The Impact of Bancassurance on the Efficiency and Profitability of Banks: Evidence from 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.

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ABSTRACT

We set out in this study to investigate whether bancassurance business leads to improvements in the efficiency and profitability of banks. We examine the positive impacts of the system using actual data provided by a unique database on banks engaging in bancassurance business in Taiwan between 2004 and 2012. Our results reveal that banks with greater involvement in bancassurance business generally tend to experience improvements in their efficiency, and thus, also accrue greater profits. Our empirical results provide evidence in support of the supposition that bancassurance business offers substantial benefits for banks, ultimately leading to an increase in shareholder value. Finally, our results also reveal that the adoption of a cooperative bancassurance strategy can have 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 model, the bank acts as an intermediary, helping an insurance company to reach its target customers with the aim of increasing its market share, an arrangement which seems to have mutual benefits for both the banks and the insurance companies. The benefit for the banks is that they can use their existing staff to earn fee income (commission) 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 the income accrued from premiums.

Bancassurance business has played an increasingly important role in banking operations over recent decades, with the banks now generating considerable commission income from such business; and indeed, bancassurance has become the most successful distribution channel within the insurance markets of many countries. Although the development of the financial markets has stimulated keen competition and encouraged aggressive banking practices, ultimately narrowing the interest spread and reducing the profit margins of all banks (Hsiao, Chang, Cianci and Huang, 2010), the commission benefit from bancassurance business now provides the banks with an important boost to their finances. Taking Taiwan as an example, whilst the ratio of bancassurance

commission to total non-interest income was just 3 per cent in 2004, by the end of 2012, it had risen sharply to 18 per cent. The changes over the years in the commission share of bancassurance business in Taiwan are illustrated in Figure 1.

<Figure 1 is inserted about here>

As shown in Table 1, within the insurance markets of France, Spain and Italy, the proportion of life insurance premiums arising from bancassurance channels in 2012 was in excess of 60 per cent, especially the market share in Brazil had reached a massive 77 per cent, representing the highest in the world.[1] In Asia, the market share of life insurance premiums attributable to bancassurance 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. Hence, it is expected that bancassurance business will continue to play an important role in the future (Gonulal et al., 2012).

<Table 1 is inserted about here>

In many respects, banks provide an ideal channel for the sale of insurance products, particularly in banking markets with stagnant interest income (Bergendahl, 1995). However, although insurers are found to benefit from the distribution of insurance products through banking channels, empirical evidence on the impact of bancassurance business on the overall performance of banks remains rather ambiguous. Amici, Fiordelisi, Masala, Ricci

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

and Sist (2013), amongst others, analyzed the consolidation within the financial industry between banking and insurance activities,[2] whilst several related studies have investigated 'merger and acquisition' (M&A) transactions between banks and insurance firms, with the primary focus being on whether firms involved in such activities succeed in increasing value for their shareholders.

Our primary aim in this study is to examine the impacts of bancassurance on banks' performance. Using data on actual commission accrued from insurance sales in the banking sector in Taiwan, we directly test whether the involvement by banks in bancassurance business enhances their efficiency and profitability levels. We further examine whether cooperative strategies of diversification or concentration can provide greater benefits for the banks, with regard to their subsequent performance.

We find that as a result of their participation in bancassurance activities, both the efficiency and profitability of banks have been improved; indeed, the higher the involvement of the banks in bancassurance, the higher their overall performance improvements. We also find that such performance can be further improved by a cooperative diversification strategy, which implies that banks tend to perform better when they choose to cooperate with more insurance partners.

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[2] These studies include Fields, Fraser and Kolari (2007), Chen and Tan (2011), Dontis-Charitos, Molyneux and Staikouras (2011) and Slijkerman, Schoenmaker and de Vries (2013). The findings of these studies are discussed in the literature review.

We make several contributions to the extant literature. Firstly, by using actual revenue data on bancassurance business, we can precisely examine the direct impacts of bancassurance business on the efficiency and profitability of the banks. The prior studies have primarily relied upon mergers with insurance companies as the proxy for involvement in bancassurance activity. Based upon a unique dataset, which includes the premiums and commission earned from bancassurance business for each bank, we are able to provide more precise evidence to demonstrate the effects of bancassurance, in terms of overall enhancements to bank performance.

Secondly, to the best of our knowledge, our study is the first to consider the effects of cooperative bancassurance strategies between banks and insurers. Due to data limitations, the prior studies have been unable to examine whether a cooperative bancassurance strategy by a bank can improve its overall performance. In this study, based upon our access to a unique database, we intend to fill this gap and contribute to the extant literature by providing new evidence on the impacts on bank performance arising from the establishment of cooperative strategies with insurers.

Finally, as a result of regulatory changes to the financial industry in Taiwan, the banking sector provides an intriguing environment for an examination of the ways in which involvement in bancassurance can affect banking efficiency and profitability. Although the bancassurance trend is already at a mature stage in many developed

countries, banks in Taiwan did not get involved in bancassurance business until 2001, when the Taiwanese government deregulated financial integration between the banking and insurance sectors.[3] This deregulation led to rapid acceleration in the growth of bancassurance business in Taiwan over a very short period of time.

The remainder of this paper is organized as follows. A review of the extant related literature 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 subsequently carried out in Section 4, leading on to the presentation of our empirical results and a discussion on their impacts. Finally, the conclusions drawn from this study are presented in Section 5.

2. Literature Review and Hypotheses

The impact of involvement by banks in insurance activities has attracted the attention of many researchers;[4] for example, based upon a cost-benefit analysis, Bergendahl (1995) noted that the benefits of bancassurance may be attributable to customers demonstrating greater faith in the banks, essentially as a result of the provision of products satisfying their individual needs. Singhal and Singh (2010) further argued that bancassurance could increase scale economies by utilizing the existing networks of the banks to offer greater

[3] The Financial Holding Companies Act, which was promulgated in 2001, was responsible for opening the door to the bancassurance market in Taiwan.

[4] Examples include Bergendahl (1995), Genetay, Molyneux and McGuire (1998), Fields et al. (2007) and Singhal and Singh (2010).

ranges of products, whilst also increasing the efficiency and skills of bank employees as they face the new challenges. Singhal and Singh (2010) also stated that by getting involved in the sale of insurance products, the banking sector was able to leverage its infrastructure, operational expertise and existing customer services to the fullest extent. These prior studies have, however, consistently failed to provide any empirical evidence in support of their arguments.

Amici, et al. (2013) recently investigated the impact by examining strategic alliances and joint ventures between banks and insurance companies, whilst Slijkerman, Schoenmaker and de Vries (2013) suggested that systemic risk could be lowered through financial conglomeration between banks and insurance companies. Within another strand of the literature, the focus is placed on the impact of operational diversification on bank performance, albeit with mixed results.

On the one hand, Altunbas and Molyneux (1996) argued that banks engaging in a variety of non-banking activities can enjoy economies of scope, ultimately boosting both their performance and market value. On the other hand, however, diversification could lead to the intensification of any agency problems existing between corporate insiders and small shareholders, which would ultimately destroy the value of the firm within the market (Jensen, 1986; Aggarwal and Samwick, 2003). Based upon a US dataset, Schmid and Walter (2009) argued that it was the diversification in financial services that caused

the discount; however, Lelyveld and Knot (2009) found that universal banking did not cause the discount in the EU market. Although the recent study by Filson and Olfati (2014) found that diversification created value, it was also found to be associated with higher post-merger risk.

The empirical studies on bancassurance have tended to focus on the potential wealth or risk effects of mergers between banking and insurance companies; for example, from an examination of the merger between Citicorp and Travelers, Carow (2001) identified increases in the stock prices of both banks and life insurance companies, whilst Fields et al. (2007) provided evidence on the potential for bidder wealth gains in bancassurance mergers through an examination of such mergers in the US and other countries. Based upon a further examination of merger deals, Chen and Tan (2011) examined the risk and wealth effects on a total of 72 M&As between banks in Europe; however, after considering risk effects and changes in risk with respect to market indices, they were unable to identify any wealth effects.

It is argued in some of the related studies that banks can benefit from bancassurance activities through the synergy and economies of scope; that is, as compared to traditional channels, bancassurance provides banks with the advantage of lower costs (Benoist, 2002). Fiordelisi and Ricci (2011) recently carried out a examination of the efficiency performance of banks involved in bancassurance activities using ownership links as a

proxy for bancassurance activities to test the efficiency effects on the banks; however, they could find no evidence in support of the involvement by banks in life insurance business. In contrast to the prior studies, we aim to fill the gap in the literature by examining whether banks selling insurance policies gain any diversification value from their bancassurance activities. By using data on actual commission from insurance sales, we can directly test whether involvement in bancassurance enhances the efficiency and performance of the banks.

Our main research question is whether the performance of the banks is affected by their involvement in bancassurance business. Based upon the report from Swiss Re (2007), bancassurance can increase the productivity of banks. When considering economies of both scope and scale, we would expect to find involvement in bancassurance business leading to increased efficiency (Singhal and Singh, 2010). Furthermore, bancassurance can provide additional commission profit for the banks through the use of existing staff and infrastructure (Bergendahl, 1995; Genetay, Molyneux and McGuire, 1998). As a result, Bancassurance business may also increase profitability, such as return on assets and risk adjusted returns. We therefore propose the following 'enhanced-performance hypothesis':

Hypothesis 1: *Involvement in bancassurance business will have positive effects on bank performance through improved efficiency and profitability.*

As already noted, the prior studies have failed to provide any evidence relating to the cooperative bancassurance strategies of banks and their resultant performance. In this study, we further examine whether bank performance has been affected by cooperative strategies in bancassurance business. By cooperating with more insurers, banks can provide diversified insurance products, harness more bargaining power and obtain more information from insurers. As a result, banks can select better products from different insurers to meet the needs of their customers. Since a cooperative diversification strategy may improve both the efficiency and profitability of the banks, we propose the following 'diversified-strategy hypothesis':

Hypothesis 2: *A cooperative diversification strategy in bancassurance business will have positive effects on bank performance.*

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 variables for our subsequent analysis, along with the descriptive statistics.

3.1. Data

Following the 2001 regulatory changes allowing financial integration between the banking and insurance sectors, Taiwanese banks were quick to get involved in bancassurance business; indeed, over a very short period of time, the cross-selling of

insurance products by banks very quickly became the most important distribution channel for insurance companies in Taiwan. Hence, the unique environment of the Taiwan banking sector provides us with an ideal institutional setting to test the impacts of bancassurance activities.

We construct a 2004-2012 panel dataset to facilitate our empirical analysis of the relationship between bancassurance and bank performance in Taiwan. We use the comprehensive bancassurance database compiled by the Taiwan Insurance Institute (TII) as our primary source of information, since this database provides information on each bank, including the premiums and commission earned from all of their insurer partners. The availability of such information enables us to examine the cooperative strategies between our sample banks and their insurer partners. The financial information on our sample banks is obtained from the Taiwan Economic Journal (TEJ) database, which provides information on factors such as balance sheets and income statements.

Our dataset, which includes details on all commercial banks in Taiwan, covers the period from 2004 to 2012. We excluded 22 observations with extreme values (such as negative equity) or where banks had been taken over by the authorities during the sample period, which left us with a total of 295 observations; 60 of these observations revealed no involvement in any form of bancassurance activity.

3.2 Methodology

3.2.1 Empirical model

The empirical specifications for our regression models are:

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

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

where *Performance* refers to the performance measure of the banks, which includes both their efficiency and profitability; *Banc* is a proxy measuring the extent of a bank's involvement in bancassurance business; Str_{HHI} in Equation (2) proxies for a cooperative bancassurance strategy; ε is the error term; α are the individual specific effects; θ are the year effects; and X is a vector of other control variables for bank i at time t.

Separate estimations are carried out on Equations (1) and (2), with the estimates on the effects of bancassurance business being denoted by β_1 and the effects of the adoption of a cooperative bancassurance strategy being denoted by β_2. Equation (1) is the regression model facilitating the analysis of the enhanced-performance hypothesis for the full sample of banks. If the coefficient on bancassurance involvement (β_1) is found to be significantly positive, then this provides support for the enhanced-performance hypothesis.

Equation (2) is designed to facilitate an investigation into our diversified- strategy hypothesis which is restricted to only those banks involved in bancassurance business; thus, any banks with no involvement in bancassurance activities were excluded from the

sample prior to carrying out the analysis of Equation (2). If the coefficient on a cooperative bancassurance strategy (β_2) is found to be significantly negative, then this would provide clear evidence in support of our diversified- strategy hypothesis.

In order to control for unobserved variables or variables that can change over time, we use panel data analysis to avoid any biased estimations resulting from individual heterogeneity; this method controls for unobserved firm differences and aggregate shocks over different years through the inclusion of 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 from the results of the Hausman test.[5]

For our measure of efficiency performance, given that the estimated efficiency is truncated at 1, we follow several prior related studies to use a Tobit regression model;[6] the main advantage of using a Tobit model is that it can avoid inconsistent estimators. Furthermore, in data-censoring applications, a random-effects model is used to solve the problem of unobserved heterogeneity; we therefore apply the Tobit random-effects model, essentially because unconditional fixed-effect estimates are biased and do not provide a sufficient statistic to allow the fixed effects to be conditioned out of the

[5] We run a Hausman test to identify whether the preferred model is a random- or fixed-effects model. If the Hausman test is rejected, then we will select the fixed-effects model. We also carry out a Wald test to further confirm whether the dummies for all years or for all entities are equal to 0, which requires time or entity fixed effects. If the Hausman test is not rejected, then we will select the random-effects model. We then undertake a Breusch-Pagan Lagrange Multiplier test (LM test) to further confirm the significant differences across both years and entities.

[6] See Casu and Molyneaux (2003), Havrylchyk (2006) and Hsiao et al. (2010).

likelihood.[7]

As a check for the robustness of our results, we further correct for the potential problem of endogeneity. We adopt the instrumental variable (IV) method, which provides a general solution to the problem of an endogenous explanatory variable. Following Campa and Kedia (2002) and Liebenberg and Sommer (2008), we choose lag value $Banc_{t-1}$ of firm characteristics that is correlated with our main independent variable $Banc_t$ as the instruments. We also use the number of cooperating insurance companies (*Co_Number*) as the instrumental variables.[8] We then carry out the estimation using the two-stage least squares (2SLS) method.

3.2.2 Bancassurance variables

a. Bancassurance measures

Following Stiroh and Rumble (2006), we measure the extent of bancassurance involvement (*Banc*) using the ratio of the commission from insurance sales to 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. *Banc* is therefore measured as:

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

[7] Details are provided in Wooldridge (2002: 538-42).

[8] These two instrumental variables are chosen by satisfying two key assumptions, non-correlation with the error term and a non-zero coefficient on the bancassurance involvement measures

We also use the ratio of the commission earned from insurance sales to the non-interest income of banks ($Banc_{non}$) as an alternative measure. A higher *Banc* or $Banc_{non}$ value indicates that the bank is involved in more bancassurance business with insurance companies.

b. Cooperative bancassurance strategy measures

We use the Herfindahl Index on the commission of the different partner insurers (Str_{HHI}) as the proxy for our measure of cooperative bancassurance strategies, since it accounts for variations in the breakdown of commission paid by different insurance company partners. Thus, our primary measure of the commission diversification of a bank is:

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

where Str_{HHI} measures the level of concentration with the insurance company within the bank's cooperative strategy; thus, a higher value of Str_{HHI} indicates that the bank adopts a more concentrated strategy with its insurance partners, whereas a lower value indicates that commission comes from more diversified sources; that is, $Str_{HHI} = 1$ indicates that all of the bank's commission comes from a single insurance company (complete concentration). Sh_{COM_i} is the share of bancassurance commission to total bancassurance commission from insurance company *i*.

3.2.3 Dependent variables - Performance

a. Efficiency measures

The efficiency measures are based on the input-output frontier methodologies. The two major efficiency methods are the econometric and mathematical programming approaches; in this study, we adopt the latter approach for our evaluation of bank efficiency – specifically, the Data Envelopment Analysis (DEA) approach.[9] Of the total of five measures of DEA efficiency performance used in our analysis, we begin by examining 'technical efficiency' (*TE*), 'allocative efficiency' (*AE*) and 'cost efficiency' (*CE*), as follows.

Technical efficiency reflects the ability of a firm to obtain the maximum output from a given set of inputs, whilst allocative efficiency reflects the ability of a firm to utilize inputs in optimal proportions, given the price of the inputs. *TE* and *AE* are then combined to provide a measure of cost efficiency (Coelli, Rao and O'Donnell, 2005). These three efficiency measures vary between 0 and 1, with an efficiency score of 1 representing total efficiency.

The efficiency measures are further illustrated in Figure 2. Using a simple example involving a firm using two inputs (x_1 and x_2) to produce a single output (y), isoquant-SS′ in Figure 2 represents the various combinations of the two inputs

[9] We adopt the mathematical programming approach (with DEA being one of the most popular) for at least two reasons. Firstly, the DEA approach avoids the possibility of specification errors that are frequently encountered when using an econometric approach; and secondly, the DEA approach is found to perform well with only a small number of observations.

required to produce a fixed amount of output. Firms using the best available technology are located on the isoquant, with these firms being considered to be technically efficient.

The value of the *TE* of a firm ranges from 0 to 1, with a value of 1 representing total technical efficiency. If the input-output combination of a firm is located at point P, then its *TE* is defined as the ratio QP/0P, which represents the amount by which the firm could reduce its inputs by adopting the best technology. *TE* is therefore represented in this study by the ratio *TE* = 0Q/0P, which is equal to 1 – QP/0P. Point Q is technically efficient, since it lies on the efficient isoquant.

<Figure 2 is inserted about here>

The isocost line AA′ in Figure 2 represents the ratio of input prices; the *AE* of a firm operating at point P is defined as the ratio *AE* = 0R/0Q, with the distance between points R and Q representing the reduction in costs that would occur if the firm operated at allocative efficient point Q′, as opposed to point Q. Total cost efficiency, *CE*, is defined in this study as the ratio 0R/0P, which is the product of *TE* and *AE*:[10]

$$TE * AE = CE \text{ or } (0Q/0P) * (0R/0Q) = 0R/0P \quad (1)$$

[10] Under the DEA approach, efficiency scores are estimated by solving linear programming problems; for space-saving purposes, we do not provide the detailed problem solving methodologies here. Interested readers should refer to the studies of Cummins and Zi (1998), Coelli et al. (2005) and Jeng and Lai (2005).

Finally, we can further decompose the *TE* measure into 'scale efficiency' (*SE*) and 'pure technical efficiency' (*PTE*), where *SE* is a measure of the extent to which the scale of a firm deviates from its optimal level (considering the relationship between outputs and inputs under constant returns to scale), and *PTE* explains the technical efficiency that cannot be attributed to deviations from the optimal scale level. Both measures can be further solved using other linear programming problems.

To decide the input/output variables used in our analysis, we follow the majority of the prior studies using the intermediation approach[11] and include three inputs (X_i) and three outputs (Y_i) within our model. The three inputs are X_1 (total deposits), X_2 (number of employees) and X_3 (total fixed assets), whilst the three outputs are Y_1 (total loans), Y_2 (other investment assets) and Y_3 (other non-interest income).

The prices of the inputs (P_i) are measured in this study as P_1 (interest expenses/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).

[11] For the details of the intermediation approach, see Berger, Hanweck and Humphrey (1987), Casu and Molyneaux (2003), Havrylchyk (2006) and Hsiao et al. (2010). Kao and Liu (2004) and Hsiao et al. (2010) also adopt the intermediation approach to examine the efficiency performance of the banks in Taiwan.

b. Profitability measures

Our profitability measures 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). Following Stiroh and Rumble (2006), we also use the 'risk-adjusted return on equity' (RA_{ROE}) and the '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 risk-adjusted return ratios are considered as the accounting returns per unit of risk. The definitions of the two risk-adjusted returns are as follows:

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

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

3.2.4 Control variables

Following the literatures, various control variables are adopted in this study to account for the differences between the sample banks, since such differences could ultimately influence their performance. These firm-specific variables include: (i) a dummy variable, *Listing*, which indicates whether or not a bank is publicly-listed on the Taiwan Stock Exchange; this is equal to 1 for listed banks, otherwise 0; (ii) a dummy variable,

Gov_Own, which indicates whether or not a bank is owned by government; this is equal to 1 for banks controlled by government, otherwise 0; (iii) *ln_Assets* which represents the scale effects and is defined as the natural logarithm of total assets;[12] (iv) *BIS* which refers to the *BIS* capital adequacy ratio[13] of the banks; (v) *Equity/Assets*, the equity ratio, which is defined as the ratio between the equity and total assets of the bank; and (vi) *Div*, the diversification effect, which is defined as the Herfindahl Index of both interest and non-interest income.[14]

The descriptive summary statistics on all of the sample banks are presented in Table 2, which reports the sample mean, standard deviation, minimum, maximum and median (50^{th} percentile). As we can see from the table, 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. It is therefore clear that, over time, the banks have become increasingly dependent on income from insurance sales.

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[12] We also consider market share (*Mkt_share*) which is defined as the market share of total deposits, as an alternative proxy for scale effect.

[13] *BIS* stands for 'Bank for International Settlements'. The Bank for International Settlements' Basel committee has used *BIS* capital adequacy ratio as the global standards for bank capital adequacy. It measures the financial strength of a bank, expressed as a ratio of its capital to its assets. The *BIS* ratio collected in this paper is sourced from the reports of the Central Bank of Taiwan.

[14] Our primary measure of the diversification (*Div*) of a bank is: $1\text{-}HHI_{INCOME} = 1\text{-} [(Interest\ income)^2 + (Non\text{-}interest\ income)]^2 / (Non\text{-}interest\ Income + Interest\ income)^2$. We follow the approach of Stiroh and Rumble (2006) for the measure of bank diversification, with a higher value of *Div* indicating that the bank adopts a more diversified strategy; if *Div* = 0, then this indicates that all of the bank's income comes from interest income. We also use the alternative measure of the diversification effect, which contains not only non-interest income and interest income

<Table 2 is inserted about here>

4. Empirical Results

Our analysis begins with an examination of the enhanced-performance hypothesis in an attempt to provide a better understanding of the ways in which involvement in bancassurance business affects the efficiency and profitability of banks. As opposed to a simple dummy variable, we use *Banc* (β_1) as the measure of bancassurance involvement, since this may provide additional information on the commission revenue arising from bancassurance business.

We then go on to examine the diversified-strategy hypothesis to determine whether a cooperative strategy between banks and insurers affects their performance. Str_{HHI} (β_2), which measures the degree of concentration between banks and insurers in bancassurance business, is used as the proxy for a cooperative strategy. Recall that a higher value for the cooperative strategy proxy (Str_{HHI}) implies that the bank adopts a more specialized strategy involving cooperation with fewer insurer partners.

4.1 Bancassurance and Efficiency

We adopt a Tobit random-effects regression model for our efficiency performance analysis, essentially because the efficiency measures are truncated and our sample comprises of panel data.[15] The results of the Tobit random-effects regressions for all

[15] Since the use of unconditional fixed-effects estimates here would be biased, we apply the random- effects

banks are presented in Table 3, which shows that the coefficients on bancassurance involvement (β_1) in the *CE*, *TE* and *PTE* regressions are all found to be significantly positive at the 1 per cent level, thereby implying that greater involvement in bancassurance improves the cost efficiency, technical efficiency and pure technical efficiency of the banks.

<Table 3 is inserted about here>

Our empirical results are consistent with the findings of Bergendahl (1995) that by engaging in the sale of insurance products, banks increase their overall productivity levels. In specific terms, our results from the *PTE* and *TE* regression imply that for a given level of inputs, banks may experience improvements in their ability to produce more outputs. 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). Our empirical results therefore provide strong evidence in support of our proposed enhanced-performance hypothesis.

We go on to examine the effects of our diversified-strategy hypothesis purely for those banks involved in bancassurance business, with the regression results of the Tobit random-effects model being reported in Table 4. The focus in the prior studies has tended

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model, whilst also using the OLS method as a check for the robustness of our results. As expected, the estimated coefficients are found to have the same sign under the traditional random-effects model estimated by the OLS method with a Tobit random-effects model.

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 insurance firms. However, the prior studies have been unable to draw any clear conclusions on the involvement of banks in bancassurance business (Dontis-Charitos et al., 2011; Fiordelisi and Ricci 2011). Thus, the results of this study provide new evidence in this field.

Similar to the results reported in the Table 3, *Banc* is found to be significantly positive in the *TE* and *PTE* regressions. We then examine the coefficient on Str_{HHI} (β_2) to see how becoming involved in a bancassurance cooperative strategy can affect the overall performance of the banks. Str_{HHI} is found to have a significantly negative coefficient in the *TE* and *SE* regressions, thereby indicating that if a bank chooses to cooperate with more insurance partners (diversification strategy) this can lead to higher technical and scale efficiencies. Our empirical results therefore provide direct support for our diversified-strategy hypothesis, and suggest that cooperation with more insurance firms as the bancassurance business model may be an appropriate strategy for improving the efficiency of the banks.

<Table 4 is inserted about here>

4.2 Bancassurance and Profitability

In order to determine whether bancassurance has positive impacts on the profitability of banks, we carry out further regression analyses examining the relationship between the

involvement of banks in bancassurance business and their subsequent profitability levels. Since the Hausman test rejects the null hypothesis, we use the fixed-effects model for *ROE* *ROA*, RA_{ROE} and RA_{ROA}, with the regression results being presented in Table 5.[16]

The results reveal that the coefficients on bancassurance involvement (β_1) in the ROE, RA_{ROE} and RA_{ROA} regressions are all found to be significantly positive at the 1 per cent level, thereby clearly indicating that banks with greater involvement in bancassurance business are likely to be more profitable than other banks. Further support is therefore provided for the enhanced-performance hypothesis when using the measures of profitability, *ROE* and *ROA*, and risk-adjusted profitability, RA_{ROE} and RA_{ROA}.

<Table 5 is inserted about here>

We further examine the effects of the diversified-strategy hypothesis purely for those banks involved in bancassurance business. As shown in Table 6, although the results on the measure of involvement in bancassurance business (*Banc*) are still found to hold, the regression results show no significant relationship between bancassurance strategy (Str_{HHI}) and profitability; thus, no support is provided for the diversified-strategy hypothesis when using the profitability measures.

<Table 6 is inserted about here>

[16] The Hausman test rejects the null hypothesis of the differences in the coefficients not being systematic, essentially because the unique errors are found to be correlated with the regressors.

4.3 Tests for Robustness

We carry out additional robustness checks on the regression results in an attempt to identify any potential endogeneity effects. We use the two-stage least squares (2SLS) approach with instrumental variables to deal with the potential problem of endogeneity, with the results being reported in Tables 7 to 10.[17] We begin by examining the effects of the enhanced-performance hypothesis for all of the banks. As we can see from Tables 7 and 8, the results are found to be consistent with those reported in Tables 3 and 5, showing significant relationships between involvement in bancassurance business and both the profitability and efficiency measures. Thus, our results once again provide support for the enhanced-performance hypothesis.

<Tables 7 and 8 are inserted about here>

We then go on to carry out further checks for robustness on the effects of the diversified-strategy hypothesis purely for those banks involved in bancassurance business. Once again, as we can see from Tables 9 and 10, the 2SLS regression results are found to be consistent with those reported in Tables 4 and 6.

<Tables 9 and 10 are inserted about here>

In particular, the coefficients on Str_{HHI} (β_2) in the *CE*, *TE* and *PTE* regressions in Table 9 are found to be significantly negative at the 1 per cent level, thereby indicating

[17] As an additional check for robustness, we also estimate the model using 'generalized method of moments' (GMM) and find that the results are consistent with the 2SLS estimations.

that where banks choose to cooperate with more insurance partners, this can lead to higher cost efficiency, technical efficiency and pure technical efficiency. Thus, the results in the Tables 4 and 9 provide strong support for the diversified-strategy hypothesis.

5. Conclusions

This paper investigates whether bancassurance improves the profitability and efficiency of the banks. The Financial Holding Companies Act in Taiwan opened the door to the bancassurance market for bank in 2001. This deregulation led to rapid acceleration in the growth of bancassurance revenue in the banking sector over a very short period of time and provided an intriguing environment to examine how bancassurance can affect banks' efficiency and profitability. Previous literature indicates that bancassurance may improve bank efficiency, not only through an increase in commission income, but also through non-monetary benefits. However, these studies have failed to provide sufficient empirical evidence to clearly identify the overall effects of bancassurance business on the banks. Using a unique database on the premiums and commission from bancassurance business for each bank in Taiwan, we provide more precise evidence in support of the enhanced bank performance attributable to bancassurance. In addition, due to data limitations, the prior studies have been unable to examine whether a cooperative

bancassurance strategy can improve bank performance. Our study is the first to examine the direct impacts of a cooperative bancassurance strategy on banking efficiency and profitability. Our results provide new evidence on the significant impacts that a cooperative bancassurance strategy can have on bank performance.

Our evidence provides support for the enhanced-performance hypothesis proposed in this study, which posits that involvement in bancassurance business does lead to improvements in the overall performance of banks. The results suggest that bancassurance provides banks with real benefits, whilst also increasing value for bank shareholders. Our analysis also sheds further light on the growing financial consolidation between banks and insurance companies.

The bancassurance advantages are identified from two sets of results on the efficiency and profitability of the banks. Firstly, the evidence shows considerable improvements in efficiency amongst banks engaging in more bancassurance business. The Tobit random-effects regression results reveal enhancements in cost efficiency, technical efficiency and pure technical efficiency. These results imply that banks may be better able to utilize their networks and other fixed costs, thereby raising their overall cost efficiency, with the resultant improvements in the skill sets of their employees ultimately raising their technical efficiency.

Secondly, involvement in bancassurance business has significantly positive effects

on profitability performance, as measured by both accounting returns and risk-adjusted returns. The results show that the bancassurance business has positive correlations with *ROE*, RA_{ROE} and RA_{ROA}, which indicates that banks with greater involvement in bancassurance business have greater profitability than other banks.

We also propose a diversified-strategy hypothesis in this study on the effects of different cooperative bancassurance strategies between banks and insurers. Interestingly, we find that banks with a diversified strategy – that is, those cooperating with more insurance companies – can enjoy significantly positive impacts on their overall level of efficiency. The regression results reveal that a diversified cooperative bancassurance strategy leads to enhanced cost efficiency, technical efficiency, scale efficiency, technical efficiency and pure technical efficiency. Our evidence therefore provides support for our diversified-strategy hypothesis; indeed, the results indicate that a diversification strategy is better for the banks than a concentration strategy. However, we find no evidence of a diversified-strategy increasing the profitability of the banks.

We suggest that our study contributes to the extant literature by providing new evidence in support of involvement by banks in bancassurance business. The empirical evidence demonstrates that the regulatory change from the government can have significant influence on the rapid financial integration between banking and insurance ssectors. Our results indicate that the advantages of bancassurance persist 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. In addition, banks' efficiency levels can be improved by cooperating with more insurers. We therefore conclude with the suggestion that banks should consider more diversified and flexible forms of cooperation with more insurance companies.

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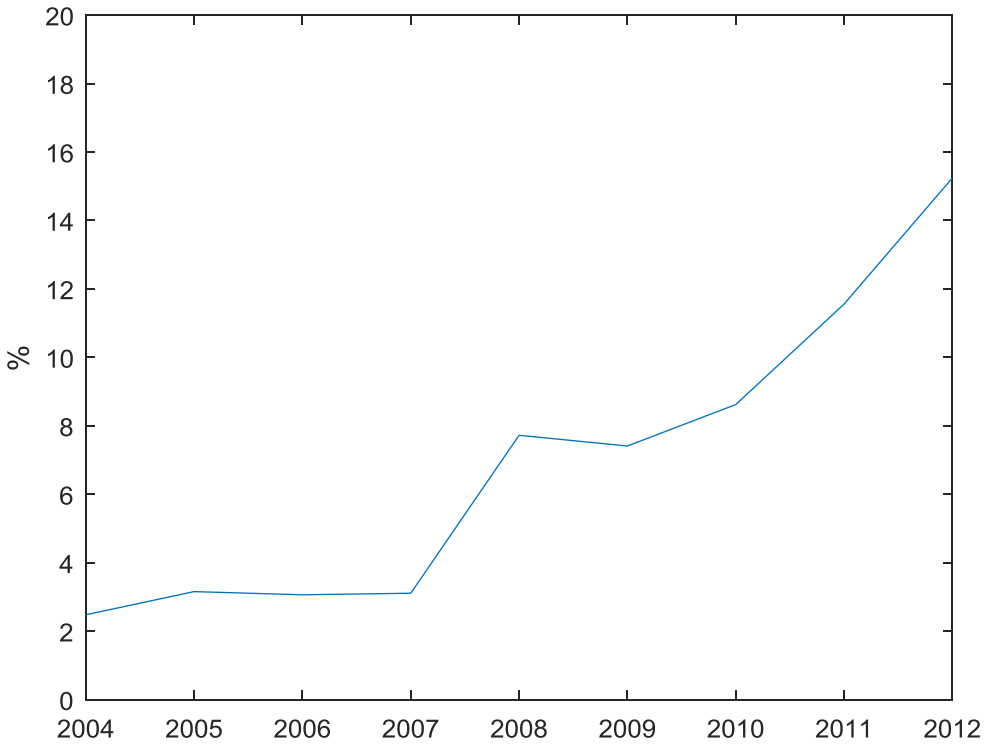

Figure 1 Insurance commission as a percentage of non-interest income of banks over 2004-2012 in Taiwan

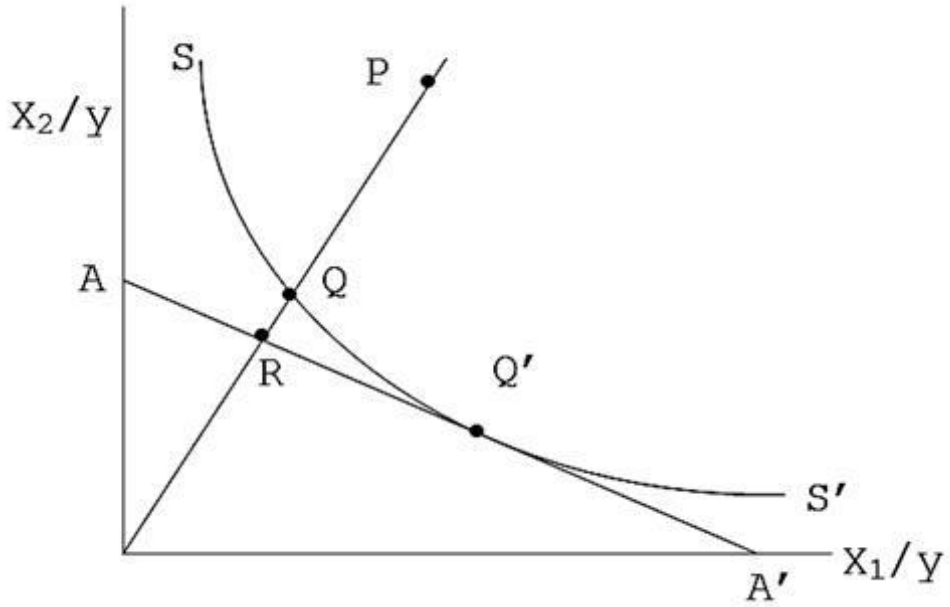

Figure 2 Illustration of Technical Efficiency

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[a]	Mean	S.D.	Min.	Max.	Median	No. of Obs.[b]
CE	0.605	0.171	0.242	1.000	0.590	295
AE	0.823	0.107	0.461	1.000	0.841	295
TE	0.735	0.178	0.281	1.000	0.742	295
PTE	0.841	0.169	0.300	1.000	0.891	295
SE	0.878	0.131	0.374	1.000	0.918	295
ROA (%)	0.009	1.207	–7.417	1.874	0.266	283
ROE (%)	0.687	43.202	–371.383	540.881	4.714	283
RA_{ROA} (%)	1.143	2.045	–3.575	4.170	1.260	283
RA_{ROE} (%)	1.148	2.022	–3.649	4.064	1.254	283
Banc	0.018	0.024	0.000	0.241	0.012	295
$Banc_{non}$	0.079	0.094	0.000	0.881	0.053	295
Str_{HHI}	0.417	0.271	0.089	1.000	0.309	235
ln_Asset	20.060	1.062	17.523	22.123	19.890	295
Div	0.591	0.172	0.113	0.897	0.626	295
BIS (%)	11.254	2.614	–2.120	29.830	11.160	295
Equity/Assets	0.061	0.020	–0.014	0.218	0.059	295
Gov_Own	0.210	0.408	0.000	1.000	0.000	295
Listing	0.305	0.461	0.000	1.000	0.000	295

Notes:

[a] The $Banc_{non}$ variable, 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.

[b] The total sample comprised of 295 observations, but only 235 observations were included in the cooperative strategy measure. As regards the profitability measure, a total of 283 observations were included (the other 12 observations were excluded as they lacked quarterly data, which is a prerequisite for the calculation of risk-adjusted returns).

Table 3 Tobit random-effects 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	–4.307***	0.745	0.061	0.266	–2.783***	0.693	–2.434***	0.625	0.199	0.443
Banc	**1.118****	0.363	0.360	0.324	**1.327****	0.428	**1.186****	0.458	0.571	0.379
ln_Asset	0.243***	0.037	0.036***	0.013	0.174***	0.035	0.170***	0.031	0.028	0.022
Div	–0.011	0.041	–0.083**	0.039	0.085*	0.051	0.066	0.053	0.018	0.046
BIS	0.009**	0.004	0.002	0.004	0.010*	0.005	0.006	0.006	0.008*	0.005
Equity/Assets	–0.791	0.692	–0.388	0.561	–0.878	0.801	–1.875**	0.875	0.301	0.703
Gov_Own	–0.210**	0.099	–0.011	0.032	–0.091	0.092	–0.004	0.093	–0.025	0.060
Listing	0.089	0.077	0.001	0.024	0.060	0.071	–0.054	0.072	0.061	0.047
Log Likelihood	194.00		234.30		126.10		75.22		159.30	

Note: Total observations = 295. *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 4 Tobit random-effects regression results on efficiency, with consideration of a strategy of cooperation

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	–6.180***	0.841	0.158	0.275	–4.107***	0.964	–2.607***	0.671	0.055***	0.535
Banc	0.474	0.411	0.137	0.371	**1.082****	0.492	**1.249****	0.478	0.479	0.425
Str_{HHI}	–0.023	0.045	0.032	0.034	–**0.091***	0.055	–0.020	0.050	–**0.090***	0.046
ln_Asset	0.330***	0.041	0.028**	0.014	0.240***	0.048	0.178***	0.034	0.036	0.027
Div	–0.434***	0.094	–0.214**	0.089	–0.286**	0.115	–0.430***	0.109	0.052	0.101
BIS	0.001	0.006	0.003	0.006	0.002	0.007	–0.004	0.007	0.009	0.006
Equity/Assets	0.206	0.923	–0.405	0.656	–0.629	1.079	–2.810***	0.921	0.828	0.846
Gov_Own	–0.276**	0.123	0.022	0.03	–0.158	0.113	–0.043	0.076	–0.019	0.061
Listing	0.164	0.107	0.003	0.024	0.090	0.094	–0.018	0.061	0.050	0.051
Log Likelihood	162.40		192.30		107.50		83.00		138.60	

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 Fixed effects 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	–0.215*	0.015	–0.257**	0.117	5.344*	3.155	–0.097	0.075
Banc	**0.348*****	0.071	**0.341*****	0.070	**4.975*****	1.874	0.041	0.045
ln_Asset	0.013**	0.006	0.015**	0.006	–0.211	0.159	0.006	0.004
Div	0.073***	0.015	0.073***	0.014	0.844**	0.390	0.050***	0.009
BIS	–0.002*	0.001	–0.001*	0.001	–0.067***	0.024	–0.001	0.001
Equity/Assets	0.484***	0.130	0.513***	0.127	2.382	3.424	0.281***	0.082
Gov_Own	–	–	–	–	–	–	–	–
Listing	–	–	–	–	–	–	–	–
R^2	0.322		0.347		0.080		0.222	
Hausman test	28.38***		29.33***		11.25**		11.03*	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 228 (12 observations were excluded as they lacked quarterly data, which is a prerequisite for the calculation of risk-adjusted returns). *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 6 Fixed and random effects regression results on profitability, with consideration of a strategy of cooperation

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	–0.420***	0.147	–0.388***	0.145	–0.375	1.297	–0.005	0.029
Banc	**0.316*****	0.082	**0.341*****	0.082	**1.496****	0.727	**0.107*****	0.037
Str_{HHI}	–0.009	0.008	–0.011	0.008	–0.112	0.074	–0.004	0.003
ln_Asset	0.022***	0.007	0.020***	0.007	0.027	0.065	0.002	0.001
Div	0.058***	0.017	0.059***	0.017	0.685***	0.154	0.039***	0.008
BIS	–0.001	0.001	–0.001	0.001	–1.008	0.010	–0.001	0.001
Equity/Assets	0.651***	0.163	0.627***	0.162	6.655***	1.445	0.090	0.064
Gov_Own	–	–	–	–	–	–	0.003	0.003
Listing	–	–	–	–	–	–	–0.003	0.003
R^2	0.385		0.393		0.308		0.208	
Hausman test	52.14***		48.26***		33.13***		8.76	
Model	Fixed		Fixed		Fixed		Random	

Note: Total observations = 223 (12 observations were excluded as they lacked quarterly data, which is a prerequisite for the calculation of risk-adjusted returns). *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 7 2SLS regression results on bancassurance and endogenous bank efficiency[a]

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	–0.608***	0.214	0.486***	0.159	–0.373	0.228	–0.389**	0.190	0.942***	0.189
Banc	**1.641****	0.559	0.333	0.417	**1.535****	0.596	**1.707****	0.496	0.081	0.495
ln_Asset	0.053***	0.011	0.015*	0.008	0.049***	0.012	0.054***	0.010	–0.004	0.010
Div	–0.034	0.056	0.078*	0.042	–0.111*	0.059	–0.063	0.049	–0.050	0.049
BIS	0.017**	0.006	0.007	0.005	0.013*	0.007	0.014**	0.006	0.000	0.006
Equity/Assets	–1.286	0.799	–1.521**	0.596	–0.188	0.852	–0.145	0.709	0.043	0.708
Gov_Own	0.068***	0.026	0.014	0.019	0.071**	0.028	0.069***	0.023	0.016	0.023
Listing	0.027	0.020	0.001	0.015	0.030	0.021	–0.039**	0.017	0.066***	0.017
R^2	0.335		0.091		0.286		0.410		0.066	

Notes:

[a] Total observations = 255. Refer to Table 3 for the correction of the endogeneity of the bancassurance involvement variable (*Banc*), where the instrumental variables are $Banc_{t-1}$ and *Co_Number*.

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 8 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	–0.102***	0.031	–0.109***	0.030	0.505	0.864	–0.025	0.021
Banc	**0.241****	0.064	**0.255****	0.064	1.908	1.807	**0.113****	0.044
ln_Asset	0.005***	0.001	0.005***	0.001	0.001	0.038	0.001	0.001
Div	–0.022*	0.013	–0.024*	0.013	–0.494	0.365	–0.025***	0.009
BIS	0.002**	0.001	0.002***	0.001	–1.015	0.021	–0.001**	0.001
Equity/Assets	–0.029	0.096	–0.046	0.095	–1.022	2.707	0.066	0.066
Gov_Own	0.011***	0.003	0.011***	0.003	0.083	0.085	0.004*	0.002
Listing	–0.003	0.002	–0.003	0.002	–0.035	0.066	–0.001	0.002
R^2	0.383		0.410		0.030		0.231	

Notes:

[a] Total observations = 246. Refer to Table 5 for the correction of the endogeneity of the bancassurance involvement variable (*Banc*), where the instrumental variables are $Banc_{t-1}$ and *Co_Number*.

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 9 2SLS regression results on bancassurance and endogenous bank efficiency, with consideration of a strategy of cooperation

Variables	*CE*		*AE*		*TE*		*PTE*		*SE*	
	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.	Coeff.	Std. Err.
Constant	–0.665***	0.254	0.384**	0.178	–0.300	0.265	–0.566***	0.187	1.134***	0.205
Banc	0.806	0.677	–0.090	0.475	0.934	0.707	**1.388****	0.498	–0.213	0.548
Str_{HHI}	–**0.082****	0.038	0.023	0.027	–**0.166****	0.040	–**0.081****	0.028	–0.045	0.031
ln_Asset	0.056***	0.013	0.019**	0.009	0.046***	0.014	0.066***	0.010	–0.015	0.011
Div	0.223*	0.128	0.207**	0.090	0.119	0.133	0.293***	0.094	–0.157	0.103
BIS	0.010	0.008	0.002	0.005	0.008	0.008	0.006	0.006	0.002	0.006
Equity/Assets	–0.469	0.090	–0.925	0.632	0.142	0.939	–1.259*	0.661	1.514**	0.728
Gov_Own	0.064**	0.027	0.033*	0.019	0.049*	0.029	0.044**	0.020	0.014	0.022
Listing	0.022	0.023	–0.001	0.016	0.026	0.024	–0.022	0.017	0.051***	0.019
R^2	0.266		0.135		0.194		0.450		0.138	

Notes:

[a] Total observations = 214. Refer to Table 4 for the correction of the endogeneity of the bancassurance involvement variable (*Banc*), where the instrumental variables are $Banc_{t-1}$ and *Co_Number*.

[b] *** 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, with consideration of a strategy of cooperation

Variables	RA_{ROE}		RA_{ROA}		*ROE*		*ROA*	
	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.	Coeff.	Std.Err.
Constant	–0.161***	0.034	–0.158***	0.034	–0.566*	0.326	–0.029	0.020
Banc	**0.310****	0.069	**0.329****	0.069	**1.507****	0.661	**0.141****	0.040
BIS	0.003	0.004	0.002	0.004	–0.010	0.041	–0.002	0.002
ln_Asset	0.007***	0.001	0.008***	0.001	0.032**	0.014	0.002***	0.001
Div	–0.009	0.014	–0.014	0.014	–0.342**	0.134	–0.026***	0.008
BIS	0.002**	0.001	0.002*	0.001	0.010	0.008	–0.000	0.000
Equity/Assets	–0.009	0.102	–0.044	0.102	–0.179	0.968	–0.077	0.058
Gov_Own	0.009***	0.003	0.010***	0.003	0.066**	0.029	0.002	0.002
Listing	–0.001	0.003	–0.002	0.003	–0.010	0.024	–0.001	0.001
R^2	0.401		0.410		0.147225		0.245	

Notes:

[a] Total observations = 209. Refer to Table 6 for the correction of the endogeneity of the bancassurance involvement variable (*Banc*), where the instrumental variables are $Banc_{t-1}$ and *Co_Number*.

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.