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**Global Impact of the Gramm-Leach-Bliley Act:  
Evidence from Insurance Industries of Developed Countries**

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**Abstract:** This paper investigates the impact of the Gramm-Leach-Bliley Act (GLBA) on the insurance industries of developed countries. We find that the insurance industries of most of the developed countries in our sample have significant negative spillover effects from the GLBA. Further, we find that the impact of this deregulation on the insurance industries of any two countries is not same. After controlling for country-specific effect, we find that profitability can explain the impact of the GLBA on non-U.S. insurance companies. This result is robust whether we use ordinary least squares or bootstrap as the estimation technique. However, we do not find any evidence demonstrating that the impact of the GLBA is statistically different for firms that are from European Union member countries versus those that are not.

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# **Global Impact of the Gramm-Leach-Bliley Act: Evidence from Insurance Industries of Developed Countries**

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## ***1. Introduction***

The Gramm-Leach-Bliley Act (GLBA) of 1999 is the most sweeping deregulation of the U.S. financial services industry in the last century. One would expect the impact of such extensive deregulation in the U.S. market would not be restricted only to its financial services industry. Thus, by analyzing the wealth effects of the GLBA on the insurance industries of other developed countries, especially on member countries of the European Union (E.U.), our study addresses three important questions that focus on opportunities created for non-U.S. insurance companies; the GLBA's impact on these companies; and, finally, the variable wealth effects on non-U.S. companies.

This study focuses on three important questions; first, does the GLBA create opportunities for non-U.S. insurance companies? Current research finds that the GLBA does not have a uniform effect on the financial services industry. However, these studies consistently find that the GLBA has positively affected shareholder value in the U.S. insurance industry. It should be noted that non-U.S. insurance companies control a substantial proportion of the U.S. insurance business. In 1990, only 9.8% of the market share in life insurance, and 7.1% of the market share in non-life insurance on a gross premium basis in the United States, was written by non-U.S. companies,<sup>1</sup> or branches and agencies of non-U.S. insurance companies. However, by 1998 the market share controlled by non-U.S. insurance companies was 17.23% of life insurance and 8.67% of non-life insurance business in the United States. Figure 1 shows the trend in non-U.S. insurance companies' market share in the United States insurance business since 1990. Historically, increases in the activity of non-U.S. financial firms in the United States have created political pressure on regulators to restrict their growth. For example, Goldberg and Saunders (1981) note that rapid growth in non-U.S. banks in the United States in the early 1970s led to restrictions in multi-state operations of all non-U.S. banks and

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<sup>1</sup> Companies in the United States whose equity is at least 10% owned by non-U.S. persons (before 1990). Thereafter, non-U.S. persons who own equity directly, or indirectly through a holding company system, 10% or more of the company.

subsequently led to the International Banking Act of 1978. So, it is interesting to investigate how a major regulatory change like the GLBA has impacted the non-U.S. insurance companies.

Second, we investigate whether the impact of the GLBA on non-U.S. insurance companies varies across countries. Specifically, we investigate whether the impact of the GLBA on E.U. insurers is different from non-E.U. insurers. Vaughan and Vaughan (1999), and Moshirian (1997) predict that U.S. insurance companies will face competition for European insurance companies in the domestic market. In addition, some of the largest insurance companies in the world are from Europe. For example, in 1998, eleven out of the top 25 insurance companies (on the basis of the revenue earned in 1998, as presented in Table 1) are from E.U. countries, 6 are from Japan, and the rest are from the United States

Previous studies that investigate the impact of the GLBA on the domestic insurance companies find that the firm specific characteristics such as size and profitability can explain the cross sectional variation in abnormal returns from the events leading to the passage of the GLBA. We also examine whether these variables can explain the wealth effects of the non-U.S. insurance companies.

Our sample includes 83 non-U.S. insurance companies from eleven countries, including eight E.U. member countries (Austria, France, Germany, Greece, Ireland, Italy, Spain and the United Kingdom) and 3 non-E.U. countries (Canada, Japan and Switzerland). We include 31 U.S. insurance companies to compare the results of the impact of the GLBA on non-U.S. insurance companies. We find that insurance industries of Canada, France, Germany, Greece, Italy and the United Kingdom (U.K.) are significantly and negatively affected by the GLBA. However, insurance industries of Austria, Ireland, Spain and Switzerland are largely unaffected by this deregulation. In addition, the impact of this deregulation on any two countries is statistically different. We find no evidence that the impact of the GLBA is statistically different for firms that are from an E.U. member country versus those that are not. Furthermore, we find that profitability can explain the cross sectional variation in the wealth effect after controlling for the country specific effects.

The rest of the study is organized as follows: section two briefly discusses the GLBA; the third section provides a literature review; section four introduces the major hypotheses; section five describes the methodology, data and lists the major events; section six presents the empirical results and a final section concludes findings of our study.

## ***2. Literature Review***

Several studies examine the impact of the GLBA on the financial services industry; they consistently find that the GLBA positively affects shareholder value in the domestic insurance industry. Carow and Heron (2002) find that only the insurance industry gains from this deregulation. Akhigbe and Whyte (2001) and Mamun, Hassan and Lai (2004) find that all the sectors of the financial services industry benefit from this deregulation, while Hendershott, Lee, and Tompkins (2002) conclude that this deregulation does not impact the banking industry. Most of these studies include size and profitability measures in their cross sectional regression. Hendershott, Lee, and Tompkins (2002) find that only size can explain the cross sectional variation in wealth effect in the insurance industry. Mamun et al (2005) investigate the impact of the deregulation only on the insurance industry and find that size, profitability, and diversification benefit can explain the cross-sectional variation in wealth effect.

There is evidence in the literature that suggests the impact of GLBA may not be limited to the U.S. financial services industry. Bruner and Simms (1987) examine the reaction of U.S. banks to Mexico's loan crisis and find that U.S. banks reacted negatively to the news. Musumerci and Sinkey (1990) find that Brazil's announcement of a debt moratorium in 1987 had a negative impact on U.S. money center banks. Madura, Whyte and McDaniel (1991) find that Citicorp's announcement of substantial increase in loan-loss reserves in 1987 had a significant negative impact on British banks. Carow and Heron (2002) document cross border spillover effects from the GLBA. This study primarily focuses on the implications of the GLBA on domestic financial institutions but includes a sub-sample of 10 non-U.S. banks that are publicly traded in the United States. These banks experienced a negative wealth effect from the passage of the GLBA. Carow and Heron (2002) argue that the less favorable reaction of non-U.S. banks (compared to that of U.S. banks) is due to the requirement imposed by the GLBA that the entire non-

U.S. banking organization has to be well capitalized. Although the sample size in this study is very small, it provides us with evidence of spillover effects of the GLBA on non-U.S. banks. In addition, Berger et al (2000) predict that cross-border mergers and acquisitions may be motivated by the GLBA. In a more recent study Akhigbe, Frye and Whyte (2005) find that this deregulation only has a limited cross-border affect on non-U.S. banks. Their sample consists of Australian, Canadian, Dutch, German, Japanese, Swiss, and British banks.

There are several studies that investigate foreign direct investment (FDI) in the U.S. insurance industry. Moshirian (1997) finds that demand for insurance services in the United States, in addition to the relative rate of return, labor cost, exchange rate, size of the source country's insurance sector, bilateral relations, and trade between the United States and the host countries are the major determinants of FDI in the insurance industry in the United States. Grosse and Goldberg (1991) investigate foreign banking activity in the United States by country of origin. Their results show that foreign investment (FDI and foreign portfolio investment) in the United States, bilateral trade, and the size of each country's banking sector (demand deposits and time deposits) are positively related with the presence of that country's banks in the United States. Seth et al (1998) show that one of the major determinants of financial institutions' growth abroad has been the parallel growth of FDI and foreign trade by globally oriented multinational corporations from the institution's home country.

### ***3. GLBA and the Insurance Industry***

Under the new regulation (GLBA), insurance remains a state-regulated business (the McCarran-Ferguson Act remains in place). The GLBA repeals sections of the Banking Act of 1933, including sections 20 and 32, which prohibit national banks from maintaining securities firms and bank officials from sitting on corporate boards of insurance companies. It also amends the Bank Holding Company Act of 1956 and creates a new entity known as a financial holding company (FHC). The FHC is the centerpiece of this financial modernization. FHCs may engage in activities that are financial in nature including banking, securities, insurance (underwriting as well as sales as an agent), and merchant banking. To qualify as an FHC. each subsidiary has to be well managed and

well capitalized. In addition, the depository subsidiary of the FHC has to comply with the Community Reinvestment Act (CRA) rating requirement.

The GLBA also creates a new type of subsidiary, known as a financial subsidiary, through which banks can conduct many of the same activities as that of a subsidiary of a FHC.<sup>2</sup> However, to own such a financial subsidiary, the GLBA requires that the bank and each of its depository subsidiaries be well managed and well capitalized. A significant exception is that insurance underwriting may not be conducted in a financial subsidiary.

The GLBA also repeals Title VI of the Garn-St. Germain Act, which states that the sale or underwriting of insurance is “not closely related” to banking, which had effectively prevented bank holding companies from selling and underwriting insurance. The GLBA also preempts anti-affiliation laws. Any attempt by a state to deny a depository institution from trying to affiliate an insurer can be nullified since states are forbidden from discriminating against such entities. Hence, the GLBA allows cross industry mergers that were not previously allowed under the previous Office of the Comptroller of the Currency rulings.

In order to engage in business in the U.S. financial services industry, a foreign financial intermediary must be well capitalized and well managed by the standards set by the Federal Reserve (Fed). The Fed will review worldwide operations of the financial intermediary to determine whether or not they can operate in the United States.

#### ***4. Hypotheses***

We test the following three hypotheses.

**Hypothesis 1:** *The GLBA will have a significant negative spillover effect on the insurance industries of developed countries.*

We expect that insurance industries of developed countries are going to have significant negative wealth effects from the passage of the GLBA for four reasons: first, Bruner and Simms (1987), Musumerci and Sinkey (1990) and Madura, Whyte and McDaniel (1991) predict that if the financial sector of a country has exposure to any foreign market, then an event in that foreign market can have spillover effects on the

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<sup>2</sup> Broome and Markham, 2001.

financial sector of that country. In 1998, non-U.S. controlled insurance companies, branches or agencies controlled 17.23% of the U.S. life insurance market and 8.67% of the non-life insurance market in the U.S., and the major share of these non-U.S. companies are from developed countries. So, we expect that the GLBA will have spillover effect on non-U.S. insurance companies of the developed countries.

Second, the insurance industry depends upon diversification of risk for its survival.<sup>3</sup> Traditionally, the United States has been the largest insurance market in the world. In 1990, the market share of the U.S. insurance industry was 44.39% and in 1998 it was 45.14% (on gross premium basis) of all OECD countries combined.<sup>4</sup> In addition, the United States has the largest market share in both the life and non-life insurance business. For example, in 1998 the U.S. insurance industry had 34.20% of the market share in life insurance and 57.23% of the market share in non-life insurance of OECD countries.<sup>5</sup> The size of the market share makes the United States insurance market a natural target for the non-U.S. insurance companies to diversify their portfolio risk and also to expand their business. Due to the size of the U.S. market, any major regulatory change like the GLBA should have an impact on insurance industries of other countries.

Third, the GLBA will increase competition in the U.S. insurance industry. Under this regulation, a FHC is allowed to underwrite insurance and also work as an agent, which means that newly created FHCs will increase competition. One possible way holding companies may enter the insurance business is through acquisitions. Hendershott, Lee, and Tompkins (2002) predict that banks will acquire insurance firms and enter the insurance business. These new domestic participants in the insurance business will have a home field advantage<sup>6</sup> over non-U.S. firms; thus, we expect that non-U.S. insurance companies may have negative wealth effects from the passage of the GLBA.

Furthermore, capital adequacy and management requirements by the Fed under the GLBA can also be a potential reason for negative wealth effects for non-U.S. insurance companies that are present in the U.S. Carow and Heron (2002) argue that many countries impose lower capital requirements than the United States. These new

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<sup>3</sup> Pfeffer (1976) argues that no country has sufficient private insurance capacity to absorb all the insurable risk in its territory.

<sup>4</sup> OECD publications.

<sup>5</sup> OECD publications.

<sup>6</sup> See Berger et al (2000) for details discussion of the Home Field Advantage hypothesis.

eligibility requirements impose new costs for non-U.S. insurance companies that would like to participate in the U.S. insurance business, whether as an FHC or under any other structure.

**Hypothesis 2:** *The economic impact of the GLBA on the insurance industries of any two countries will not be the same.*

Studies find that country specific characteristics such as exchange rate, size of the source country's insurance sector, and trade with the source country may explain FDI in the United States. Since such characteristics, or the exposure to the U.S. insurance market, are not same for any two countries, the impact of the GLBA on any two countries' insurance industries will not be the same.

**Hypothesis 3:** *Only the most profitable non-U.S. insurance companies will benefit from the GLBA.*

The GLBA will create more competition in the U.S. insurance industry. Under the GLBA, banks can work as insurance agents and sell insurance. FHCs can underwrite insurance or work as insurance agents. These new participants in the U.S. insurance market have home field advantage over foreign insurance companies that are willing to participate in this market. As a result, we expect that the U.S. insurance market for foreign insurance companies will become more competitive. In addition, newly placed regulation will increase costs for participating in the U.S. market for the international insurance companies. Thus, the GLBA may eliminate some of the international competition and allow only the more efficient international insurance companies to enter, expand and continue to participate in the U.S. insurance market. So we expect that only the more profit efficient international insurance companies will benefit from the GLBA.

## **5. Data & Methodology**

### **5.1 Data and Events**

We test the above hypotheses using daily common stock returns over the period of January 1998 to December 2000. Daily stock return and balance sheet information for major insurance companies from Austria, Canada, France, Germany, Greece, Ireland,

Italy, Japan, Spain, Switzerland, and the U.K. are obtained from the DataStream database. The daily stock returns for 31 major U.S. insurance firms are obtained from the Center for Research in Security Prices database. The distribution of these firms across countries, along with some firm specific information and information regarding bilateral trade with the United States, is presented in Table 2. We identify 5 major events from the *Wall Street Journal* and Lexis-Nexis wire service. In Table 3, we summarize the key dates related to the GLBA.

## 5.2 Portfolio Analysis

We first adapt the model used by Binder (1985) and then, following Wagster (1996), introduce long-term and short-term interest rates to control for interest rate risk. Returns on the exchange rate with the U.S. dollar are included because returns on foreign investment will depend not only on returns on the assets within each market but also changes in the exchange rate. Then, following the model of Cornett and Tehranian (1990), a lagged value of the market index is introduced to control for possible nonsynchronous trading effects. We use dummy variables to identify the major events that led to the passage of the GLBA. The dummy variable is equal to one over every event window (-1,0) and zero otherwise. The coefficient estimate associated with the dummy variable measures the impact of the event on the portfolio. The model we estimate is:

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^2 \beta m_{ij} Rm_{i,t+j-2} + \sum_{j=1}^2 \beta m_{ij}' DRm_{i,t+j-2} + \sum_{j=1}^2 \beta w_{ij} Rw_{t+j-2} + \sum_{j=1}^2 \beta w_{ij}' DRw_{t+j-2} + \delta l_i Rrl_{i,t} + \delta s_i Rrs_{i,t} + \kappa_i Rf_{i,t} + \sum_{j=1}^5 \gamma_{ij} D_j + e_{it} \quad (1)$$

where,  $R_{it}$  is the return on portfolio  $i$  ( $i= 12$ , each country has one equally weighted portfolio) at day  $t$ ,  $Rm_{i,t}$  is the return on the market index of country  $i$  at day  $t$ ;  $Rw_t$  is the return on Morgan Stanley Composite Index (MSCI) world equity index at day  $t$ ;  $D_j$  is a dummy variable that is equal to one over event window  $j$  and zero otherwise;  $\gamma_{ij}$  is the coefficient of a dummy variable that captures the impact of  $j$ th event on the insurance industry of the  $i$ th country.  $Rf_{i,t}$  represents the return on the exchange rate between the United States dollar and the currency of the  $i$ th country at day  $t$ ;  $Rrs_{i,t}$  represents the return on the short term interest rate for country  $i$  at day  $t$ ; and  $Rrl_{i,t}$

represents the return on the long term interest rate for country  $i$  at day  $t$ .  $D$  is a dummy variable that is equal to one after the enactment of the regulation and zero otherwise. Thus,  $\beta m'_{i1} - \beta m'_{i2}$  captures the change in exposure to systematic risk between pre-act and post-act for country  $i$  with respect to its own country equity index, and  $\beta w'_{i1} - \beta w'_{i2}$  captures the change in exposure to systematic risk between pre-act and post-act for country  $i$  with respect to its MSCI world equity index.

We estimate the model presented in equation 1 using seemingly unrelated regression (SUR). Schwert (1981) argues that individual asset returns of the firms in the same industry measured over a common time period are contemporaneously correlated since firms will react similarly to any unanticipated event. So in events such as regulatory changes the residuals will not be *iid*. If there is a contemporaneous correlation among the disturbances across equations but not correlated over time, SUR model estimates will be more efficient than ordinary least squares (OLS).

We use a likelihood ratio (LR) test to test the null hypothesis that the off-diagonal elements of the variance-covariance matrix is zero. We perform this test to check for contemporaneous correlation among the disturbances across equations. The result of the specification test for our portfolio model shows that the null hypothesis that the off-diagonal elements of the variance-covariance matrix are zero is rejected at the 1% level. Statistically that means that estimating the model with SUR is asymptotically more efficient as opposed to OLS.

The main advantage of using SUR is that it allows us to test interesting cross-country restrictions. In order to test for hypothesis 2 we test the following null hypothesis:

$$H_0 : \sum_{i=1}^5 \gamma_{i1} = \sum_{i=1}^5 \gamma_{i2} = \sum_{i=1}^5 \gamma_{i3} \dots = \sum_{i=1}^5 \gamma_{i11} \quad (2)$$

### 5.3 Cross Sectional Analysis

In order to test whether size and profitability can explain the variation in abnormal return, we generate average abnormal returns, i.e.  $\Phi_i$  ( $i=1$  to 83), for each firm using the model presented in equation 3.

$$R_{it} = \alpha_i + \alpha_i' D + \sum_{j=1}^2 \beta_{m_{ij}} Rm_{i,t+j-2} + \sum_{j=1}^2 \beta_{m_{ij}}' DRm_{i,t+j-2} + \sum_{j=1}^2 \beta_{w_{ij}} Rw_{t+j-2} + \sum_{j=1}^2 \beta_{w_{ij}}' DRw_{t+j-2} \quad (3)$$

$$+ \delta l_i Rrl_{i,t} + \delta s_i Rrs_{i,t} + \kappa_i Rf_{i,t} + \Phi_i DG_i + e_{it}$$

Here  $DG$  is a dummy variable that is equal to one on every event window and zero otherwise. All other parameters are same as the model presented in equation 1. We then estimate the following model using OLS, where  $\Phi_i$  is the dependent variable. The cross-sectional model is:

$$\Phi_{i,j} = \theta_{aus} aus + \theta_{can} can + \theta_{fra} fra + \theta_{ger} ger + \theta_{gre} gre + \theta_{ire} ire + \theta_{ita} ita \quad (4)$$

$$+ \theta_{spa} spa + \theta_{swi} swi + \theta_{uk} uk + \theta_{size} Size_i + \theta_{ROA} ROA_i + \varepsilon_i$$

where,  $aus, can, fra, ger, gre, ire, ita, spa, swi, uk$  are country dummy variables, representing Austria, Canada, France, Germany, Greece, Ireland, Italy, Spain, Switzerland, and the U.K. respectively. These dummy variables are equal to one if a firm is from that country and zero otherwise. As mentioned in hypothesis 2, these dummy variables shall control for country specific variations.  $Size_i$  is defined as the log of total asset value (in U.S. dollar) in 1998 for firm  $i$  and  $ROA_i$  is the return on asset of firm  $i$  in 1998.

## 6. Empirical Results

### 6.1 Portfolio Analysis

Estimates of model parameters of the portfolio model are presented in Table 4. We find that, for all the countries, their own country equity index is highly significant and positive while we find that MSCI world equity index is positive and significant only for Italy and the United States. Change in own country equity index after the enactment of the GLBA is negative and significant for most of the countries.

We find that in eight out of the twelve countries we analyzed, there are significant average abnormal returns from the events leading to the passage of the GLBA. The insurance industries of Canada, France, Germany, Greece, Italy, and the U.K. have been negatively affected from the passage of the GLBA. However, insurance industries of Austria, Ireland, Spain, and Switzerland do not experience any impact from the five major announcements that we analyze in this paper. These results generally support our

first hypothesis that the GLBA will have significant negative spillover effects on the insurance industries of other developed countries.

Our second hypothesis, that the information produced over these five events has the same impact on the insurance industry of any two countries, is rejected at 1%. This hypothesis is tested using a Wald test (presented in equation 2) where the underlying distribution is  $\chi^2$  with eleven degrees of freedom.

## 6.2 Cross Section Analysis

In order to identify the sources of the variation in wealth effects around the events that led to the GLBA, we performed a cross sectional analysis. We estimate equation 4 using OLS. The results of the estimation are presented in Panel A of Table 5; the  $t$ -statistics are computed using the formulas suggested by MacKinnon and White (1985). We use country dummy variables to control for the country specific effects. The purpose of the test was to identify the source of cross sectional variation in abnormal return. In particular, we want to test our third hypothesis that only the most profit efficient international insurance companies may benefit from this deregulation. After controlling for the country effect, we find that profitability represented by *ROA* can explain cross sectional variation of abnormal return of non-U.S. insurers.

We use the bootstrap method to test for the precision of our estimators due to the small number of observations. One may argue that asymptotic theory may provide a poor guide to the significance of the estimator. We can express equation 3 as follows:

$$y_i = X_i\theta + \varepsilon_i$$

We then use the following procedure:

1. We sample with replacement from the original  $(y, X)$  sample in pairs.
2. Then we estimate  $\hat{\theta}_j$  and pseudo  $t$ -statistics for each  $\hat{\theta}_j$ , we also compute 95% confidence interval for  $\hat{\theta}_j$  and pseudo  $t$ -statistics for each  $\hat{\theta}_j$ .
3. Repeat steps 1 and 2 for 1000 times.
4. Then compare the estimates and statistical significance with the normal OLS regression.

The bootstrap results are presented in panel B of Table 5. It presents value of coefficient estimates and  $t$ -statistics from 1000 bootstrap re-samples for all the country dummy variables,  $Size$ , and  $ROA$ . It also presents the average coefficient estimates and average  $t$ -statistics for all the independent variables. Using the bootstrap  $t$ -value, seven out of eleven country dummy variables are not significantly different from zero. The coefficient estimates for  $Size$  is also not significantly different from zero. The only variable that is significant at the cross section regression is the profitability indicator  $ROA$ .

We also test whether E.U. firms experience a different impact from the GLBA than non-E.U. firms. We modify equation 3, and then replace all the country dummy variables with one dummy, which is one if the firm is from an E.U. country and zero otherwise. The modified model is presented in equation 5as:

$$\gamma_{i,j} = Intercept + \theta_{eu} eu + \theta_{size} Size_i + \theta_{ROE} ROA_i + \varepsilon_i \quad (5)$$

Here we test the hypothesis  $H_0 : \theta_{eu} = 0$ . The result, as presented in Table 6, shows that the null hypothesis is maintained; i.e. insurance companies from E.U. member countries are not affected differently from those in non-E.U. countries.

## 7. Conclusion

We have examined the impact of the GLBA, a major regulatory change in the U.S. financial services industry, on a sample of 83 non-U.S. insurance companies from 11 countries. In an era of globalization of financial markets, it is argued that deregulations like the GLBA or the single market program of the E.U. should have an impact beyond the boundaries of the jurisdiction<sup>7</sup>. In this paper we present further evidence of the globalization of financial institutions. In our portfolio analysis we find that the insurance industries of 7 out of 11 developed countries have significant negative spillover (wealth) effects from passage of the GLBA. We also find that the impact of the GLBA is not the same for insurance industries of any two foreign countries.

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<sup>7</sup> Berger, DeYoung and Udell (2000).

Furthermore, the impact of the GLBA is statistically not different between firms from an E.U. member or non-member countries.

Most interestingly we find that a profitability indicator can explain the cross sectional variation in wealth effect after controlling for the country effect. We predict that this is due to increased competition in the U.S. insurance market from the new domestic participants and increased cost imposed by the GLBA due to more strict capital adequacy and management requirement for foreign financial firms as argued by Carow and Heron (2002). As a result, the most efficient international insurance companies may continue to operate, enter or expand in the largest insurance market in the world.

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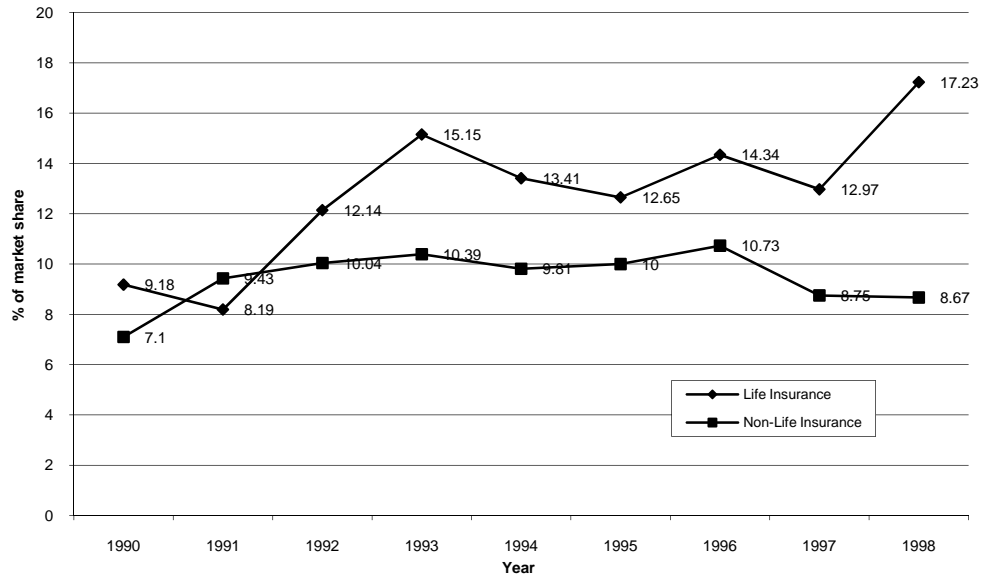
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Figure 1: Market share of non-U.S. controlled companies and branches and agencies of non-U.S. companies in the U.S. insurance market (Gross Premium Basis)



Source: OECD Insurance Statistics Yearbook

Table 1: World's Largest Insurance Companies by Revenues, 1998

Rank	Name	Country of Domicile	1998 Revenues (\$ millions)
1.	AXA	France	78,729
2.	Nippon Life	Japan	66,300
3.	Allianz	Germany	64,875
4.	ING Group	Netherlands	56,469
5.	Assicurazioni Generali	Italy	48,478
6.	State Farm	USA	44,621
7.	Dai-ichi Mutual Life	Japan	44,486
8.	Sumitomo Life	Japan	39,535
9.	Zurich Financial	Switzerland	39,115
10.	CGNU	UK	37,589
11.	TIAA-CREF	USA	35,889
12.	Munich Re Group	Germany	35,465
13.	Prudential of America	USA	34,427
14.	Prudential (UK)	UK	33,677
15.	American Int'l Group	USA	33,296
16.	Meiji Mutual Group	Japan	28,476
17.	Metropolitan Life	USA	26,735
18.	Allstate	USA	25,879
19.	Royal and Sun Alliance	UK	25,436
20.	CNP Assurances	France	24,108
21.	Mitsui Mutual Life	Japan	22,226
22.	Loews	USA	20,713
23.	New York Life	USA	19,849
24.	Asahi Mutual Life	Japan	19,418
25.	Aegon	Netherlands	18,727

Source: Jeremy Kahn, "The Fortune Global 500," *Fortune*, August 2, 1999.

Table 2: Descriptive statistics of non-U.S. insurance firms

Country	No. of firms	Total Asset in 1999* <sup>⊕</sup>	ROA in 1999 <sup>⊕</sup>	Export from U.S. 99* <sup>Ⓝ</sup>	Import to U.S. 99* <sup>Ⓝ</sup>
Austria	4	\$7,361.03	5.85	\$2,588.20	\$2,909.30
Canada	8	\$13,581.62	5.53	\$166,600.00	\$198,711.10
France	5	\$121,844.71	19.00	\$18,877.40	\$25,708.60
Germany	10	\$83,787.01	14.88	\$26,800.20	\$55,228.40
Greece	2	\$788.53	12.85	\$995.50	\$563.10
Ireland	2	\$21,395.57	7.82	\$10,090.60	\$22,356.50
Italy	7	\$35,842.49	16.84	\$19,436.60	\$8,475.00
Netherlands	2	\$356,892.93	13.18	\$57,465.70	\$130,863.90
Spain	3	\$3,998.56	19.14	\$6,133.40	\$5,059.20
Switzerland	7	\$48,517.03	9.82	\$8,371.30	\$9,538.60
UK	23	\$60,554.09	20.33	\$38,407.10	\$39,237.20
USA	31	\$91,216.92			

\*In millions of U.S. dollars

<sup>⊕</sup>Source: Datastream

<sup>Ⓝ</sup>Source: Board of Governors Federal Reserve System.

Table 3: Timeline of the Gramm-Leach-Bliley Act

**Note:** The first column 'Date' is the event date. If the event occurred after the trading closed for a day, then the next trading day is the event date. Event Window is defined as Event Date, -1 day and day 0. The second column 'Event' describes the main event.

<b>Date</b>	<b>Event</b>
1/8/99	1. Financial Services Reform Bill is reintroduced in Congress.
4/12/99	2. Senator Gramm meets with Senate minority leader to work on the bill.
5/4/99	3. Clinton raises the privacy issue to be included in the bill.
10/22/99	4. Gramm makes deal with White House on CRA.
11/02/99	5. Joint House Conference Report signed by the majority of the conferees, clearing the way for the votes in both the House and the Senate.

Table 4: Estimation results of model parameters of the portfolio model (equation 1)

	Intercept	Change in intercept	Own country equity index (1 day lag)	Own country equity index	Change in own country equity index (1 day lag)	Change in own country equity index	MSCI World Equity Index (1 day lag)	MSCI World Equity Index	Change in MSCI World Equity Index (1 day lag)	Change in MSCI World Equity Index	Exchange rate with U.S.	Long-term interest rate	Short-term interest rate
	0.001	-0.001	0.145 ***	0.582 ***	-0.113	-0.190 *	-0.068	0.046	0.060	-0.001	0.011	-0.005	-0.012
<b>Austria</b>	1.103	-0.903	3.110	12.004	-1.160	-1.937	-1.174	0.842	0.662	-0.014	0.232	-0.120	-0.238
	-0.001	0.001	0.050	0.581 ***	-0.084	-0.239 **	-0.010	0.056	0.175	-0.110	0.079	-0.006	-0.021
<b>Canada</b>	-0.971	1.454	0.596	6.827	-0.768	-2.141	-0.110	0.578	1.179	-0.731	0.599	-0.122	-0.421
	0.001 *	0.000	0.075	0.592 ***	-0.144 *	-0.227 ***	0.151 **	0.087	0.094	-0.158	-0.115 *	0.004	0.028
<b>France</b>	1.656	-0.044	1.571	11.533	-1.912	-2.971	2.234	1.331	0.852	-1.505	-1.888	0.142	0.732
	0.000	0.001	0.081 **	0.570 ***	-0.050	-0.230 ***	0.081	-0.037	-0.122	-0.003	0.010	0.031	-0.005
<b>Germany</b>	0.581	1.034	2.551	17.128	-0.882	-4.034	1.572	-0.772	-1.425	-0.033	0.236	1.095	-0.155
	0.003 ***	-0.003 **	-0.010	0.717 ***	0.035	0.309 ***	0.003	-0.120	0.015	0.201	0.013	0.036	-0.040
<b>Greece</b>	3.306	-2.041	-0.280	18.012	0.539	4.442	0.031	-1.362	0.095	1.363	0.142	0.711	-1.145
	0.000	0.000	0.027	0.456 ***	-0.016	-0.126 *	-0.040	0.047	0.132	-0.088	0.048	0.006	-0.027
<b>Ireland</b>	0.392	0.312	0.717	10.648	-0.227	-1.757	-0.650	0.880	1.335	-0.975	0.794	0.119	-1.174
	0.000	0.001 *	0.058 *	0.930 ***	-0.171 ***	-0.452 ***	0.068	0.119 **	0.030	-0.100	-0.019	0.010	0.025
<b>Italy</b>	-0.357	1.880	1.724	26.141	-2.670	-7.079	1.136	2.040	0.311	-1.052	-0.332	0.268	0.593
	-0.001 *	0.001	0.035	0.750 ***	-0.156 ***	-0.518 ***	-0.031	-0.012	-0.117	0.073	0.028	-0.002	0.000
<b>Japan</b>	-1.764	1.411	0.842	17.685	-2.411	-7.350	-0.512	-0.210	-1.149	0.794	0.619	-0.142	0.472
	-0.001	0.002 *	0.105 **	0.756 ***	-0.022	-0.584 ***	0.170 **	0.022	-0.177	0.050	-0.047	-0.012	0.023
<b>Spain</b>	-1.359	1.941	2.285	16.055	-0.261	-7.018	2.303	0.301	-1.474	0.428	-0.712	-0.251	0.687
	0.000	0.000	0.030	0.957 ***	0.028	-0.390 ***	0.064	0.005	-0.118 *	0.023	-0.044	0.015	0.001
<b>Switzerland</b>	0.792	0.402	0.940	28.957	0.419	-5.704	1.388	0.117	-1.698	0.335	-1.194	0.709	0.116
	0.000	0.001	0.045	0.392 ***	-0.072	-0.064	0.120 ***	-0.048	-0.010	-0.068	-0.058	0.017	0.019
<b>UK</b>	1.218	1.336	1.216	10.146	-1.130	-0.992	2.711	-1.121	-0.143	-0.964	-1.309	0.729	0.571
	-0.003	0.012	-1.834 **	4.690 ***	-0.153	-5.368 ***	0.435	7.523 ***	-2.382 *	2.553 **	2.463 ***	-1.287 ***	0.585
<b>USA</b>	-0.757	1.527	-2.031	5.286	-0.124	-4.351	0.553	9.632	-1.859	1.980	2.481	-2.535	0.964

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Table 4: Estimation results of model parameters of the portfolio model (equation 1) (continued)

	Event 1	Event 2	Event 3	Event 4	Event 5	$R^2$
<b>Austria</b>	0.004	-0.002	-0.002	-0.001	-0.003	0.236
	0.486	-0.231	-0.225	-0.108	-0.354	
<b>Canada</b>	0.006	-0.019 **	-0.003	-0.005	-0.019 **	0.200
	0.677	-2.113	-0.374	-0.550	-2.160	
<b>France</b>	-0.019 ***	-0.011	-0.010	-0.015 **	-0.004	0.380
	-2.661	-1.493	-1.347	-2.067	-0.543	
<b>Germany</b>	0.002	-0.012 **	0.003	-0.007	0.004	0.464
	0.306	-2.178	0.477	-1.211	0.676	
<b>Greece</b>	0.004	-0.002	-0.032 ***	0.048 ***	-0.004	0.509
	0.275	-0.152	-2.474	3.702	-0.325	
<b>Ireland</b>	0.010	-0.006	0.012	-0.010	0.010	0.231
	1.279	-0.731	1.548	-1.366	1.333	
<b>Italy</b>	-0.013 *	-0.001	0.000	-0.010	-0.002	0.652
	-1.868	-0.198	0.044	-1.465	-0.309	
<b>Japan</b>	-0.001	0.008	0.018 **	0.010	0.003	0.369
	-0.173	0.968	2.322	1.279	0.341	
<b>Spain</b>	0.010	-0.003	-0.002	-0.004	-0.005	0.424
	1.148	-0.353	-0.225	-0.434	-0.621	
<b>Switzerland</b>	-0.007	0.006	0.007	0.001	-0.004	0.704
	-1.417	1.254	1.363	0.183	-0.843	
<b>UK</b>	0.000	0.002	0.002	-0.009 *	-0.008 *	0.281
	-0.015	0.339	0.507	-1.810	-1.685	
<b>USA</b>	-0.033	-0.025	0.044	0.298 ***	0.009	0.494
	-0.449	-0.346	0.599	4.075	0.121	

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Table 5: Cross sectional analysis of wealth effect on each firm in the insurance industries of selected developed countries

We estimate the following model:

$$\gamma_{i,j} = \theta_{aus}aus + \theta_{can}can + \theta_{fra}fra + \theta_{ger}ger + \theta_{gre}gre + \theta_{ire}ire + \theta_{ita}ita + \theta_{spa}spa + \theta_{swi}swi + \theta_{uk}uk + \theta_m\beta m'_{i,j} + \theta_w\beta w'_i + \theta_{size}Size_i + \theta_{ROA}ROA_i + \varepsilon_i$$

We estimate the model using OLS for 71 firms in the sample. Here  $\gamma_{i,j}$  is the abnormal return of firm  $i$  of country  $j$ .  $aus, can, \dots, uk$  are dummy variables for a particular country; these variables are equal to one for that country and zero otherwise.  $Size$  is log of book value of total assets and  $ROA$  is return on Asset. Bootstrap  $p$ -values are based on 1000 replications.

Variables	Estimation Method: OLS		Estimation Method: Bootstrap	
	Coefficient Estimates	t-statistic	Coefficient Estimates	t-statistics
$\theta_{aus}$	-0.265	-0.595	-0.341	-0.603
$\theta_{can}$	-0.98 *	-1.826	-1.074	-2.36
$\theta_{fra}$	-1.592 ***	-2.746	-1.696	-3.353
$\theta_{ger}$	-0.733	-1.487	-0.853	-1.703
$\theta_{gre}$	0.192	0.524	0.092	0.222
$\theta_{ire}$	-0.223	-0.521	-0.287	-0.468
$\theta_{ita}$	-0.873 *	-1.794	-0.982	-2.035
$\theta_{spa}$	-0.411	-0.928	-0.483	-0.889
$\theta_{swi}$	-0.121	-0.233	-0.229	-0.36
$\theta_{uk}$	-0.364	-0.929	-0.437	-1.025
$\theta_{size}$	0.017	0.602	0.023	0.772
$\theta_{ROA}$	0.004 ***	2.89	0.004	1.853
$R^2$	0.386			
$F$ -Statistics	3.257 ***			

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.

Table 6: Cross sectional analysis of wealth effect on each firm in the insurance industries  
E.U. vs. Non-E.U. countries

We estimate the following model:

$$\gamma_{i,j} = \text{Intercept} + \theta_{eu} eu + \theta_{size} Size_i + \theta_{ROE} ROA_i + \varepsilon_i$$

We estimate the model using OLS for 83 firms in the sample. Here  $\gamma_{i,j}$  is the abnormal return of firm  $i$  of country  $j$ , and  $eu$  is a dummy variable which is 1 if it is a E.U. member country and zero otherwise.  $Size$  is log of book value of total asset and  $ROA$  is return on Asset.

<b>Parameter</b>	<b>Estimate</b>	<b>t-statistic</b>
Intercept	-0.173	-0.263
$\theta_{eu}$	-0.003	-0.014
$\theta_{size}$	-0.010	-0.265
$\theta_{ROA}$	0.004***	3.370
$R^2$	0.035	
F-Statistics	0.784	

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels respectively.