Developed and Developing Countries and the Decision to Internationalize: An Expansion of the Eclectic Paradigm Applied to the U.S. Reinsurance Industry

Author Information:

Cassandra R. Cole, Ph.D.
Associate Professor
College of Business
Florida State University
Tallahassee, FL 32306
USA
(850) 644-9283 - telephone
(850) 644-4077 - fax
ccole@cob.fsu.edu

William L. Ferguson, Ph.D.
Associate Professor
Purvis Endowed Chair of Insurance
B.I. Moody III College of Business
University of Louisiana
Lafayette, LA 70504
USA
(337) 482-6664 - telephone
(337) 482-6675 - fax
ferguson@louisiana.edu

Ryan B. Lee, Ph.D.
Associate Professor
Haskayne School of Business
University of Calgary
2500 University Drive NW
Calgary, Alberta T2N 1N4
CANADA
(403) 220-4350 - telephone
(403) 770-8104 - fax
ryan.lee@haksayne.ucalgary.ca

Kathleen A. McCullough, Ph.D.
Associate Professor
College of Business
Florida State University
Tallahassee, FL 32306
USA
(850) 644-8358 - telephone
(850) 644-4077 - fax
kmccullo@cob.fsu.edu

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Abstract

In today's global marketplace, the internationalization decision has become increasingly relevant for a greater number of firms. Developing countries are of key interest partially because of the potential benefits of these untapped markets. We use the framework of the eclectic paradigm to empirically investigate the decision of U.S. reinsurers to internationalize into developed and developing countries. We provide strong evidence that the economic status of a country is an important factor in a reinsurer's decision to conduct business in that country. In addition, we find that the characteristics impacting the volume of reinsurance assumed vary between developed and developing countries.

Key words: internationalization; reinsurance; eclectic paradigm

INTRODUCTION

In today's global marketplace, the internationalization decision is one that has become relevant for a greater number of firms, with companies using foreign market penetration as a viable means of growth and/or diversification. Commonly cited factors for the increasing foreign market penetration include a rise in the number of countries participating in free trade agreements, the continued growth in the domestic markets of developed and developing countries, and an overall increase in the demand for various goods and services. Developing countries are of key interest in the internationalization strategies of firms due, in part, to the potential opportunities of these untapped markets. These opportunities include the growth in wealth in these countries, the underdeveloped markets in many industries to serve this demand, and governmental incentives that are intended to help quickly foster the knowledge base to further develop these markets.

While existing research has explored a number of related issues, such as international market cycles (e.g., Cummins and Outreville, 1987), loss shocks, capacity constraints in the reinsurance market place (e.g. Weiss and Chung, 2004; Cummins, Dionne, Gagné, Nouira, 2008), trends in international supply and demand for insurance (e.g., Beenstock, Dickinson and Khajuria, 1988; Outreville, 1990; Browne and Kim, 1993; Outreville, 1995; Outreville, 1996; Ma and Pope, 2003), and the impact of free trade (e.g., Campbell, Goldgerg, and Rai, 2003), few have focused specifically on the motives for the internationalization of insurance (e.g., Ma and Pope, 2003; Cole, Lee, and McCullough, 2007). In addition, these studies have generally focused on OECD countries, leaving developing nations largely unstudied. However, over the period from 1996 to 2004, the amount of reinsurance assumed from developing countries by U.S. reinsurance has grown from $101.7 million to $437.1 million. However, the percentage of premiums assumed from developing countries has dropped slightly from approximately 23 percent in 1996 to close to 18 percent in 2004.[1] In light of these facts and results of existing studies which find different cycles and/or factors that impact firm solvency and profitability between developing nations and insurance and financial services issues (e.g., Booth, Aivazian, Demirguc-Kunt and Maksimovic; 2001; Chen and Wong, 2004), further investigation of the potential differences in the factors that impact internationalization of insurers into developed and developing countries is warranted. Specifically, we analyze the internationalization decisions of U.S. reinsurers into both developed and developing nations to test whether factors influencing internationalization differ based on the developing nation status of the country the reinsurance is assumed from.

The remainder of the paper is organized as follows. The following section provides information on the background literature and motivation related to both insurance in developing countries as well as the eclectic paradigm. The next section outlines the data, research methodology and hypotheses. The results are in the subsequent section, followed by the conclusions and public policy implications of the study.

BACKGROUND AND MOTIVATION

There are several key streams of literature that create the background for this paper. The first two streams focus on the international insurance literature as well as literature related to developing insurance markets to provide some general background information as well as the motivation for our study. The third stream relates to the eclectic paradigm and provides a theoretical framework for the paper.

[1]These figures are based on our sample of U.S. reinsurers. Detailed information related to the sample selection and the definition of developing countries utilized in the current study are provided in a later section.

International Insurance

Insurance and reinsurance has long been considered important for a country's economic development. As described in Outreville (1990), at the first session of the United Nations Conference on Trade and Development (UNCTAD), it "formally acknowledged that 'a sound national insurance and reinsurance market is an essential characteristic of economic growth.'" There has been some empirical research specifically focused on the motives of insurers and reinsurers to operate internationally as well as the individual supply and demand of insurance on an international basis (e.g., Beenstock et al., 1988; Outreville, 1990; Browne and Kim, 1993; Outreville, 1995; Outreville, 1996; Ma and Pope, 2003). These studies find that factors including higher levels of GDP, reduced trade barriers, market structure, and competition influence all impact the extent of a firm's international involvement.

While much of the existing research focuses primarily on host country-specific factors, a recent study, which considers firm-specific and industry-specific factors as well as host country factors, is that of Cole et al. (2007).[2] The authors modify the basic eclectic paradigm framework set forth by Dunning (1977) such that it is applicable to the reinsurance industry. As with many of the prior studies related to the eclectic paradigm, the authors find that both firm-specific and country-specific factors play a major role in the decision to internationalize. This supports the use of a more holistic model in examining the decision of U.S. reinsurers to internationalize.

[2] Cole et al. (2007) use a sample comprised only of developed countries. Due to the fact that developed countries may be more similar in terms of host country characteristics, using only these countries may have resulted in a sample with less differentiation in the host-country or location-specific variables examined. By including both developed and developing nations in the current study, we are more likely to capture variation between countries ceding reinsurance to U.S. reinsurers, thus providing a more robust and global study of the demand for reinsurance.

The importance of the international reinsurance marketplace has been the focus of a variety of papers. Weiss and Chung (2004) examine underwriting cycles and their effect on reinsurance and find a relation between nonproportional property reinsurance prices and relative capital in the US reinsurance industry as well as a relation to reinsurance capacity in other parts of the world. The paper also noted the importance of controlling for factors such as major loss shocks like 9/11 when investigating reinsurance prices. Cummins et al. (2008) discuss the fact that mega-catastrophes provide an economic motivation for a global reinsurance market. Through global diversification, international reinsurers need less capital to support catastrophe risks than local reinsurers.

Developing Insurance Markets

As mentioned earlier, a great deal of prior research on international insurance issues has focused on developed nations, primarily for reasons related to data availability. However, some research has highlighted potential differences between developed and developing countries. For example, in an analysis of capital structures in developing nations, Booth et al. (2001) find that while the same factors impact decisions in developing nations, there are country-specific factors that impact decisions as well. For example, they find that financial variables, specifically total debt and long-term book debt ratios, are less informative than the characteristics of the firm's country. Further, research by Chen and Wong (2004) explores differences in the determinants of financial health in Asian economies at different stages of development. Based on an analysis of both general insurers and life/health insurers, they conclude that "authorities should develop their guiding principles according to the stages of economic development of their own country …" (Chen and Wong, 2004). With respect to insurance, Arena (2008) finds increasing non-life insurance market activities is a significant factor in the economic growth of developing countries. This further underscores the importance of examining potential differences in developed and developing nations in more detail.

Studies such as Outreville (1990, 1996) focus specifically on insurance in developing nations. For example, Outreville (1996) explores life insurance in developing countries. In addition to finding a link between the country's level of financial development and the demand for life insurance, he also finds that competitive markets are more developed than monopolistic markets. This underscores the importance of looking at both the development of the nation and the structure of its insurance market. Similarly, in a study of the demand for property-liability insurance in developing countries, Outreville (1990) finds that property-liability insurance has grown in importance in these nations as part of the development of financial institutions. Outreville (1990) also finds that in developing countries, property-liability insurance has a supply-leading pattern of development.

While historically, the insurance markets in some of the developing countries may have been highly protective and immature in nature (e.g. Skipper, 1987; Outreville, 1990), the demand for foreign insurance (measured by the amount of reinsurance assumed from a particular country) in some developing countries is currently high. For example, our dataset shows that, in every year between 1996 and 2004, at least one of the top six countries in terms of total volume of reinsurance assumed is a developing nation.[3]

The demand for foreign involvement in insurance and reinsurance markets may be the result of several factors relating to the needs of the domestic insurance industry. For example, in developing countries, due to the nature and size of the market, there may not be adequate

[3] See Table 2 for more detailed information.

diversification of risk based on the business written by domestic insurers, thus creating a need for a substantial transfer of their portfolio to reinsurers.[4] In addition, as the economies in developing countries continue to grow; their domestic markets may no longer be able to support any excess demand (Outreville, 1990, 1995).

Entering developing markets may have advantages for the insurer or reinsurer as well.[5] For example, it may create diversification that the insurer or reinsurer is unable to obtain within its own domestic market (Cummins et al., 2008). Internationalization also may create opportunities for the insurer or reinsurer to deploy excess capacity that is not needed in its domestic market (and possibly other developed markets), thus more effectively utilizing its full underwriting capacity. However, there are potential costs related to the entrance into developing markets. Some of these markets are quite small compared to the markets in developed countries. This may result in higher entry costs. In addition, the insurance markets in developing countries may be highly protective and immature (e.g. Ma and Pope, 2003). As such, insurers and reinsurers that choose to conduct business in these markets must weigh the benefits against the costs associated with entering developing markets.

Eclectic Paradigm

The eclectic paradigm is one framework that has been used to explain the motives for internationalization. While some research involving the eclectic paradigm relates to the theoretical development of the paradigm (e.g., Dunning, 1977), other work empirically tests the

[4] The heavy reliance upon agriculture in many of these countries is one example of the high correlation of insured risks. It is estimated that nearly one-half of all employment in developing countries is associated with agricultural-related jobs (Swiss Reinsurance, 2007).

[5] More details, including the findings of prior research related to advantages and disadvantages of conducting business with developing countries, are provided in the hypotheses section.

framework. The majority of the empirical studies focus on manufacturing firms (e.g., Johanson and Valhne, 1990; O'Farrell, Wood, and Zheng, 1996; Katrishen and Scordis, 1998). However, more recent studies have provided empirical evidence that the relation between international diversification and performance is not the same for service firms as it is for manufacturing firms (e.g., Tong, Alessandri, Reuer, and Chintakananda, 2008). As noted earlier, a recent study by Cole et al. (2007) tests the applicability of the eclectic paradigm to a financial services industry, specifically U.S. reinsurers. The authors find that both country-specific and firm specific factors impact the decision to internationalize. However, this study was limited only to OECD countries.

DATA AND METHODOLOGY

Data

In the current study, we analyze the decision of U.S. property and casualty reinsurers to internationalize for the period of 1996 through 2004. Because of the detailed nature of the data available for these firms, we are able to create a measure of internationalization based on the individual contracts sold by each reinsurer to insurers operating in countries around the world. Due to the focus on U.S. reinsurers, our data source for the firm-specific variables is the National Association of Insurance Commissioners' (NAIC) *Property/Casualty Insurance Database*. The NAIC *Database* includes information on all U.S. insurers and reinsurers.

We utilize the A. M. Best definition to identify professional U.S. reinsurers. Specifically, A. M. Best defines a reinsurer as a firm whose reinsurance assumed from non-affiliates is more than 75 percent of the direct business written plus reinsurance assumed from affiliates.[6] This definition also was used by Cole et al. (2007). The NAIC data is then used to develop a proxy for

[6] Note that reinsurers with missing data or non-logical values for data required for the analysis are removed. This results in a final dataset of 37 unique reinsurers, and 1,368 total observations.

each reinsurer's value of business in a given country for a given year. Specifically, we aggregate the total amount of reinsurance assumed from a given country for each of the reinsurers in the sample based on information obtained from Schedule F, Part 1 of the NAIC's *Database.* This schedule provides contract level data for reinsurance assumed by the reinsurer, including the country from which the business was ceded. Because of the necessity of this information, if we are unable to determine the ceding company's country of domicile, that particular contract is not included in the empirical analysis. Also note that the NAIC data are used to create industry aggregates for the levels of liquidity and leverage of the U.S. reinsurance industry. This is done separately for each year in the sample. By focusing on a single industry from a single country, we are able to eliminate potentially confounding effects due to variations in the costs and advantages related to the host country.

The country-specific variables are obtained from a variety of sources including, Axco Insurance Information Services Ltd. *Global Statistics* database, SwissRe *sigma*, the OECD *Insurance Statistics Yearbook*, World Bank *Government Indicators*, and World Bank *World Development Indicators*. Specifically, the Axco, OECD, and SwissRe data provide information on the insurance markets and overall economic conditions of foreign countries while the World Bank data are used to create the governmental efficiency variable. In addition, we utilize the World Bank's definition of a developing country which distinguishes between developed and developing countries based solely on the level of gross national income (GNI) per capita. Countries with GNI per capita below $10,065 in the most recent year of the data set are considered developing countries.[7] A complete list of the variables utilized in the model, along with the appropriate source and expected sign, can be found in the appendix.

Methodology

Based on the eclectic paradigm, we hypothesize that the internationalization decision of U.S. reinsurers is impacted by three categories of factors: country-specific factors (location), firm-specific factors (ownership/internalization), and reinsurance industry-specific factors. As such, we use models in which the dependent variable (the natural logarithm of reinsurance assumed from a particular country in a given year for each reinsurer) is a function of variables representing these three categories of factors. The variables are discussed in detail in the following section.

We conduct the empirical analysis in two phases. The first phase builds on prior studies related to the internationalization of insurers. Here, we create a test of the eclectic paradigm including developing nation status as a location-specific variable to determine whether the fact that a firm is a developing nation is significant in the decision to internationalize. The basic model is structured similar to that of Cole et al. (2007) and can be written as:[8]

$$Log\_assum_{ijjt} = \alpha + \beta\Sigma X_{it} + \beta\lambda\Sigma Y_{jt} + \delta\Sigma Z_{jt} + \varepsilon_{ijt}$$, where:

- log_assum_{ijt}: natural log of foreign reinsurance assumed by the i^{th} insurer from the j^{th} country for the t^{th} year
- X_{ij} = a vector of variables representing the location factors of the i^{th} insurer for the t^{th} year
- Y_{jt} = a vector of variables representing the ownership/internalization characteristics of the j^{th} country for the t^{th} year

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[7] There are other methods of identifying developing countries. One method is that of UNCTAD. However, upon comparing the UNCTAD classification scheme to the World Bank classification scheme, we find that the vast majority (56 of the 64 countries) of the countries are similarly classified. The countries that are classified differently are the Bahamas, Croatia, Hong Kong, Kuwait, Romania, Saudi Arabia, Singapore, Ukraine, and United Arab Emirates.

[8] We create multiple versions of the models to allow for the testing of specific hypotheses related to the interaction of key variables as well as to control for issues related to multicollinearity.

- Z_t = a vector of variables representing the reinsurance factors in the t^{th} year

In the second phase, we recognize that due to the different traits of developed and developing markets discussed above, factors important to the internationalization decision of reinsurers may vary between developed and developing nations. As such, we construct two additional sets of models. In the first approach, the firm-specific and industry-specific factors remain the same, but the location-specific factors are interacted with a series of dummy variables differentiating between developed and developing nations. The interactions are obtained by combining the location-specific factors with indicator variables: first where the indicator variable (D) is equal to one representing the developing countries and zero otherwise; and second where the indicator variable (F) is equal to zero representing the developed countries and 0 otherwise. The model can be written as:

$$Log\_assum_{ijjt} = \alpha + \beta\Sigma X_{it} + \beta\lambda(D*\Sigma Y_{jt}) + \beta\lambda(F*\Sigma Y_{jt}) + \delta\Sigma Z_{jt} + \varepsilon_{ijt}\text{ , where:}$$

- log_assum_{ijt}: natural log of foreign reinsurance assumed by the i^{th} insurer from the j^{th} country for the t^{th} year
- X_{ij} = a vector of variables representing the location factors of the i^{th} insurer for the t^{th} year
- Y_{jt} = a vector of variables representing the ownership/internalization characteristics of the j^{th} country for the t^{th} year
- Z_t = a vector of variables representing the reinsurance factors in the t^{th} year
- D = indicator variable equal to one for developing countries and zero otherwise
- F = indicator variable equal to one for developed countries and zero otherwise

This methodology allows us to more closely study the impact of developing country status on the amount of reinsurance assumed from countries. More specifically, we will be able to observe if the relation between reinsurance assumed and the location-specific factors vary for developed and developing countries.

In the second approach, we divide the dataset into two subsets and examine developing and developed countries in separate models. One subset includes only firm-level observations for developing countries while the other only includes firm-level observations for developed countries. This variation of the models is designed to test the robustness of the prior results. With this approach, the firm-specific and industry-specific factors included are the same as in the previous two versions of the models. However, the location-specific factors are adjusted based on the structure of the data. For example, since only Mexico is consistently listed as both a developing country and a member of a free trade agreement, there is minimal variation in the free-trade initiatives variable within the developing country subset. Therefore the free-trade variable is not included in that model.

An examination of the data indicates the presence of heteroscedasticity in some model variations. In these cases, robust standard errors are used. Tests do not indicate the presence of autocorrelation. Finally, we consider several variations of the models to manage the presence of multicollinearity as indicated by the variance inflation factors.

HYPOTHESES DEVELOPMENT

Based on the eclectic paradigm, a variety of location-specific and firm-specific factors are considered in the decision to internationalize. Additionally, as with earlier versions of the eclectic paradigm (e.g., Dunning, 1977) and consistent with Cole et al. (2007), industry characteristics of the host country (the U.S. reinsurance industry) are included to capture the potential impact of changes in the U.S. reinsurance market on the decision of U.S. reinsurers to internationalize.

Country-Specific Factors

The first category of variables we consider in the decision to internationalize relate to country-specific traits. These include developing country status, the loss experience of the foreign market, growth, and regulation. In each case, we base the factors on the characteristics of each country in a given year.

Our main variable of interest is whether developing nation status is related to the decision to internationalize. As described earlier, there are several reasons as to why a developing country would demand foreign reinsurance including the possibility that the supply within the domestic market is not sufficient given the demand (e.g. Outreville, 1990 and 1996). We utilize the World Bank's categorization to distinguish between developed and developing countries. As such, we create a binary variable equal to one if the country is a World Bank defined developing economy and zero otherwise.

Prior research has documented a relation between the size of the foreign market and the decision to internationalize (e.g., O'Farrell et al., 1996; Galan and Gonzalez-Benito, 2001). This relation likely exists because larger markets may be viewed more favorably due to the presence of greater opportunities. We hypothesize that this relation also will hold for U.S. reinsurers. As such, a common measure of overall market size, the natural logarithm of gross domestic product per capita, is included. It is expected that overall market size will be positively related to foreign reinsurance assumed.

In addition, we consider the loss experience of the foreign market. A firm may decide to purchase or cede to a reinsurer for a variety of reasons. For example, purchasing reinsurance results in shifting at least a part of the ceding company's risk to another firm which can decrease its probability of bankruptcy. In addition, the insurer is able to utilize the specialized knowledge and real services provided by the reinsurer. The benefits of these services and the potential impact on firm profitability are discussed extensively in the corporate demand for insurance literature (e.g., Mayers and Smith, 1990; Garven and Lamm-Tennant, 2003; Cole and McCullough, 2006). Due to these potential benefits, it is expected that the loss experience in the foreign market will be positively related to the reinsurance assumed from that market.

We also include a measure of insurance penetration, defined as the volume of non-life insurance premiums relative to the gross domestic product. As with the previous variable, it is expected that the larger the insurance proportion of the country's total market, the more attractive the market will be to foreign reinsurers. In addition, the demand in these markets may be greater as the capacity of the domestic market may not be sufficient to meet the domestic insurers' needs. As such, a positive result is expected.

The premium growth in a given market also is likely to impact the internationalization decision of U.S. reinsurers. Specifically, countries experiencing higher growth rates are likely to have a greater demand for reinsurance which cannot be fully satisfied by the domestic market. As such, countries with higher growth rates are expected to attract more interest as foreign reinsurers may see this market as having greater opportunities. For this reason, we expect that premium growth in a host market will be positively associated with the amount of foreign reinsurance assumed from that market.

We also include the market share of the country, as measured by the percentage of the country's non-life premiums relative to the total world non-life premiums, in the analysis. We expect that this variable will be positively related to the amount of foreign reinsurance assumed from a particular market. This rationale is similar to that made for the size of the country's market in that larger markets may be more attractive to U.S. reinsurers due to the greater opportunities present. However, this ‘size’ measure is specific to the insurance industry.

It also is important to control for the potential impact of participation in a free-trade initiative such as NAFTA or the EU. Studies such as Habib and Zurawicki (2002) find that there is an increase in the level of internationalization associated with free-trade agreements. As in Habib and Zurawicki (2002) and Cole et al. (2007), we include an indicator variable equal to one if a firm is a member of either the EU or NAFTA and zero otherwise. We expect a positive and significant relation between participation in a free-trade initiative and the decision to internationalization.

We also include a measure of the regulatory environment of the country, as this is very important to firms considering doing business in a particular country. Like Cole et al. (2007), we use a measure of government effectiveness created by the World Bank. As defined by the World Bank, the government effectiveness measure captures “…the quality of public service provision, the quality of the bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government’s commitment to policies” (Kaufmann, Kraay and Mastruzzi, 2007). It is hypothesized that U.S. reinsurers will do more business with governments that are more effective.

As noted earlier, we create variations of the models designed to control for the possible joint effect of developing or developed country status and the location-specific factors. The purpose of examining the interactions is to determine if the differences between developed and developing countries impact the relation between the location-specific factors and the volume of reinsurance assumed from these countries. For example, we consider the interaction of developing country status and government effectiveness and developed country status and government effectiveness. If government effectiveness has a stronger impact in developing countries in comparison to developed countries, the first interaction will be significant and positive while the other will be insignificant. There are no specific *a priori* hypotheses made for the interactions.

Firm-Specific Factors

The firm-specific factors relate to both the ownership and internalization advantages outlined in the eclectic paradigm. While the general factors included are similar to the broader factors considered in prior tests of the eclectic paradigm, some of the measures are refined to fit the characteristics of the reinsurance industry.

Ownership Advantages. The first of the ownership advantages considered is the reinsurer's expertise in the foreign market. In the case of U.S. reinsurers, this expertise can stem from current international activity and/or from ownership by an international parent. The importance of these factors is noted in previous work which suggests that prior experience in international markets is a significant driver in the decision to enter a foreign market (e.g., Galan and Gonzalez-Benito 2001). Following Cole et al. (2007), the percentage of foreign reinsurance assumed relative to total reinsurance assumed as well as a variable indicating if the reinsurer is owned by a U.S. or foreign parent are included in the analysis. A higher percentage of business in foreign markets as well as foreign ownership are both expected to be signs of increased expertise in international markets, thus creating a comparative advantage for the firm. A higher percentage of business assumed from foreign markets also may provide evidence of economies of scale in the international markets.

Another ownership advantage relates to firm profitability. Javalgi, Griffith, and White (2003) consider adequate financial resources as a potential comparative advantage in internationalization. In addition, Galan and Gonzalez-Benito (2001) find the availability of capital for new investments an important factor. We use two insurance-specific factors, net income to losses and the two-year loss development, in an effort to capture the impact of profitability on the decision to internationalize. The net-income-to-losses variable is a measure of overall profitability and the loss development variable is a proxy for an insurer's reserving practices.[9] We expect that more profitable firms would assume more foreign reinsurance because they have the financial resources required to engage in these activities. As such, we expect the net-income-to-loss ratio will be positively associated with increased internationalization and the two-year loss development variable will be negatively associated with internationalization levels.

Internalization Advantages. Drawing from prior research, we identify firm-specific factors that could create internalization advantages. These include firm size, measured as the natural logarithm of firm assets. This variable proxies both for a firm's overall capacity to operate internationally (e.g., Javalgi et al., 2003; Cole et al., 2007) and the ability of larger firms to better manage the potential risks of internationalization (Cole et al., 2007). Consistent with insurance-related research, we expect size to be positive and significant.

We also include the ratio of direct business to policyholder's surplus, or underwriting leverage, in the models. This measure of underwriting leverage has been used in various studies examining the demand for reinsurance (e.g., Garven and Lamm-Tennant, 2003; Cole and

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[9] Prior insurance research has shown that insurers may manipulate loss reserves in order to meet specific financial goals including masking financial weakness (e.g., Grace, 1990; Petroni, 1992; and Gaver and Paterson, 1999). Therefore, a negative result would indicate that under-reserving by reinsurers may not be viewed favorably, thus negatively impacting the demand for its product by foreign insurers.

McCullough, 2006; Cole et al., 2007) and serves as an insurance-specific measure of capacity. Specifically, underwriting leverage allows us to test the extent to which a reinsurer's excess underwriting capacity impacts its ability to internationalize. Reinsurers with larger amounts of excess capacity are likely to have lower direct business to surplus ratios. Thus a negative relation to internationalization is expected. It should be noted that the issues related to capacity are closely related to the profitability measures discussed earlier. As a result, some studies have used the ratio of direct business to surplus as a proxy for a firm's profitability.

There has been some discussion and research on the relation between internationalization and risk diversification (e.g., Galan and Gonzalez-Benito, 2001; Katrishen and Scordis, 1998; Cummins et al. 2008). Early research finds that diversifying into the securities of developing countries provides the opportunity for even further risk diversification while also supporting the development of these countries' capital markets (e.g., Errunza, 1977). As such, we include both geographic and line-of-business Herfindahl indices.[10] Additionally, current levels of concentration provide a measure of firms that could potentially gain the most benefit from diversification into new markets. For example, if a firm is highly concentrated, expanding its operations into other lines of business or into other geographic locations could serve to reduce its firm-specific risk (e.g., Ferguson, Deephouse and Ferguson, 2000). As such, a positive relation is expected.

Other Firm-Specific Variables. In addition to the firm-specific variables discussed above, we also construct a version of the model which includes variables capturing the percentage of net

[10] The line-of-business (geographic) Herfindahl is calculated by first squaring the premium in each of the given lines of insurance (insurance written in each of the states) and summing across all lines (all states). This total is then divided by the square of total premiums written. A value closer to one denotes a more concentrated firm.

premiums written in each line of business relative to total premiums written. This is common in insurance-related research (e.g., Cole and McCullough, 2006) as controlling for the specific business mix of the reinsurer allows us to control for the possibility that some underwriting decisions are based on product mix rather than internationalization needs. Further, lines of business can differ significantly in terms of claims distributions, timing of loss payments, and riskiness. Also, different lines of business may have varying reinsurance patterns due to variations in agency costs. As such, insurers may cede more of the business written in certain lines than in others. No specific expectations are made with regard to individual lines of business.

Industry-Specific Factors

The final category of variables we consider relates to the U.S. reinsurance industry. This is done both for consistency with the early version of the eclectic paradigm as developed by Dunning (1977) as well as to control for the potential impact of industry-specific factors on the behavior or performance of individual firms as documented in some prior research (e.g., Browne and Hoyt, 1995; Browne, Carson and Hoyt, 1999). We consider both the average leverage and the average liquidity of the U.S. reinsurance industry.

Leverage is included for two primary reasons. First, if firms are trying to improve their financial position, they may decide not to engage in more costly international transactions (e.g., Rugman, 1981; Katrishen and Scordis, 1998). Additionally, higher levels of average leverage may suggest that the U.S. reinsurance industry does not currently have the capacity for internationalization. As such, we expect a negative relation between leverage and reinsurance assumed.

Higher levels of liquidity may signal financial strength within the U.S. reinsurance industry and result in increased demand for U.S. reinsurance. In addition, higher liquidity also could indicate excess capacity within the U.S. reinsurance industry, suggesting that the firms have the ability to assume more foreign reinsurance. As such, a positive and significant relation is expected.

Lastly, a binary variable equal to one for post-9/11 years and zero otherwise is included. This variable is designed to determine if the events of 9/11 impacted the demand for reinsurance by foreign insurers. Studies such as Weiss and Chung (2004) underscore the importance of controlling for large loss shocks such as 9/11. The potential impact is unclear. A positive result for this variable may indicate that there was a systematic shift by the U.S. reinsurance market to more foreign reinsurance. However, if other countries were unsure of the financial stability of U.S. reinsurers following 9/11, there may have been a decrease in the demand for reinsurance from U.S. firms, resulting in a negative impact on foreign reinsurance assumed. As a robustness test and to make the structure of the model more comparable to more recent empirical studies of the eclectic paradigm, the basic models also are run excluding all industry-specific variables, and the results are provided in the Robustness Section.

RESULTS

Summary Statistics

Before discussing the regression results, it is helpful to understand the pool of countries represented in the sample. The countries in the dataset are listed in Table 1. There are a total of 64 countries in the dataset which includes 16 EU countries, 28 OECD countries, and 33 developing counties (as defined by the World Bank).

Table 2 reports summary statistics for the countries included in the dataset. Specifically, Panel A of Table 2 lists the top 10 countries in terms of the number of times the country appears in the dataset for the entire sample as well as for developing and developed countries separately. Note that half of the top-ranking countries are developing countries. In addition, the top 10 developed countries account for approximately 35 percent of the total number of country-observations while the top 10 developing countries account for approximately 32 percent of the total country-observations.

Panel B of Table 2 shows the country-rankings based on total volume of reinsurance assumed from each country during the sample period. In comparing these results to those reported in Panel A, several of the top-ranking developing countries in terms of country-observations also appear in the top-rankings in terms of total volume of reinsurance assumed. However, when the developed and developing countries are examined separately, the volume of reinsurance assumed by the top five developed countries is more than four times that assumed by the top five developing countries in 2004.[11] Finally, the summary statistics for the variables included in the regression models are provided in Table 3.

Primary Model Results

The results of the basic model are reported in Table 4.[12] An examination of the variance inflation factors indicates the presence of multicollinearity when reinsurers' liquidity and the post-9/11 indicator variable are included in the same model. This also occurs with some of the reinsurance industry factors when line–of-business controls are included. However, as noted earlier, the

[11] This result is consistent with the volumes reported in Arena (2008).
[12] Note that when the reinsurance industry variables are dropped from the model, the results are consistent with those reported here.

inclusion of the line of business variables controls for the impact of the types of business the reinsurer is operating in and its decision to do business with certain countries, which is important to the analysis. In an effort to deal with multicollinearity and test our hypotheses, we construct several versions of the models including and excluding the line of business controls and alternately dropping the reinsurance industry factors yielding a total of four variations of the basic model. With the exception of when developed and developing countries are examined in separate models, the focus of the results discussion is for the models with the line of business controls. With one exception, the results are consistent for the location-specific and industry-specific variables when line-of-business controls are not included. In instances in which the results vary for the firm-specific variables, the differences are discussed in an accompanying footnote.

As can be seen by examining Model 1, our primary variable of interest (developing country status), is significant. Specifically, our results indicate that U.S. reinsurers assume more reinsurance from developing countries relative to developed nations. This provides initial support for the hypotheses that the growth in wealth in developing countries, the underdeveloped domestic insurance markets, and possibly governmental incentives make these countries attractive to U.S. reinsurers.

In addition, most of the other location-specific factors are significant. Consistent with expectations, we find that more reinsurance is assumed from countries with larger domestic markets and greater insurance penetration. In addition, reinsurers assume more insurance from countries that have a larger market share of property-casualty business. The free-trade initiatives variable also is significant, indicating that reinsurers assume more business from countries with fewer trade barriers. Finally, loss experience is significant and positive. This may be a demand driven result as host countries with higher loss experience have an increased need to transfer risks as they are already dealing with financial constraints.

The results for the firm-specific factors are generally consistent with prior research.[13] We find reinsurers that are already conducting more business in foreign markets and larger reinsurers assume more reinsurance from specific foreign countries. In addition, highly leveraged reinsurers assume less foreign reinsurance. The foreign parent variable is positively related to the amount of business written in foreign markets. While contrary to initial expectations, this may be the result of foreign parents using reinsurers domiciled outside the U.S. rather than a U.S. reinsurer to write this coverage.[14]

Examining the U.S. reinsurance industry factors, we find that the leverage of the overall reinsurance industry does impact the amount of foreign reinsurance assumed. Specifically, the results suggest that when the U.S. reinsurance industry is highly leveraged, reinsurers assume more foreign reinsurance. This result could potentially be related to a perceived increase in risk by the domestic market or an increased need for U.S. reinsurers to reduce insolvency risk through international diversification. Finally, in the models excluding the post-9/11 indicator variable, the liquidity variable is not significant. However, in the model excluding the liquidity variable, the post-9/11 indicator variable is significant and positive. This result suggests that after 9/11, U.S. reinsurers assumed more foreign reinsurance.

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[13] Note that when line-of-business controls are not included, the U.S. parent variable is no longer significant. In addition, the line of business Herfindahls and geographic Herfindahls are significant and negative, suggesting that firms that are concentrated in terms of location and business mix assume less foreign reinsurance. This lends some support for the hypotheses that particular lines of business do impact the reinsurance decision.
[14] Caution should be used when interpreting this result as the average government efficiency for the developing countries is much closer to zero than the developed nations and has a smaller degree of variation.

The results for Model 2 are reported in Table 5.[15] These models include the interactions of the developing country and developed country indicators with all of the location-specific factors. Several of the location-specific interaction variables are significant. First, we find that for developed countries, reinsurance is generally assumed from countries with greater insurance penetration and larger market share.[16] Also, loss experience is significant and inconsistent with our expectations. This may indicate that for developed countries, the number of domestic reinsurers or reinsurers in countries that are more similarly cultured may reduce the demand for U.S.-based coverage.[17]

For developing countries, we find a similar result for the market share variable. However, the government effectiveness variable also is significant. This result suggests that reinsurers assume less from developing countries with more effective governments. Finally, the free-trade initiatives variable is significant and positive suggesting that reinsurers assume more from these countries. The variation in the results between the interactions of the location-specific factors with the developed and developing country indicators provides further evidence that the economic status of the country does impact a firm's decision to conduct business in that country.

The results for the firm-specific variables are generally consistent with those reported in Table 4.[18] In addition, as it relates to the industry variables, while the reinsurance industry leverage variable is still significant and positive in the models alternately including the

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[15] Note that when the reinsurance industry variables are dropped from the model, the results are consistent with those reported here.
[16] Note that when line-of-business controls are not included, the interaction of developed country and insurance penetration is no longer significant.
[17] Outreville (2008) finds that cultural distance plays a significant role in the choice of countries in which to place foreign affiliates.
[18] Note that when the line of business controls are not included, the reinsurer leverage variable is significant and negative, indicating that highly leveraged firms assume less reinsurance. In addition, the line-of-business Herfindahl is significant and negative, suggesting that more concentrated reinsurers assume less reinsurance.

reinsurance industry liquidity variable and the post-9/11 indicator variable, neither of these variables is significant.

The final set of models is presented in Table 6. The structure of the models is similar to that shown in Table 4 except the developed and developing countries are examined in separate models.[19] The results for the developing country sample are similar to those obtained when the developing country indicator was interacted with the location-specific factors. More specifically, we again find that for developed countries, more reinsurance is assumed from countries with worse loss experience and larger market shares. Alternatively, for developing countries, we find that more reinsurance is assumed from countries with larger market shares and less effective governments. As in the prior models, the reinsurance leverage variable is significant and positive, suggesting that when the U.S. reinsurance industry is more highly leveraged, they assume more reinsurance from developed countries.

There are a few differences in the firm-specific variables. The direct business to surplus variable is only significant in the developed country model, suggesting that more highly leveraged firms assume less reinsurance from developed countries. Also, the U.S. parent variable and the net income to losses variable are only significant in the developing countries model. Finally, the line-of-business Herfindahl is significant and negative in the developing countries models, indicating that firms that are more concentrated assume less reinsurance from developing countries.

As noted earlier, we find that since the free-trade initiatives indicator represents countries that are members of either EU or NAFTA, only Mexico is consistently classified as both a developing country and a member of a free-trade agreement. To determine if this is impacting

[19] Due to issues related to multicollinearity (as indicated by the variance inflation factors), the line of business controls are not included in any of the models presented in this portion of the analysis.

the results, we drop this variable from the analysis and reexamine the results of Model 1 and Model 2. The results for Model 1 are consistent with those reported in Table 4 with the exception of marginal significance for the premium growth variable for one of the model variations. However, for Model 2, we find that two additional interactions are marginally significant, specifically the developed country and government effectiveness interaction and the developing country and GDP interaction. These results indicate that free-trade initiatives may proxy for effective governments for developed countries and size for developing countries.[20] In addition, we find that the results for the firm-specific and industry-specific are consistent with those reported in Tables 4 and 5.

CONCLUSION

This paper investigates potential differences in internationalization into developing versus developed countries. The participation of U.S. reinsurers in these markets is important for a variety of reasons including diversification of risk and use of excess capacity. As developing insurance markets continue to expand, growth in reinsurance in these markets also is likely to grow. The paper builds on both the literature related to international insurance operation as well as the eclectic paradigm to test whether the factors impacting internationalization differ based on the developing nation status of the country from which reinsurance is assumed.

We find strong support for the importance of developing countries in the reinsurance marketplace. Specifically, we find that U.S. reinsurers assume more business from developing countries than from developed countries. This may be the result of higher demand for foreign

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[20] Note that, the interaction of developed country and premium growth is significant in the two model variations when the line of business controls are dropped such that the result for this variable is consistent, regardless of whether line of business controls are included.

reinsurance by developing countries as their domestic markets may not be able to serve the demand of domestic insurers. Additionally, we find that the characteristics impacting the amount of reinsurance assumed varies between developed and developing countries and that the condition of the U.S. reinsurance industry as a whole can impact the decision and ability of U.S. reinsurers to do business in foreign markets. Finally, our results for firm-specific variables are generally consistent with existing research on internationalization.

The results of this study add to existing literature on internationalization. First, we provide strong evidence of the importance of the economic status of a country in a firm's decision to conduct business in that country. This result is robust to several model specifications. In addition, we provide further support of the impact of the general characteristics of the country in the decision of firms to enter into foreign markets. Our results also lend additional support for the importance of controlling for the overall health and performance of the industry when examining the decision of firms to internationalize. Finally, for some less preferred firms in their domestic market, internationalization, especially to developing markets, may present a viable business option.

TABLE 1

Country	OECD Dev. Country	WB Dev. Country	EU Country	OECD Country
Algeria	*	*		
Argentina	*	*		
Australia				*
Austria			*	*
Bahamas	*			
Bangladesh	*	*		
Barbados	*	*		
Belgium			*	*
Canada				*
China	*	*		
Costa Rica	*	*		
Croatia	*	*		
Denmark			*	*
Ecuador	*	*		
Finland			*	*
France			*	*
Germany			*	*
Greece			*	*
Guatemala	*	*		
Hong Kong	*			
Hungary		*		*
Iceland				*
India	*	*		
Indonesia	*	*		
Ireland			*	*
Italy			*	*
Japan				*
Jordan	*	*		
Kuwait	*			
Luxembourg			*	*
Malaysia	*	*		
Mauritius	*	*		
Mexico		*		*
Morocco	*	*		
Namibia	*	*		
Netherlands			*	*
New Zealand				*
Nigeria	*	*		
Norway				*
Oman	*	*		
Paraguay	*	*		
Peru	*	*		
Philippines	*	*		
Poland		*		*
Portugal			*	*
Qatar	*			

Table 1 continued

Country	OECD Dev. Country	WB Dev. Country	EU Country	OECD Country
Romania	*	*		
Russia	*			
Saudi Arabia	*			
Singapore				*
South Africa	*	*		
Spain			*	*
Sweden			*	*
Switzerland				*
Syria	*			
Thailand	*	*		
Tunisia	*	*		
Turkey		*		*
Ukraine	*	*		
United Arab Emirates	*			
United Kingdom			*	*
Uruguay	*	*		
Venezuela	*	*		
Vietnam	*	*		
TOTAL	**37**	**33**	**15**	**27**

TABLE 2

Panel A: Rankings by Number of Company Observations per Country

Country	# of Obs.	Developed Country	# of Obs.	Developing Country	# of Obs.
Canada	93	Canada	93	Mexico	76
United Kingdom	77	United Kingdom	77	China	56
Mexico	76	France	49	Venezuela	50
China	56	Japan	49	Peru	47
Venezuela	50	Norway	45	Guatemala	45
France	49	Australia	41	Argentina	44
Japan	49	Switzerland	40	Ecuador	38
Peru	47	Italy	34	Turkey	33
Guatemala	45	Belgium	30	Malaysia	30
Norway	45	Germany	29	Costa Rica	26
TOTAL	**587**		**487**		**445**

Panel B: Rankings by Volume of Reinsurance Assumed (in thousands)

	All Countries		Developing Countries		Developed Countries	
1996	Canada	$ 251,603	Argentina	$ 31,928	Canada	$ 251,603
	Japan	$ 36,083	Mexico	$ 30,644	Japan	$ 36,083
	Argentina	$ 31,928	Indonesia	$ 5,653	Norway	$ 19,779
	Mexico	$ 30,644	Peru	$ 5,291	Australia	$ 14,817
	Norway	$ 19,779	India	$ 5,251	Denmark	$ 8,835
1997	Canada	$ 237,565	Mexico	$ 42,676	Canada	$ 237,565
	Australia	$ 58,310	Poland	$ 33,495	Australia	$ 58,310
	Japan	$ 54,767	Argentina	$ 20,959	Japan	$ 54,767
	Mexico	$ 42,676	Peru	$ 14,539	Norway	$ 18,033
	Poland	$ 33,495	Indonesia	$ 7,084	New Zealand	$ 11,881
1998	U.K.	$ 270,421	Mexico	$ 50,371	U.K.	$ 270,421
	Canada	$ 207,491	Argentina	$ 29,830	Canada	$ 207,491
	Australia	$ 69,971	Poland	$ 20,386	Australia	$ 69,971
	Mexico	$ 50,371	Peru	$ 13,617	Japan	$ 37,173
	Japan	$ 37,173	China	$ 10,203	Norway	$ 16,750
1999	U.K.	$ 286,869	Mexico	$ 31,800	U.K.	$ 286,869
	Canada	$ 184,112	Argentina	$ 20,926	Canada	$ 184,112
	Australia	$ 94,890	Ecuador	$ 14,464	Australia	$ 94,890
	Japan	$ 42,677	Peru	$ 11,743	Japan	$ 42,677
	Mexico	$ 31,800	China	$ 8,901	Norway	$ 14,610
2000	U.K.	$ 498,563	Mexico	$ 42,538	U.K.	$ 498,563
	Germany	$ 452,362	Argentina	$ 24,973	Germany	$ 452,362
	Canada	$ 283,350	China	$ 10,522	Canada	$ 283,350
	Australia	$ 130,696	Poland	$ 9,089	Australia	$ 130,696
	France	$ 125,327	Philippines	$ 6,621	France	$ 125,327

Table 2 continued

2001	France	$ 287,191	China	$ 213,480	France	$ 287,191
	China	$ 213,480	Mexico	$ 70,227	Germany	$ 206,547
	Germany	$ 206,547	Turkey	$ 18,404	U.K.	$ 200,514
	U.K.	$ 200,514	Ecuador	$ 10,803	Austria	$ 105,738
	Austria	$ 105,738	Peru	$ 10,737	Iceland	$ 88,753
2002	U.K.	$ 1,060,946	China	$ 357,928	U.K.	$ 1,060,946
	China	$ 357,928	Mexico	$ 95,669	Germany	$ 158,586
	Germany	$ 158,586	Barbados	$ 32,135	Iceland	$ 105,520
	Iceland	$ 105,520	Turkey	$ 27,739	Austria	$ 98,875
	Austria	$ 98,875	Indonesia	$ 17,659	Belgium	$ 85,329
2003	Germany	$ 663,109	China	$ 406,881	Germany	$ 663,109
	U.K.	$ 541,853	Mexico	$ 66,855	U.K.	$ 541,853
	China	$ 406,881	Barbados	$ 39,731	France	$ 204,870
	France	$ 204,870	South Africa	$ 17,611	Canada	$ 60,870
	Mexico	$ 66,855	Malaysia	$ 15,248	Iceland	$ 37,457
2004	Germany	$ 901,459	China	$ 291,834	Germany	$ 901,459
	U.K.	$ 570,787	Mexico	$ 65,046	U.K.	$ 570,787
	China	$ 291,834	Malaysia	$ 18,731	France	$ 240,933
	France	$ 240,933	Costa Rica	$ 13,123	Austria	$ 67,897
	Austria	$ 67,897	Turkey	$ 12,169	Canada	$ 65,250

TABLE 3

Variable	Mean	SD	Min	Max
Log of Reinsurance Assumed	6.3315	2.6628	0.0000	13.8081
Location-Specific Factors				
Developing Country Indicator	0.4810	0.4998	0.0000	1.0000
Log of GDP	26.1062	1.6314	21.6782	29.1889
Loss Ratio	0.6376	0.2129	0.0405	2.5603
Insurance Penetration	2.6626	2.3346	0.0100	15.1900
Premium Growth	6.5230	15.9982	-70.8200	150.4200
Market Share	1.6228	2.5635	0.0100	12.3900
Free-Trade Initiatives Indicator	0.3816	0.4860	0.0000	1.0000
Firm-Specific and Internationalization Factors				
Percent of Foreign Reins. Assumed	0.2197	0.1908	0.0000	0.7610
U.S. Parent	0.1345	0.3413	0.0000	1.0000
Net Income/Losses	0.0511	0.1497	-0.2851	2.5589
2-yr Loss Development	0.8848	8.6385	-32.3610	35.0000
Size	18.6127	3.6712	11.9495	24.3789
Direct Business/Surplus	32.9587	145.4279	0.0000	2357.3740
Geographic Herfindahl	0.5054	0.3982	0.0324	1.0000
Line-of-Business Herfindahl	0.4004	0.2041	0.1613	1.0000
U.S. Reinsurance Industry Factors				
Reinsurers' Dir. Bus./Surplus	180.2701	200.4493	0.1506	511.7076
Reinsurers' Liquidity	4627.0010	7018.8410	2.1075	20244.1300
Post 9/1 Indicator	0.2990	0.4580	0.0000	1.0000

TABLE 4

	Model 1			
Location-Specific Factors				
Developing Country Indicator	0.71***	0.73***	0.72***	0.70***
	[0.17]	[0.18]	[0.17]	[0.18]
Log of GDP	0.28***	0.25***	0.29***	0.25***
	[0.06]	[0.06]	[0.06]	[0.06]
Loss Ratio	1.32***	1.04***	1.37***	0.92**
	[0.35]	[0.37]	[0.35]	[0.37]
Insurance Penetration	0.07**	0.08***	0.07**	0.07**
	[0.03]	[0.03]	[0.03]	[0.03]
Premium Growth	0	0	0	0.01
	[0.00]	[0.00]	[0.00]	[0.00]
Market Share	0.21***	0.20***	0.21***	0.20***
	[0.04]	[0.04]	[0.04]	[0.04]
Free-Trade Initiatives Indicator	0.60***	0.57***	0.59***	0.59***
	[0.17]	[0.18]	[0.17]	[0.18]
Firm-Specific and Internationalization Factors				
Percent of Foreign Reinsurance Assumed	3.99***	2.82***	3.98***	2.78***
	[0.49]	[0.37]	[0.49]	[0.37]
U.S. Parent	0.41**	0.23	0.41**	0.24
	[0.20]	[0.18]	[0.20]	[0.18]
Net Income to Losses	-0.32	-0.26	-0.42	0
	[0.53]	[0.44]	[0.53]	[0.47]
2-Yr Loss Development	0.01	0	0.01	0
	[0.01]	[0.01]	[0.01]	[0.01]
Size	0.59***	0.49***	0.59***	0.49***
	[0.05]	[0.04]	[0.05]	[0.04]
Direct Business to Surplus	-0.00**	-0.00**	-0.00**	-0.00**
	[0.00]	[0.00]	[0.00]	[0.00]
Geographic Herfindahl	-0.16	-0.39**	-0.18	-0.35**
	[0.21]	[0.18]	[0.21]	[0.18]
Line-of-Business Herfindahl	-0.34	-1.22***	-0.28	-1.29***
	[0.43]	[0.35]	[0.43]	[0.35]
U.S. Reinsurance Industry Factors				
Reinsurers' Direct Business to Surplus		0.01***		0.01***
		[0.00]		[0.00]
Reinsurers' Liquidity	0			0
	[0.00]			[0.00]
Post 9/11 Indicator		0.42*	0.49*	
		[0.23]	[0.29]	
Constant	-16.47***	-12.61***	-16.56***	-12.45***
	[1.95]	[1.92]	[1.95]	[1.92]
Line of Business Controls	Yes	No	Yes	No
Observations	1368	1368	1368	1368
R-squared	0.34	0.24	0.34	0.24

Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 5

	Model 2			
Location-Specific Factors				
Developed Country*Log of GDP	0.00	0.01	0.00	0.01
	[0.09]	[0.09]	[0.09]	[0.09]
Developed Country*Loss Ratio	2.35***	2.17***	2.35***	2.17***
	[0.51]	[0.52]	[0.51]	[0.52]
Developed Country*Insurance Penetration	0.07*	0.04	0.07*	0.04
	[0.04]	[0.04]	[0.04]	[0.04]
Developed Country*Premium Growth	0.01	0.02*	0.01	0.02*
	[0.01]	[0.01]	[0.01]	[0.01]
Developed Country*Market Share	0.32***	0.31***	0.32***	0.31***
	[0.05]	[0.05]	[0.05]	[0.05]
Developed Country*Government Effectiveness	0.26	0.25	0.26	0.26
	[0.17]	[0.17]	[0.17]	[0.17]
Developing Country*Log of GDP	0.08	0.09	0.08	0.09
	[0.09]	[0.09]	[0.09]	[0.09]
Developing Country*Loss Ratio	0	-0.37	0	-0.37
	[0.58]	[0.60]	[0.58]	[0.60]
Developing Country*Insurance Penetration	0.06	0.06	0.06	0.06
	[0.06]	[0.06]	[0.06]	[0.06]
Developing Country*Premium Growth	0	0	0	0
	[0.01]	[0.01]	[0.01]	[0.01]
Developing Country*Market Share	2.68***	2.50***	2.68***	2.50***
	[0.59]	[0.59]	[0.59]	[0.59]
Developing Country*Government Effectiveness	-0.51***	-0.38**	-0.51***	-0.38**
	[0.18]	[0.18]	[0.18]	[0.18]
Free-Trade Initiatives Indicator	0.55***	0.49***	0.55***	0.49***
	[0.18]	[0.19]	[0.18]	[0.19]
Firm-Specific and Internationalization Factors				
Percent of Foreign Reinsurance Assumed	4.49***	3.50***	4.49***	3.50***
	[0.51]	[0.41]	[0.51]	[0.41]
U.S. Parent	0.51**	0.39**	0.51**	0.39**
	[0.20]	[0.20]	[0.20]	[0.20]
Net Income to Losses	-0.09	0.17	-0.09	0.17
	[0.54]	[0.52]	[0.54]	[0.52]
2-Yr Loss Development	0.01	0	0.01	0
	[0.01]	[0.01]	[0.01]	[0.01]
Size	0.62***	0.62***	0.62***	0.62***
	[0.05]	[0.04]	[0.05]	[0.04]
Direct Business to Surplus	0	-0.00***	0	-0.00***
	[0.00]	[0.00]	[0.00]	[0.00]
Geographic Herfindahl	-0.19	-0.12	-0.19	-0.12
	[0.21]	[0.18]	[0.21]	[0.18]
Line-of-Business Herfindahl	-0.2	-0.89**	-0.2	-0.89**
	[0.43]	[0.36]	[0.43]	[0.36]

Table 5 continued

U.S. Reinsurance Industry Factors				
Reinsurers' Direct Business to Surplus		0.01***		0.01***
		[0.00]		[0.00]
Reinsurers' Liquidity	0	0		
	[0.00]	[0.00]		
Post 9/11 Indicator			0.51	0.3
			[0.60]	[0.25]
Constant	-11.22***	-10.61***	-11.22***	-10.61***
	[2.54]	[2.51]	[2.54]	[2.51]
Line of Business Controls	Yes	No	Yes	No
Observations	1110	1110	1110	1110
R-squared	0.36	0.3	0.36	0.3

Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 6

	Developed Countries		Developing Countries	
Location-Specific Factors				
Log of GDP	0.13	0.13	0.00	0.00
	[0.12]	[0.12]	[0.13]	[0.13]
Loss Ratio	2.18***	2.17***	-0.45	-0.45
	[0.56]	[0.56]	[0.57]	[0.57]
Insurance Penetration	0.04	0.04	0.04	0.04
	[0.05]	[0.05]	[0.06]	[0.06]
Premium Growth	0.02	0.02	0	0
	[0.01]	[0.01]	[0.01]	[0.01]
Market Share	0.27***	0.27***	3.27***	3.27***
	[0.06]	[0.06]	[0.73]	[0.73]
Government Effectiveness	0.23	0.24	-0.34**	-0.34**
	[0.19]	[0.19]	[0.17]	[0.17]
Free-Trade Initiatives Indicator	-0.88	-0.88		
	[1.19]	[1.19]		
Free-Trade Initiatives*Size	0.06	0.06		
	[0.06]	[0.06]		
Firm-Specific and Internationalization Factors				
Percent of Foreign Reinsurance Assumed	2.81***	2.81***	4.04***	4.04***
	[0.59]	[0.59]	[0.60]	[0.60]
U.S. Parent	0.5	0.5	0.49*	0.48*
	[0.31]	[0.31]	[0.26]	[0.26]
Net Income to Losses	-0.71	-0.71	2.06**	2.06**
	[0.65]	[0.65]	[0.89]	[0.89]
2-Yr Loss Development	0.01	0.01	0	0
	[0.01]	[0.01]	[0.01]	[0.01]
Size	0.62***	0.62***	0.53***	0.53***
	[0.07]	[0.07]	[0.06]	[0.06]
Direct Business to Surplus	-0.00***	-0.00***	0	0
	[0.00]	[0.00]	[0.00]	[0.00]
Geographic Herfindahl	0.1	0.1	-0.21	-0.21
	[0.26]	[0.26]	[0.26]	[0.26]
Line-of-Business Herfindahl	0.61	0.61	-3.33***	-3.33***
	[0.48]	[0.48]	[0.54]	[0.54]
U.S. Reinsurance Industry Factors				
Reinsurers' Direct Business to Surplus	0.01***	0.01***	0.01***	0.01***
	[0.00]	[0.00]	[0.00]	[0.00]
Reinsurers' Liquidity	0		0	
	[0.00]		[0.00]	
Post 9/11 Indicator		0.54		-0.15
		[0.39]		[0.33]
Constant	-14.29***	-14.31***	-5.79	-5.78
	[3.50]	[3.50]	[3.58]	[3.58]
Line of Business Controls	No	No	No	No
Observations	571	571	539	539
R-squared	0.32	0.32	0.3	0.3

Standard errors in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

APPENDIX

Variable	Source	Definition	Exp. Sign
Location-Specific Factors			
Developing Country Indicator	World Bank	Dummy variable equal to 1 if developing country, 0 otherwise	+/-
Log of GDP	World Bank	Natural logarithm of gross domestic product per capita	+
Loss Ratio	OECD or AXCO	Non-life domestic claims paid/net premiums written	+
Insurance Penetration	SwissRe	Volume of non-life insurance premiums relative to the gross domestic product	+
Premium Growth	AXCO or SwissRe	Annual growth percentage of premiums over the previous 12-month period	+
Market Share	SwissRe	Percentage of country's non-life premium volume relative to total world non-life premium volume	+
Government Effectiveness	World Bank	Government effectiveness	+
Free-Trade Initiatives Indicator		Dummy variable equal to 1 for EU and NAFTA countries, 0 otherwise	+
Firm-Specific and Internationalization Factors			
Percent of Foreign Reins. Assumed	NAIC	Business assumed from foreign markets/total reinsurance assumed	+
U.S. Parent	NAIC	Dummy variable equal to 1 if reinsurer has a US parent, 0 otherwise	-
Net Income/Losses	NAIC	Net income/losses and LAE	+
2-yr Loss Development	NAIC	2-year loss development	-
Size	NAIC	Natural logarithm of admitted assets	+
Direct Business/Surplus	NAIC	Direct business written/surplus	-
Geographic Herfindahl	NAIC	Geographic Hefindahl index	+
Line-of-Business Herfindahl	NAIC	Line-of-business Herfindahl index	+
U.S. Reinsurance Industry Factors			
Reinsurers' Dir. Bus./Surplus	NAIC	Direct business written/surplus of the reinsurance industry	-
Reinsurers' Liquidity	NAIC	Cash and invested assets/total liabilities of the reinsurance industry	+
Post 9/1 Indicator		Dummy variable equal to 1 if year greater than 2001 and zero otherwise	+/-

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