sample					Life sample					Nonlife sample				
Variables	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE
Globalization_entropy_c	-0.122	-0.217	-0.0156	-0.0112**	-0.00740	-1.777***	-1.872***	0.0635	0.00790	0.128*	-0.266	-0.290	-0.00645	-0.0113**	-0.0152
	(0.306)	(0.321)	(0.0299)	(0.00516)	(0.0192)	(0.544)	(0.511)	(0.0910)	(0.00760)	(0.0666)	(0.284)	(0.302)	(0.0254)	(0.00493)	(0.0178)
Globalization_entropy_c2	0.356	0.378	0.0939	-0.00375	-0.0319	-0.961	-1.995	-0.710*	-0.00125	-0.0876	0.158	0.284	0.0754	-0.00280	-0.0235
	(0.606)	(0.683)	(0.0612)	(0.00972)	(0.0428)	(2.059)	(2.088)	(0.376)	(0.0390)	(0.258)	(0.688)	(0.734)	(0.0523)	(0.00990)	(0.0399)
Globalization_entropy_c*life	-1.294	-1.976*	-0.205	0.0402**	0.0211										
	(1.058)	(1.057)	(0.136)	(0.0157)	(0.110)										
Globalization_entropy_c2*life	0.499	-1.069	-0.844**	0.0751*	0.143										
	(2.210)	(2.369)	(0.367)	(0.0423)	(0.300)										
LnAsset_c	0.179	0.420***	-0.0220	-0.00242***	0.00563	0.627**	0.877***	0.00273	0.00265**	0.0211***	0.143	0.314	-0.0211	-0.00405***	-0.00442
	(0.151)	(0.157)	(0.0236)	(0.000892)	(0.00398)	(0.253)	(0.273)	(0.0438)	(0.00110)	(0.00741)	(0.186)	(0.210)	(0.0271)	(0.00130)	(0.00397)
LnAsset_c2	0.0271	0.0703	0.00236	0.00122***	0.00188*	0.0705	0.113	0.0176	-0.000311	-0.00248	-0.0399	0.000777	-0.00252	0.00122**	-0.000134
	(0.0412)	(0.0459)	(0.00955)	(0.000322)	(0.000997)	(0.0752)	(0.0783)	(0.0225)	(0.000528)	(0.00316)	(0.0494)	(0.0551)	(0.00780)	(0.000531)	(0.00128)
Real asset growth	0.310**	0.211	0.0456**	-0.000401	-0.0219*	0.289	0.412	-0.00163	0.00140	-0.00847	0.0633	-0.0464	0.0582**	-0.00235	-0.0214
	(0.155)	(0.192)	(0.0203)	(0.00300)	(0.0121)	(0.255)	(0.296)	(0.0480)	(0.00344)	(0.0195)	(0.205)	(0.216)	(0.0244)	(0.00364)	(0.0136)
Premium retention ratio	0.982**	0.902**	0.0810	0.0128**	0.0531**	0.784	1.907**	0.420**	-0.0167	0.00381	1.124***	0.853*	0.0175	0.0139**	0.0660***
(inverse reinsurance ratio)	(0.389)	(0.400)	(0.0681)	(0.00557)	(0.0209)	(0.776)	(0.759)	(0.162)	(0.0150)	(0.0699)	(0.407)	(0.444)	(0.0677)	(0.00601)	(0.0237)
Leverage ratio	-0.0166**	-0.0141**	0.00202**	-7.78e-05	0.000115	-0.0197**	-0.0208***	0.00160	-2.07e-05	1.94e-05	-0.139***	-0.0792*	0.00225	-0.00117***	0.00658**
	(0.00684)	(0.00593)	(0.00102)	(0.000136)	(0.000386)	(0.00783)	(0.00735)	(0.00108)	(8.82e-05)	(0.000495)	(0.0411)	(0.0471)	(0.00441)	(0.000403)	(0.00267)
Liquidity ratio	0.499***	0.190	0.0706***	0.00299	-0.00720**	-0.189	-0.824*	-0.0867	0.0112	0.106	0.373**	0.169	0.0808***	0.00172	-0.00360
	(0.185)	(0.182)	(0.0205)	(0.00230)	(0.00342)	(0.435)	(0.489)	(0.0756)	(0.0115)	(0.0729)	(0.168)	(0.190)	(0.0189)	(0.00184)	(0.00296)
Insurance density	0.0914	-0.00793	-0.0333***	0.00263**	0.00934	0.0294	-0.0335	-0.0362**	0.00237*	0.00415	0.216	0.133	-0.0907	-0.00465	-0.0227
	(0.123)	(0.124)	(0.0114)	(0.00133)	(0.00787)	(0.104)	(0.114)	(0.0148)	(0.00127)	(0.00987)	(0.444)	(0.463)	(0.0597)	(0.00604)	(0.0209)
Real GDP growth	-0.0262	-0.0306	-0.00256	0.000222	0.00154*	0.0462	0.0196	-0.00988	-0.000131	0.00154	-0.0419	-0.0388	0.000372	0.000656**	0.00188**
	(0.0308)	(0.0325)	(0.00415)	(0.000218)	(0.000840)	(0.0480)	(0.0558)	(0.00607)	(0.000250)	(0.00189)	(0.0361)	(0.0380)	(0.00509)	(0.000258)	(0.000831)
Mean of ROA, ROE over years				-0.0170	-0.263**				0.721**	-0.125				-0.0844	-0.287**
				(0.0865)	(0.118)				(0.346)	(0.179)				(0.0897)	(0.128)
Life				-0.0204***	-0.00658										
				(0.00633)	(0.0350)										
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Country FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Observations	890	878	890	890	883	226	220	226	226	222	664	658	664	664	661
No. of firms	209	205	209	209	206	51	49	51	51	49	158	156	158	158	157
R^2	0.134	0.125	0.201	0.447	0.355	0.315	0.394	0.285	0.631	0.492	0.161	0.106	0.264	0.471	0.315

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.3 Alternative globalization measurement

	Full sample					Life sample					Nonlife sample				
Variables	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE
Globalization_globalHHI_c	0.251	0.129	0.0183	-0.0132**	-0.0344	-1.879**	-1.942**	0.181*	-0.00816	-0.0408	0.157	0.180	0.0582	-0.0133**	-0.0347*
	(0.398)	(0.412)	(0.0417)	(0.00528)	(0.0221)	(0.856)	(0.892)	(0.108)	(0.0150)	(0.0836)	(0.414)	(0.428)	(0.0354)	(0.00556)	(0.0191)
Globalization_globalHHI_c2	1.613	2.040	0.141	-0.0551**	-0.135	-0.443	-1.328	-1.750**	0.0708	0.715	0.136	0.671	-0.128	-0.0595**	-0.110
	(1.727)	(1.727)	(0.191)	(0.0246)	(0.115)	(5.655)	(5.554)	(0.719)	(0.105)	(0.563)	(1.624)	(1.708)	(0.169)	(0.0252)	(0.0982)
Globalization_globalHHI_c*life	-2.094**	-2.235**	-0.0723	0.0278**	0.0624										
	(1.003)	(0.985)	(0.127)	(0.0127)	(0.0967)										
Globalization_globalHHI_c2*life	0.427	-1.321	-2.175**	0.209*	1.069*										
	(5.850)	(5.824)	(0.908)	(0.108)	(0.616)										
LnAsset_c	0.297***	0.386***	0.0320***	-0.00332***	0.00596***	0.257***	0.376***	0.0423**	-0.00221***	0.00889**	0.303***	0.369***	0.00584	-0.00395***	-0.00352*
	(0.0643)	(0.0659)	(0.0116)	(0.000435)	(0.00218)	(0.0801)	(0.0850)	(0.0165)	(0.000642)	(0.00450)	(0.0858)	(0.0899)	(0.0124)	(0.000607)	(0.00200)
LnAsset_c2	-0.00876	-0.00588	0.00514*	0.000567***	-7.32e-05	-0.0161	0.00173	0.00793*	0.000391	-0.000769	-0.0259	-0.0337*	-0.00693***	0.000468**	0.000188
	(0.0149)	(0.0161)	(0.00266)	(0.000134)	(0.000661)	(0.0224)	(0.0227)	(0.00420)	(0.000253)	(0.00162)	(0.0167)	(0.0197)	(0.00247)	(0.000222)	(0.000747)
Real asset growth	0.0455	0.0358	-0.00782	0.00132	0.00650	-0.148	-0.138	-0.0501***	0.00340*	0.0102	0.280***	0.220**	0.0488***	0.000987	-0.00315
	(0.0732)	(0.0797)	(0.0113)	(0.00138)	(0.00658)	(0.0997)	(0.120)	(0.0151)	(0.00195)	(0.0103)	(0.102)	(0.103)	(0.0122)	(0.00187)	(0.00646)
Premium retention ratio	0.343	0.0670	0.124***	0.0155***	0.0621***	-0.582*	-0.530	0.317***	-0.0120*	0.0464	0.687**	0.280	0.0187	0.0202***	0.0846***
(inverse reinsurance ratio)	(0.243)	(0.249)	(0.0372)	(0.00350)	(0.0125)	(0.344)	(0.344)	(0.0567)	(0.00613)	(0.0321)	(0.299)	(0.319)	(0.0320)	(0.00404)	(0.0128)
Leverage ratio	-0.0159***	-0.0136***	0.000574	-0.000139***	0.000365*	-0.0115***	-0.0119***	0.000324	-0.000130**	0.000110	-0.165***	-0.0943***	-0.00254	-0.00117***	0.00855***
	(0.00309)	(0.00346)	(0.000442)	(5.21e-05)	(0.000207)	(0.00255)	(0.00319)	(0.000420)	(5.63e-05)	(0.000220)	(0.0202)	(0.0260)	(0.00253)	(0.000231)	(0.00118)
Liquidity ratio	0.0567***	0.0425***	0.00390	0.000780*	-0.00454***	0.205***	0.184***	0.0360***	-5.35e-06	-0.0158***	0.0395***	0.0311***	0.00113	0.000644	-0.00293***
	(0.0171)	(0.0141)	(0.00325)	(0.000399)	(0.00154)	(0.0562)	(0.0515)	(0.00940)	(0.00162)	(0.00599)	(0.0119)	(0.0110)	(0.00270)	(0.000409)	(0.000978)
Insurance density	0.0478	0.0531	-0.0237***	0.00270***	0.00422	0.0210	0.0183	-0.00514	0.00231***	-0.00492	0.334*	0.358*	-0.163***	0.00560**	0.00898
	(0.0385)	(0.0448)	(0.00584)	(0.00103)	(0.00519)	(0.0396)	(0.0490)	(0.00603)	(0.000538)	(0.00405)	(0.203)	(0.215)	(0.0292)	(0.00284)	(0.0115)
Real GDP growth	-0.0267**	-0.0225*	-0.00924***	-7.55e-05	-0.000171	-0.0215	-0.0137	-0.0172***	-0.000247	0.000674	-0.0288*	-0.0294*	-0.00281*	0.000254**	0.000225
	(0.0123)	(0.0125)	(0.00166)	(0.000104)	(0.000462)	(0.0178)	(0.0187)	(0.00283)	(0.000155)	(0.000850)	(0.0155)	(0.0161)	(0.00152)	(0.000128)	(0.000474)
Mean of ROA, ROE over years				-0.0682*	-0.329***				-0.251***	-0.532***				-0.0819*	-0.221***
				(0.0367)	(0.0381)				(0.0885)	(0.0678)				(0.0423)	(0.0393)
Life				-0.0221***	-0.0424										
				(0.00601)	(0.0324)										
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Country FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Observations	4,812	4,751	4,812	4,812	4,779	1,690	1,665	1,690	1,690	1,678	3,122	3,086	3,122	3,122	3,101
No. of firms	975	962	975	975	962	350	344	350	350	334	625	618	625	625	618
R^2	0.125	0.121	0.135	0.410	0.305	0.211	0.199	0.214	0.457	0.416	0.159	0.120	0.249	0.382	0.313

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.4 Alternative return measurements

	Full sample					Life sample					Nonlife sample				
Variables	R.A.ROA2	R.A.ROE2	R.A.ROA3	R.A.ROE3	R.A.ROP	R.A.ROA2	R.A.ROE2	R.A.ROA3	R.A.ROE3	R.A.ROP	R.A.ROA2	R.A.ROE2	R.A.ROA3	R.A.ROE3	R.A.ROP
Globalization_entropy_c	0.126	0.0320	-37.02**	-9.860	0.000327	-1.286**	-1.306**	-220.6***	-23.47**	-2.102***	0.0503	0.0482	-8.409	-4.391	-0.0724
	(0.253)	(0.262)	(18.02)	(7.305)	(0.221)	(0.581)	(0.590)	(63.76)	(10.70)	(0.610)	(0.255)	(0.265)	(7.388)	(6.956)	(0.227)
Globalization_entropy_c2	0.260	0.313	18.02	-7.977	0.265	-0.648	-1.424	194.2	35.96	-0.0670	-0.295	-0.181	2.185	-10.29	-0.154
	(0.501)	(0.543)	(29.23)	(14.71)	(0.465)	(2.334)	(2.338)	(268.0)	(43.12)	(2.809)	(0.581)	(0.633)	(15.21)	(15.37)	(0.530)
Globalization_entropy_c*life	-1.463*	-1.698**	-124.5**	-5.200	-2.098**										
	(0.806)	(0.804)	(60.40)	(12.52)	(1.023)										
Globalization_entropy_c2*life	0.0397	-0.979	70.58	23.84	0.302										
	(2.375)	(2.454)	(258.8)	(42.74)	(2.881)										
LnAsset_c	0.297***	0.385***	26.01***	3.829	0.243***	0.258***	0.376***	56.63***	9.611***	0.184**	0.300***	0.366***	4.206	1.381	0.296***
	(0.0646)	(0.0663)	(7.188)	(2.521)	(0.0627)	(0.0801)	(0.0850)	(14.85)	(3.461)	(0.0847)	(0.0864)	(0.0908)	(2.822)	(3.533)	(0.0883)
LnAsset_c2	-0.00889	-0.00612	5.795**	0.862	0.00288	-0.0163	0.00161	14.06***	3.437*	0.0147	-0.0269	-0.0347*	-1.291	-1.107	-0.0158
	(0.0150)	(0.0163)	(2.419)	(0.816)	(0.0159)	(0.0224)	(0.0227)	(5.076)	(1.772)	(0.0195)	(0.0169)	(0.0200)	(1.114)	(0.962)	(0.0208)
Real asset growth	0.0471	0.0378	-14.06**	-3.473	0.0996	-0.149	-0.139	-40.87**	-6.935	-0.00231	0.284***	0.225**	1.699	-2.834	0.211**
	(0.0732)	(0.0796)	(6.159)	(3.544)	(0.0701)	(0.0997)	(0.120)	(17.66)	(4.516)	(0.112)	(0.103)	(0.104)	(5.648)	(5.405)	(0.0935)
Premium retention ratio	0.348	0.0730	-3.138	-9.872	-0.329	-0.577*	-0.528	9.504	-9.677	-0.809**	0.697**	0.291	1.567	-7.452	-0.181
(inverse reinsurance ratio)	(0.243)	(0.248)	(9.905)	(7.615)	(0.276)	(0.342)	(0.341)	(25.97)	(11.96)	(0.378)	(0.299)	(0.320)	(5.839)	(9.899)	(0.364)
Leverage ratio	-	-	0.972	-0.148	-	-	-	0.772	-0.211*	-	-0.165***	-	1.513	-0.301	-0.144***
	0.0159***	0.0136***			0.0182***	0.0115***	0.0119***			0.0142***		0.0946***			
	(0.00309)	(0.00347)	(0.625)	(0.103)	(0.00330)	(0.00255)	(0.00320)	(0.621)	(0.113)	(0.00280)	(0.0202)	(0.0260)	(2.325)	(1.055)	(0.0177)
Liquidity ratio	0.0567***	0.0426***	0.239	0.440	0.0648***	0.205***	0.184***	-7.851	2.971	0.129**	0.0395***	0.0311***	0.0211	0.248	0.0538***
	(0.0172)	(0.0141)	(0.278)	(0.336)	(0.0198)	(0.0563)	(0.0516)	(6.860)	(3.315)	(0.0521)	(0.0119)	(0.0110)	(0.157)	(0.329)	(0.0185)
Insurance density	0.0481	0.0533	-21.09***	-3.448**	0.0131	0.0208	0.0181	-29.36***	-3.972**	-0.0278	0.335	0.358*	-23.13	-10.04	0.370*
	(0.0386)	(0.0448)	(6.223)	(1.640)	(0.0442)	(0.0397)	(0.0490)	(8.433)	(1.827)	(0.0470)	(0.203)	(0.215)	(19.65)	(15.89)	(0.202)
Real GDP growth	-0.0268**	-0.0226*	1.895*	0.0694	-0.0212*	-0.0214	-0.0136	4.675	0.0938	-0.0196	-0.0290*	-0.0297*	0.304	0.0946	-0.0197
	(0.0123)	(0.0125)	(1.089)	(0.545)	(0.0117)	(0.0178)	(0.0187)	(3.209)	(0.814)	(0.0186)	(0.0155)	(0.0161)	(0.556)	(0.704)	(0.0144)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,751	3,276	3,228	4,746	1,690	1,665	1,131	1,102	1,659	3,122	3,086	2,145	2,126	3,087
No. of firms	975	962	823	811	944	350	344	288	282	336	625	618	535	529	608
R^2	0.125	0.121	0.046	0.024	0.114	0.211	0.200	0.090	0.050	0.198	0.159	0.120	0.023	0.030	0.128

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.5 Alternative risk measurement

	Full sample		Life sample		Nonlife sample	
Variables	S.D.ROA3	S.D.ROE3	S.D.ROA3	S.D.ROE3	S.D.ROA3	S.D.ROE3
Globalization_entropy_c	-0.00525	-0.00943	0.0211**	0.0453	-0.00649*	-0.00731
	(0.00348)	(0.0137)	(0.0101)	(0.0582)	(0.00364)	(0.0128)
Globalization_entropy_c2	-0.0136	-0.0330	-0.0383	-0.152	-0.0128	-0.0310
	(0.00862)	(0.0302)	(0.0445)	(0.232)	(0.00832)	(0.0279)
Globalization_entropy_c*life	0.0231**	0.000617				
	(0.00984)	(0.0682)				
Globalization_entropy_c2*life	0.00583	-0.0415				
	(0.0460)	(0.227)				
LnAsset_c	-0.00247***	0.00627***	-0.00130**	0.0125***	-0.00318***	-0.00327*
	(0.000416)	(0.00206)	(0.000558)	(0.00408)	(0.000605)	(0.00191)
LnAsset_c2	0.000429***	7.70e-05	0.000106	-0.00137	0.000330	-0.000270
	(0.000133)	(0.000646)	(0.000201)	(0.00146)	(0.000202)	(0.000708)
Real asset growth	-0.000824	-0.00346	0.00275	-0.00729	-0.000448	-0.00113
	(0.00195)	(0.00986)	(0.00270)	(0.0212)	(0.00256)	(0.00967)
Premium retention ratio	0.0127***	0.0471***	-0.00214	0.0362	0.0160***	0.0650***
(inverse reinsurance ratio)	(0.00348)	(0.0122)	(0.00604)	(0.0343)	(0.00417)	(0.0134)
Leverage ratio	-0.000156***	2.33e-05	-0.000162***	-0.000277	-0.000904***	0.00588***
	(5.05e-05)	(0.000204)	(5.71e-05)	(0.000233)	(0.000234)	(0.00118)
Liquidity ratio	0.000933**	-0.00299*	-0.000368	-0.0163*	0.000855*	-0.00208*
	(0.000453)	(0.00160)	(0.00291)	(0.00951)	(0.000476)	(0.00117)
Insurance density	0.00263***	0.00804	0.00213**	0.00357	0.00984**	0.00953
	(0.000963)	(0.00558)	(0.00101)	(0.00704)	(0.00489)	(0.0155)
Real GDP growth	-0.000525***	-0.00276***	-9.99e-05	-0.00208	-0.000664***	-0.00223***
	(0.000137)	(0.000594)	(0.000158)	(0.00131)	(0.000192)	(0.000588)
Mean of ROA, ROE over years	-0.0611*	-0.260***	-0.145**	-0.406***	-0.0955**	-0.199***
	(0.0317)	(0.0370)	(0.0726)	(0.0654)	(0.0373)	(0.0417)
Life	-0.00690	-0.000414				
	(0.00633)	(0.0306)				
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	No	No	No	No	No	No
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,277	3,228	1,132	1,102	2,145	2,126
No. of firms	823	811	288	282	535	529
R^2	0.344	0.221	0.385	0.329	0.316	0.221

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.6 Alternative efficiency measurement

	Full sample			Life sample			Nonlife sample		
Variables	CE_global	R.A.ROA	R.A.ROE	CE_global	R.A.ROA	R.A.ROE	CE_global	R.A.ROA	R.A.ROE
Cost efficiency_global		0.824***	0.692***		1.754***	1.734***		0.520*	0.479*
		(0.249)	(0.252)		(0.274)	(0.266)		(0.274)	(0.280)
Cost efficiency_global*life		0.800**	0.965***						
		(0.365)	(0.369)						
Globalization_entropy_c	-0.0233	0.149	0.0510	0.106	-1.472**	-1.496**	0.0109	0.0447	0.0426
	(0.0246)	(0.250)	(0.259)	(0.0645)	(0.609)	(0.625)	(0.0211)	(0.253)	(0.263)
Globalization_entropy_c2	0.0671	0.197	0.259	-0.515**	0.255	-0.518	-0.0132	-0.289	-0.174
	(0.0481)	(0.493)	(0.538)	(0.252)	(2.359)	(2.356)	(0.0523)	(0.570)	(0.622)
Globalization_entropy_c*life	-0.0377	-1.368*	-1.589**						
	(0.103)	(0.810)	(0.782)						
Globalization_entropy_c2*life	-0.629**	1.135	0.169						
	(0.319)	(2.475)	(2.536)						
LnAsset_c	0.0290***	0.260***	0.353***	0.0295*	0.206**	0.332***	0.00990	0.295***	0.360***
	(0.0112)	(0.0633)	(0.0639)	(0.0150)	(0.0811)	(0.0849)	(0.0121)	(0.0871)	(0.0909)
LnAsset_c2	0.00410*	-0.0148	-0.0117	0.00290	-0.0213	-0.00364	-0.00313	-0.0252	-0.0331
	(0.00241)	(0.0143)	(0.0156)	(0.00313)	(0.0213)	(0.0218)	(0.00255)	(0.0170)	(0.0201)
Real asset growth	-0.00785	0.0653	0.0568	-0.0235*	-0.108	-0.0955	0.0247**	0.271***	0.212**
	(0.00972)	(0.0716)	(0.0790)	(0.0129)	(0.0942)	(0.117)	(0.0105)	(0.103)	(0.105)
Premium retention ratio	0.120***	0.156	-0.120	0.318***	-1.135***	-1.088***	0.000599	0.696**	0.294
(inverse reinsurance ratio)	(0.0352)	(0.251)	(0.256)	(0.0530)	(0.343)	(0.347)	(0.0284)	(0.302)	(0.321)
Leverage ratio	0.000624	-0.0169***	-0.0151***	0.000518	-0.0124***	-0.0133***	-0.00362*	-0.164***	-0.0929***
	(0.000427)	(0.00314)	(0.00357)	(0.000415)	(0.00259)	(0.00333)	(0.00201)	(0.0206)	(0.0265)
Liquidity ratio	0.00219	0.0535***	0.0393***	0.0267**	0.158**	0.138**	0.000823	0.0391***	0.0307***
	(0.00294)	(0.0151)	(0.0123)	(0.0110)	(0.0636)	(0.0585)	(0.00239)	(0.0114)	(0.0107)
Insurance density	-0.00626	0.0576	0.0639	-0.000985	0.0225	0.0206	0.0293	0.320	0.343
	(0.00564)	(0.0400)	(0.0461)	(0.00553)	(0.0403)	(0.0497)	(0.0237)	(0.203)	(0.216)
Real GDP growth	-0.00702***	-0.0187	-0.0150	-0.00794***	-0.00745	-0.000135	-0.00471***	-0.0266*	-0.0275*
	(0.00151)	(0.0124)	(0.0126)	(0.00303)	(0.0176)	(0.0183)	(0.00133)	(0.0156)	(0.0162)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,812	4,751	1,690	1,690	1,665	3,122	3,122	3,086
No. of firms	975	975	962	350	350	344	625	625	618
R^2	0.187	0.139	0.134	0.174	0.247	0.231	0.382	0.161	0.121

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.7 Only linear term of globalization entropy

	Full sample					Life sample					Nonlife sample				
Variables	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE	R.A.ROA	R.A.ROE	CE	S.D.ROA	S.D.ROE
Globalization_entropy	0.135	0.0443	0.0147	-0.00854***	-0.0236*	-1.319**	-1.382**	0.0954	-0.00501	-0.0291	0.0447	0.0443	0.0371	-0.00812**	-0.0227**
	(0.247)	(0.258)	(0.0257)	(0.00309)	(0.0133)	(0.556)	(0.570)	(0.0756)	(0.00984)	(0.0587)	(0.256)	(0.264)	(0.0232)	(0.00331)	(0.0114)
Globalization_entropy*life	-1.542**	-1.554**	0.0723	0.00664	-0.0292										
	(0.624)	(0.672)	(0.0796)	(0.00968)	(0.0618)										
LnAsset_c	0.295***	0.383***	0.0321***	-0.00332***	0.00590***	0.259***	0.378***	0.0427**	-0.00224***	0.00851*	0.304***	0.369***	0.00637	-0.00389***	-0.00334*
	(0.0645)	(0.0664)	(0.0116)	(0.000436)	(0.00219)	(0.0802)	(0.0852)	(0.0167)	(0.000645)	(0.00448)	(0.0847)	(0.0891)	(0.0124)	(0.000612)	(0.00202)
LnAsset_c2	-0.00921	-0.00660	0.00493*	0.000560***	-0.000117	-0.0164	0.00123	0.00755*	0.000388	-0.000787	-0.0257	-0.0340*	-0.00681***	0.000494**	0.000248
	(0.0152)	(0.0165)	(0.00268)	(0.000134)	(0.000659)	(0.0224)	(0.0227)	(0.00420)	(0.000254)	(0.00163)	(0.0166)	(0.0198)	(0.00247)	(0.000223)	(0.000747)
Real asset growth	0.0479	0.0389	-0.00792	0.00126	0.00635	-0.149	-0.138	-0.0504***	0.00340*	0.0102	0.281***	0.223**	0.0484***	0.000843	-0.00342
	(0.0731)	(0.0795)	(0.0113)	(0.00138)	(0.00657)	(0.0997)	(0.120)	(0.0152)	(0.00195)	(0.0103)	(0.101)	(0.102)	(0.0122)	(0.00186)	(0.00643)
Premium retention ratio	0.352	0.0824	0.130***	0.0149***	0.0596***	-0.569*	-0.509	0.328***	-0.0124**	0.0419	0.688**	0.286	0.0174	0.0196***	0.0830***
(inverse reinsurance ratio)	(0.241)	(0.247)	(0.0382)	(0.00350)	(0.0124)	(0.340)	(0.336)	(0.0589)	(0.00617)	(0.0321)	(0.298)	(0.318)	(0.0319)	(0.00403)	(0.0127)
Leverage ratio	-0.0158***	-0.0136***	0.000515	-0.000141***	0.000357*	-0.0116***	-0.0120***	0.000265	-0.000131**	0.000108	-0.165***	-0.0946***	-0.00256	-0.00117***	0.00856***
	(0.00308)	(0.00348)	(0.000439)	(5.21e-05)	(0.000207)	(0.00255)	(0.00320)	(0.000419)	(5.62e-05)	(0.000218)	(0.0202)	(0.0260)	(0.00253)	(0.000231)	(0.00118)
Liquidity ratio	0.0568***	0.0427***	0.00394	0.000779*	-0.00454***	0.205***	0.185***	0.0364***	-1.46e-05	-0.0159***	0.0394***	0.0311***	0.00113	0.000640	-0.00294***
	(0.0172)	(0.0142)	(0.00327)	(0.000399)	(0.00154)	(0.0565)	(0.0518)	(0.00941)	(0.00161)	(0.00601)	(0.0118)	(0.0110)	(0.00269)	(0.000409)	(0.000975)
Insurance density	0.0485	0.0539	-0.0238***	0.00265**	0.00422	0.0208	0.0183	-0.00509	0.00233***	-0.00471	0.333	0.356*	-0.163***	0.00530*	0.00844
	(0.0386)	(0.0450)	(0.00582)	(0.00103)	(0.00521)	(0.0398)	(0.0491)	(0.00606)	(0.000535)	(0.00405)	(0.203)	(0.215)	(0.0292)	(0.00283)	(0.0115)
Real GDP growth	-0.0269**	-0.0227*	-0.00921***	-8.80e-05	-0.000221	-0.0213	-0.0134	-0.0171***	-0.000251	0.000632	-0.0289*	-0.0296*	-0.00279*	0.000238*	0.000196
	(0.0123)	(0.0125)	(0.00166)	(0.000104)	(0.000468)	(0.0178)	(0.0187)	(0.00284)	(0.000155)	(0.000853)	(0.0155)	(0.0161)	(0.00152)	(0.000127)	(0.000476)
Mean of ROA, ROE over years				-0.0684*	-0.329***				-0.250***	-0.531***				-0.0824*	-0.222***
				(0.0366)	(0.0381)				(0.0883)	(0.0679)				(0.0423)	(0.0392)
Life				-0.0168***	0.00390										
				(0.00292)	(0.0144)										
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Country FE	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	Yes
Observations	4,812	4,751	4,812	4,812	4,779	1,690	1,665	1,690	1,690	1,678	3,122	3,086	3,122	3,122	3,101
No. of firms	975	962	975	975	962	350	344	350	350	334	625	618	625	625	618
R^2	0.125	0.121	0.132	0.408	0.304	0.211	0.199	0.210	0.457	0.415	0.159	0.120	0.249	0.380	0.312

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.8 Newey-West standard errors

	Full sample			Life sample			Nonlife sample		
Variables	R.A.ROA	R.A.ROE	CE	R.A.ROA	R.A.ROE	CE	R.A.ROA	R.A.ROE	CE
Globalization_entropy_c	0.126	0.0320	0.0132	-1.286**	-1.306**	0.125*	0.0503	0.0482	0.0381*
	(0.226)	(0.222)	(0.0239)	(0.578)	(0.577)	(0.0676)	(0.224)	(0.225)	(0.0215)
Globalization_entropy_c2	0.260	0.313	0.0350	-0.648	-1.424	-0.572*	-0.295	-0.181	-0.0514
	(0.480)	(0.474)	(0.0483)	(2.124)	(2.219)	(0.302)	(0.480)	(0.496)	(0.0477)
Globalization_entropy_c*life	-1.463*	-1.698**	-0.0857						
	(0.776)	(0.781)	(0.120)						
Globalization_entropy_c2*life	0.0397	-0.979	-0.712**						
	(2.145)	(2.251)	(0.335)						
LnAsset_c	0.297***	0.385***	0.0320***	0.258***	0.376***	0.0420***	0.300***	0.366***	0.00561
	(0.0551)	(0.0568)	(0.0100)	(0.0743)	(0.0795)	(0.0154)	(0.0733)	(0.0773)	(0.0101)
LnAsset_c2	-0.00889	-0.00612	0.00503**	-0.0163	0.00161	0.00771**	-0.0269	-0.0347*	-0.00701***
	(0.0128)	(0.0136)	(0.00205)	(0.0210)	(0.0215)	(0.00390)	(0.0164)	(0.0179)	(0.00216)
Real asset growth	0.0471	0.0378	-0.00802	-0.149	-0.139	-0.0505***	0.284***	0.225**	0.0489***
	(0.0699)	(0.0762)	(0.0104)	(0.0961)	(0.113)	(0.0146)	(0.0951)	(0.0968)	(0.0119)
Premium retention ratio	0.348	0.0730	0.126***	-0.577*	-0.528	0.321***	0.697**	0.291	0.0190
(inverse reinsurance ratio)	(0.227)	(0.238)	(0.0326)	(0.309)	(0.334)	(0.0513)	(0.293)	(0.308)	(0.0305)
Leverage ratio	-0.0159***	-0.0136***	0.000545	-0.0115***	-0.0119***	0.000299	-0.165***	-0.0946***	-0.00255
	(0.00258)	(0.00311)	(0.000388)	(0.00225)	(0.00301)	(0.000371)	(0.0173)	(0.0213)	(0.00198)
Liquidity ratio	0.0567***	0.0426***	0.00391	0.205***	0.184***	0.0362***	0.0395***	0.0311**	0.00113
	(0.0153)	(0.0134)	(0.00261)	(0.0533)	(0.0507)	(0.00842)	(0.0130)	(0.0122)	(0.00242)
Insurance density	0.0481	0.0533	-0.0239***	0.0208	0.0181	-0.00511	0.335*	0.358*	-0.163***
	(0.0356)	(0.0400)	(0.00568)	(0.0390)	(0.0445)	(0.00609)	(0.182)	(0.186)	(0.0256)
Real GDP growth	-2.679**	-2.260*	-0.923***	-2.138	-1.359	-1.717***	-2.905*	-2.973*	-0.281*
	(1.168)	(1.206)	(0.148)	(1.701)	(1.825)	(0.266)	(1.519)	(1.581)	(0.154)
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year FE / Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,751	4,812	1,690	1,665	1,690	3,122	3,086	3,122
No. of firms	975	962	975	350	344	350	625	618	625

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

Appendix B.9 Random effects models

	Full sample			Life sample			Nonlife sample		
Variables	R.A.ROA	R.A.ROE	CE	R.A.ROA	R.A.ROE	CE	R.A.ROA	R.A.ROE	CE
Globalization_entropy_c	0.126	0.0360	-0.00522	-1.279**	-1.273**	0.0620	0.0627	0.0549	0.00778
	(0.253)	(0.261)	(0.0201)	(0.579)	(0.583)	(0.0559)	(0.253)	(0.264)	(0.0186)
Globalization_entropy_c2	0.259	0.298	-0.0126	-0.669	-1.438	-0.449**	-0.254	-0.195	-0.0500
	(0.501)	(0.543)	(0.0445)	(2.333)	(2.351)	(0.190)	(0.577)	(0.637)	(0.0433)
Globalization_entropy_c*life	-1.461*	-1.685**	-0.124						
	(0.805)	(0.802)	(0.0967)						
Globalization_entropy_c2*life	-0.0223	-0.979	-0.622**						
	(2.367)	(2.461)	(0.280)						
LnAsset_c	0.298***	0.364***	0.0213***	0.258***	0.356***	0.0255***	0.350***	0.340***	0.0127***
	(0.0644)	(0.0657)	(0.00381)	(0.0799)	(0.0830)	(0.00616)	(0.0849)	(0.0901)	(0.00423)
LnAsset_c2	-0.00927	-0.00331	0.00235**	-0.0166	0.00363	0.00453*	-0.0288	-0.0317	-0.00279**
	(0.0150)	(0.0162)	(0.00112)	(0.0224)	(0.0223)	(0.00232)	(0.0176)	(0.0200)	(0.00129)
Real asset growth	0.0473	0.0380	-0.0133	-0.149	-0.148	-0.0593***	0.274***	0.230**	0.0467***
	(0.0730)	(0.0796)	(0.0110)	(0.0995)	(0.120)	(0.0142)	(0.102)	(0.104)	(0.0117)
Premium retention ratio	0.343	0.0574	0.141***	-0.580*	-0.557	0.404***	0.627**	0.273	0.0508**
(inverse reinsurance ratio)	(0.242)	(0.248)	(0.0264)	(0.342)	(0.342)	(0.0419)	(0.298)	(0.319)	(0.0237)
Leverage ratio	-0.0148***	-0.0134***	0.000826**	-0.0112***	-0.0115***	0.000791***	-0.154***	-0.0963***	-0.00370*
	(0.00299)	(0.00345)	(0.000327)	(0.00252)	(0.00316)	(0.000289)	(0.0197)	(0.0260)	(0.00199)
Liquidity ratio	0.0567***	0.0436***	0.00415	0.205***	0.189***	0.0283***	0.0390***	0.0319***	0.00260
	(0.0172)	(0.0143)	(0.00282)	(0.0563)	(0.0521)	(0.00753)	(0.0116)	(0.0111)	(0.00251)
Insurance density	0.0492	0.0571	-0.0212***	0.0213	0.0212	-0.00859*	0.401**	0.400*	-0.0778***
	(0.0385)	(0.0448)	(0.00456)	(0.0397)	(0.0490)	(0.00469)	(0.201)	(0.215)	(0.0154)
Real GDP growth	-0.0274**	-0.0238*	-0.00930***	-0.0219	-0.0172	-0.0166***	-0.0305**	-0.0305*	-0.00380***
	(0.0123)	(0.0125)	(0.00145)	(0.0178)	(0.0187)	(0.00227)	(0.0155)	(0.0162)	(0.00143)
Life	48.30***	-5.671***	0.236***						
	(7.692)	(1.599)	(0.0369)						
Number of LOB (factor var.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE / Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm random effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,812	4,751	4,812	1,690	1,665	1,690	3,122	3,086	3,122
No. of firms	975	962	975	350	344	350	625	618	625
R^2	0.125	0.121	0.130	0.211	0.200	0.204	0.158	0.120	0.239

Notes: The clustered robust standard errors are provided in parentheses. *, **, *** indicate that the coefficients significantly differ from 0 at 10%, 5%, 1% levels, respectively.

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