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Bancassurance and the coexistence of multiple insurance distribution channels

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Abstract

Purpose – This paper investigates why bancassurance coexists with alternative insurance distribution channels in the long run, considering the bank channel is known to involve lower costs than traditional distribution systems. It tests the product-quality hypothesis that maintains that the higher costs of some distribution systems represent expenses associated with producing higher product quality, greater service intensity and/or skills to solve principal-agent conflicts.

Design/methodology/approach – An analysis is conducted on firms operating in the life segment of the Spanish insurance industry over an eight-year sample period. First, the author estimates cost efficiency and profit inefficiency using data envelopment analysis. Cost efficiency enables one to evaluate if the use of the banking channel increases cost efficiency. Profit inefficiency is addressed to identify the existence/absence of product-quality differences. The performance implications of using bancassurance are analyzed by applying Heckman's two-stage random-effects regression model.

Findings – The results support the product-quality arguments. The use of banking channel was found to increase cost efficiency. However, the distribution channel/s utilized did not affect profit inefficiency.

Practical implications – A regulatory environment that supports the development of bancassurance enables this and alternative distribution channels to be sorted into market niches, where each system enjoys comparative advantages in order to minimize insurer costs and maximize insurer revenues. There is no single optimal insurance distribution system.

Originality/value – This is the first study to investigate why bancassurance coexists with alternative insurance distribution channels.

Keywords *Bancassurance*, Product quality, Insurance distribution channels

Paper type Research paper

1. Introduction

Bancassurance is a key life insurance distribution channel in many European markets such as France, Italy, Portugal and Spain [1]. This system involves the distribution of insurance services through bank branches to a bank's customer base (see e.g. Bergendahl, 1995; Swiss Re, 2007). Cost synergies and distribution advantages represent the main benefits of *bancassurance* in comparison to alternative distribution systems. These originate from cross-selling opportunities and joint back-office activities (e.g. asset management, human resources and information technology) (see e.g. Mäenpää and Voutilainen, 2011; Hilliard *et al.*, 2013; Dreassi and Scheider, 2015; Chen, 2019). Despite these recognized cost advantages, the banking channel has been coexisting with alternative insurance distribution systems in some of the European markets for decades. Since economic theory predicts that, in the long-run

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competitive equilibrium, the price of a good or a service will equal the minimum average cost associated with the most efficient product technology and firms with inefficient technologies and higher average costs will not survive, questions arise about the logic of this coexistence [2]. In the insurance industry, researchers have investigated as to why alternative insurance distribution systems (other than the banking channel), which involve different levels of cost for insurers, concur in a market. They have explained this coexistence with two competing arguments: differences in product quality and market imperfections (see e.g. Berger *et al.*, 1997; Klumpes, 2004). However, we are not aware of any studies that have investigated why the banking channel has coexisted over long periods of time with alternative insurance distribution systems. Investigating this issue is relevant: first, to develop theory with empirical support in order to understand the coexistence of alternative distribution channels in a market; second, for regulators, to generate information about the convenience of regulations that allow the sale of insurance products through banking networks and the ownership link of insurance companies and banks; and third, from the management point of view, to provide information about the insurance distribution system choice.

This study aims to contribute to advancing knowledge in these three relevant aspects by investigating why *bancassurance* coexists with alternative distribution systems in the life insurance segment of the Spanish market over an eight-year sample period. Spain is a prominent example of the *bancassurance* phenomenon as banks have been the leading distribution channel for life insurance products over the last three decades (see Rubio-Misas, 2007; DGSFP, 2020). We, *a priori*, explain the long-term presence of the banking channel with alternative insurance distribution systems in a market by the *product-quality* arguments [3]. This theoretical background maintains that the higher costs of some distribution systems represent expenses associated with producing higher product quality, greater service intensity and/or skills to solve principal-agent conflicts (see e.g. Kim *et al.*, 1996; Regan and Tennyson, 1996; Berger *et al.*, 1997; Venezia *et al.*, 1999; Trigo-Gamarra, 2008; Eckardt and Räthke-Döppner, 2010). Since product quality in insurance is essentially unobserved, we follow Berger *et al.* (1997) and test this hypothesis by estimating both cost efficiency and profit inefficiency, using the modern frontier efficiency analysis [4]. The measurement of cost efficiency will be addressed to evaluate if the use of the banking channel increases the insurer cost efficiency. Measuring profit inefficiency will allow identifying the existence/absence of product-quality differences, so that the additional costs of a particular distribution system could be due to superior services, which are compensated through higher revenues.

To answer the main question of this study, we first estimate cost efficiency and profit inefficiency by using the data envelopment analysis (DEA) (see e.g. Cooper *et al.*, 2011; Cummins and Weiss, 2013), which is a non-parametric frontier approach. Then, we analyze the performance implications of the *bancassurance* use by applying Heckman's (1979) two-stage procedure (see e.g. Whitler *et al.*, 2018; Feng *et al.*, 2021). We utilize this framework because the management of insurance firms does not make choices concerning distribution system/s randomly (see Parente *et al.*, 2010). Such a self-selection of distribution system/s needs to be accounted for when determining if *bancassurance* performs better than alternative distribution systems. In particular, we adopt Heckman's (1979) two-stage random-effects regression model as our sample consists of panel data and some of the explanatory variables are time invariant. This analysis, in a first stage, implies the estimation of a probit model on insurer determinants of choosing the bank channel. Consequently, the results of this first-stage analysis are not only used to generate a correction variable for *bancassurance* self-selection, but also provide complementary and useful information. While researchers have devoted efforts to analyzing insurer characteristics that determine the probability of using a particular distribution system (see e.g. Kim *et al.*, 1996; Regan and Tennyson, 1996; Regan and Tzeng, 1999), we are not aware of any previous studies that have evaluated insurer factors associated with the probability of using the banking channel. An investigation of this issue contributes to channel management

research, particularly to our understanding of how company characteristics determine the choice of distribution channel/s (see e.g. Kraft *et al.*, 2015).

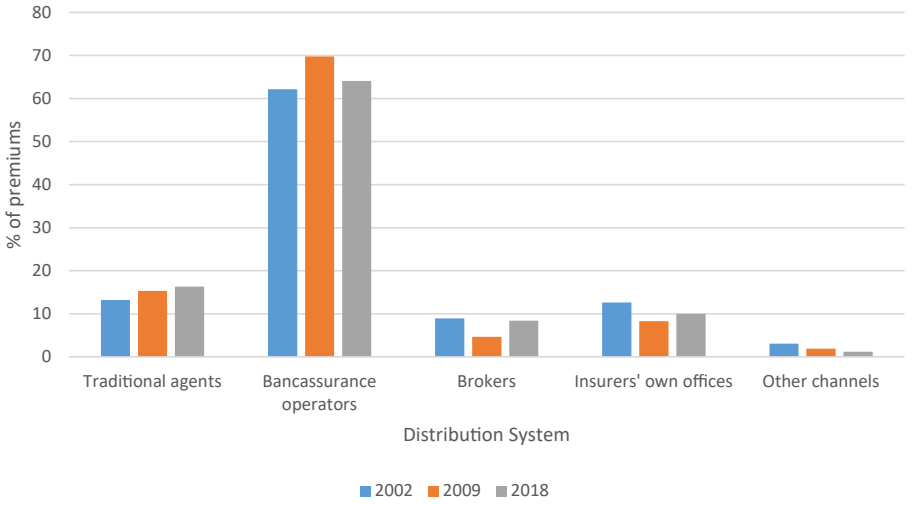
To sum up, this study not only belongs to the strand of literature on the choice of insurance distribution channels but also to the one concerning the convergence of financial services. This is the first study to do the following: (1) formulate and test hypotheses that explain the coexistence of *bancassurance* with alternative insurance distribution channels in the long run; (2) take into account the endogenous selection of distribution systems in the analysis of the performance implications of using *bancassurance* by applying Heckman's two-stage random-effects regression model; and (3) analyze insurer factors that determine the probability of using the banking channel.

The rest of the paper is structured as follows: Section 2 presents an overview of distribution systems in the Spanish life insurance market; Section 3 discusses the theoretical considerations; Section 4 describes the empirical modeling strategy; Section 5 presents the data and the descriptive statistics; Section 6 shows the results and discussion; and finally, Section 7 presents a summary and the conclusions.

2. Distribution channels in the Spanish life insurance market

Since the main distribution systems that operate in the market have been concurring for the last three decades, the Spanish insurance industry offers a particularly interesting laboratory to study why *bancassurance* coexists with alternative distribution channels in the long run. These insurance distribution channels can be classified as follows: (1) traditional agents, (2) *bancassurance* operators, (3) brokers, (4) insurers' own offices and (5) other channels. While traditional agents, *bancassurance* operators and brokers conform the indirect distribution systems that operate in the Spanish insurance market, insurers' own offices and other channels conform the direct distribution systems. Traditional agents are individuals or business firms that have a mercantile contractual relationship with (most times) a single insurer (sometimes with several insurers). However, they are not employees of the insurer/s. They receive commissions as well as incentives based on objectives from the insurer/s on which they depend. *Bancassurance* operators also act as agents. For this reason, they have, like traditional agents, mercantile contractual relationships with (most times) several insurers (although sometimes with a single insurer). However, this channel requires the insurance product sale activity to be carried out by the bank offices. As with the traditional agents, the possible ways through which the *bancassurance* operators could be remunerated are commissions and incentives based on objectives from the insurer/s on which they depend [5]. It is important to highlight that, in the case of traditional agents and *bancassurance* operators, policyholders are customers of the insurers. Brokers are independent individuals or business firms who provide an objective service to their customers by offering several products from different insurers after studying the needs to be covered. They act as market makers who match the insurance needs of policyholders with insurers who have the capacity to meet those needs (see Cummins and Doherty, 2006). In this case, policyholders are broker customers. To ensure their independence from the insurers, brokers only receive commissions from them, never the incentives based on objectives. Nevertheless, brokers may receive direct compensation from their customers. While the insurers' own office channel involves distribution within the insurer offices through a sales force that is under the direct employment of a single insurer, the other channel category refers to distribution via the Internet as well as direct marketing methods such as call centers (see Rubio-Misas, 2007; DGSFP, 2020).

Figure 1 provides information about the allocation (in terms of market share) of life insurance premiums by distribution systems. It presents figures for 2002, 2009 and 2018. We observe that *bancassurance* operators were the main life insurance distribution channel in 2002 (with 62.13% of life insurance premiums), 2009 (with 69.79% of life insurance premiums) and 2018 (with 64.1% of life insurance premiums). The second and third life insurance



Note(s): This figure reports, for 2002, 2009 and 2018, the allocation of life insurance premiums (in terms of market share) by distribution channels in the Spanish insurance industry

Figure 1.
Market share by distribution systems of life insurance premiums in the Spanish insurance market

distribution channels in terms of market share were traditional agents and insurers' own offices, respectively. Traditional agents sold 13.23%, 15.3% and 16.3% of life insurance premiums corresponding to the years 2002, 2009 and 2018, respectively. However, insurers' own offices sold 12.64%, 8.3% and 9.98% of life insurance premiums corresponding to these respective years. We have to highlight from Figure 1 that the importance of the different distribution systems for selling life insurance has persisted over time. In the Spanish insurance industry, the ranking of life insurance distribution channels, in terms of the market share that has persisted over the years, is as follows: (1) *bancassurance* operators, (2) traditional agents, (3) insurers' own offices, (4) brokers and (5) other channels. Since these systems seem to involve different costs for the insurer, these market characteristics have led us to investigate this concurrence.

3. Theoretical background and hypotheses

We explain the coexistence of *bancassurance* with alternative insurance distribution systems in the long run by *product-quality* arguments. As stated before, since product quality in insurance is essentially unobserved, we have followed Berger *et al.* (1997) and framed our study within the context of the modern frontier efficiency analysis by estimating both cost efficiency and profit inefficiency. The starting point of this analysis is to evaluate if the insurers' cost frontier efficiency is positively affected by the use of the bank channel [6]. This is the first step in evaluating the *product-quality* arguments.

Bancassurance is known to involve lower costs for the insurers than traditional distribution channels. One of the main advantages offered by the bank distribution of insurance products relative to other channels is customer relationships. Events that trigger the sales of banking products, such as mortgage applications, allow the cross-selling of insurance products, thus, generating a lower cost-per-sales lead (see e.g. Begendahl, 1995; Swiss Re, 2007; Mäenpää and Voulitainen, 2011). The lower cost could be due to the sharing of physical inputs, staff costs, and distribution networks, the employment of common information systems, investment departments, and account service centers and the reusing of managerial expertise or information to provide multiple financial services (see e.g. Berger, 2000; Hilliard *et al.*, 2013;

Chen, 2019). In addition, brand awareness within geographical regions, frequent interactions with clients and extensive use of technology suggest a competitive advantage over traditional channels (see Swiss Re, 2007; Chen, 2019). Therefore, *bancassurance* seems to outperform traditional marketing channels in saving expenses and expanding the customer segment. This is basically due to the synergy of cross-selling.

These arguments have led us to formulate the following hypothesis.

H1. The higher the proportion of life insurance premiums sold by the banking channel, the higher the insurers' cost efficiency.

Starting from the fact that our results will (presumably) show a positive link between the use of *bancassurance* and cost frontier efficiency, the next step will be to explain why this channel coexists with alternative distribution systems in the market in the long run. As stated, this coexistence can be explained through *product-quality* arguments. According to these arguments, the higher cost associated with some distribution systems is due to the production of higher product quality or greater service intensity, such as reducing the policyholder search costs, offering a greater variety of product choices or providing additional customer assistance (see e.g. Kim *et al.*, 1996; Regan and Tennyson, 1996; Berger *et al.*, 1997). The *product-quality* arguments would imply that the customers who prefer higher product quality or greater service intensity would pay more for the product. This hypothesis is also linked to agency-theoretic explanations of the existence of alternative technologies (see e.g. Mayers and Smith, 1981; Kim *et al.*, 1996; Cummins *et al.*, 2004). This means that principal-agent problems such as incentive conflicts between insurers and customers may be more important for some customers, or for some product variants, and some specific distribution channels may deal with this kind of conflict efficiently (Berger *et al.*, 1997). This could be the case of brokers who, for instance, may discipline insurers more effectively in order to pay claims fairly and promptly. This way, one of the mechanisms that brokers have (which *bancassurance* operators do not) to effectively discipline insurers is the ownership of the policyholder list. Since, in this case, the insurer cannot approach policyholders directly, brokers can threaten to shift their businesses to alternative insurers.

Consequently, we argue that the differences in product quality provided by the different distribution systems explain why *bancassurance* coexists with alternative insurance distribution channels. These differences would imply that the market sorts out distribution channels into market niches, where each one has comparative advantages in production and/or agency costs. With regard to sorting, it is known that the bank channel tends to be specialized in the sale of standardized life insurance products that are easy to sell to the bank customer base through the use of salaried bank employees (see e.g. Swiss Re, 2007; Chen, 2019). That is, since banks have long marketed asset accumulation products, such as saving accounts, it is natural for them to sell life insurance products that have a saving component. Other insurance services that are easy to sell through the bank channel are simple life insurance products that are bundled with existing bank offers, such as credit life. These products are well-suited to be marketed by a generalist bank's sales force. However, complex and advice-intensive products will require more staff training and are not suitable for every bank customer (see Swiss Re, 2007). Complex life insurance products tend not to be sold by the banking channels. Nevertheless, alternative distribution systems, such as brokers, are more suitable for providing complex and advice-intensive products although this may involve higher distribution costs (see Swiss Re, 2007). Therefore, the higher costs of alternative distribution systems in comparison with the ones of the bank channel may represent expenses associated with producing higher product quality, greater service intensity and/or skills to solve principal-agent conflicts. Customers will compensate these expenses by providing higher revenues. Taking into account the aforementioned arguments and considering that profit efficiency is the most comprehensive efficiency concept and the

closest concept to the goal of value maximization, we state the following hypothesis, which is the second step to evaluate the *product-quality* arguments.

H2. The distribution channel/s utilized does/do not affect the profit inefficiency of insurers.

4. Empirical modeling strategy

4.1 Cost efficiency and profit inefficiency

We use the modern frontier efficiency analysis (see Cooper *et al.*, 2011) to obtain the performance measures that allow testing the hypotheses that conform this study. Frontier efficiency measures summarize performance in a single statistic that controls for differences among firms in a sophisticated multidimensional framework, which has its roots in economic theory (Cummins and Weiss, 2013). We particularly use the DEA to provide measures of cost efficiency and profit inefficiency for each firm in our sample. DEA is a non-parametric frontier approach that does not require the specification of a functional form and error term. Efficiency is measured relative to best practice frontiers, which consist of the dominant firms in the industry. Cost efficiency for a given firm is measured as the ratio of the cost of a fully efficient firm (this firm would be on the efficient cost frontier) with the same output quantities and input prices to the given firm's actual costs. A two-step procedure is followed to estimate cost efficiency. First, a linear programming problem is solved to estimate the input vector that minimizes the cost. Second, the minimum cost (the cost of a fully efficient firm with the same output quantities and input prices) to the firm's cost ratio is calculated to obtain the cost efficiency measure of every firm in the industry in the respective year. Cost efficiency scores vary between zero and one, with the efficiency scores of one indicating fully efficient firms.

Profit inefficiency shows the net effects of cost and revenue efficiency. It is defined in terms of the firm's actual profits and optimal profits. Optimal profits refer to the profits that could be obtained if the firm were fully efficient. To estimate profit inefficiency, we particularly utilize the DEA profit efficiency model by Cooper *et al.* (2000) based on the model proposed by Färe *et al.* (1985), which also implies the use of a two-step procedure. First, a linear programming problem is solved to estimate the optimal output vector and the optimal input vector that maximize the (revenues and costs) difference corresponding to a firm with the same output prices and input prices as the ones of the given firm. Then, profit inefficiency is estimated in the following way: (1) the profits of the given firm are subtracted from the optimal profits to provide a measure of the "profit lost (in the form of an 'opportunity cost') by not operating in a fully efficient way" (see Cooper *et al.*, 2000); (2) following this, we express this difference as a ratio in order to be more consistent with our measure of cost efficiency. In doing so, we normalize this difference by dividing it by the sum of actual costs and revenues (see Cooper *et al.*, 2011). Optimal or actual profits, as the denominator, are not used because optimal profits can be zero and actual profits can be ≤ 0. Therefore, unlike cost-efficiency ratios, profit inefficiency does not have to be between zero and one. The optimization problems to estimate both cost efficiency and profit inefficiency are solved with the constraints that imply assuming constant returns to scale [7].

We utilize a modified version of the value-added approach to measure output quantities, input quantities and the corresponding prices, which are needed to estimate cost efficiency and profit inefficiency (see Leverty and Grace, 2010). This approach is in line with most studies on efficiency in insurance (Cummins and Weiss, 2013). Most of the existing studies on efficiency in the insurance industry recognize three main services provided by insurers: risk-pooling and risk-bearing services, real financial services related to insured losses and intermediation services. We follow previous studies on efficiency in the Spanish insurance industry and proxy output quantities by the value of real incurred losses/benefits (see e.g. Cummins *et al.*, 2004).

The value of real incurred losses/benefits – defined as current losses/benefits paid plus addition to reserves – is a satisfactory proxy for the amount of risk-pooling and real insurance services provided. The net addition to reserves is a satisfactory proxy for the current year's intermediation services (see Cummins *et al.*, 2004). Considering that the Spanish insurance industry includes non-life specialists, life specialists and composite insurers that offer both life and non-life insurance, we conduct the analysis over the set of firms that conform the industry by using two separate output quantity measures. These measures are the following: the value of real incurred benefits corresponding to life insurance and the value of real incurred losses corresponding to non-life insurance. Then, since our output quantity variable incorporates the value added from the risk-pooling and intermediation functions, our pricing definition includes both functions. Thus, for each output quantity measure, the output price is defined as [(premiums earned + investment income – output quantity)/output quantity] (see e.g. Cummins *et al.*, 2004; Cummins and Weiss, 2013).

Insurer input quantities are classified into three groups: equity capital, one input category constructed from the business expenses category and debt financial capital. We use the average rate of the total return of the Madrid Stock Exchange Index for the ten-year period preceding each year of the sample period as a proxy for the cost of equity capital. Additionally, since labor is the most important non-interest expense for the Spanish insurance industry, we use the average monthly wage paid to employees in the Spanish insurance sector, provided by the *Instituto Nacional de Estadística* (INE), as a proxy for the cost of the input category constructed from the business expenses category. Finally, we employ the one-year Spanish Treasury bill rate for the cost of debt financial capital (see Cummins and Rubio-Misas, 2006).

4.2 The nexus of bancassurance and cost efficiency/profit inefficiency

The main hypotheses of this study are tested through an empirical model that regresses cost efficiency or profit inefficiency on a variable that represents the insurers' use of the bank channel to sell life insurance, controlling for firm-specific factors [8]. We conducted our analysis using Heckman's (1979) two-step procedure via the maximum likelihood estimation (Wooldridge, 2010). We have used this procedure because the management of insurance firms does not make distribution system choices randomly and, consequently, the self-selection of distribution system/s needs to be accounted for when examining if a specific distribution system performs better than others. This procedure was previously used by Parente *et al.* (2010) to analyze the comparative performance of direct writing and independent agency systems. However, we are not aware of any studies that use it to analyze the comparative performance of the bank channel and alternative distribution channels. This procedure implies that the estimation results of the first-stage model (i.e. a probit model of the probability of choosing the bank channel) are used to generate a correction variable for distribution system self-selection. Furthermore, complementarily to Parente *et al.* (2010), we adopted Heckman's two-stage random-effects regression model as some explanatory variables are time invariant and our sample consists of panel data.

The basic model used for the second stage in this study is as follows:

$$\text{Cost efficiency}_{i,t} \text{ or } \text{Profit inefficiency}_{i,t} = \alpha_1 + \beta_1 \text{Bancassurance}_{i,t} + \beta_2 \text{Firm}_{1i,t} + \beta_3 \text{Crisis}_t + \eta_{1i} + \varepsilon_{1i,t} \quad (1)$$

where i and t refer to the firm and year, respectively. The dependent variable is a measure of cost efficiency or profit inefficiency for firm i in year t. A higher cost efficiency (profit inefficiency) indicates that the firm is more cost-efficient (profit-inefficient). Our key explanatory variable is $Bancassurance_{i,t}$. It represents the proportion of life insurance premiums distributed by the *bancassurance* operators.

We included a set of firm-level (matrix $\text{Firm}_{1i,t}$) control variables in Eq. (1), previously used in literature, which may affect insurer efficiency (see e.g. Gaganis *et al.*, 2013; Cummins and Xie, 2013; Eling and Schaper, 2017). We controlled for firm size by including the log of total assets (see e.g. Cummins *et al.*, 2017; Alhassan and Biekpe, 2019; Rubio-Misas, 2020). We also controlled for capitalization by using the ratio of equity capital to total assets (see e.g. Eling and Schaper, 2017; Cummins and Rubio-Misas, 2021). Furthermore, since the Spanish insurers that operate in the life insurance segment may be life specialists and composite insurers offering life and non-life insurance, we followed Berger *et al.* (1997) and controlled for the insurer product mix. In doing so, we included a variable defined as the ratio of the life insurance output to the total insurance output. Additionally, we took into account that, in the Spanish market, an insurer may use more than one distribution channel. We controlled for this by including a dummy variable that took one if the firm uses more than one distribution system to sell life insurance (see e.g. Trigo-Gamarra and Growitsch, 2010). The effect of organizational form on efficiency was controlled by including a dummy variable that is equal to one for mutuals and zero for stocks (see e.g. Cummins and Xie, 2013; Eling and Schaper, 2017; González-Fernández *et al.*, 2020). Finally, we also considered the period since the financial crisis started (i.e. 2008–2009) by including a crisis dummy variable (Crisis_t). In addition, we included the insurer fixed effect η_{1i} to control for unobservable insurer characteristics constant over time, and $\varepsilon_{1i,t}$ is a random error that has a normal distribution.

The probit model used for the selection process in the first stage is as follows:

$$s_{it} = 1\left(\alpha_2 + \beta_4 \text{Ownership}_{i,t} + \beta_5 \text{Firm}_{2i,t} + \varepsilon_{2i,t} > 0\right) \tag{2}$$

where i and t refer to the firm and year, respectively. Dependent variable s_{it} is equal to one if the firm uses *bancassurance* and zero otherwise. We argue that ownership type is a key factor that influences the probability of using *bancassurance*. We distinguish four ownership types: unaffiliated single company, parent of Spanish insurance group, subsidiary of insurance group and subsidiary of banking group. We expected the subsidiary of the banking group ownership type to have the highest probability of using *bancassurance* as this is the form with the highest level of integration of banking and insurance activities. Therefore, $Ownership_{i,t}$ is a matrix of three variables that represent unaffiliated single companies, parents of Spanish insurance groups and subsidiaries of insurance groups. The omitted ownership type variable is the subsidiary of a banking group. In addition, we consider a set of firm-level control variables (matrix $\text{Firm}_{2i,t}$) that may affect the probability of using *bancassurance*. More precisely, we control for size, capitalization and insurer product mix by using the proxy variables for these determinants, as previously defined. $\varepsilon_{2i,t}$ is a random error that has a normal distribution. The definitions of the variables used in the analysis are listed in Table 1.

5. Data and descriptive statistics

5.1 Data sources

The primary data used in our study consist of balance sheets and income statements for insurers in the Spanish market over the sample period. The data have been obtained from the annual financial statements filed by the insurers with the Spanish regulatory and supervisory authority, namely the *Dirección General de Seguros y Fondos de Pensiones* (DGSFP) [9]. Regarding the information on market share by distribution system, in compliance with the passage of an insurance regulation order of July 2001, insurers under the supervision of the DGSFP have been required to report data on distribution systems since 2002, but this information is not publicly available. Nevertheless, the DGSFP has provided us with confidential reports on market share per distribution system for the 8-year period of 2002–2009. For this reason, our sample period is restricted to the years from 2002 to 2009.

Name	Variable definition
Performance variables	
Cost efficiency	Cost efficiency score calculated using data envelopment analysis
Profit inefficiency	Profit inefficiency score calculated using data envelopment analysis
Distribution system variables	
Bancassurance dummy	*Bancassurance* dummy = 1 if the insurer uses *bancassurance*; 0 otherwise
Traditional agents	Proportion of life insurance premiums distributed by traditional agents
Bancassurance	Proportion of life insurance premiums distributed by *bancassurance* operators
Brokers	Proportion of life insurance premiums distributed by brokers
Insurers' own offices	Proportion of life insurance premiums distributed in the insurers' own offices
Other channels	Proportion of life insurance premiums distributed by other channels
Control variables	
Organizational form	Mutual = 1 for mutual firms; 0 otherwise
Size	Log of total assets
Business mix	Proportion of the total output that the life insurance output represents
Ownership type	
Unaffiliated single company (USC)	USC = 1 if unaffiliated single company; 0 otherwise
Parent of Spanish insurance group (PSIG)	PSIG = 1 if parent of Spanish insurance group; 0 otherwise
Subsidiary of banking group (SBG)	SBG = 1 if subsidiary of banking group; 0 otherwise
Subsidiary of insurance group (SIG)	SIG = 1 if subsidiary of insurance group; 0 otherwise
Additional control variables	
Capitalization	Equity capital/total assets
Multichannel	Multichannel = 1 if the insurer uses more than 1 channel; 0 otherwise
Crisis	Crisis = 1 for observations in the years of the period 2008–2009

Table 1.
Definition of the variables used in the analysis

This period is representative to carry out the main goal of this study, which is to evaluate why *bancassurance* coexists with alternative distribution channels in an insurance market. As we can see in Figure 1, the main distribution systems for the life insurance segment that coexisted in the market in 2002 persisted in 2009 as well as in 2018. As stated above, we particularly observe that the ranking of the distribution systems per market share corresponding to life insurance that appeared in 2002 prevailed not only in 2009, but also in 2018. Therefore, theoretical advances with empirical support about the coexistence of alternative distribution systems that this study provides for the analyzed sample period could be valid for a more recent period. Additional data on ownership type were handmade collected from information on the annual report about the total premiums ranking published in *Actualidad Aseguradora* (INESE).

Furthermore, some observations have been eliminated from the sample because of data problems such as zero or negative net worth or premiums. We consider neither the branches of non-European foreign firms nor reinsurance specialists. Additionally, we have eliminated social benefit institutions (*mutualidades de prevision social*) from the analysis because they hardly account for 2% of the total premium volume in the market. The final sample utilized in the study consists of 679 firm-year observations corresponding to stock and mutual insurers operating in the Spanish life insurance segment. Supplementary data used as proxies of input prices have been obtained from the previously mentioned Spanish governmental sources.

5.2 Descriptive statistics

Summary statistics of the variables used in the analysis of all the firms in the sample as well as the firms using *bancassurance* (*bancassurance* firms) and those who do not use it (non-*bancassurance* firms) are shown in Table 2. The *t*-tests for the differences between the means of the non-dummy variables of these two groups of firms are also included. *Bancassurance* firms represent 61.3% of the sample observations. We observe that, on average, cost efficiency is 0.22 (indicating a 78% potential reduction in cost on average), which is in line with previous results on cost efficiency for the Spanish insurance industry (see Cummins and Rubio-Misas, 2006). We estimated the efficiency scores on all the insurers operating each year in the Spanish market (including life specialists, non-life specialists and composite insurers) since frontier efficiency is a relative measure of performance and these firms compete in the market (for a similar procedure, see Cummins *et al.*, 2004; Cummins and Rubio-Misas, 2006). The mean values per year of output quantities, input quantities, output prices and input prices utilized to estimate cost efficiency and profit inefficiency are shown in Appendix Table A1. The number of firms per year used to construct the yearly efficiency frontiers is also specified in Table A1.

	All firms		*Bancassurance*		Non-*bancassurance*		Differences between *bancassurance* and non-*bancassurance* firms
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev	
Performance variables							
Cost efficiency	0.2179	0.1913	0.2517	0.2114	0.1643	0.1386	0.0874***
Profit inefficiency	5.4933	5.0460	5.2075	5.1268	5.9453	4.8911	−0.7378*
Distribution system variables							
Traditional agents	0.2678	0.3410	0.1138	0.2045	0.5114	0.3708	−0.3976***
Bancassurance	0.4493	0.4708	0.7333	0.3915	0.0000	0.0000	0.7333***
Brokers	0.1310	0.2089	0.0856	0.1702	0.2030	0.2418	−0.1174***
Insurers' own offices	0.1239	0.2361	0.0524	0.1235	0.2370	0.3148	−0.1846***
Other channels	0.0236	0.0897	0.0149	0.0645	0.0372	0.1179	−0.0223***
Control variables							
Mutual	0.1016		0.0385		0.2015		
Size	8.8012	0.7116	8.9368	0.7048	8.5867	0.6694	0.3501***
Product mix	0.7504	0.3594	0.8678	0.2830	0.5646	0.3884	0.3032***
Unaffiliated single company (USC)	0.1414		0.0361		0.3080		
Parent of Spanish insurance group (PSIG)	0.0884		0.0313		0.1787		
Subsidiary of banking group (SBG)	0.3196		0.5072		0.0228		
Subsidiary of insurance group (SIG)	0.4507		0.4255		0.4905		
Capitalization	0.1576	0.1749	0.1248	0.1694	0.2095	0.1711	−0.0847***
Multichannel	0.6362		0.5433		0.7833		
Number of observations	679		417		262		

Note(s): This table reports summary statistics of the variables used in the analysis for the whole sample as well as for *bancassurance* and non-*bancassurance* firms. The last column reports differences in mean values between *bancassurance* and non-*bancassurance* firms. *** and * represent significance at the 1% and 10% level, respectively

Table 2. Summary statistics of the variables used in the analysis. *Bancassurance* vs non-*bancassurance* firms

Regarding the distribution channel variables, the figures in Table 2 show that the percentage of life insurance premiums sold, on average per firm, by the different distribution systems is 26.78%, 44.93%, 13.10%, 12.39% and 2.36%, corresponding to traditional agents, *bancassurance* operators, brokers, insurers' own offices and other channels, respectively. These figures indicate that *bancassurance* operators constituted the main life insurance distribution channel during the sample period. We notice important differences between the *bancassurance* and non-*bancassurance* firms of our sample. The firms using the bank channel are, on average, more cost-efficient than the firms that do not use it. This is a first indicator that *bancassurance* seems to involve lower costs for the insurers than traditional distribution channels. However, *bancassurance* firms are, on average, less profit-inefficient (although this difference is only statistically significant at the 10% level). As expected, the relevance of the different distribution channels differs between these groups of firms. In non-*bancassurance* firms, the fact that the bank channel is not used implies that the importance of all the alternative distribution systems is, on average, higher compared with the *bancassurance* firms. Furthermore, the use of a multichannel distribution strategy is also different between them, with 54.33% (78.33%) of the *bancassurance* firms (non-*bancassurance* firms) using more than one channel. A detailed analysis of the number of distribution systems that the insurers of our sample use, drawing a distinction between the *bancassurance* and non-*bancassurance* firms, is presented in Figure 2. We observe that the allocation of *bancassurance* firms (non-*bancassurance* firms), per number of distribution systems, is as follows: 45.67% (20.77%) used one channel, 14.18% (15%) used two channels, 9.86% (51.15%) used three channels, 17.79% (13.08%) used four channels and 12.5% (0%) used five distribution channels. Consequently, a multichannel distribution strategy is more frequent among the non-*bancassurance* firms of our sample. In fact, most of the non-*bancassurance* firms used three distribution channels.

Organizational form and ownership type also differ between the *bancassurance* and non-*bancassurance* firms of our sample. In this sense, 3.85% (20.15%) of the *bancassurance* firms (non-*bancassurance* firms) are mutuals. Furthermore, the distribution of the *bancassurance* firms (non-*bancassurance* firms) of our sample per ownership type is as follows: 3.61% (30.8%) were unaffiliated insurance companies, 3.13% (17.87%) were parents of Spanish

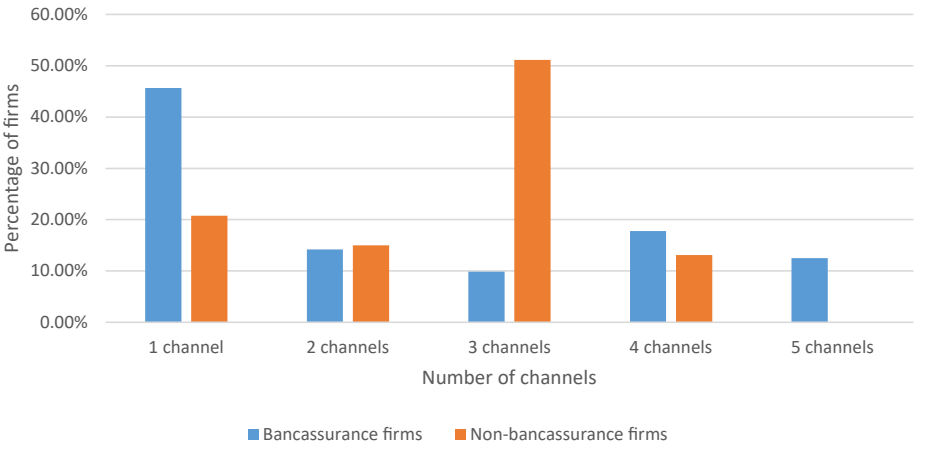


Figure 2.
Multichannel and type of firms

Note(s): This figure reports the allocation of the firms of the sample (in terms of percentage) by the number of insurance distribution channels that they use, distinguishing between bancassurance and non-bancasssurance firms

insurance groups, 50.72% (2.28%) were subsidiaries of banking groups and 42.55% (49.05%) were subsidiaries of insurance groups. We then observe that most of the *bancassurance* firms were subsidiaries of banking groups, which is the model with the highest level of integration of banking and insurance activities. Lastly, we also notice that, on average, *bancassurance* firms were larger and less capitalized than non-*bancassurance* firms.

6. Results and discussion

6.1 Impact of bancassurance on insurer cost efficiency

We started the analysis by evaluating if the insurer cost frontier efficiency increases with the use of the bank distribution channel effectively. Column 1 of Panel A in Table 3 reports the estimation results corresponding to the regression based on Eq. (1) with endogenous sample selection. Within-panel correlation was accounted for using panel-level random effects. Following this, we evaluated the effect that each alternative distribution system compared to the bank channel had on cost efficiency. In doing so, we included variables representing firms' use of these systems instead of the *bancassurance* variable. These variables were traditional agents, brokers, insurers' own office and other channels and represented the proportion of total life insurance premiums distributed by the respective channel. The results of the effects of the use of alternative distribution systems on cost efficiency in comparison to the use of the

	Model 1	Model 2
Panel A: Panel regression estimates of the impact of bancassurance on cost efficiency. The outcome equation		
Bancassurance	0.1242***	
Traditional agents		−0.0873
Brokers		−0.1551**
Insurers' own offices		−0.1467*
Other channels		−0.1147
Size	0.0251	0.0237
Capitalization	−0.3009***	−0.3033***
Product mix	−0.2411***	−0.2367***
Multichannel	−0.0646**	−0.0654**
Mutual	0.1638**	0.1689**
Crisis	0.0355**	0.0343**
Intercept	0.2421	0.3752
Panel B. Probit regression estimates of bancassurance choice. The selection equation		
Parent of Spanish insurance group	−2.7081***	−2.7097***
Unaffiliated single company	−2.7218***	−2.7297***
Subsidiary of insurance group	−1.8494***	−1.8508***
Size	0.5279***	0.5262***
Capitalization	−0.0721	−0.0741
Product mix	0.5753***	0.5709***
Intercept	−3.0543***	−3.0348***
Number of observations	679	679
Number of insurers	115	115
Log likelihood	−75.198	−74.871
Errors correlation	−0.7762***	−0.7757***
Wald Chi-squared	60.33***	61.35***

Note(s): This table presents results of Heckman's two-stage random-effects regression models on the cost efficiency implications of using *bancassurance*. Panel A presents the outcome equation results while Panel B the profit regression results of the *bancassurance* choice. ***, **, * mean statistically significant at 1%, 5% and 10%, respectively

Table 3.
The impact of *bancassurance* on cost efficiency

banking channel are presented in Column 2 of Panel A in Table 3. Focusing on the model fitness results of Table 3 (log likelihood values, error correlation test results and Wald Chi-square statistics), we notice that the correlation between the observation level errors of the outcome and selection equations is significantly different from zero. Consequently, we may conclude that endogenous sample selection is observed and that the use of Heckman's two-stage sample selection is suitable [10].

The results presented in Column 1 of Panel A in Table 3 indicate that the higher the proportion of life premiums sold by the banking channel, the higher insurer cost efficiency. This is because the coefficient of the *bancassurance* variable ($\beta = 0.1242$, $p < 0.01$) is positive and statistically significant. This finding is consistent with the results of Hwang and Gago (2005) and Fiordelisi and Ricci (2011), who found that, in the Irish and the Italian life insurance industry respectively, the use of the bank distribution channel to sell life insurance increases cost efficiency. Furthermore, the results presented in Column 2 of Panel A in Table 3 show that the cost advantages of the bank distribution channel appear particularly in comparison to the brokers and insurers' own office channels. This is because the coefficients of these two distribution system variables ($\beta = -0.1551$ with $p < 0.05$ and $\beta = -0.1467$ $p < 0.1$, respectively) are negative and statistically significant. These results indicate that the higher the proportion of life premiums sold by the brokers or insurers' own office channels compared with the banking channel, the lower the insurers' cost efficiency. This finding indicates that the bank channel seems to involve lower distribution costs for the insurer than the latter two distribution systems. Therefore, our results provide evidence in support of the first hypothesis in the evaluation of the *product-quality* arguments to explain the coexistence of *bancassurance* with alternative distribution channels [11].

Focusing now on the control variables of the cost efficiency analysis (see Table 3), the results indicate that cost efficiency decreased with capitalization as the coefficient of the capitalization variable ($\beta = -0.3009$ with $p < 0.01$ and $\beta = -0.3033$ with $p < 0.01$ in Models 1 and 2) is negative and statistically significant. This finding is consistent with the findings of Eling and Schaper (2017), who, in their analysis of the efficiency of European life insurance companies, found that the overutilization of capital decreased cost efficiency. Furthermore, the results show that the use of more than one channel to distribute life insurance decreased cost efficiency, considering that the coefficient of the multichannel variable ($\beta = -0.0646$ with $p < 0.05$ and $\beta = -0.0654$ with $p < 0.05$ in Models 1 and 2) is negative and statistically significant. Easinwood and Storey (1996) stated that cost disadvantages of a multichannel strategy may arise because of the high investment cost of establishing an additional distribution channel and coordinating the channels. We also notice that the mutuals of our sample show higher levels of cost efficiency than the stocks. This is because the coefficient of the mutual variable ($\beta = 0.1638$ with $p < 0.05$ and $\beta = 0.1689$ with $p < 0.05$ in Models 1 and 2) is positive and statistically significant. This finding is consistent with the one by Cummins *et al.*'s (2010) on the US insurance industry as well as with the one by Eling and Schaper's (2017) on European life insurance companies. The results also indicate that the higher the proportion of total output in life insurance is (the coefficient of the product mix variable is $\beta = -0.2411$ with $p < 0.01$ and $\beta = -0.2367$ with $p < 0.01$ in Models 1 and 2), the lower the cost efficiency, suggesting that operating in non-life insurance seems to be more cost efficient than operating in life insurance. Finally, the results show that the coefficient of the crisis variable ($\beta = 0.0355$ with $p < 0.05$ and $\beta = 0.0343$ with $p < 0.05$ in Models 1 and 2) is positive and statistically significant, indicating that cost efficiency was higher during the sample crisis period.

6.2 Impact of bancassurance on insurer profit inefficiency

The second step to test the *product-quality* arguments was also conducted via Heckman's two-stage panel regression model by using profit inefficiency as the dependent variable in Eq. (1).

We conducted the same regression models as presented in Table 3 and showed the results in Table 4, now considering profit inefficiency as the dependent variable. The results presented in Panel A of Table 4 and the results presented in Panel A of Table 3 provide empirical evidence concerning the *product-quality* arguments. As stated in the cost efficiency analysis, we find that, the higher the proportion of life insurance sold by the bank channel, the higher the insurers' cost efficiency (see Table 3). However, the results presented in Column 1 of Panel A in Table 4 show that the coefficient of the *bancassurance* variable ($\beta = 0.0222$) is not statistically significant, indicating that the use of the banking channel does not affect profit inefficiency. These results suggest that the cost advantage of using the bank channel may be due to the distribution of lower-quality outputs, less intensive services and/or fewer skills to solve principal-agent conflicts that are translated into less expense loading in the insurance premium rate. This finding is in line with the ones by Fiordelisi and Ricci (2011), who found substantial cost economies in the Italian life insurance industry when life policies were offered by bank branches. However, they did not find evidence in favor of revenue synergies. Our results are also in line with recent findings by Chen (2019), who showed that marketing through *bancassurance* reduces the quality of underwriting service in Taiwan. Therefore, our results suggest that the cost economies of using the bank channel seem to translate into lower prices for insurance consumers, since the use of the bank channel does not affect profit inefficiency. This finding is also consistent with the result by Okeahalam (2008), who found a price reduction in financial services thanks to *bancassurance* bundling.

	Model 1	Model 2
Panel A: Panel regression estimates of the impact of bancassurance on profit inefficiency. The outcome equation		
Bancassurance	0.0222	
Traditional agents		−1.7934
Brokers		−0.7982
Insurers' own offices		3.9948
Other channels		1.4260
Size	−0.7063	−0.7487
Capitalization	6.1363***	5.6311**
Product mix	−3.0051	−3.6944**
Multichannel	1.1658	1.1476
Mutual	0.4041	−0.4133
Crisis	−0.1567	−0.0887
Intercept	12.9926**	14.1366*
Panel B. Probit regression estimates of bancassurance choice. The selection equation		
Parent of insurance group	−2.5790***	−2.5910***
Unaffiliated single company	−2.6454***	−2.6394***
Subsidiary of insurance group	−1.6998***	−1.7013***
Size	0.5021***	0.5036***
Capitalization	0.0461	0.0518
Product mix	0.4888***	0.4894***
Intercept	−2.9151***	−2.9273***
Number of observations	679	679
Number of insurers	115	115
Log likelihood	−1456.4209	−1454.1526
Errors correlation	−0.3264**	−0.3306**
Wald Chi-squared	25.83***	30.68***

Note(s): This table presents results of Heckman's two-stage random-effects regression models on the profit inefficiency implications of using *bancassurance*. Panel A presents the outcome equation results while Panel B the probit regression results of the *bancassurance* choice. ***, **, * mean statistically significant at 1%, 5% and 10%, respectively

Table 4. The impact of *bancassurance* on profit inefficiency

The results presented in Column 2 of Panel A in Table 4 reinforce the evidence in support of the *product-quality* arguments, since none of the coefficients of the variables representing alternative distribution systems compared to the bank channel are statistically significant. Consequently, these results, along with those of the cost efficiency analysis (see Column 2, Panel A, Table 3), seem to indicate that the higher cost of using brokers or insurers' own office channels to sell life insurance products seem to be due to the provision of higher quality outputs, more intensive services and/or skills to solve principal-agent problems that are compensated by higher revenues [12].

Observing differences in cost efficiency among distribution channels, but no differences in profit inefficiency, seems to indicate that the different distribution systems coexisting in the Spanish life insurance market in the long run were sorted into market niches, where each channel enjoys comparative advantage in order to minimize costs and maximize revenues. Sorting is predicted to occur through the natural operation of the market as distribution channels compete in terms of price, product offerings and other service dimensions. Our results are in line with those by Berger *et al.* (1997), who found evidence in support of the product-quality arguments for the US property-liability insurance industry. They showed that the higher costs of independent-agency insurers compared to direct-writing insurers were compensated by higher revenues. Furthermore, the results presented in Table 4 also indicate that capitalization not only had a cost efficiency penalty but also a profit efficiency penalty. This is because the coefficient of the capitalization variable ($\beta = 6.1363$ with $p < 0.01$ and $\beta = 5.6311$ with $p < 0.05$ in Models 1 and 2, respectively) is positive and statistically significant in the profit inefficiency analysis [13]. These results are in line with recent findings by Cummins and Rubio-Misas (2021), who showed a cost and a revenue penalty in the insurers that proportionately consume more capital.

6.3 Additional results: bancassurance system choice

As stated before, the two-stage procedure of Heckman's analysis implies the estimation of, in a first stage, a probit model with regard to firm determinants of choosing the bank channel. The results of this first-stage analysis yield complementary and useful information to the performance implications of *bancassurance* results provided in the second stage, since, to our knowledge, this is the first analysis that provides evidence concerning insurer factors associated with the probability of using the bank channel. This is to say that, although there is a relevant strand of insurance literature on the probability of choosing distribution systems (e.g. Kim *et al.*, 1996; Regan and Tennyson, 1996; Regan and Tzeng, 1999), we are not aware of any previous studies evaluating insurers' characteristics associated with the probability of using the bank distribution channel. We present the results of the probit models in Panel B of Tables 3 and 4. All the models have explanatory power as their Wald Chi-squared values are statistically significant at the 1% level. We notice that, in all the regressions, the coefficients of a parent of a Spanish insurance group, an unaffiliated single company and a subsidiary of an insurance group variables are negative and statistically significant at the 1% level [14]. Since a subsidiary of a banking group is the omitted variable, these results indicate that a subsidiary of a banking group is the ownership type with the highest probability of using the bank channel. This result is a consequence of the fact that the *bancassurance* model with the highest level of integration with the banking and insurance activities managed by the same owner is well established in the Spanish insurance market. In this respect, we note that the convergence of banking and insurance in Spain came about in the late 1980s, when many banks entered the Spanish market and gained significant market share, encouraged by the deregulation process [15]. We also observe that the probability of using the bank channel increases with firm size. This finding is in line with previous results showing that insurer size is a determinant of the selection of a distribution system, as shown by Parente *et al.* (2010).

They found that the probability of using direct writers decreases with insurer size. The results also indicate that the higher the proportion of the total output in life insurance output, the higher the probability of using the banking channel. This finding is explained because the banking channel seems to be more suitable for selling life insurance than non-life insurance products. This is due, among other reasons, to the greater similarities that exist between banking products and some life insurance products.

7. Summary and conclusions

This study contributes to the understanding of the choice of insurance distribution channels and to literature concerning the convergence of financial services. It is the first paper to investigate why *bancassurance* coexists with alternative insurance distribution systems in the long run, considering the bank channel is known to involve lower costs than traditional distribution systems. The analysis is conducted on firms operating in the life insurance segment of the Spanish market over an eight-year sample period. The article particularly contributes to advancing knowledge on developing theory with empirical support to understand the coexistence of alternative distribution systems in a market and to generating information to be primarily used by managers and regulators. In this respect, the coexistence of *bancassurance* with alternative insurance distribution channels is explained by *product-quality* arguments, which maintain that the higher costs of some distribution systems represent expenses associated with producing higher product quality, greater service intensity and/or skills to solve principal-agent conflicts. To test these arguments, we follow an empirical model strategy that implies: first, estimating both cost efficiency and profit inefficiency using the DEA; and, second, applying Heckman's two-stage random-effects regression model to investigate the performance implications of using *bancassurance*. Since product quality in insurance is essentially unobserved, cost efficiency has been used to evaluate if the use of *bancassurance* has increased cost efficiency, while profit inefficiency has allowed the identification of the existence or absence of product-quality differences. If the additional cost of a particular distribution system is due to superior service that is compensated by higher revenue, it is expected that the distribution channel/s utilized does/do not affect profit inefficiency, indicating that product-quality differences exist. Furthermore, some steps of the empirical model strategy used in the analysis involve contributions and provide additional information. This is because it is the first paper to consider the endogenous selection of distribution system/s and to control for unobservable characteristics constant over time in the analysis of the performance implications of *bancassurance* utilization and also the first to evaluate insurer determinants influencing the choice of using *bancassurance*. The latter contributes to channel management research, particularly to our understanding of how company factors determine the choice of distribution channel/s.

Consistent with our expectations, the results provide evidence in support of the *product-quality* arguments to explain the coexistence of *bancassurance* with alternative insurance distribution channels. We find that the higher the proportion of life insurance premiums sold by the banking channel (particularly in comparison to the use of brokers or insurers' own office channels), the higher the cost efficiency. However, the results show that the distribution channel/s utilized does/do not affect profit inefficiency. These findings suggest that the cost advantage of using the bank channel seems to be due to the distribution of lower-quality outputs, lower service intensity and/or fewer skills to solve principal-agent conflicts that are translated into lower prices for consumers. These results are in line with previous findings that showed a reduction in the price of financial services due to *bancassurance* bundling (Okeahalam, 2008) and that marketing through *bancassurance* reduced underwriting service quality (Chen, 2019). The results also indicate that a multichannel distribution strategy seems to decrease cost efficiency, probably because of additional investments and coordination

costs. We also find that capitalization has a cost as well as a profit efficiency penalty and that the mutuals of our sample show higher levels of cost efficiency than stocks. Regarding the probit analysis conducted in the first stage, we find that the subsidiary of a banking group is the ownership type with the highest probability of using the bank channel and insurer size increases the chance of utilizing *bancassurance*.

The fact that we notice differences in cost efficiency among the distribution channels, but not in profit inefficiency seems to indicate that the diverse distribution systems coexisting over long periods of time in the life insurance segment of the Spanish market have been sorted into market niches, where each channel enjoys comparative advantages in order to minimize costs and maximize revenues. The deregulation process that started in the 1980s supported the successful development of *bancassurance* in Spain. In view of the current *bancassurance* penetration growth in both developed and emerging markets, one of the implications of our findings is that the establishment of a regulatory environment that allows the sale of insurance products through banking networks would enable the banking channel and alternative insurance distribution systems to be sorted into market niches, where each channel has comparative advantages in production and/or agency costs. From the management point of view, another implication of our findings is that there is no single optimal insurance distribution system in the choice of distribution channels. In addition, observing a positive relationship between the use of the bank channel and insurers' cost efficiency reveals that *bancassurance* success is linked to distribution cost savings for insurers. As a consequence, the mix of products offered by banks should be continuously revised in light of customer needs in order to offer insurance products in which banks have advantages in saving distribution costs in comparison to alternative insurance distribution channels. To do so, banks and insurers in the digital era face the challenge to refine their partnership to ensure they can jointly respond to consumer demand and pool their customer, product and technology expertise to improve the way they serve their shared client base.

Notes

1. To illustrate the importance of the banking distribution channel in some of the European insurance markets, in 2018, the percentage of life insurance premiums sold through the bank channel in France, Italy, Portugal and Spain was 65%, 75%, 80% and 64.1%, respectively (see https://www.insuranceeurope.eu/insurancedata). The concept of an insurance premium used in this paper is the amount of money an individual or business pays for the insurance policy (see e.g. Cummins and Weiss, 2013). In addition to the European insurance markets, *bancassurance* is spreading to other regions, obtaining significant penetration levels in some of the countries of Oceania, Asia and Latin America.

2. These questions are framed within the marketing literature that seeks to understand the different channels that coexist in a market, which are particularly developed in areas such as retailing and tourism (see e.g. Coughlan *et al.*, 2006; Huang *et al.*, 2009; Krafft *et al.*, 2015; Fadairo *et al.*, 2017).

3. The notion of product quality used in this paper is based on the product-based definition of quality (see Garvin, 1984). According to this view, the differences in quality reflect the differences in the quantity of some of the ingredients or attributes possessed by the product (see Leffler, 1982). There are two corollaries in this approach that are important for the analysis conducted in this paper. First, higher quality can only be obtained at a higher cost; second, quality is viewed as an inherent characteristic of goods or services, rather than as something ascribed to them. That is, quality reflects the presence or absence of measurable product attributes and is based on more than preferences alone (Garvin, 1984).

4. The concept of firm cost (profit) frontier efficiency refers to the success of the firm in minimizing (maximizing) cost (profit) conditional on the existing technology (see Cummins and Weiss, 2013). This implies that the cost (profit) of the firm is compared with the cost (profit) of the "best practice' frontier, which is formed by the most cost (profit) efficient firms in the reference set. Therefore, cost

efficiency describes how well a firm utilizes its resources to produce a given output mix and it depends on the extent to which it limits the wasting of resources. Profit efficiency measures how close a firm gets to generating the maximum possible profits, given the input prices and outputs prices, and their comparison with the best-practice frontier (see e.g. Krasnicov *et al.*, 2009).

5. Most traditional agents act as exclusive (tied) agents. That is, traditional agents usually have a mercantile contractual relationship with a single insurer they depend on. However, most *bancassurance* operators act as linked (multi-tied) agents. That is, *bancassurance* operators usually have mercantile relationships with several insurers they depend on. To illustrate this difference, in Spain, by the end of 2019, 69,174 of the 69,411 traditional agents acted as exclusive agents, while in the case of *bancassurance* operators, only 14 of the 52 operators acted as exclusive agents.
6. Most of the previous literature shows that the insurers' cost frontier efficiency depends on the utilized insurance distribution system/s and that the relationship between the use of the bank channel and cost efficiency is positive (see e.g. Berger *et al.*, 1997; Klumpes, 2004; Hwang and Gao, 2005; Cummins *et al.*, 2010; Fiordelisi and Ricci, 2011).
7. See Cummins and Weiss (2013) for a detailed description of the linear programming problems used for estimating cost efficiency and profit inefficiency.
8. Banker and Natarajan (2008) and Banker *et al.* (2019) have demonstrated that the two-step DEA-regression procedure, where DEA-efficiency scores have regressed as dependent variables, yields consistent estimates and performs as well as the best parametric (econometric) method.
9. This database is available at http://www.dgsfp.mineco.es/es/Entidades/balancesycuentas/Paginas/Balancescuentasentidadesaseguradoras.aspx
10. This fact is also valid for the regression models presented in Table 4.
11. As robustness tests of these findings, we conducted the analysis by adopting the Tobit random-effects regression models alternatively, since cost efficiency scores fall between zero and one and our sample consists of panel data (see Peng *et al.*, 2017). In this alternative analysis, the results (available upon request) provide similar findings. That is, in the first regression, we noticed a positive and a statistically significant relationship between the *bancassurance* variable and cost efficiency. In the second regression, the coefficients of brokers and insurers' own office variables are negative and statistically significant.
12. We additionally conducted the profit inefficiency analysis by adopting panel data models. We did not use Tobit random-effects regressions models in this alternative analysis since profit inefficiency ratios do not have to be between zero and one. Results (available upon request) show that none of the coefficients of the distribution system variables are statistically significant, also providing evidence to the *product-quality* arguments.
13. We also investigated if the effect of using *bancassurance* on performance (both on cost efficiency and on profit inefficiency) was different if the insurer is a subsidiary of a banking group, given that this form of ownership type is the model with the highest level of integration of insurance and banking activities. In doing so, we include an interaction term variable that is the result of the subsidiary of a banking group dummy variable and the *bancassurance* variable in Models 1 of Tables 3 and 4. Results (available upon request) show that the coefficient of this interaction term variable is not statistically significant in the cost efficiency analysis as well as the profit inefficiency analysis. These findings indicate that the effect of *bancassurance* on insurance performance does not seem to be different between ownership types.
14. More precisely, the coefficient of a parent of an insurance group is −2.7081, −2.7097, −2.5790 and −2.5910 in Model 1 Table 3, Model 2 Table 3, Model 1 Table 4 and Model 2 Table 4, respectively. The coefficient of an unaffiliated single company is −2.7218, −2.7297, −2.6454 and −2.6394 in the same models, respectively. The coefficient of a subsidiary of an insurance group is −1.8494, −1.8508, −1.6998 and −1.7013 in the same models, respectively.
15. To illustrate this importance, in 1986, 35 banking institutions had a real presence in the Spanish insurance market, and in 1991, the insurers affiliated to banking institutions accounted for 68% of the life insurance premiums (see Esteban-Jodar, 1993).

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Appendix

	2002	2003	2004	2005	2006	2007	2008	2009
Output quantities								
Life	99.229	72.328	78.272	87.372	97.073	95.177	98.966	112.739
Non-life	49.438	50.752	55.377	62.543	66.932	70.418	72.652	72.921
Output prices								
Life	0.333	0.228	0.242	0.214	0.285	0.353	0.488	0.356
Non-life	0.638	0.707	0.727	0.813	0.923	0.95	0.998	0.926
Input quantities								
Equity capital	44.874	49.444	58.52	69.82	79.843	82.576	87.39	94.056
Debt capital	26.41	32.379	41.61	47.185	52.454	57.07	61.939	65.02
Business expenses	10.145	8.917	10.039	11.579	13.665	14.931	11.794	11.519
Input prices								
Equity capital	0.188	0.172	0.153	0.186	0.196	0.194	0.158	0.068
Debt capital	0.034	0.022	0.021	0.022	0.033	0.041	0.037	0.001
Business expenses	2.47	2.535	2.637	2.529	2.556	2.57	3.422	3.477
N	321	331	308	292	278	268	264	267

Note(s): Monetary variables are expressed in constant million 2006 euros, based on the Spanish Consumer Price Index

Table A1. Mean values per year of outputs, output prices, inputs and input prices to estimate efficiency levels

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