The Impact of Bancassurance on Efficiency and Profitability of Banks: Evidence from the Banking Industry in Taiwan

Jin-Lung Peng

Associate Professor, Department of Risk Management and Insurance

National Chengchi University, Taiwan

Vivian Jeng

Associate Professor, Department of Risk Management and Insurance

National Chengchi University, Taiwan

Jennifer L .Wang

Professor, Department of Risk Management and Insurance

National Chengchi University, Taiwan

Yen-Chih Chen[*]

Ph.D. Candidate, Department of Risk Management and Insurance

National Chengchi University, Taiwan

[*] Jin-Lung Peng: Tel: 886 2 29393091 Ext.77447, E-mail: jlpeng@nccu.edu.tw; Vivian Jeng: Tel: +886 2 29393091 Ext.81231, E-mail: vjeng@nccu.edu.tw; Jennifer L. Wang, Tel: +884 2 29393091 Ext.81235, E-mail: jenwang@nccu.edu.tw; and Yen-Chih Chen(the corresponding author): Tel: +886 919 089945, Fax: +886 2 29390344, e-mail: 101358501@nccu.edu.tw. The authors are collocated within the Department of Risk Management and Insurance at the National Chengchi University, Taiwan. Address for correspondence: 64 Zhinan Road, Section 2, Wenshan District, Taipei City, Taiwan 116, ROC.

The Impact of Bancassurance on Efficiency and Profitability of Banks: Evidence from the Banking Industry in Taiwan

This version: July 10, 2015

ABSTRACT

We set out in this study to investigate whether the profitability and efficiency of banks are improved by bancassurance business. As opposed to the use of dummy variables, as in the extant literature, we use actual data provided by a unique database on all banks engaging in bancassurance business in Taiwan between 2004 and 2012 to examine the impact of the system. We find evidence to show that banks with greater involvement in bancassurance tend to accrue larger risk-adjusted returns, with our empirical results also indicating that such greater involvement improves efficiency. Our results provide support for the notion that bancassurance offers substantial benefits for banks whilst also increasing shareholder value. Finally, we find that a bancassurance cooperation strategy has significant impacts on bank performance.

JEL Classification: G21 G22

Keywords: Bancassurance; Banking; Efficiency; Profitability.

1. Introduction

The use of banks by insurance companies as an additional distribution channel for their products is known as 'bancassurance'. Under the bancassurance business model, the bank acts as an intermediary, helping an insurance company to reach its target customers so as to increase its market share, an arrangement which seems to have mutual benefits for both the banks and insurance companies alike. The benefit for the banks is that they can use their existing staff to earn fee/non-interest income by delivering insurance services in addition to their existing tasks (Gonulal, Goulder and Lester, 2012), whilst the insurers can gain access to new customers through this new distribution channel, thereby increasing their premium income.

In many countries around the world, Bancassurance has become the most successful distribution channel within the insurance market, with the penetration rate of bancassurance business varying in different countries as a result of differences in their domestic regulatory systems. As shown in Table 1, the proportion of life insurance premiums arising from bancassurance channels in 2012 was in excess of 60 per cent for France, Spain and Italy, whilst the market share in Brazil reached a massive 77 per cent, representing the highest in the world.[1]

<Table 1 is inserted about here>

[1] The bancassurance penetration rates for the various countries are obtained from the Finaccord Bancassurance database.

In Asia, the market share of bancassurance business is close to 50-60 per cent in countries such as China, South Korea and Hong Kong, with the figure for Taiwan having reached 53 per cent in 2013, and it is argued bancassurance business will continue to play an important role in the future (Gonulal et al., 2012). In many respects, banks provide an ideal channel for the sale of insurance products, particularly in a banking market with stagnant interest income (Bergendahl, 1995). Banks can generate fee income from bancassurance business whilst also improving their profitability and efficiency through more effective use of their existing staff and premises.

The development of the financial markets has stimulated keen competition and encouraged aggressive banking practices, ultimately narrowing the interest spread and reducing the banks' profit margins (Hsiao, Chang, Cianci and Huang, 2010). The commission benefit from bancassurance business therefore provides an important boost to bank finances. The ratio between bancassurance commission and total non- interest income in Taiwan was just 3 per cent in 2004; however, by the end of 2012, it had risen sharply, to 18 per cent. The changes over the years in the revenue share of bancassurance business and insurance premiums in Taiwan are illustrated in Figure 1.

<Figure 1 is inserted about here>

Amici, Fiordelisi, Masala, Ricci and Sist (2013) recently examined strategic alliances and joint ventures between banks and insurance companies, whilst a number

of other related studies have analyzed the consolidation within the financial industry between banking and insurance activities; several of these studies have investigated banking and insurance 'merger and acquisition' (M&A) transactions,[2] with the primary focus in these studies essentially being placed on whether firms involved in such activities succeed in increasing shareholder value.

Some of the related studies have indicated that insurers can benefit from bancassurance activities through the synergy that exists in the one-stop service that bancassurance business offers; as compared to traditional channels, bancassurance provides insurers with the advantage of lower costs (Benoist, 2002; Fiordelisi and Ricci, 2011). However, whilst insurers are found to benefit from the distribution of insurance products through banking channels, the impact of bancassurance business on the performance of banks is still unknown, essentially because of data limitations by the banks themselves; we aim to fill this gap in the present study.

Our primary aim in this study is to examine the impacts of bancassurance on the performance of banks in Taiwan using a 2004-2012 dataset on the island's banking industry. Our examination of the related impacts uses 'data envelopment analysis' (DEA) and involves both profitability and efficiency measures to evaluate the performance of the banks and calculate the original and risk-adjusted 'return on assets'

[2] Examples include Fields, Fraser and Kolari (2007), Chen and Tan (2011), Dontis-Charitos, Molyneux and Staikouras (2011) and Slijkerman, Schoenmaker and de Vries (2013).

(ROA) and ‘return on equity’ (ROE). We further examine whether strategies of diversification or concentration are found to have provided greater benefits for banks in Taiwan, in terms of their subsequent performance.

Our results are summarized as follows. We find that both the efficiency and profitability of the banks have been improved by their participation in bancassurance activities; indeed, the higher the commission ratio earned from bancassurance business, the higher the performance of the banks. We also find that such performance is improved by a diversification strategy, which implies that banks will tend to perform better when they choose to cooperate with more insurance partners.

We make several contributions to the extant literature in the present study, as follows. Firstly, to the best of our knowledge, our study is the first to carry out an examination of the direct impact of bancassurance business on the efficiency and profitability of banks using the revenue share of bancassurance. As far as we can ascertain, the prior related studies have considered only the indirect effects of bancassurance activities, relying primarily on the use of mergers with insurance companies as the main proxy for involvement in bancassurance business.

Secondly, based upon the availability of a unique database, which includes the premiums and commission earned from bancassurance business for each bank, we are able to examine numerous efficiency and profitability variables and present more precise

evidence on whether bancassurance business has enhanced bank performance. Thirdly, to the best of our knowledge, our study is also the first to consider the effects of cooperative bancassurance strategies between banks and insurers.

The remainder of this paper is organized as follows. A review of the extant related literature on bancassurance is provided in Section 2, followed in Section 3 by a description of the data, methodology and variables adopted for our study. Regression analyses are carried out in Section 4, which also includes the presentation of our empirical results and a subsequent discussion on their impacts. Finally, the conclusions drawn from this study are presented in Section 5.

2. Literature review

Following the deregulation of financial integration and convergence between banks and firms in the insurance industry, in an attempt to compensate for their falling interest spread the banks very quickly began to get involved in bancassurance business by engaging in the cross-selling of insurance products. Some detailed descriptions of bancassurance activities have been provided in numerous prior related studies,[3] with some of the earlier studies identifying the significant advantages from becoming involved in bancassurance business. For example, based upon a cost-benefit analysis on bancassurance in five European banks, Bergendahl (1995) noted that the benefits

[3] See, for example, Bergendahl (1995), Genetay, Molyneux and McGuire (1998), Benoist (2002), Swiss Re (2007), Fields et al. (2007), Singhal and Singh and (2010) Chang, Peng and Fan (2011).

were not confined to improvements in sales margins, since there were also non-monetary advantages, such as providing customers with a one-stop shop, and customers demonstrating greater faith in the bank essentially as a result of the provision of products that satisfy their individual needs; this is achieved by acting on specific financial information relating to such customers.

In the report published by Swiss Re (2007) it was argued that bancassurance contributes to the overall efficiency of banks by increasing their productivity and economies of scope. Singhal and Singh (2010) further concluded that bancassurance could increase scale economies by utilizing the existing networks of the banks to sell greater ranges of products, whilst also increasing the overall efficiency and skills of bank employees as they face the new challenges.

Singhal and Singh (2010) noted that by becoming involved in the sale of insurance products, the banking industry was able to leverage its infrastructure, operational expertise and existing customer services to the fullest extent. However, as a result of data limitations/restrictions, the prior research on bancassurance business has tended to concentrate more on the wealth or risk effects of mergers between banking and insurance providers.

In some of the related studies, the focus has been placed on potential increases in firm value arising from such mergers; for example, from an examination of the merger

between Citicorp and Travelers, Carow (2001) identified increases in the stock prices of both the banks and the life insurance companies, whilst Fields et al. (2007) provided further evidence on the potential for bidder wealth gains in bancassurance mergers through an examination of such mergers in the US and other countries. They suggested that since the bancassurance architectural structure for financial firms offers specific benefits, it may well become more prominent in the future.

Based upon a further examination of merger deals, Dontis-Charitos et al. (2011) also found similar positive results in Canada, Europe and the US, whereas they reported that the equity returns of Australasian bidders were found to be statistically insignificant in their study. Chen and Tan (2011) examined the risk and wealth effects on a total of 72 M&As between banks in Europe during the 1989-2004 period; however, after considering risk effects and changes in risk with respect to market indices, they were unable to identify any wealth effects.

Although Slijkerman et al. (2013) demonstrated that downside risk can be lowered through financial conglomeration, the recent study by Filson and Olfati (2014) – which examined numerous US bank holding company acquisitions between 2001 and 2011 of investment banking firms, insurance firms and securities brokerages under the Gramm-Leach-Bliley Act of 1999 – found that whilst diversification created value, it was associated with higher post-merger risk.

A similar recent examination of the efficiency performance of Italian banks with varying degrees of bancassurance activities, carried out by Fiordelisi and Ricci (2011), provides an appropriate comparison to the work on efficiency in the present study. They used ownership links as a proxy for bancassurance activities to test the efficiency effects on the banks but could find no evidence in support of the involvement by banks in life insurance business; the focus in their study was, however, on a comparison between different flexible forms of cooperation, such as cross-selling agreements and non-equity strategic alliances.

Clearly, despite the increasing importance of bancassurance, there appears to be little or no direct empirical data on the potential benefits of bancassurance and related sources of such benefits. Our study therefore aims to fill this gap in the related literature

3. Data and methodology

This section begins with a description of our primary data sources and details on the construction of the database. We then go on to define the methodology and key variables for our subsequent analysis, along with the descriptive statistics.

3.1. Data

We adopt a panel dataset for our empirical analysis of the relationship between bancassurance and performance of banks in Taiwan. Following the announcement of the *Financial Holding Companies Act* in 2001, banks and insurers began linking themselves

to financial holding companies (FHCs), with many banks starting to engage in bancassurance business from 2003 onwards; since 2004 to 2012 are the most recent sample years available, this period provides the focus for our study.

We use a unique bancassurance database compiled by the Taiwan Insurance Institute (TII) as our primary source of information, since this database provides comprehensive information on each sample bank, including the premiums and commission earned from all of their insurer partners. The financial information on our sample banks is obtained from the *Taiwan Economic Journal* (TEJ) database, which provides information on areas such as balance sheets and income statements. The availability of such detailed information enables us to examine the cooperative strategies between our sample banks and their insurer partners.

All domestic banks in operation during the 2004-2012 period were included in our sample;[4] 60 banks with missing data on the premiums and commission earned from their insurer partners were excluded, as were 22 banks with negative assets or equity, leaving us with 235 bank-years observations. A further seven observations were discarded for the calculation of risk-adjusted returns, since this requires quarterly data. Following this exclusion process, the final dataset for our profitability regressions comprised of a total of 228 bank-years observations.

[4] Due to their specific characteristics, banks that are classified as industrial banks or branches of foreign banks are excluded from the sample, as are those on which there was any lack of information.

3.2. Methodology

3.2.1. Empirical model

The timing of the removal of business barriers between insurance companies and banks provides an ideal setting for an empirical exploration of the ways in which such new business affected the banking industry. Several prior studies have employed an event study approach to investigate the consequences of the removal of restrictions on bancassurance for the banks; one such example, Fiordelisi and Ricci (2011), involved an investigation of the relationship between engagement in bancassurance business by various banks and the subsequent impacts on efficiency.[5]

However, in contrast to many of the prior studies, the focus in the present study is on direct involvement in bancassurance business, using the actual commission from insurance sales. The empirical specifications for our regression model are:

$$Performance_{it} = \beta_0 + \beta_1 Banc_{it} + \gamma X_{it} + \varepsilon_{it} \quad (1)$$

$$Performance_{it} = \beta_0 + \beta_1 Banc_{it} + \beta_2 Str_{HHI_{it}} + \gamma X_{it} + \varepsilon_{it}, \quad (2)$$

where *Performance* refers to the measures of performance, which include both the profitability and efficiency of the banks; *Banc* is a proxy measuring the extent of a bank's involvement in bancassurance business; Str_{HHI} is a proxy for a bancassurance cooperation strategy; ε is the error term; and X is a vector of other control variables for

[5] See Fields et al. (2007), Chen and Tan (2011), Dontis-Charitos et al. (2011) and Slijkerman et al. (2013).

bank *i*. Separate estimations are carried out on Equations (1) and (2), with our estimates on the bancassurance business effects being denoted by β_1.

3.2.2. Dependent variables

a. Efficiency measures

There are two major approaches to efficiency estimation in the related literature, a parametric approach, involving methods such as stochastic frontier analysis, and a non-parametric approach, involving methods such as data envelopment analysis (DEA). We decided to use the DEA approach for our evaluation of bank efficiency in the present study for the following reasons.

Firstly, this methodology has been adopted in many studies within the banking and insurance literature.[6] Secondly, there are some distinct advantages to this approach, including the avoidance of the possibility of specification error and the difficulties involved in separating efficiency into different components, thereby avoiding any erroneous assumptions on the distribution of the error terms used in the parametric approach. Thirdly, the DEA approach is also found to perform well with only a small number of observations.

The DEA method includes a total of five measures of efficiency performance, comprising of 'technical efficiency' (TE), 'allocative efficiency' (AE), 'cost

[6] See Berger, Hanweck and Humphrey (1987), Casu and Molyneux (2003), Drake, Hall and Simper (2006), Havrylchyk (2006), Hsiao et al. (2010) Sun and Chang (2011) and Cummins and Weiss (2013).

efficiency' (CE), 'scale efficiency' (SE) and 'pure technical efficiency' (PTE). However, prior to using the DEA approach, there is a need to select the input and output variables to be used in the subsequent analysis.

Within the extant banking literature, there are two competing methodologies for such analysis, i.e., the 'production' and 'intermediation' approaches. In line with many of the prior banking studies, efficiency performance is evaluated in the present study using the intermediation approach.[7] Under this approach, it is assumed that the main function of a bank is to intermediate between depositors and borrowers at the lowest possible cost.

Following the approaches used in the prior related studies, we propose an intermediation model with three outputs (Y_i) and three inputs (X_i). The three outputs are Y_1 (total loans), Y_2 (other investment assets) and Y_3 (other non-interest income), whilst the three inputs are X_1 (total deposits), X_2 (number of employees) and X_3 (total fixed assets). The prices of the inputs (P_i) are measured in this study as P_1 (interest expense/total deposits), P_2 (salary expenses divided by the number of employees) and P_3 (operating expenses minus salary expenses, divided by fixed assets), with all of the money-related figures being deflated using the 2011 'consumer price index' (CPI).

[7] See Berger et al. (1987), Casu and Molyneux (2003), Havrylchyk (2006) and Hsiao et al. (2010).

The efficiency measures, *TE*, *AE* and *CE*, are described as follows: *TE* refers to the ability to produce the maximum outputs at a given level of inputs or the ability to use the minimum level of inputs at a given level of outputs; *AE* refers to the ability to select the optimal mix of inputs with given prices in order to produce a given level of outputs; and *CE* is the product of *TE* and *AE*. As noted by Havrylchyk (2006), the *TE* measure can be further decomposed into 'pure technical efficiency' (*PTE*) and 'scale efficiency' (*SE*).

b. Profitability measures

Our measures of profitability comprise of 'return on equity' (*ROE*), defined as net income divided by equity, and 'return on assets' (*ROA*), defined as net income divided by total assets. Similar to the approach of Stiroh and Rumble (2006), we use the risk-adjusted return on equity (RA_{ROE}) and risk-adjusted return on assets (RA_{ROA}) as our primary measures. The standard deviations in both *ROE* and *ROA* are calculated using data on the last twelve quarters, which represents the total volatility of profits. These ratios can be considered as the accounting returns per unit of risk.

$$RA_{ROE} = \frac{\text{Return on Equity}}{\text{Standard Deviation of Return on Equity}}$$

$$RA_{ROA} = \frac{\text{Return on Asset}}{\text{Standard Deviation of Return on Asset}}$$

c. Bancassurance measures

We follow a similar approach to Stiroh and Rumble (2006) for our measure of non-interest income activity, measuring the extent of bancassurance activity (*Banc*) as the ratio of the commission from insurance sales to the net operating revenue of the banks, including both interest and non-interest income. The non-interest income of the banks includes fiduciary income, fees and service charges, trading revenue and any other sources of non-interest income.

We also use an alternative variable, the ratio of the commission earned from insurance sales to the non-interest income of banks ($Banc_{non}$), as a check for the robustness of our results, with a higher (lower) value for *Banc* or $Banc_{non}$ indicating that the bank is involved in more (less) bancassurance activities with an insurance company. Using this breakdown, *Banc* is measured as:

$$Banc = \frac{\text{Commission Earned From Insurance}}{\text{Interest and Non-interest Income of the Bank}}$$

For our measure of bancassurance cooperation strategies, we use the basic Herfindahl Index of the total commission of the partner insurers as our proxy (Str_HHI) since it accounts for variations in the breakdown of commission paid by different insurance companies. Using this breakdown, our primary measure of the commission diversification of a bank is:

$$Str_{HHI} = \sum_i Sh^2_{COM_i},$$

where Sh_{COM_i} is the share of bancassurance commission from insurance company *i*, which is defined as:

$$Sh_{COM_i} = \frac{\text{Bancassurance Commission from Insurance Company i}}{\text{Total Bancassurance Commission}}$$

where Str_{HHI} measures the degree of concentration with the insurance company in the bank's cooperation strategy. A higher (lower) value indicates that the bank adopts a more (less) concentrated strategy with an insurance company: if Str_{HHI} = 1, this indicates that all of the bank's commission comes from a single insurance company (complete concentration), whereas a lower value indicates that commission comes from more diversified sources.

3.2.3. Control variables

We also select various control variables to account for differences between the sample banks which could ultimately influence their performance. These firm- specific variables include: (i) a dummy variable indicating whether or not a bank is listed (*Listing*) which is equal to 1 for listed banks, otherwise 0; (ii) the BIS capital adequacy ratio (*BIS*) provided by the Central Bank of Taiwan; (iii) the market share of each bank (*Mkt_Share*) which is defined as the ratio between a bank's total loans and the total for the industry; (iv) a dummy variable indicating whether or not a bank is owned by government (*Gov_Own*) which is equal to 1 for banks controlled by government, otherwise 0; and (v) the equity ratio (*Equity/Assets*) which is defined as the ratio

between the equity and total assets of the bank.[8]

The descriptive summary statistics on the sample banks are presented in Table 2, which reports the mean, standard deviation, minimum, maximum and median (50^{th} percentile). During the 2004-2012 sample period, the mean value of bancassurance commission to the total income of the banks was 2.1 per cent, whilst the mean value of such commission to the non-interest income of the banks was 9.6 per cent, with a standard deviation of 8.0 per cent. Clearly, over time, the banks have become increasingly dependent on income from insurance sales.

3.3. Estimation Technique

3.3.1. Efficiency estimations

Given that the efficiency score value runs from 0 to 1, the prior studies have often used Tobit regression models to analyze the relationship between efficiency and bancassurance involvement (see, for example, Hsiao et al., 2010). Hence, we also estimate Equations (1) and (2) using Tobit regressions.

In data-censoring applications, the random-effects Tobit model is used to solve the problem of unobserved heterogeneity. In order to control for such unobserved effects, time-constant and firm-constant variables, which are designed to reduce the error variance, are included as the explanatory variables. We apply the random- effects model,

[8] We also consider bank size (*Size*) which is defined as the natural log of total assets, as an alternative proxy for market share, and find that the results are consistent for the different estimation models.

essentially because unconditional fixed-effects estimates are biased and do not provide a sufficient statistic to allow the fixed effects to be conditioned out of the likelihood.[9] The variables on involvement in Bancassurance business are also checked for endogeneity in the Tobit model.

Equations (1) and (2) are estimated under the Smith-Blundell procedure using the 'maximum likelihood estimation' (MLE) method; prior to obtaining the MLE, the null hypothesis of exogeneity can be tested using the t-statistic, making use of the Smith-Blundell endogeneity test procedure.[10]

3.3.2. Estimation of profitability

In order to control for unobserved variables or variables that can change over time, but not across entities, we use panel data analysis to avoid any biased estimations resulting from individual heterogeneity under the OLS estimation; this method controls for unobserved firm differences and aggregate shocks over different years through firm and year effects. We adopt either a fixed- or random-effects model, depending on the correlation between the explanatory variables and the error term.

To further correct for the potential problem of endogeneity, we also use the 'instrumental variable' (IV) method which provides a general solution to the problem of an endogenous explanatory variable. We then estimate the result using the 'two-stage

[9] Details are provided in Wooldridge (2002: 538-42).
[10] *ibid*, at pp.530-33).

least squares' (2SLS) method. Based upon the IV approach, along with endogenous bancassurance participation measures, we use the lagged independent variable of involvement in bancassurance business as the instrumental variable, thereby satisfying two key assumptions, non-correlation with the error term and a non-zero coefficient on the bancassurance participation measures.[11] Thus, $Banc_{t-1}$ is defined as the one-year lagged variable of *Banc*.

4. Empirical results

Our analysis begins with an examination of the ways in which the level of participation in bancassurance business affects the efficiency measures of the banks, including their cost efficiency, allocative efficiency, technical efficiency, pure technical efficiency and scale efficiency. We then examine whether a cooperative strategy between banks and insurers affects their efficiency performance. We also use profit measures, such as the original and risk-adjusted *ROE* and *ROA* to examine the impacts of participation in bancassurance and cooperative strategies.

4.1. Bancassurance and Efficiency

The results of the Tobit regressions on the proxies for the level of involvement in bancassurance business and the effects on efficiency, as described above, are presented

[11] The most common test for endogeneity is the Hauman test, which rejects the null hypothesis that lagged explanatory variables are exogenous; we therefore employed instrumental variables in order to correct for such endogeneity. See Wooldridge (2002) for details.

in Table 3, which shows that the coefficients on the level of bancassurance business in the *CE*, *TE* and *PTE* equations are significantly positive at the 1 per cent level, thereby implying that greater involvement in bancassurance business improves these efficiency measures. In other words, revenue earned from bancassurance business does result in an increase in the efficiency performance of the banks.[12]

<Table 3 is inserted about here>

Our results are consistent with Bergendahl (1995) in which it was noted that by engaging in the sale of insurance products to their customers, banks represent a one-stop shop, with a resultant increase in their overall productivity level (Swiss Re, 2007). In specific terms, our results from the *PTE* and *TE* equations imply that banks may experience improvements in their ability to produce more outputs for a given level of inputs. Furthermore, involvement in bancassurance business may enhance the skills of bank employees, ultimately leading to increases in both cost efficiency and technical efficiency (Singhal and Singh, 2010).

We go on to examine Equation (2) by adding the effects of the cooperative strategy proxies into the models, with the results being reported in Table 4. Similar to the results reported in Table 3, *Banc* is found to be significantly positive in the *CE*, *TE* and *PTE* equations. Recall that a higher value for the cooperative strategy proxy (Str_{HHI}) implies

[12] Since unconditional fixed-effect estimates are biased, we apply the random effects model. See Wooldridge (2002), pp.538-42.

that the bank has a more specialized cooperative strategy with its insurer partner. We find that Str_{HHI} has a significantly negative coefficient in the *SE* equation, thereby indicating that a cooperative strategy with more insurance companies leads to higher scale efficiency, although the coefficients on the other efficiency measures are not found to be significant.

<Table 4 is inserted about here>

Within the prior related studies focusing on M&As, no clear evidence has yet been provided on the involvement of banks in bancassurance business through such deals (Dontis-Charitos et al., 2011; Fiordelisi and Ricci, 2011); and indeed, the focus in the prior related studies has tended to be placed on banks with highly concentrated cooperative strategies, whilst also being largely based on M&A data or the use of ownership links as the proxy for the insurance company. Our results suggest that greater cooperation by banks with insurance companies may be an appropriate strategy for the bancassurance business model.

4.2. Bancassurance and Profitability

In this section, we focus on two techniques used to analyze the panel data and then go on to provide our empirical evidence. Depending on whether the unobserved effect is uncorrelated with the explanatory variables, we use either the fixed- or random-effects model to analyze the impact of those variables that tend to vary over time. The estimates

on Equation (1), using the four performance measures (*ROE, ROA, RA_{ROE} and RA_{ROA}*) as the dependent variables, are presented in Table 5.

<Table 5 is inserted about here>

Since the Hausman test rejects the null hypothesis, we use the fixed-effects model for *ROE*, RA_{ROE} and RA_{ROA}.[13] The measure of involvement in bancassurance business (*Banc*) is found to have a positive coefficient, which indicates that banks with greater involvement in bancassurance business are more profitable than other banks. This finding of a significant impact of bancassurance business on profitability is consistent with the results reported in the prior studies, such as Bergendahl (1995).

Our results are also found to remain consistent when using measures of risk-adjusted profitability. As noted earlier, in some of the prior related studies, the wealth and risk effects for banks were examined using an event study methodology; in two related examples, Chen and Tan (2011) could find no wealth effects, whilst Filson and Olfati (2014) found that value creation was actually associated with higher risk. Our results indicate that bancassurance business does indeed improve the risk-adjusted profitability of the banks.

As shown in Table 6, when we include the bancassurance strategy variable, the results on the measure of involvement in bancassurance business (*Banc*) are still found

[13] The Hausman test rejects the null hypothesis of the differences between the coefficients not being systematic, since the unique errors are found to be correlated with the regressors.

to hold. We use the Herfindahl Index of the total commission from the partner insurer (Str_{HHI}) as our independent variable; however, the data show no significant relationship between bancassurance strategy (Str_{HHI}) and profitability.

<Table 6 is inserted about here>

4.3. Interaction Regressions

It may be interesting to determine the ways in which the impacts of involvement in bancassurance business may vary with other aspects of cooperative strategy choices. Although banks with greater sales of insurance products are likely to be cooperating with more insurance companies, the above empirical results provide no clear evidence in support of diversified or concentrated cooperative strategies.

In order to further investigate this issue, an interactive term is included in our analysis, which is the involvement in bancassurance business variable multiplied by the bancassurance strategy variable ($Banc^{*}Str_{HHI}$). The regression estimates on this interactive term are reported in Tables 7 and 8, from which we can see that, once again, the benefits of involvement in bancassurance business appear to be significant, although such benefits can vary with specific diversification strategies.

<Tables 7 and 8 are inserted about here>

The interactions are found to be significant in the *PTE* and *TE* regressions, thereby indicating that the benefits are reduced when the banks cooperate with fewer insurance

companies. These findings are consistent with the notion that greater involvement in bancassurance business leads to more cooperation with insurance companies. When the strategy interaction terms are included in the profitability regressions, the results are found to be insignificant.

4.4. Tests for Robustness

We now go on to present robustness checks on the profitability and efficiency regressions for potential endogeneity and alternative bancassurance variable definitions ($Banc_{non}$). In order to control for the potential causality loop within the model between the profitability measure and the bancassurance variables, which can give rise to endogeneity, we also use instrumental variables estimated using the 2SLS approach; lagged values are therefore used as the control variables in our attempts to correct for the potential problem of endogeneity.[14]

Within the data-censoring applications, the Tobit model is adopted for our two-stage estimations in the present study; this represents the so-called Smith- Blundell procedure based upon the MLE method. The results on the five efficiency measures, which are presented in Table 9, are found to be consistent with the Tobit model, with lower statistical significance.

<Table 9 is inserted about here>

[14] Observations of the model are reduced due to the use of lagged values.

We subsequently go on to estimate our IV model using the traditional 2SLS approach, with the estimation results being reported in Table 10. Following the 2SLS estimations, we carry out the usual tests for endogeneity as suggested in the prior related works,[15] and use the *C*-statistic based upon 'generalized method of moments' (GMM) estimations.[16] The unreported test results reveal that endogeneity is a potential problem. As we can see from Table 10, the results for each column are found to be consistent with the initial model.[17]

<Table 10 is inserted about here>

The results using the alternative bancassurance variable definitions ($Banc_{non}$) are presented in Tables 11 and 12. Using all of the measures of profitability and bancassurance ($Banc_{non}$), the data show highly significant relationships between profitability performance and involvement in bancassurance business. Bancassurance is also found to be associated with the *TE* and *PTE* proxies. The coefficients on involvement in bancassurance business are found to be positive and significant, thereby indicating that an increased reliance on bancassurance revenue is generally associated with higher risk-adjusted profits.

<Tables 11 and 12 are inserted about here>

[15] Durbin (1954), Wu (1974) and Hausman (1978).
[16] See Wooldridge (2002: 199-200).
[17] As a check for the robustness of our results, we also estimate our model using GMM estimations, and find that the results (not reported here) are consistent with the 2SLS estimation.

5. Conclusions

Our primary aim in this study is to investigate whether bancassurance improves the profitability and efficiency of banks. The prior studies indicate that bancassurance can improve bank efficiency, not only through an increase in commission income, but also through non-monetary benefits, such as increasing the faith of customers in the banks. However, due to data restrictions, there is insufficient empirical evidence to clearly identify the overall effect of bancassurance on the banking industry.

To the best of our knowledge, our study is the first to examine the direct impacts of involvement in bancassurance business on the efficiency and profitability of banks using the bancassurance revenue share. The evidence presented here reveals that involvement in bancassurance business has had significantly positive impacts on the efficiency and profitability of banks, and that it plays an important role in terms of a non-interest source of income for the banks. These results provide strong support for the notion that bancassurance offers banks with real benefits, whilst also increasing value for bank shareholders. Our analysis also sheds further light on the financial consolidation between banks and insurance companies.

Consistent bancassurance advantages are identified from two sets of results. Firstly, involvement in bancassurance business is found to have significantly positive effects on profitability performance, as measured by accounting returns and risk- adjusted returns.

Secondly, the evidence shows considerable improvements in efficiency amongst banks engaging in more bancassurance business. Our DEA approach using financial intermediaries reveals enhancements in cost efficiency, technical efficiency and pure technical efficiency. One possible explanation for such efficiency improvements is that banks may utilize their networks and other fixed costs better, thereby raising their overall cost efficiency, with resultant improvements in the skills of employees, thereby raising their technical efficiency.

We also examine the effects of different bancassurance cooperative strategies between insurers and banks. Interestingly, we find that banks with more diversified strategies – those banks cooperating with more insurance companies – will enjoy significantly positive impacts on their efficiency performance, which suggests that a diversification strategy is better for the banks than a concentration strategy.

Our study contributes to the extant literature by providing new evidence in support of involvement by banks in bancassurance business. We find that the advantages of bancassurance exist even after adjusting for risk and efficiency levels. Overall, our empirical results suggest that bancassurance business can provide banks with higher profits and efficiency improvements, such that increased cooperation with insurers would appear to be a viable bancassurance strategy; banks may therefore wish to consider further flexible forms of cooperation with other insurance companies.

References

Amici, A., F. Fiordelisi, F. Masala, O. Ricci and F. Sist (2013), 'Value Creation in Banking through Strategic Alliances and Joint Ventures', *Journal of Banking and Finance*, **37**(5): 1386-96.

Benoist, G. (2002), 'Bancassurance: The New Challenges', *Geneva Papers on Risk and Insurance - Issues and Practice*, **27**(3): 295-303.

Bergendahl, G. (1995), 'The Profitability of Bancassurance for European Banks', *International Journal of Bank Marketing*, **13**(1): 17-28.

Berger, A.N., G.A. Hanweck and D.B. Humphrey (1987), 'Competitive Viability in Banking: Scale, Scope and Product Mix Economies', *Journal of monetary economics*, **20**(3): 501-20.

Carow, K.A. (2001), 'Citicorp-Travelers Group Merger: Challenging the Barriers between Banking and Insurance', *Journal of Banking and Finance*, **25**(8): 1553-71.

Casu, B. and P. Molyneux (2003), 'A Comparative Study of Efficiency in European Banking', *Applied Economics*, **35**(17): 1865-76.

Chang, P.-R., J.-L. Peng and C.K. Fan (2011), 'A Comparison of Bancassurance and Traditional Insurer Sales Channels', *Geneva Papers on Risk and Insurance - Issues and Practice*, **36**(1): 76-93.

Chen, Z. and J. Tan (2011), 'Does Bancassurance Add Value for Banks? Evidence from Mergers and Acquisitions between European Banks and Insurance Companies', *Research in International Business and Finance*, **25**(1): 104-12.

Cummins, J.D. and M.A. Weiss (2013), 'Analyzing Firm Performance in the Insurance Industry using Frontier Efficiency and Productivity Methods', in G. Dionne (ed.) (2013), *Handbook of Insurance*, Springer, pp. 795-861.

Dontis-Charitos, P., P. Molyneux and S.K. Staikouras (2011), 'Does the Stock Market Compensate Banks for Diversifying into the Insurance Business?', *Financial Markets, Institutions and Instruments*, **20**(1): 1-28.

Drake, L., M.J.B Hall and R. Simper (2006), 'The Impact of Macroeconomic and Regulatory Factors on Bank Efficiency: A Non-parametric Analysis of Hong Kong's Banking System', *Journal of Banking and Finance*, **30**(5): 1443-66.

Fields, P.L, D.R. Fraser and J.W. Kolari (2007), 'Bidder Returns in Bancassurance Mergers: Is there Evidence of Synergy?', *Journal of Banking and Finance*, **31**(12): 646-62.

Filson, D. and S. Olfati (2014), 'The Impacts of Gramm-Leach-Bliley Bank Diversification on Value and Risk', *Journal of Banking and Finance*, **41**: 209-21.

Fiordelisi, F. and O. Ricci (2011), 'Bancassurance Efficiency Gains: Evidence from the Italian Banking and Insurance Industries', *European Journal of Finance*, **17**(9-10): 789-810.

Genetay, N., P. Molyneux and S. McGuire (1998), *Bancassurance*: Macmillan London.

Gonulal, S.O, N. Goulder and R. Lester (2012), 'Bancassurance: A Valuable Tool for Developing Insurance in Emerging Markets', World Bank, Policy Research Working Paper, No. 6196.

Havrylchyk, O. (2006), 'Efficiency of the Polish Bbanking Industry: Foreign versus

Domestic Banks', *Journal of Banking and Finance*, **30**(7): 1975-96.

Hsiao, H.-C., H. Chang, A.M. Cianci and L.-H. Huang (2010), 'First Financial Restructuring and Operating Efficiency: Evidence from Taiwanese Commercial Banks', *Journal of Banking and Finance*, **34**(7): 1461-71.

Singhal, A.K. and R. Singh (2010), 'Bancassurance: Leveraging on the Synergy between the Banking and Insurance Industry', *IUP Journal of Risk and Insurance*, **7**(1): 28-37.

Slijkerman, J.F., D. Schoenmaker and C.G. de Vries (2013), 'Systemic Risk and Diversification across European Banks and Insurers', *Journal of Banking and Finance*, **37**(3): 773-85.

Stiroh, K.J. and A. Rumble (2006), 'The Dark Side of Diversification: The Case of US Financial Holding Companies', *Journal of Banking and Finance*, **30**(8): 2131-61.

Sun, L. and T.-P. Chang (2011), 'A Comprehensive Analysis of the Effects of Risk Measures on Bank Efficiency: Evidence from Emerging Asian Countries', *Journal of Banking and Finance*, **35**(7): 1727-35.

Swiss Re. (2007), 'Bancassurance: Emerging Trends, Opportunities and Challenges', *Sigma*, **5**: 1-39.

Wooldridge, J.M. (2002), *Econometric Analysis of Cross Section and Panel Data*, Cambridge, MA: MIT Press.

Table 1 Bancassurance market shares across countries[a]

Country	Market Share (%)[b]	Country	Market Share (%)[b]
Brazil	77	Poland	43
Spain	65	Indonesia	40
France	60	Chile	35
Italian	60	Malaysia	32
Morocco	60	Thailand	31
South Korea	59	Mexico	28
Taiwan	53	Hungary	20
Hong Kong	50	India	10
China	48		

Notes:

[a] The bancassurance market shares are calculated in terms of the premiums coming from all channels within the life insurance industry.

[b] 2010 data on France, Hong Kong, Indonesia, Italy, Mexico, South Korea and Spain are obtained from the World Bank Policy Research Working Paper; 2012 data on Brazil, Chile, China, Hungary, India, Malaysia, Morocco, Poland and Thailand are obtained from the Finaccord Global Bancassurance Database; and 2013 data on Taiwan were collected from the Taiwan Insurance Institute.

Table 2 Descriptive summary statistics

Variables	Mean	S.D.	Min.	Max.	Median	No. of Obs.
ROA (%)	0.098	1.007	−6.201	1.874	0.287	228
ROE (%)	0.995	16.445	−115.754	22.313	5.410	228
RA_{ROA} (%)	1.266	2.003	−3.431	4.168	1.365	228
RA_{ROE} (%)	1.253	1.992	−3.430	4.060	1.443	228
CE	0.634	0.165	0.242	1.000	0.624	235
AE	0.831	0.104	0.461	1.000	0.849	235
TE	0.762	0.166	0.281	1.000	0.773	235
PTE	0.870	0.145	0.300	1.000	0.919	235
SE	0.878	0.125	0.493	1.000	0.914	235
Banc	0.023	0.025	0.000	0.241	0.016	235
$Banc_{non}$*	0.099	0.095	0.002	0.881	0.079	235
BIS (%)	11.383	2.269	5.380	29.830	11.160	235
Str_{HHI}	0.417	0.271	0.089	1.000	0.309	235
Mkt_Share	0.031	0.026	0.004	0.107	0.018	235
Equity/Assets	0.060	0.019	0.027	0.218	0.058	235
Gov_Own	0.221	0.416	0.000	1.000	0.000	235
Listing	0.294	0.456	0.000	1.000	0.000	235

Note: * $Banc_{non}$, which is an alternative proxy for the *Banc* variable, is defined as the ratio of bancassurance commission earned from insurance to the non-interest income of banks.

Table 3 Regression results on bancassurance and bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.501***	0.075	0.748***	0.047	0.706***	0.081	0.955***	0.082	0.759***	0.061
Banc	1.501***	0.492	0.238	0.373	1.755***	0.530	1.797***	0.537	0.604	0.413
BIS	0.022***	0.007	0.008	0.005	0.016**	0.008	0.013*	0.007	0.009	0.006
Mkt_Share	2.765***	1.045	1.253***	0.473	1.719	1.120	3.557***	1.108	−0.781	0.761
Equity/Assets	−3.586***	0.947	−0.669	0.654	−3.420***	1.013	−5.084***	1.023	0.325	0.765
Gov_Own	−0.002	0.125	−0.098*	0.057	0.313**	0.154	0.733	28.847	0.326***	0.105
Listing	0.011	0.055	−0.014	0.024	0.019	0.061	−0.067	0.058	0.063	0.041
Log Likelihood	127.1		186.6		90.66		61.31		140.8	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 4 Regression results on efficiency, with consideration of cooperation strategy

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.499***	0.076	0.735***	0.048	0.721***	0.082	0.956***	0.083	0.782***	0.061
Banc	1.513***	0.495	0.277	0.372	1.682***	0.533	1.787***	0.542	0.517	0.412
BIS	0.022***	0.007	0.007	0.005	0.017**	0.008	0.013*	0.007	0.010	0.006
Str_{HHI}	0.010	0.053	0.048	0.035	−0.064	0.058	−0.007	0.056	−0.085**	0.043
Mkt_Share	2.759***	1.048	1.220**	0.476	1.783	1.106	3.572***	1.113	−0.693	0.752
Equity/Assets	−3.607***	0.953	−0.726	0.654	−3.308***	1.016	−5.067***	1.033	0.430	0.761
Gov_Own	−0.004	0.125	−0.102*	0.057	0.323**	0.154	0.780	59.109	0.340***	0.105
Listing	0.013	0.056	−0.005	0.025	0.007	0.061	−0.069	0.058	0.048	0.041
Log Likelihood	127.1		187.5		91.28		61.32		142.7	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 5 Regression results on bancassurance and bank profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.034**	0.015	-0.029*	0.015	-0.338**	0.133	-0.009*	0.005
Banc	0.482***	0.075	0.505***	0.074	2.615***	0.670	0.159***	0.037
BIS	0.001	0.001	0.001	0.001	0.001	0.009	-0.000	0.001
Mkt_Share	-0.039	0.309	-0.107	0.307	-2.216	2.760	0.099**	0.050
Equity/Assets	0.447***	0.159	0.430***	0.157	5.952***	1.415	0.089	0.066
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	23.69***		23.85***		22.57***		5.47	
R^2	0.326		0.335		0.229		0.145	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 6 Regression results on profitability, with consideration of cooperation strategy

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.033**	0.015	-0.028*	0.015	-0.325**	0.133	-0.008	0.005
Banc	0.472***	0.076	0.493***	0.075	2.458***	0.676	0.155***	0.038
BIS	0.001	0.001	0.001	0.001	0.003	0.009	-0.000	0.001
Str_{HHI}	-0.007	0.009	-0.009	0.009	-0.115	0.078	-0.003	0.003
Mkt_Share	-0.012	0.311	-0.074	0.308	-1.779	2.768	0.101**	0.051
Equity/Assets	0.454***	0.159	0.439***	0.157	6.064***	1.413	0.094	0.067
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	26.68***		26.53***		25.16***		7.07	
R^2	0.337		0.338		0.238		0.138	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 7 Interaction regression results on bancassurance and bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.472***	0.078	0.747***	0.050	0.681***	0.084	0.926***	0.084	0.769***	0.063
Banc	2.616***	0.866	−0.208	0.673	3.522***	0.932	3.144***	0.965	1.044	0.739
BIS	0.022***	0.007	0.007	0.005	0.017**	0.008	0.013*	0.007	0.010	0.006
Str_{HHI}	0.059	0.062	0.026	0.043	0.015	0.066	0.050	0.065	−0.063	0.050
$Banc*Str_{HHI}$	−2.191	1.417	0.977	1.129	−3.597**	1.509	−2.755*	1.608	−1.032	1.202
Mkt_Share	2.995***	1.093	1.180**	0.476	2.138*	1.155	3.757***	1.125	−0.615	0.765
Equity/Assets	−3.741***	0.952	−0.689	0.654	−3.527***	1.009	−5.146***	1.018	0.3885	0.762
Gov_Own	−0.021	0.129	−0.099*	0.057	0.294*	0.157	0.777	60.225	0.333***	0.106
Listing	0.015	0.057	−0.006	0.025	0.011	0.063	−0.067	0.059	0.049	0.041
Log Likelihood	128.3		187.9		904.08		62.72		143.1	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 8 Interaction regression on profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.032**	0.015	-0.026*	0.015	-0.318**	0.135	-0.008	0.005
Banc	0.406***	0.125	0.424***	0.123	2.174*	1.109	0.179***	0.063
BIS	0.001	0.001	0.001	0.001	0.003	0.009	-0.000	0.001
Str_{HHI}	-0.010	0.010	-0.012	0.010	-0.127	0.087	-0.002	0.004
$Banc*Str_{HHI}$	0.140	0.210	0.147	0.208	0.604	1.869	-0.051	0.107
Mkt_Share	-0.056	0.319	-0.120	0.316	-1.967	2.835	0.103**	0.052
Equity/Assets	0.477***	0.163	0.464***	0.162	6.167***	1.451	0.091	0.068
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	26.73***		26.51***		24.36***		7.06	
R^2	0.330		0.340		0.238		0.140	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 9 Regression results on bancassurance and endogenous bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.353***	0.067	0.799***	0.058	0.510***	0.072	0.598***	0.070	0.743***	0.047
Banc	1.415*	0.731	0.291	0.521	1.316*	0.781	5.424***	1.357	-0.662	0.630
BIS	0.017**	0.008	0.008	0.005	0.014	0.008	0.007	0.009	0.002	0.007
Str_{HHI}	-0.066	0.040	0.036	0.029	-0.135***	0.043	-0.062	0.044	-0.089**	0.035
Mkt_Share	2.635***	0.493	1.325***	0.352	1.856***	0.530	4.750***	0.585	-0.876**	0.428
Equity/Assets	-0.100	0.988	-0.941	0.705	1.210	1.071	-0.085	1.056	2.213**	0.867
Gov_Own	0.113*	0.064	-0.052	0.045	0.348***	0.097	0.676	201.300	0.331***	0.077
Listing	0.047*	0.025	0.003	0.018	0.042	0.027	-0.010	0.026	0.057***	0.022
Log Likelihood	685.7		694.2		654.9		645.4		751.3	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 10 2SLS Regression results on bancassurance and bank profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.032***	0.007	-0.033***	0.007	-0.014***	0.004	-0.344	0.068
Banc	0.389***	0.070	0.374***	0.070	0.151***	0.038	1.848***	0.678
BIS	0.002**	0.001	0.002***	0.001	0.001	0.000	0.017**	0.008
Str_{HHI}	0.005	0.004	0.006	0.004	0.001	0.002	0.023	0.041
Mkt_Share	0.376***	0.051	0.365***	0.052	0.111***	0.028	2.000**	0.501
Equity/Assets	-0.032	0.104	-0.024	0.105	0.013	0.057	0.629	1.013
Gov_Own	0.001	0.006	0.002	0.007	-0.002	0.004	-0.032	0.063
Listing	0.002	0.003	0.002	0.003	0.000	0.001	0.016	0.026
R^2	0.371		0.365		0.147		0.165	

Note: Total observations = 196. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 11 Regression results on robustness test for efficiency and Banc

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.445***	0.074	0.720***	0.046	0.667***	0.080	0.895***	0.081	0.769***	0.059
$Banc_{non}$	0.162	0.108	-0.038	0.082	0.232**	0.116	0.207*	0.115	0.099	0.089
BIS	-3.491***	0.972	-0.676	0.657	-3.230***	1.037	-4.909***	1.061	0.435	0.761
Str_{HHI}	-0.001	0.054	0.045	0.035	-0.075	0.058	-0.020	0.057	-0.087**	0.043
Mkt_Share	2.701**	1.062	1.159**	0.489	1.761	1.116	3.572***	1.130	-0.692	0.747
Equity/Assets	-0.009	0.126	-0.105*	0.058	0.323**	0.155	0.734	30.928	0.340***	0.105
Gov_Own	0.003	0.056	-0.008	0.025	-0.003***	0.061	-0.080	0.059	0.045	0.040
Listing	0.028***	0.007	0.010*	0.005	0.023***	0.007	0.020***	0.007	0.011*	0.006
Log Likelihood	123.7		187.4		88.43		57.58		142.6	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 12 Regression results on robustness test for profitability and Banc

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.050***	0.015	-0.046***	0.015	-0.421***	0.131	-0.013**	0.005
Banc	0.096***	0.017	0.099***	0.017	0.393***	0.149	0.024***	0.009
BIS	0.456**	0.161	0.441***	0.160	6.043	1.435	0.102**	0.069
Str_{HHI}	-0.010	0.009	-0.012	0.009	-0.135*	0.078	-0.004	0.004
Mkt_Share	0.083	0.314	0.026	0.312	-1.220	2.803	0.101*	0.054
Equity/Assets	0.454***	0.159	0.439***	0.157	6.064***	1.413	0.094	0.067
Gov_Own	–	–	–	–	-0.003	0.006	-0.003	0.006
Listing	–	–	–	–	-0.004	0.003	-0.004	0.003
Hausman test	19.39***		20.08***		28.10***		6.71	
R^2	0.313		0.318		0.214		0.097	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 1 Bancassurance market shares across countries[a]

Country	Market Share (%)[b]	Country	Market Share (%)[b]
Brazil	77	Poland	43
Spain	65	Indonesia	40
France	60	Chile	35
Italian	60	Malaysia	32
Morocco	60	Thailand	31
South Korea	59	Mexico	28
Taiwan	53	Hungary	20
Hong Kong	50	India	10
China	48		

Notes:

[a] The bancassurance market shares are calculated in terms of the premiums coming from all channels within the life insurance industry.

[b] 2010 data on France, Hong Kong, Indonesia, Italy, Mexico, South Korea and Spain are obtained from the World Bank Policy Research Working Paper; 2012 data on Brazil, Chile, China, Hungary, India, Malaysia, Morocco, Poland and Thailand are obtained from the Finaccord Global Bancassurance Database; and 2013 data on Taiwan were collected from the Taiwan Insurance Institute.

Table 2 Descriptive summary statistics

Variables	Mean	S.D.	Min.	Max.	Median	No. of Obs.
ROA (%)	0.098	1.007	−6.201	1.874	0.287	228
ROE (%)	0.995	16.445	−115.754	22.313	5.410	228
RA_{ROA} (%)	1.266	2.003	−3.431	4.168	1.365	228
RA_{ROE} (%)	1.253	1.992	−3.430	4.060	1.443	228
CE	0.634	0.165	0.242	1.000	0.624	235
AE	0.831	0.104	0.461	1.000	0.849	235
TE	0.762	0.166	0.281	1.000	0.773	235
PTE	0.870	0.145	0.300	1.000	0.919	235
SE	0.878	0.125	0.493	1.000	0.914	235
Banc	0.023	0.025	0.000	0.241	0.016	235
$Banc_{non}$*	0.099	0.095	0.002	0.881	0.079	235
BIS (%)	11.383	2.269	5.380	29.830	11.160	235
Str_{HHI}	0.417	0.271	0.089	1.000	0.309	235
Mkt_Share	0.031	0.026	0.004	0.107	0.018	235
Equity/Assets	0.060	0.019	0.027	0.218	0.058	235
Gov_Own	0.221	0.416	0.000	1.000	0.000	235
Listing	0.294	0.456	0.000	1.000	0.000	235

Note: * $Banc_{non}$, which is an alternative proxy for the *Banc* variable, is defined as the ratio of bancassurance commission earned from insurance to the non-interest income of banks.

Table 3 Regression results on bancassurance and bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.501***	0.075	0.748***	0.047	0.706***	0.081	0.955***	0.082	0.759***	0.061
Banc	1.501***	0.492	0.238	0.373	1.755***	0.530	1.797***	0.537	0.604	0.413
BIS	0.022***	0.007	0.008	0.005	0.016**	0.008	0.013*	0.007	0.009	0.006
Mkt_Share	2.765***	1.045	1.253***	0.473	1.719	1.120	3.557***	1.108	−0.781	0.761
Equity/Assets	−3.586***	0.947	−0.669	0.654	−3.420***	1.013	−5.084***	1.023	0.325	0.765
Gov_Own	−0.002	0.125	−0.098*	0.057	0.313**	0.154	0.733	28.847	0.326***	0.105
Listing	0.011	0.055	−0.014	0.024	0.019	0.061	−0.067	0.058	0.063	0.041
Log Likelihood	127.1		186.6		90.66		61.31		140.8	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 4 Regression results on efficiency, with consideration of cooperation strategy

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.499***	0.076	0.735***	0.048	0.721***	0.082	0.956***	0.083	0.782***	0.061
Banc	1.513***	0.495	0.277	0.372	1.682***	0.533	1.787***	0.542	0.517	0.412
BIS	0.022***	0.007	0.007	0.005	0.017**	0.008	0.013*	0.007	0.010	0.006
Str_{HHI}	0.010	0.053	0.048	0.035	−0.064	0.058	−0.007	0.056	−0.085**	0.043
Mkt_Share	2.759***	1.048	1.220**	0.476	1.783	1.106	3.572***	1.113	−0.693	0.752
Equity/Assets	−3.607***	0.953	−0.726	0.654	−3.308***	1.016	−5.067***	1.033	0.430	0.761
Gov_Own	−0.004	0.125	−0.102*	0.057	0.323**	0.154	0.780	59.109	0.340***	0.105
Listing	0.013	0.056	−0.005	0.025	0.007	0.061	−0.069	0.058	0.048	0.041
Log Likelihood	127.1		187.5		91.28		61.32		142.7	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 5 Regression results on bancassurance and bank profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.034**	0.015	-0.029*	0.015	-0.338**	0.133	-0.009*	0.005
Banc	0.482***	0.075	0.505***	0.074	2.615***	0.670	0.159***	0.037
BIS	0.001	0.001	0.001	0.001	0.001	0.009	-0.000	0.001
Mkt_Share	-0.039	0.309	-0.107	0.307	-2.216	2.760	0.099**	0.050
Equity/Assets	0.447***	0.159	0.430***	0.157	5.952***	1.415	0.089	0.066
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	23.69***		23.85***		22.57***		5.47	
R^2	0.326		0.335		0.229		0.145	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 6 Regression results on profitability, with consideration of cooperation strategy

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.033**	0.015	-0.028*	0.015	-0.325**	0.133	-0.008	0.005
Banc	0.472***	0.076	0.493***	0.075	2.458***	0.676	0.155***	0.038
BIS	0.001	0.001	0.001	0.001	0.003	0.009	-0.000	0.001
Str_{HHI}	-0.007	0.009	-0.009	0.009	-0.115	0.078	-0.003	0.003
Mkt_Share	-0.012	0.311	-0.074	0.308	-1.779	2.768	0.101**	0.051
Equity/Assets	0.454***	0.159	0.439***	0.157	6.064***	1.413	0.094	0.067
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	26.68***		26.53***		25.16***		7.07	
R^2	0.337		0.338		0.238		0.138	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 7 Interaction regression results on bancassurance and bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.472***	0.078	0.747***	0.050	0.681***	0.084	0.926***	0.084	0.769***	0.063
Banc	2.616***	0.866	−0.208	0.673	3.522***	0.932	3.144***	0.965	1.044	0.739
BIS	0.022***	0.007	0.007	0.005	0.017**	0.008	0.013*	0.007	0.010	0.006
Str_{HHI}	0.059	0.062	0.026	0.043	0.015	0.066	0.050	0.065	−0.063	0.050
$Banc*Str_{HHI}$	−2.191	1.417	0.977	1.129	−3.597**	1.509	−2.755*	1.608	−1.032	1.202
Mkt_Share	2.995***	1.093	1.180**	0.476	2.138*	1.155	3.757***	1.125	−0.615	0.765
Equity/Assets	−3.741***	0.952	−0.689	0.654	−3.527***	1.009	−5.146***	1.018	0.3885	0.762
Gov_Own	−0.021	0.129	−0.099*	0.057	0.294*	0.157	0.777	60.225	0.333***	0.106
Listing	0.015	0.057	−0.006	0.025	0.011	0.063	−0.067	0.059	0.049	0.041
Log Likelihood	128.3		187.9		904.08		62.72		143.1	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 8 Interaction regression on profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.032**	0.015	-0.026*	0.015	-0.318**	0.135	-0.008	0.005
Banc	0.406***	0.125	0.424***	0.123	2.174*	1.109	0.179***	0.063
BIS	0.001	0.001	0.001	0.001	0.003	0.009	-0.000	0.001
Str_{HHI}	-0.010	0.010	-0.012	0.010	-0.127	0.087	-0.002	0.004
$Banc*Str_{HHI}$	0.140	0.210	0.147	0.208	0.604	1.869	-0.051	0.107
Mkt_Share	-0.056	0.319	-0.120	0.316	-1.967	2.835	0.103**	0.052
Equity/Assets	0.477***	0.163	0.464***	0.162	6.167***	1.451	0.091	0.068
Gov_Own	–	–	–	–	–	–	-0.003	0.006
Listing	–	–	–	–	–	–	-0.003	0.003
Hausman test	26.73***		26.51***		24.36***		7.06	
R^2	0.330		0.340		0.238		0.140	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 9 Regression results on bancassurance and endogenous bank efficiency

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.353***	0.067	0.799***	0.058	0.510***	0.072	0.598***	0.070	0.743***	0.047
Banc	1.415*	0.731	0.291	0.521	1.316*	0.781	5.424***	1.357	-0.662	0.630
BIS	0.017**	0.008	0.008	0.005	0.014	0.008	0.007	0.009	0.002	0.007
Str_{HHI}	-0.066	0.040	0.036	0.029	-0.135***	0.043	-0.062	0.044	-0.089**	0.035
Mkt_Share	2.635***	0.493	1.325***	0.352	1.856***	0.530	4.750***	0.585	-0.876**	0.428
Equity/Assets	-0.100	0.988	-0.941	0.705	1.210	1.071	-0.085	1.056	2.213**	0.867
Gov_Own	0.113*	0.064	-0.052	0.045	0.348***	0.097	0.676	201.300	0.331***	0.077
Listing	0.047*	0.025	0.003	0.018	0.042	0.027	-0.010	0.026	0.057***	0.022
Log Likelihood	685.7		694.2		654.9		645.4		751.3	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 10 2SLS Regression results on bancassurance and bank profitability

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.032***	0.007	-0.033***	0.007	-0.014***	0.004	-0.344	0.068
Banc	0.389***	0.070	0.374***	0.070	0.151***	0.038	1.848***	0.678
BIS	0.002**	0.001	0.002***	0.001	0.001	0.000	0.017**	0.008
Str_{HHI}	0.005	0.004	0.006	0.004	0.001	0.002	0.023	0.041
Mkt_Share	0.376***	0.051	0.365***	0.052	0.111***	0.028	2.000**	0.501
Equity/Assets	-0.032	0.104	-0.024	0.105	0.013	0.057	0.629	1.013
Gov_Own	0.001	0.006	0.002	0.007	-0.002	0.004	-0.032	0.063
Listing	0.002	0.003	0.002	0.003	0.000	0.001	0.016	0.026
R^2	0.371		0.365		0.147		0.165	

Note: Total observations = 196. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 11 Regression results on robustness test for efficiency and Banc

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	0.445***	0.074	0.720***	0.046	0.667***	0.080	0.895***	0.081	0.769***	0.059
$Banc_{non}$	0.162	0.108	-0.038	0.082	0.232**	0.116	0.207*	0.115	0.099	0.089
BIS	-3.491***	0.972	-0.676	0.657	-3.230***	1.037	-4.909***	1.061	0.435	0.761
Str_{HHI}	-0.001	0.054	0.045	0.035	-0.075	0.058	-0.020	0.057	-0.087**	0.043
Mkt_Share	2.701**	1.062	1.159**	0.489	1.761	1.116	3.572***	1.130	-0.692	0.747
Equity/Assets	-0.009	0.126	-0.105*	0.058	0.323**	0.155	0.734	30.928	0.340***	0.105
Gov_Own	0.003	0.056	-0.008	0.025	-0.003***	0.061	-0.080	0.059	0.045	0.040
Listing	0.028***	0.007	0.010*	0.005	0.023***	0.007	0.020***	0.007	0.011*	0.006
Log Likelihood	123.7		187.4		88.43		57.58		142.6	

Note: Total observations = 235. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 12 Regression results on robustness test for profitability and Banc

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	-0.050***	0.015	-0.046***	0.015	-0.421***	0.131	-0.013**	0.005
Banc	0.096***	0.017	0.099***	0.017	0.393***	0.149	0.024***	0.009
BIS	0.456**	0.161	0.441***	0.160	6.043	1.435	0.102**	0.069
Str_{HHI}	-0.010	0.009	-0.012	0.009	-0.135*	0.078	-0.004	0.004
Mkt_Share	0.083	0.314	0.026	0.312	-1.220	2.803	0.101*	0.054
Equity/Assets	0.454***	0.159	0.439***	0.157	6.064***	1.413	0.094	0.067
Gov_Own	–	–	–	–	-0.003	0.006	-0.003	0.006
Listing	–	–	–	–	-0.004	0.003	-0.004	0.003
Hausman test	19.39***		20.08***		28.10***		6.71	
R^2	0.313		0.318		0.214		0.097	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.