Profitability Determinants of the Insurance Sector in Small Pacific Island States: A Study of Fiji's Insurance Companies

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We examine the determinants of profitability of insurance companies in Fiji as a reference country. In Fiji, insurance companies and the services have grown over the years. The study uses a financial evaluation approach. Profitability is measured by the return on assets and the return on equity. Using the two measures and the data published in the key disclosure statements as a mandatory requirement by the Reserve Bank of Fiji, we develop regression models. The fixed-effects regression model and a balanced panel are considered for the analysis. The sample comprises eight insurance companies' financial data over the period 2010–2015. First, a base model is estimated, followed by additional models which include interaction effects as part of the sensitivity analysis and further insights. The general outcome of the estimation is that premium income, underwriting expenses, administrative expenses, and volume of capital are positively associated with profitability, whereas leverage measured by total liability over equity, and contingent liability are negatively associated with profitability. Inclusion of interaction effects provides results consistent with the base model. The study is a first attempt to analyse Fiji's insurance sectors and provides useful information in terms of financial management of the sector. The findings can assist the insurance sector and the policy makers to formulate strategies for revenue and cost management.

Keywords: *Insurance Sector; Profitability; Fixed-Effects; Developing Nations; Fiji.*

Introduction

The insurance industry is based on the principle of trades in risk. The insurer is the underwriter of the insurance cover or the insurance company who undertakes to compensate the insured against certain events. First, the trades in risk, like trade in any other goods, are mutually beneficial. Agents who are risk-averse transfer risk to the insurers who are less risk-averse (usually risk-neutral) and pay a price for the risk transfer, the premium. Insurers eliminate risks via diversification. Because of the fact that risks are ubiquitous in human life, the type of insurance cover varies from medical, vehicle, building and life, among other types of insurance products.

While a considerable number of studies have investigated insurance markets, they are mainly focused on developed countries. Studies focusing on less-developed, and small island countries are meagre.

Similar to the banking sector, the business of insurance is built on consumers' trust and confidence that the insurance company will be in the position to compensate for the financial damage. However, the insured is not in the position to oversee the company's financial performance or assess if the company will be able to bear all the risks in the future.

Therefore, it is important that the insurer sustains consumers' confidence so as to ensure proper functioning of insurance markets. This is due to the time structure of insurance contracts where the insured pays periodically an insurance premium and expects to receive compensation in the event the risk materializes at some point in the future. Thus, an insurance company must be able to compensate for these contingent damages.

In economic theory, models of insurance markets are mostly based on the papers of Akerlof (1970) and Rothschild and Stiglitz (1976). The path-breaking ideas behind these papers are the market failures resulting from adverse selection and moral hazard. Accordingly, most of the papers in the literature focus like the mentioned ones on the existence of equilibria in insurance markets and on the efficiency of insurance contracts (Stiglitz *et al.,* 2017). The role of insurance companies plays only a minor role in the theoretical literature; in most papers it is simply assumed that the market of insurance is competitive and that the production costs and transaction costs of insurances are zero (Rees & Wambach, 2008 p. 46). However, Raviv (1979) was one of the first who has introduced positive transaction costs, which in general to the outcome that optimal contracts imply deductibles. Other important issues regarding solvency and capital requirements were tackled by Munch and Smallwood (1981), Finsinger and Pauly (1984) and Rees et al (1999). They investigate why regulation is probably necessary and unavoidable, particularly if insurance buyer has only bounded rationality. If the buyer would be fully rational is will be sufficient if the regulatory agency would collect and distribute information

about the default risks of the insurer. In the presence of regulation, it must be stated, that the more a regulatory agency requires from an insurer the higher the barriers to entry the insurance market and the lower is the degree of competition in the insurance market. Another issue is that insurances have partly problems to solve which are usually related to financial institutions like investment funds. This results from the fact that insurers, particularly life insurers, have to invest huge amounts of wealth resulting from premiums. Therefore, effective oversight, supervision and regulation through a government body help boost consumer confidence in the insurance market and the related products while assuring long-term solvency. The main reason and justification for the government intervention in the insurance market is, that similar to the banking sector, a bankruptcy of one insurer can lead to the loss of the customers' confidence in the insurances' solvency and as a consequence the whole insurance market will be negatively impacted by a reduced demand, and in the worst case the insurance market will breakdown. Hence, the performance of the insurance companies is of high importance, because only profitable insurance companies are able to cover the risks they have taken.

In order to keep the insurance markets working efficiently, in most countries the central bank is the competent institution to supervise the insurance companies, because it has the capacity to estimate risks and to value the securities of insurances. Nevertheless, the central bank has no better information about uncertainties than insurers and may consider different indicators to monitor the economic performance of insurance companies.

In this study, we examine the determinants of the profitability of the insurance sector in Fiji, a small developing island economy in the Pacific. The financial market of Fiji is considered reasonably more developed than the other smaller Pacific Island Countries (PICs). Earlier studies on the financial institutions in the PICs largely focused on the profitability, efficiency and competitiveness in the commercial banking sector (Sharma & Nguyen, 2010; Sharma & Gounder, 2013; Sharma, Gounder, & Xiang, 2013, 2015; Sharma *et al.,* 2014; Kumar & Patel, 2014; Sharma & Gounder, 2015; Kumar *et al.,* 2018). Outside the Pacific region, studies on the financial sector, for example in the European Union member countries includes Lileikienė (2008), Lileikiene & Likus (2011), Sufian & Kamarudin (2014) and Mileris (2015).

The absence of studies on the insurance sector in the PICs is due to the lack of data availability in the past. Since 2010, the Reserve Bank of Fiji (RBF) made it compulsory for all financial institutions, including the insurance companies operating in Fiji to provide an annual key disclosure statement (KDS). The KDSs are published on the RBF's website for the general public to access the basic financial information.

The study is undertaken as a first attempt to examine the profitability determinants of the insurance companies in Fiji. The motivation to pursue the study is as follows. First, the demand for insurances has steadily increased due to the economic development of the economy and the changing institutional arrangements. For example, with the rise in the demand for cars, largely propelled by the ease of obtaining credit facilities from banks, developments in infrastructure and reduction of duties on specific types of vehicles, there is a subsequent increase in the demand for motor vehicle insurance policies.

Second, more employers are making it compulsory for their employees to be insured against health risks, and this led to an increase of demand for health insurances. Although governments in the developing Pacific island economies including Fiji do not strictly require employers to insure their employees against health risks, large organizations prioritize employees' health insurance.

Third, there is a general concern for a well written code of conduct to protect the interest of insurance policy holders. The concerns are mostly resulting from a lack of clarity of the code of conduct regarding the time frame in which the insurers have to respond to claims, requests, and complaints. This is critical to ensure business confidence (Payne & Dimanche, 1996) and high level of business ethics and moral standards (Laczniak & Murphy, 1991). In the case of Fiji, the review of regulations on the insurance sector and their services have not been forthcoming despite noting a strong growth of insurance sector measured in terms of in customer base and types of services.

Fourth, the growth in the real estate market and the subsequent demand for mortgages have contributed to the increase in the demand for property insurances, because usually banks require such an insurance to secure the loan.

Our initial analysis based on the computation Hirschman-Herfindahl index indicates the insurance sector in Fiji is moderately concentrated, with HHI of 2400.[1] Moreover, the determinants of profitability for insurance sector can vary across countries and regions. One reason is that insurance firms have generally two income sources – the insurance premiums and the returns generated by funds from the accumulated insurance premiums. If the latter is the main source of income, then either the funds are placed in risky forms of investments or in long-term investments. In both cases, insufficient liquidity can result if a systemic risk such as natural disasters like cyclones or tsunamis, which are common in the Pacific and Atlantic oceans, eventuate. Further, Fiji's insurance sector is growing in terms of premium incomes, and there are some concerns that the services are not affordable and accessible to low-income earners.

Clearly, insurance sector has an important role in the economic development of Fiji. Its existence and solvency is necessary for other sectors of the economy to function effectively. However, there is no study done on the insurance sector along these lines in the small and island economies in the Pacific. Thus, this study aims to examine the plausible determinants of insurance profitability in the developing PICs. Understanding the key determinants of profitability will facilitate in developing strategies to improve the level of efficiency and profitability. For regulators and general public, study of this type gives important information regarding the factors influencing the insurer's profitability.

Our analysis is mainly restricted to the firm-level financial data provided by the insurance companies as KDSs to the RBF. We use regression analysis to examine the level of significance of various factors that could influence

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[1] HHI lies in the range 0 (highly competitive market) and 10,000 (monopoly).

profitability of the insurance companies. The rest of the study contains sections on literature review, data and methodology, results, and conclusion.

Literature Review

Financial institutions use profitability as an important indicator of performance and valuation (Strumickas & Valanciene, 2006). Various studies have examined the factors influencing insurance companies' performance in various countries.

Adams' (1996) study focuses on life insurance companies in New Zealand. Adams explores the relationship between investment earnings measured by the percentage yield on invested assets net of transaction cost such as management fees, and the organizational characteristics over the period of 1988 to 1993. The results obtained from a pooled weighted least squares regression method showed that investment earnings were higher for stock companies (insurance companies owned by policyholders) than mutual insurers (insurance companies owned by shareholders). Further, it was noted that investment earnings were positively associated with size, leverage and underwriting risk. The underwriting risk was computed as the actual annual loss divided by annual premium income. However, a negative correlation was noted between financial assets of the insurance firms and investment yields; and the liability structure had no effect on the investment earnings.

Focusing on insurance companies in Nigeria over the period 1984-1991 and using a quantile regression, Born (2001) notes that profits have strong association with size and the number of competitors. However, a weak relationship was noted between profit and the insurer's regulatory and legal requirements.

In another study, the determinants of corporate financial performance were investigated in the Bermuda insurance market by Adams and Buckle (2003). Their analysis use insurance firm-level data over the period 1993-1997. They measure financial performance as the ratio of net investment income to net premiums earned, and the ratio of annual operating expenses to net premiums. They note that these two measures of profitability were positively related to the underwriting risk. However, the study notes that size of the insurance firms, measured by total assets, and scope of insurance firms' activities did not have any influence on profitability. It was further noted that high leveraged firms had a better financial performance than the low leveraged ones.

Shiu's (2004) study is based on the UK's 1,922 general insurance companies, over the period 1986–1999. The results indicate that liquidity, unexpected inflation, interest rate and underwriting profits have significant influence on the performance of the insurance companies. The study uses three indicators of financial performance – investment yield, percentage change in shareholders' fund and return on return on equity or shareholders' fund.

Browne, Carson and Hoyt (2001) examine 1,593 life insurance companies in the US over the period 1985–1995. They use fixed-effects (FE) and random-effects (RE) regression methods. They found that portfolio returns on bonds and personal income of the insured were positively related to the performance of the insurance companies,

whereas unanticipated inflation had a negative association. In another study, Greene and Segal (2004) explore the profitability and efficiency in the US life insurance industry over the period 1995–1998. They use the stochastic frontier method to derive cost efficiency and conclude that inefficiency was negatively associated with return on equity; and that the shareholder owned companies were as efficient and profitable as the policy-holder owned companies.

McShane, Cox and Butler (2010) examine the relationship between the regulatory competition measured by multiple regulators in the market, and the profitability of life insurance firms in the US over the period 1999-2003. Data on regulatory competition was gathered from the multi-jurisdictional regulatory system and the number of regulators monitoring the insurers. Using a sample of 554 insurance firms, the study notes that the regulatory competition and profitability were positively associated.

Boadi, Antwi and Lartey (2013) analyze the profitability of sixteen insurance firms in Ghana over the period 2005-2010. They used the ordinary least squares approach. Their findings note that leverage and liquidity are positively associated with profitability.

In a more recent study, Ismail (2013) considers the determinants of financial performance of Islamic and conventional insurance companies in Malaysia over the period 2004-2007. The financial performance was measured by investment yield, calculated as net investment income divided by average assets. The study notes that size, measured by total assets, reinsurance dependence, measured as reinsurance ceded to total assets, and solvency margin are significant determinants of investment performance of general Islamic companies. For conventional insurance companies, profit and interest rate levels, solvency margin, stability of underwriting operation, measured by the change in gross contributions that is written off in the current year relative to the previous year, and liquidity were negatively related to financial performance, whereas size and reinsurance dependence were positively related.

In the case of Lithuania, Ulbinaite, Kucinskiene and Moullec (2013) examine insurance policy purchasing behavior in using survey data with 336 respondents. Their study identified five plausible factors affecting the decision to buy an insurance policy – the suitability of insurance conditions, insurer's competence, the customers' monetary attitude towards insurance, the customers' previous insurance experience, and the option of reducing insurance premiums for a given insurable sum.

Burca and Batrinca (2014) study 21 Romanian insurance firms over the period 2008–2012 using fixed-effect and random-effect methods. Their estimations show that financial leverage, company size, measured by total assets, growth of gross written premiums, underwriting risk (ratio of gross claims to gross written premiums), risk-retention ratio (net written premiums to gross written premiums) and solvency

margin are significant drivers of the financial performance, measured by return on assets.[2]

Alhassan, Addisson and Asamoah (2015) test the structure-conduct-performance hypothesis of Bain (1951) and Baumol, Panzar and Willig (1983), measured by the Herfindahl Hirschman index and concentration ratio, and the efficiency structure hypothesis, measured by the efficiency scores obtained through data envelopment analysis. Alhassan et al. report a positive association between firm size and profitability of life insurance companies. However, a negative association was noted between underwriting risk with profitability. Moreover, for non-life insurance companies, leverage had a positive association with profitability whereas for life insurance companies, leverage was negatively associated with profitability. In general, inflation had a negative association with profitability.

In a study of 202 Portuguese and Spanish insurance firms, Felicio and Rodrigues (2015) find that firm size and the age of insurance companies did not have statistically significant relationship with profitability.

As noted from above studies, the determinants of profitability vary for each country's insurance market. Moreover, it is evident that earlier researches have mainly concentrated on developed and emerging markets. By focusing on a small island country like Fiji, this study provides additional insights and contributes to the insurance firm performance literature.

Profiles of Insurance Companies Operating in Fiji

The Reserve Bank of Fiji (RBF) is the regulator for all insurance companies in Fiji. The insurance industry consists of eight companies. These are Life Insurance Corporation of India (LICI), Sun Insurance, Tower Insurance, Dominion Insurance, BSP Life, QBE, New India Assurance Company Ltd and Fiji Care Insurance Ltd. Table 1 presents a summary of the insurance firms in Fiji. Figure 1 shows a general increase in the net earned premiums in the insurance sector, in nominal terms.
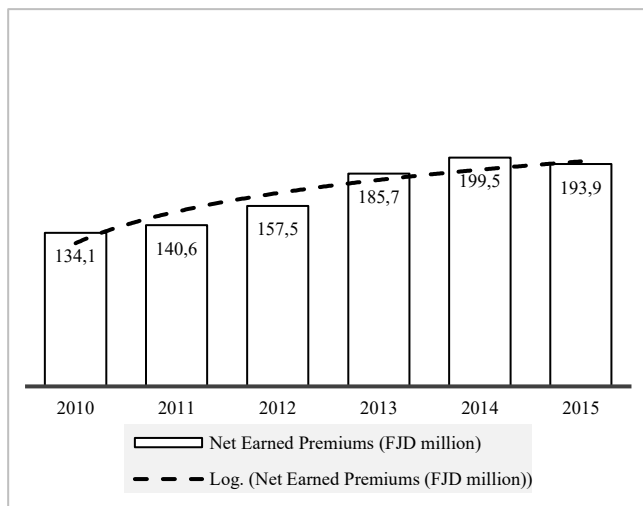

Figure 1. Net Earned Premiums (FLD Milion)

Note: Data on insurance companies complied from the Reserve Bank of Fiji's website. *Source*: Reserve Bank of Fiji (2017) and authors' own calculations.

Figure 2. Net Earned Premiums (% of Assets and Equity)

Note: Data on insurance companies compiled from the Reserve Bank of Fiji's website. *Source*: Reserve Bank of Fiji (2017) and authors' own calculations.
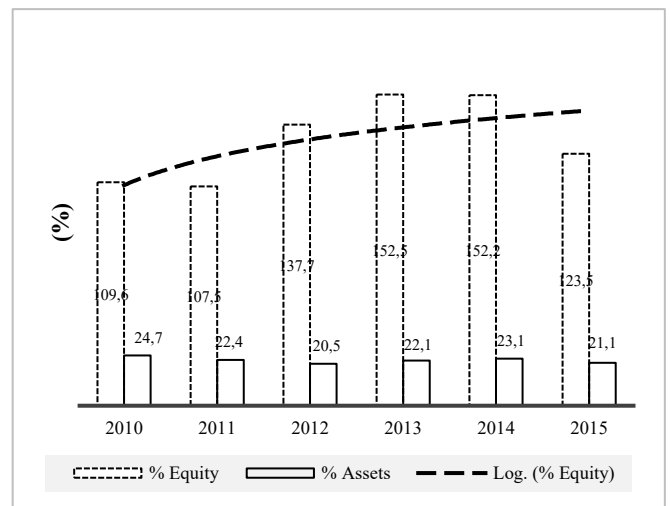
Table 1

Profile of Insurance Companies in Fiji

Company Name	Ownership	Establishment date	No. of branches	Products and Services	Total asset base (for year 2015)	Total customers
Life Insurance Corporations of India (LICI)	Subsidiary Company of LICI India	1956	3	Personal insurance, Micro Insurance, Group Insurance	560.29 million	> 55000
Sun Insurance	100 % locally owned company	1999	15	Public liability insurance, Motor vehicle Insurance, House insurance, Commercial insurance & workers compensation insurance	70.60 million	> 80000

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[2] From the literature survey, it was noted that the studies which used fixed and random effects model, the former was preferred based on the Hausman test.

Company Name	Ownership	Establishment date	No. of branches	Products and Services	Total asset base (for year 2015)	Total customers
Tower Insurance	Subsidiary of TOWER Limited from New Zealand	1974	2	Business Insurance, Travel insurance, Motor Insurance, House Insurance	39.38 million	N.A
Dominion Insurance	Subsidiary of Capital Insurance Group Limited from PNG	1987	2	Commercial Insurance, House Insurance, Motor vehicle insurance, personal insurance & workers compensation insurance	24.88 million	N.A
BSP Life	Subsidiary of bank of South Pacific Limited from PNG	1876	10	Life insurance, Mortgage Protection	17.78 million	> 50000
QBE	Subsidiary of QBE Insurance Group Limited from Australia	1974	1	Commercial Insurance, Personal Insurance, House insurance, Motor vehicle insurance & workers compensation insurance	66.27 million	N.A
The New India Assurance company Ltd	Subsidiary of New India Assurance company Ltd from India	1954	4	Personal insurance, commercial insurance, liability insurance, social insurance	128.45 million	N.A
FijiCare Insurance Limited	Incorporated and Domiciled in Fiji; Listed on South Pacific Stock Exchange	1995	3	Health Insurance & mortgage protection	13.33 million	N.A

Note: N.A means data not available for the respective insurance companies. Only FijiCare Insurance Limited, and BSP Convertible Notes (BCN), a subsidiary of BSP Financial Group Limited, are listed on the South Pacific Stock Exchange. *Source*: Authors' compilation from annual reports and company websites.

Figure 2 shows the ratio of net earned premium to assets has been fairly stable, whereas the ratio of net earned premium to shareholders equity has shown an increase from 2010 to 2014 and a modest decline in 2015. The general growth in net earned premium is largely attributed to increase in the demand for insurance services, and more specifically, in the second-hand vehicles sales market (Kumar, 2014). Also, the close link between credit institutions and the insurance companies to facilitate credit sales of vehicles further simplifies the premium generating strategies of insurance companies.

Data & Method

Data

The data was handpicked from the key disclosure statements (KDSs) reported on the Reserve Bank of Fiji's (RBF) website (RBF, 2017). Our sample consists of all eight insurance companies. Due to conflicting start dates in data, we restrict the sample to the period from 2010 to 2015 to achieve a balanced sample for analysis.

The decision to use the return on assets (ROA) and equity (ROE) as measures of profitability was based on the literature. Moreover, we used the literature as a guide to identify the factors that can plausibly influence the profitability of the insurance firms in Fiji. Our sample is restricted to data available in the KDSs of the respective insurance firms. The KDSs contain a standard set of data on each insurance company in Fiji, as it is required by the RBF for monitoring and regulatory purposes. In this regard, we argue that the data available is appropriate to conduct firm-level analysis and generate useful insights. Each KDS report contains data on

underwriting provisions, other provisions and other liabilities as part of total liabilities which we use as a measure of debt and to calculate the leverage. Unfortunately, data on the number of employees, expenses at disaggregated levels, the board structure and composition, the specific debt levels, history and strategic plans, are not available in the disclosures. Arguably, it is safe to assume that the available data are most important to assess the liquidity and stability positions and performance of the insurance sector in Fiji.

In Table 2, we provide the definitions of the key variables that were computed from the raw data. Additionally, we construct nine hypotheses that are tested in this study.

Model and Method

The base model (Model I) is set-up based on the literature and is specified below:

$$\pi_{i,t} = \beta_1 LEV_{i,t} + \beta_2 PREMINC_{i,t} + \beta_3 CONTINGENT_{i,t} + \beta_4 UNDEXP_{i,t} + \beta_5 UNDWRPRV_{i,t} + \beta_6 ADMIN_{i,t} + \beta_7 HHI_{i,t} + \varepsilon_{i,t} \qquad (1)$$

where $\pi_{i,t}$ represents profitability measured by the ROA and ROE. The subscript *i* denotes the specific insurance company (*i*= 1, …, 8) and the subscript *t* denotes the year (*t*= *2010,…, 2015*). In the fixed-effect estimation, a one way error component is assumed, that is, $\varepsilon_{i,t} = \mu_{i,t} + \lambda_{i,t} + \vartheta_{i,t}$ where $\mu_{i,t}$ denotes the insurance-specific effects that cannot be observed. For example, in our case, this can be the staff skills, knowledge and experience, and the organizational and hierarchical structure that may influence the profitability and performance; $\lambda_{i,t}$ is the time-specific component, and $\vartheta_{i,t}$

denotes a random term which is assumed to be independently and identically distributed.[3]

The model is further extended to gain additional insights and also to assess the stability and robustness of the results. Thus, we incorporate the interactions effects. In Model II, HHI is replaced with SIZE. In Model III, we incorporate both SIZE and HHI. In model IV, VOC is included. In models V, VI and VII, the interaction effects are added. That is, the interaction between SIZE and HHI (Model V), SIZE and VOC (Model VI) and HHI and VOC (Model VII) are included. Further, the Hausman test is conducted to determine identify the appropriate test to select between the fixed-effect and random-effect (Ismail, 2013; Sumaira & Amjad, 2013; Burca & Batrinca, 2014; Kamat *et al.,* 2016; Kumar & Patel, 2014; Kumar et al., 2018; Alhassan *et al.,* 2015). For our purpose, the test indicated the fixed-effect regression model as the most appropriate one to use.

Table 2

Data Indicators and Hypotheses

Hypo-thesis (H#)	Variables	Definition	Expect-ed Sign
Independent Variable			
N.A	Return on Assets (ROA)	$ROA_{i,t}$ $= \dfrac{Net\ profit\ before\ ta}{Total\ Assets_{i,t}}$	N.A
N.A	Return on Equity (ROE)	$ROE_{i,t}$ $= \dfrac{Net\ profit\ before\ ta}{Total\ Equity_{i,t}}$	N.A
Dependent Variable (Base Model)			
H₁	Leverage (LEV)	$LEV_{i,t}$ $= \dfrac{Total\ Liability_{i,t}}{Total\ Equity_{i,t}}$	(-)
H₂	Premium Income (PREMINC)	$PREMINC_{i,t}$ $= \dfrac{Net\ Premium\ Incom}{Total\ Assets_{i,t}}$	(+)
H₃	Contingent Liability (CONTINGENT)	$CONTINGENT_{i,t}$ $= \dfrac{Contingent\ Liability}{Total\ Liability_{i,t}}$	(-)
H₄	Underwriting Expenses (UNDEXP)	$UNDEXP_{i,t}$ $= \dfrac{Underwriting\ expen}{Total\ expenses_{i,}}$	(-)
H₅	Underwriting Provisions (UNDWRPRV)	$UNDWRPRV_{i,t}$ $= \dfrac{Underwrting\ provis}{Total\ Liability}$	(-)
H₆	Administration Expenses (ADMIN)	$ADMIN_{i,t}$ $= \dfrac{Admin\ Expenses_{i,t}}{Total\ Expenses_{i,t}}$	(-)
H₇	Herfindahl-Hirschman index (HHI)	$HHI_{i,t}$ $= \sum_{i=1}^{8} (\dfrac{Total\ Re}{\sum_{i=1}^{8} Total\ Re}$	(+)
Additional Dependent Variables (Robustness Check)			
H₈	Firm Size (SIZE)	$LnAssets_{i,t}$	(+)
H₉	Volume of Capital (VOC)	$VOC_{i,t}$ $= \dfrac{Total\ Equity_{i,t}}{Total\ Assets_{i,t}}$	(+)
	HHI and SIZE	$HHI * SIZE$	(?)
	SIZE and VOC	$SIZE * VOC$	(?)
	HHI and VOC	$HHI * VOC$	(?)

Source: Authors

Table 3

Variables and Definitions

Variables	Definitions
Dependent Variables	
Return on Assets (ROA)	Measure of profitability relative to the amounts of assets invested in an insurance firm
Return on Equity (ROE)	ROE is an indicator for profitability, where it is measured by the ratio between profits and equity of an insurance firm.
Explanatory Variables	
Leverage (LEV)	Is defined as the debt to equity ratio of an insurance firm assessing its ability to meet its financial obligations.
Premium Income (PREMINC)	Major form of revenue for insurance firms. The net premium income to total assets can interpreted as an indicator for the solvency of an insurance, and hence, the lower the value the lower is the risk that the insurance has not enough securities to cover potential losses.
Contingent Liability (CONTINGENT)	A liability which is not recorded in the financial statements as it is not known yet if a liability will be materialized, for example an insurance firm facing a lawsuit so this can impact the profitability in a negative manner.
Underwriting Expenses (UNDEXP)	Represents the expense involved in the underwriting process which can directly have an impact of the profitability
Underwriting Provisions (UNDWRPRV)	Represents the present obligation of insurance firms to pay for the claim which it takes in the underwriting process which can affect the stability and profitability of insurance firms
Administrative Expense (ADMINEXP)	Represents the expenses which are not tied to a specific function such as manufacturing but includes expenses such as salaries and wages and general services expenses which can directly impact profitability
Market Share Concentration (HHI)	Measures the size of firms in relation to the industry which mainly indicates the amount of competition in the market which can improve efficiency, stability and profitability of insurance firms
Firm Size (SIZE)	Size in this case is measured by assets of companies which can directly impact the amount of profit they earn in the market
Volume of capital (VOC)	Measures the capitalization which is the amount of capital present in an insurance firm. This under the signalling hypothesis of Berger (1995) is that the banks management signals private information that future prospects are good by increasing capital. This can also apply in the case of insurance firms which can affect its stability and profitability.

Source: Authors

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[3] Moreover, we also considered the macroeconomic variables such as inflation, economic growth, interest rates and the structural variables such as political and financial crisis. They were excluded from the final analysis as they did not have any effect on the profitability.

Results

Descriptive Statistics and Correlation Matrix

In Table 4, the descriptive statistics are presented. Apparently, the total equity figure for insurance companies is relatively small compared to the assets, thus giving a higher percentage of ROE, compared to ROA, which is smaller due to high asset values. Moreover, the standard deviation of ROE (6.97) is relatively higher than ROA (0.09) thus implying that ROE is comparatively more volatile. Notably, there is a greater disparity in profitability in terms of ROE while ROA is reasonably stable across firms. In this regard, ROA should be a better measure of profitability than ROE. In any case, we consider both measures.

On explanatory variables, the leverage (LEV) is computed as total liability/total equity; and premium income (PREMINC) is premium income over total assets. As noted from the variance, the PREMINC is relatively stable across firms. The contingent liability as the ratio of total liability is used to compute CONTINGENT. The contingent liability is not listed in the statement of financial position. However, it is included as part of the notes in the financial reports. The low ratio of CONTINGENT is due to the low levels of contingent liability across the insurance companies, which indicates that insurance firms in Fiji operates generally in a low risk environment.

The underwriting expense (UNDEXP) is measured as the underwriting expense/total expense. The underwriting provision (UNDWRPRV) is the underwriting provisions over total liability. The administration expense as a ratio of total expense is denoted by ADMIN. The HHI based on the premium income as a measure of market concentration has a mean value of 2401 and indicates a relatively concentrated insurance market for Fiji.[4] The natural log of assets of the insurance firms is used to measure the size (SIZE). As noted, the average SIZE is 17.683 (FJ$47.84 million) and ranges between 15.93 (FJ$8.25 million) and 20.14 (FJ$560) million. The huge disparity in the range indicates the presence of a few relatively large and dominant insurance companies in Fiji. Additionally, the volume of capital (VOC) measured is by equity over assets as a share of total assets.

In terms of correlation, (Table 5) ROA is positively correlated with LEV, UNDEXP, UNDWRPRV, SIZE, and the interaction between SIZE and HHI (SIZE*HHI). However, only UNDEXP, SIZE and SIZE*HHI are statistically significant within the conventional 1-10 percent level. We also find that ROA is negatively correlated with PREMINC, CONTINGENT, ADMIN, HHI, VOC, SIZE*VOC and HHI*VOC but only PREMINC and CONTINGENT are statistically significant. Considering ROE as a measure of profitability, the results indicate that ROE is positively and significantly correlated with LEV, UNDWRPRV, SIZE and SIZE*HHI. Notably, the PREMINC, VOC, SIZE*VOC, and HHI*VOC have a negative and statistically significant correlation with ROE.

Regression Analysis

The Hausman test statistics is carried out on the base model to select appropriate model of estimation. The results

based on the chi-squared statistic supports fixed-effects over random-effects model in both cases. We note that for dependent variable, ROA, $\chi^2 = 52.47$ and for ROE, $\chi^2 = 101.75$. The regression results from the fixed-effects estimation are reported in Table 6 (with ROA as the dependent variable) and Table 7 (with ROE as the dependent variable). As noted, LEV, CONTINGENT, HHI, VOC and HHI*VOC are negatively associated with ROA. However, only LEV, CONTINGENT and HHI*VOC are statistically significant within the conventional levels. A reason for leverage (LEV) having a negative association with ROA and ROE, caused by the effect that increasing liabilities or debt level put a greater pressure on the firm's ability to meet its financial obligations, and increases the possibility of drawing down liquid and fixed assets to meet obligations. Thus, increasing liabilities decrease the ability of firms to use and accumulate assets to generate profits, and hence they negatively affect the profitability. Another possibility is that high leverage or debt level can give rise to higher financial stress thus decreases the adjusted present value and hence the profitability of the highly leveraged firms. Additionally, LEV and HHI*VOC have a negative and significant association with ROE as a dependent variable (Table 7). The high HHI generally indicates a concentrated market, and hence lower competition. As a result, too high premiums and too less contrasts compared to the competitive outcomes have to be expected. While CONTINGENT and HHI are positively associated with ROE, they are not statistically significant.

The results indicate that PREMINC has a positive and significant association with ROA and ROE, thus implying that an increase in premium improves the level of profitability. This is consistent with other studies (....), since premium income is the main source of revenue for the insurers. Hence, **H₁** and **H₂** are accepted; both, a higher leverage and higher premiums imply a higher profitability.

Both CONTINGENT and UNDEXP (Table 6) are statistically significant. We note that CONTINGENT has a negative association and UNDEXP has a positive association with ROA. The contingent liability represents payment that can possibly materialize at any time in future for reasons such as lawsuit where the insurance company can be legally required to pay for the liability. If a firm is in such a situation, it has to raise or set aside adequate collaterals which cannot be paid out to the shareholders. A higher amount of contingent liabilities puts greater stress on the resources and hence exerts a negative effect on profitability. Thus, **H₃** is accepted; contingent liabilities and profitability are negatively associated. On the other hand, the positive association between UNDEXP and ROA results in the rejection of **H₄**. UNDEXP is an inherent expense of the insurance industry in order to attract new customers and to accomplish new insurance contracts. The positive association between UNDEXP and ROA indicates that higher underwriting expenses can result in greater profitability. The logic behind this at the first moment paradoxical result, is that the expenses lead to more contracts and accordingly more premiums, and as a result the profits will increase. Thus, the growth in revenue outweighs the increase in underwriting expenditure, with a net positive effect on profits. We also note

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[4] Note: a HHI < 1500, 1500 < HHI < 2500 and HHI > 2500 implies a competitive market, moderately concentrated market, and a highly concentrated market, respectively. See for example: https://www.justice.gov/atr/herfindahl-hirschman-index.

a marginally positive correlation between UNDEXP (expenses) and PREMINC (revenues).

The underwriting provisions (UNDWRPRV) represent the present obligation of insurance firms to pay for the claims taken in the underwriting process. The provision can be computed as the probability of a bad event multiplied by the expected damage resulting from it. The results show that UNDWPRV, although positively associated with ROA and negatively associated with ROE, is not statistically significant. The UNDWPRV does not directly affect net profits and any increase does not necessarily translates to actual payments. On one hand, the positive effect of

UNDWRPRV is plausible because increased underwriting provisions could mean high expected risks which are met via stored liquidity management or adjusting the assets of the company. With higher anticipated risks and decline in the size of the company measured by total assets, the ROA will increase if the net premiums remain unchanged or increases. On the other hand, a negative association between ROE and UNDWRPRV could be the case due to decline in net premiums, downward adjustments to assets, whilst holding shareholders equity unchanged. In both cases, the size of the firm decreases. In our case, we reject **H₅** that underwriting provision is negatively associated with profitability (ROA).

Table 4

Descriptive Statistics

	ROA	ROE	LEV	PREM-INC	CONTI-NGENT	UNDEXP	UND-WRPRV	ADMIN	HHI	SIZE	VOC	SIZE*HHI	SIZE*VOC	HHI*VOC
Mean	0.07	2.51	20.19	0.43	0.00	0.23	0.85	0.16	2401	17.68	0.34	42473	5.81	797.81
Median	0.08	0.23	1.69	0.33	0.00	0.15	0.85	0.13	2350	17.62	0.37	42043	6.41	827.15
Maximum	0.31	29.84	183.45	0.99	0.05	0.75	0.99	0.46	2736	20.14	0.60	54190	10.45	1598.8
Minimum	-0.10	-0.99	0.67	0.12	0.00	0.09	0.63	0.00	2013	15.93	0.01	32272	0.11	12.38
Std. Dev.	0.09	6.97	49.50	0.25	0.01	0.15	0.09	0.12	249.9	1.13	0.17	5326	2.94	404.67
Skewness	0.24	2.99	2.47	0.72	3.29	1.46	-0.40	0.44	-0.038	0.48	-0.64	0.19	-0.56	-0.52
Kurtosis	3.25	10.83	7.42	2.27	13.63	4.75	2.87	2.25	1.845	2.61	2.67	2.38	2.68	2.81
Jarque-Bera	0.61	193.97	87.74	5.26	312.38	23.02	1.32	2.71	2.681	2.12	3.48	1.07	2.75	2.23
Probability	0.74	<0. 01	<0.01	0.07	<0.01	<0.01	0.52	0.26	0.262	0.35	0.18	0.59	0.25	0.33

Note: The ratios presented in the table are not in percent but report as percent.
Source: Authors

The administrative expense (ADMIN) has a positive association with both measures of profitability, however only statistically significant with ROA. An efficient administration of resources and daily operation is likely to support income generating activities and have an overall positive effect on profitability. Hence, we reject **H₆**.

With respect to market concentration measured by the HHI, we find a negative association with ROA and a positive association with ROE. However, the association is not statistically significant within the conventional levels The results indicate that even the HHI is high, that Fiji's insurance market has the characteristics of a contestable market (Baumol, Panzar and Willig, 1983). Hence, we do not have sufficient evidence to accept **H₇**, that HHI is positively associated with profitability. We note that the average HHI is close to 2500 which indicates a relatively concentrated market for insurance in Fiji. Furthermore, we note that the interaction terms, HHI*VOC (Table 6 and 7I) and SIZE*HHI (Table 7) have negative and significant association with profitability. This implies that the strength of the association between HHI and profitability is largely influenced by SIZE and VOC. Moreover, the coefficient of SIZE is negatively associated with ROA and ROE in all the estimations. Thus, we reject **H₈** that SIZE is positively associated with profitability. The impact of SIZE could be non-linear with profitability. Thus, profitability could increase with SIZE and then declining because of increasing bureaucratic and overhead costs and other reasons (Athanasoglou et al., 2008). Barros et al. (2007),

using banks in their study, argue that diversified banks perform poorer than smaller banks, which are able to reduce asymmetric information problems with lending. A similar argument can be put forward for insurance companies to explain the negative association between size and profitability. Moreover, growth in assets like buildings and branches (fixed assets) can be counterproductive as marginal returns diminishes with low economies of scale. In case of Fiji, with relatively small geography and population size, increasing asset base of insurance companies may not necessarily improve profitability.

The volume of capital (VOC) is the amount of capital available for the insurance firm. The association between VOC and ROA is negative but not statistically significant. The association is positive and statistically significant in Model VII of Table 6 only when the SIZE and the interaction effect of HHI and VOC (HHI*VOC) are used. In this case, we note that in addition to the positive association between the VOC and ROA, HHI*VOC is negative and statistically significant. The association between VOC and ROE is positive and statistically significant as well. The positive association between VOC and profitability is plausible because high a volume of capital signals a high degree of credibility in the market, which can lower the costs of refinancing. Additionally, it cannot be denied that economies of scale occur in the management of investment activities. Thus, we accept **H₉** that the association between VOC and profitability is positive

Table 5

Correlation Matrix

Variable	ROA	ROE	LEV	PREM-INC	CONTI-GENT	UND-EXP	UND-WRPRV	ADMIN	HHI	SIZE	VOC	SIZE*HHI	SIZE*VOC	HHI*VOC
ROA/ROE	1.00 -----	1.00 -----												
LEV	0.19 (0.21)	0.61^A (<0.01)	1.00 -----											
PREM-INC	-0.36^B (0.01)	-0.38^A (0.01)	-0.55^A (0.000)	1.00 -----										
CONTI-NGENT	-0.30^B (0.04)	-0.09 (0.53)	-0.14 (0.35)	$(0.49)^A$ (<0.01)	1.00 -----									
UND-EXP	0.34^B (0.02)	-0.21 (0.16)	-0.29^B (0.05)	0.07 (0.63)	0.19 (0.18)	1.00 -----								
UND-WRPRV	0.12 (0.43)	0.44^A (0.00)	0.58^A (<0.01)	-0.13 (0.38)	0.09 (0.55)	-0.48^A (<0.01)	1.00 -----							
ADMIN	-0.12 (0.43)	-0.11 (0.47)	-0.15 (0.31)	0.25^C (0.08)	-0.14 (0.34)	-0.61^A (<0.01)	0.19 (0.19)	1.00 -----						
HHI	-0.19 (0.20)	-0.12 (0.44)	0.09 (0.55)	-0.00 (0.99)	-0.05 (0.72)	-0.02 (0.87)	-0.01 (0.94)	-0.13 (0.39)	1.00 -----					
SIZE	0.35^B (0.01)	0.52^A (<0.01)	0.71^A (<0.01)	-0.94^A (<0.01)	-0.49^A (<0.01)	-0.08 (0.57)	0.18 (0.21)	-0.35^B (0.02)	0.06 (0.70)	1.00 -----				
VOC	-0.21 (0.16)	-0.64^A (<0.01)	-0.99^A (<0.01)	0.58^A (<0.01)	0.14 (0.35)	0.28^B (0.05)	-0.57^A (<0.01)	0.16 (0.27)	-0.08 (0.60)	-0.73^A (<0.01)	1.00 -----			
SIZE*HHI	0.30^B (0.04)	0.48^A (<0.01)	0.70^A (<0.01)	-0.91^A (<0.01)	-0.49^A (<0.01)	-0.09 (0.55)	0.18 (0.23)	-0.36^B (0.01)	0.26^C (0.08)	0.98^A (<0.01)	-0.72^A (<0.01)	1.00 -----		
SIZE*VOC	-0.22 (0.14)	-0.66^A (<0.01)	-0.99^A (<0.01)	0.61^A (<0.01)	0.15 (0.32)	0.27^B (0.06)	-0.56^A (<0.01)	0.17 (0.24)	-0.08 (0.62)	-0.75^A (<0.01)	0.99^A (<0.01)	-0.74^A (<0.01)	1.00 -----	
HHI*VOC	-0.21 (0.16)	-0.64^A (<0.01)	-0.99^A (<0.01)	0.58^A (<0.01)	0.14 (0.35)	0.28^B (0.05)	-0.57^A (<0.01)	0.16 (0.26)	-0.09 (0.54)	-0.73^A (<0.01)	0.99^A (<0.01)	-0.72^A (<0.01)	0.99^A (<0.01)	1.00 -----

Notes: p-values are given in the brackets; A, B and C represents 1 %, 5 % and 10 % level of statistical significance.
Source: Authors

Table 6

Fixed-Effects Regression: Dependent Variable ROA

Independent Variable	I	II	III	IV	V	VI	VII
Constant	0.332	0.33	0.54	0.33	5.81	-0.10	2.71
	(0.55)	(0.82)	(0.91)	(0.91)	(8.81)	(1.30)	(1.28)
LEV	-0.04^A	-0.04^A	-0.04^A	-0.20	-0.18	-0.25	0.02
	(0.02)	(0.01)	(0.02)	(0.13)	(0.14)	(0.16)	(0.15)
PREMINC	0.09^A	0.08^B	0.08^B	0.13^B	0.12^B	0.14^B	0.04
	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)	(0.06)	(0.07)
CONTINGENT	-3.24^A	-3.34^A	-3.35^A	-3.14^A	-3.42^A	-2.97^B	-3.92^A
	(1.11)	(1.17)	(1.18)	(1.18)	(1.27)	(1.25)	(1.14)
UNDEXP	0.13^A	0.13^A	0.13^A	0.12^A	0.13^A	0.12^A	0.15^A
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
UNDWRPRV	0.16	0.17	0.17	0.19	0.18	0.19	0.20
	(0.14)	(0.14)	(0.14)	(0.14)	(0.15)	(0.15)	(0.13)
ADMIN	0.33^B	0.34^B	0.32^B	0.32^B	0.32^B	0.34^B	0.24
	(0.16)	(0.16)	(0.17)	(0.17)	(0.17)	(0.17)	(0.16)
HHI	-0.04	-	-0.04	-0.04	-0.72	-0.03	-0.225^B
	(0.07)		(0.07)	(0.07)	(1.09)	(0.07)	(0.10)
SIZE	-	-0.02	-0.01	-0.02	-0.33	0.00	-0.04
		(0.04)	(0.04)	(0.04)	(0.49)	(0.06)	(0.04)
VOC	-	-	-	-0.22	-0.18	-0.42	1.12^B
				(0.17)	(0.18)	(0.46)	(0.57)
SIZE*HHI	-	-	-	-	0.04	-	-
					(0.06)		
SIZE*VOC	-	-	-	-	-	0.01	-
						(0.01)	
HHI*VOC	-	-	-	-	-	-	-0.13^A
							(0.05)
R-squared	0.81	0.81	0.82	0.82	0.83	0.83	0.85
Adjusted R-squared	0.74	0.73	0.73	0.73	0.73	0.73	0.77
SER	0.04	0.04	0.04	0.04	0.04	0.04	0.04
SSR	0.06	0.06	0.06	0.05	0.05	0.05	0.04
Log likelihood	94.20	94.02	94.26	95.45	95.76	95.62	99.87
F-statistic	10.32	10.23	9.38	9.04	8.37	8.31	10.26
Mean dependent var.	0.07	0.07	0.07	0.07	0.07	0.07	0.07
S.D. dependent var.	0.08	0.08	0.08	0.08	0.08	0.08	0.08
AIC	-3.30	-3.29	-3.26	-3.27	-3.24	-3.23	-3.41
SBC	-2.72	-2.71	-2.64	-2.61	-2.54	-2.53	-2.71
HQC	-3.08	-3.07	-3.03	-3.02	-2.98	-2.97	-3.15
DW stat.	2.43	2.39	2.38	2.46	2.46	2.55	2.59

Notes: A, B and C represents 1 %, 5 % and 10 % level of statistical significance, and ( ) includes the standard errors.
Source: Authors

Table 7

Fixed-Effects Regression: Dependent Variable ROE

Independent Variable	I	II	III	IV	V	VI	VII
Constant	-10.99^B	-16.89^B	-17.85^B	-14.39^C	119.01^C	6.80	9.34
	(4.85)	(7.12)	(7.93)	(7.48)	(68.17)	(9.11)	(9.96)
LEV	-1.15^A	-1.17^A	-1.18^A	1.45	2.06^B	3.65^A	3.69^A
	(0.13)	(0.13)	(0.13)	(1.06)	(1.06)	(1.14)	(1.17)
PREMINC	2.66^A	2.91^A	2.90^A	2.10^A	1.82^A	1.53^A	1.21^B
	(0.31)	(0.37)	(0.38)	(0.48)	(0.48)	(0.45)	(0.51)
CONTINGENT	5.62	8.93	8.98	5.62	-1.08	-2.92	-2.20
	(9.87)	(10.17)	(10.31)	(9.66)	(9.84)	(8.78)	(8.84)
UNDEXP	-0.24	-0.25	-0.25	-0.15	-0.06	0.09	0.12

Independent Variable	I	II	III	IV	V	VI	VII
UNDWRPRV	(0.26)	(0.26)	(0.26)	(0.24)	(0.24)	(0.22)	(0.23)
	-0.66	-0.86	-0.81	-1.24	-1.44	-0.98	-1.15
ADMIN	(1.26)	(1.23)	(1.26)	(1.18)	(1.13)	(1.03)	(1.04)
	0.90	1.27	1.39	1.27	1.15	0.44	0.48
HHI	(1.39)	(1.38)	(1.46)	(1.35)	(1.30)	(1.20)	(1.22)
	0.31	-	0.17	0.17	-16.41^C	-0.02	-1.70^B
SIZE	(0.577)	-	(0.59)	(0.55)	(8.443)	(0.48)	(0.76)
	-	0.41	0.39	0.51	-6.99^C	-0.35	0.33
VOC	-	(0.35)	(0.36)	(0.34)	(3.83)	(0.39)	(0.30)
	-	-	-	3.55^A	4.40^A	13.53^A	16.94^A
SIZE*HHI	-	-	-	(1.42)	(1.43)	(3.25)	(4.40)
	-	-	-	-	0.946^B	-	-
SIZE*VOC	-	-	-	-	(0.48)	-	-
	-	-	-	-	-	-0.39^A	-
HHI*VOC	-	-	-	-	-	(0.12)	-
	-	-	-	-	-	-	-1.33^A
							(0.42)
R-squared	0.94	0.94	0.94	0.95	0.96	0.96	0.96
Adjusted R-squared	0.91	0.91	0.91	0.92	0.93	0.94	0.94
SER	0.37	0.36	0.36	0.34	0.32	0.29	0.30
SSR	4.39	4.24	4.23	3.53	3.12	2.58	2.64
Log likelihood	-10.71	-9.89	-9.83	-5.45	-2.53	2.07	1.50
F-statistic	34.72	36.00	32.67	36.01	37.25	45.50	44.39
Mean dependent var.	0.39	0.39	0.39	0.39	0.39	0.39	0.39
S.D. dependent var.	1.21	1.21	1.21	1.21	1.21	1.21	1.21
AIC	1.07	1.04	1.08	0.94	0.86	0.66	0.69
SBC	1.66	1.62	1.70	1.60	1.56	1.37	1.39
HQC	1.29	1.26	1.31	1.19	1.12	0.93	0.95
DW stat.	2.17	2.35	2.35	2.07	2.08	1.96	2.09

Notes: A, B and C represents 1 %, 5 % and 10 % level of statistical significance
Source: Authors

Conclusion

This study explores the firm specific factors that significantly affect the profitability of insurance companies in Fiji over the period of 2010–2015. We take a financial evaluation approach to conduct the analysis. Our balanced sample consists of all insurance firms which make up the insurance sector in Fiji. Profitability is measured by the return on assets and return equity. We use the fixed-effect method for estimation. Some important results are underscored in the context of Fiji's insurance sector. The association of leverage and contingent liability with profitability is negative and statistically significant, whereas the association of premium income, underwriting expense, administration expense and volume of capital with profitability is positive and significant. The interaction effects are included to gain additional insights and to examine the possibility of changes in the sign of the variables used in the base model. We note that HHI and SIZE are negatively associated with profitability provided certain interaction effects are accounted for. Additionally, based on the association of VOC with ROA and ROE, we conclude that the insurance sector's profitability depends only weakly on the asset incomes but strongly on premiums or revenues following the underwriting of policies.

However, we are cautious not to generalize the finding. We acknowledge that a similar and more detailed analysis will provide additional insights, especially when we include data on the number of policyholders, branches, investment portfolio, specific debt levels relative to equity, and the different types of products among others. Also, we appreciate the fact that causality may go in multiple directions which can be explored as part of further research. Additional insights can be derived if we consider larger sample size, which unfortunately was not available at this point for Fiji's case. Given the small insurance sector relative to the European markets, direct comparisons could not be made. However, small developing economies could possibly relate to the findings of this paper.

To improve profitability, insurance companies will need to ensure they continue to generate sufficient premiums. To do so, they will need to develop greater trust, and build strong customer relationship. The regulators and the insurance sector need to closely work together in order to maintain insurance services affordable given the fact that there are various phases of a typical cycle that the insurance company endures, and one of them is the hard market stage that involves substantial increase in insurance premiums and reduced availability (Gron, 1994). With small population size and geographical reach, insurance companies will be faced with challenges in achieving economies of scale. However, accuracy in calculating the probability of risk eventuating and keeping close tabs on the developments in different sectors like real estate, transportations, health, banking, investment vehicles, among others will prepare the insurance firms to develop, diversify and innovate products to generate stable profits.

This study contributes to the existing literature on profitability and insurance in the context of developing PICs. The study provides some important considerations to improve and/or sustain profitability in the insurance sector in Fiji. The study can be extended to other small and developing countries', especially in the Pacific, because in most regard, the structural features of the insurance sectors are same – few insurance firms, concentrated market, small population and

customer base, and growth in the demand for similar insurance products/services. Finally, government can make insurances affordable for the poor by providing some form incentive scheme combined with subsidies. From an academic point of view, this study will be useful for classroom studies by students and researchers working on projects in the area of insurance in small island economies.

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