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Ownership type, business model, market structure, and the performance of Takaful and conventional insurance companies in Malaysia

Shaikh Hamzah Abdul Razak[1], Fekri Ali Shawtari[2]* and Bilal Ahmad Elsalem[3]

Abstract: The paper evaluates the performance of the Takaful and insurance companies in Malaysia. It examines the impact of ownership, business model, and market structure on conventional and Takaful companies' performance. The inter-firm comparisons provide information about the performance and competitiveness of firms operating under different modes of business. The study adopts the unbalanced panel data approach with Panel Corrected Standard Error (PCSE) regression to analyse the data of 44 Malaysian Takaful and insurance companies with 255 firm observations over the period from 2011 to 2016. The study's findings show that Takaful and insurance companies perform at par in terms of their premiums. However, Takaful has better investment income. Foreign-owned firms perform better than local firms. The efficient market hypothesis is more powerful than the structural conduct hypothesis in explaining the firms' performance. The study's implications are expected to help improve and develop the Takaful and insurance sector as an efficient industry in-line with regulation changes. To the

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PUBLIC INTEREST STATEMENT

• Takaful and Insurance industry are growing rapidly in Malaysia in last two decades.

• Comparison between Takaful and conventional insurance based on performance indicators, market structure, banking model and ownership type is conducted.

• The difference between Takaful and conventional insurance is very clear in their investment incomes, but not in premium.

• Foreign firms are better than local firms in the some of the selected indicators of performance.

• The efficient market hypothesis is more powerful than the structural conduct hypothesis in explaining the firms' performance.

• It is well-documented that Takaful operators face significant competition from the well-established and well-capitalised conventional insurance

• Regulators are recommended to promote the healthy competition in the industry.

best of our knowledge, this paper is the first to compare the Takaful with conventional insurance in Malaysia concerning their performance, market structure, and ownership.

Subjects: Economics; Insurance; Business, Management and Accounting

Keywords: Takaful; insurance; performance; ownership; market structure; PCSE. Malaysia

1. Introduction

The interest in the Islamic finance industry has been growing during the last decade. The resilience of industry in the market even during economic turmoil has motivated researchers to investigate the institutions' various aspects and characteristics under its umbrella and compare them with the counterpart, the conventional industry. The Takaful industry (Islamic insurance) has been under investigation recently due to the concerns raised over the conventional insurance functioning (Rubio-Misas, 2020; Kantakji et al., 2020; Lee et al., 2019, 2018).[1] For the case of Malaysia, Takaful and the insurance industry have recorded positive growth in recent years. The share of *Takaful* net contribution as a proportion of the total insurance and Takaful business increased to 18.3% in 2019 compared to 16.6% in 2018. This indicates consistent growth of the Malaysian's Takaful business ((Bank Negara Malaysia, 2019). Fitch ratings' special report ((2019) shows that Takaful continues to gain share in the insurance market, where the family Takaful recorded a market share of 32% of the life market in 2018 compared to 30% in 2018, and it has made up of 60% of the new business in Malaysia. Bank Negara Malaysia report of 2019 reported that compound annual growth rate (CAGR) of net contribution income for years 2017–2019 was 16.7% for family Takaful compared 6.7% for life insurance. It was also reported that general Takaful CAGR for the same period was 19.7% compared to 1.15 for general insurance (Bank Negara Malaysia, 2019). These indicators show the Takaful industry's significance in Malaysia and stiff competition with conventional insurance players. These structural changes in the market are healthy as they enhance the sector's performance, and reflect its real growth, positively impacting the whole economy.

Takaful companies operate in parallel with conventional insurance in a dual system; it is of paramount importance to understand the Takaful and insurance industry and elaborate on the drivers of the performance on which the industry and regulatory bodies should focus to reduce their inefficiency, maintain competition, enhance the stability of the sector, fulfil the needs and satisfaction of their current and prospective customers, and hence putting together the industry in the appropriate setting in terms of competition and efficiency. Specifically, this paper investigates the interrelationships between market structure, business models, ownership and performance in a comparative manner between Takaful and conventional insurance.

In this regard, our study is distinctive from prior research in several ways. First, the previous investigation of the Takaful business in Malaysia has explored non-life Takaful firms with several Takaful operators sampled was four to six companies (see, e.g., Ismail, 2013; Ismail et al., 2011) or Takaful operators without comparing with conventional insurance (see, e.g., Lee et al., 2019, 2018). However, this study examines the determinants of performance for the conventional insurance and Takaful in both types of business, namely life and non-life operations for a sample of 11 Takaful companies and 33 conventional insurance firms operated in Malaysia of 2016.

Second, we assess those companies' performance considering their business models classified into Takaful operations and conventional insurance operations. There is careful attention given to whether the business model's influence on performance is shaped by factors such as operators' size, total administrative expense, and market structure. Few studies in Malaysia have conducted an empirical

investigation on the business models. However, they have not further examined the conditionality of such relationship on other factors (Ismail, 2013; Ismail et al., 2011; Lee et al., 2018).

Third, this study adds to the literature by ascertaining whether ownership types categorised into the local and foreign matter for firms' performance. Lee et al. (2019) examined the impact of foreign participation on Takaful firms' performance. However, this paper extends Lee et al. (2019) by comparing the impact of ownership on conventional and Takaful firms. Moreover, the study further examines whether ownership's influence on the performance is different if interacted with other factors.

Fourth, research in the Malaysian context has overlooked the importance of market structure in determining firms' performance. Therefore, we expand the research on the determinants by looking into the influence of market structure on various firms' performance. The market structure could play a significant role in the pricing policy, which contributes to evaluating the risk and hence on the premium earned by the firms. Limited studies have examined the link between market structure and performance worldwide (see, e.g., Alhassan et al., 2015; Elango et al., 2008; Lorenz & Jumah, 2006). However, to the best of our knowledge, we are not aware of any previous papers analysing market structure influence on the conventional and Takaful performance in Malaysia.

Finally, the study uses panel correlation standard errors to correct for any econometric problems, given the small sample size. This paper discusses the literature review in section 2 and hypotheses development in section 3. Section 4 highlights the methodology of the article. While the results are discussed in section 5, section 6 concludes and offers the implications of the study.

2. Literature review

Physical and moral hazards emerge out of risk awaiting those encountering them. People or businesses are exposed to many threats that can compromise their financial circumstances (Sherif & Hussnain, 2017). They can hold these risks and bear the future consequences or can pass the risks to insurance agencies by paying premiums to avail the same (Bouslama & Lahrichi, 2017). This type of insurance appears to be contrary to Shariah principles. Islamic way to diversify risks is to build the Takaful industry. Takaful works on Tabarru (donations) and cooperation, free from forbidden elements of Islam, such as Gharar (uncertainty), Maysir (speculation), and Riba (interest) (Saiti & Abdullah, 2016).

The literature analyses the performance and factors that may drive the performance of conventional insurance and Takaful companies. They are growing in the last decade (see, e.g., (Al-Amri, 2015; Alshammari et al., 2019; Hussein et al., 2014; Kader et al., 2010; Kantakji et al., 2020; Saad et al., 2006).

Kader et al. (2010) studied the cost-efficiency of non-life *Takaful* insurance firms operating in 10 Islamic countries. They found that nonexecutive directors and separating the Chief Executive Officer (CEO) and Chairman functions do not improve the cost-efficiency of Takaful insurers. However, the board size, firm size, and product specialisation positively affect the cost of efficiency of the *Takaful* insurers. The larger firms are better placed than smaller firms or entities to realise operational improvements. They can draw upon the expertise of the larger pool of experienced and financially skilled directors. They found the effect of the regulatory environment to be statistically insignificant.

In their study, Hussein et al. (2014) investigated the relationship between the Malaysian *Takaful* and conventional life insurance industries' performance levels from 2005 to 2010. They used discriminant analysis (DA) using financial ratios and macroeconomic variables, namely Gross Domestic Product (GDP), Consumer Price Index (CPI) and Treasury Bill Rate (TRB). Their sample comprises six *Takaful* and conventional insurance companies. They found that conventional insurers perform better than *Takaful* companies in profitability and risk measurement, but *Takaful* outperforms conventional insurance according to premiums-to-surplus ratio. They also found that *Takaful* companies have prudent underwriting practices in place to curb information asymmetry. They discovered that

macroeconomic variables have no impact on *Takaful* companies' growth measured by net premiums or contributions. However, both industries' net investment income is significant, indicating both industries efficiently utilise their funds to generate the desired return on their investment.

Saad (2012) examines the efficiency of general or non-life *Takaful* (6) and insurance (22) industry in Malaysia from 2007 to 2009 using a non-parametric approach DEA. On average, she found that the TFP of the non-life Takaful and insurance in Malaysia is mainly due to efficiency change as measured by both scale and pure efficiency. Antonio et al. (2013) and Saad and Idrus (2011) used DEA with outputs: premium and net income, while input is management expenses and commission. They both found that conventional insurance companies performed better than *Takaful* companies. The primary source of efficiency change is scale efficiency rather than pure efficiency.

Ismail et al. (2011) found that Takaful has a lower technical efficiency than conventional insurance and organisation forms influence efficiency. Conventional insurance has a higher scale efficiency than the *Takaful* industry. Ismail (2013) investigated the determinants of the financial performance of general Islamic and conventional insurance companies in Malaysia from 2004 to 2007. He found that size, *Retakaful* dependency, and solvency margin are statistically significant determinants of general Islamic insurance's investment performance. In contrast, conventional insurance, all factors namely profit/interest rate levels, size, *Retakaful*/reinsurance dependence, solvency margin, liquidity and contribution/premium growth are significant determinants of investment performance, except for equity returns. Rahman et al. (2014) in the study of efficiency comparison between life and non-life *Takaful* companies in Bangladesh found that the smaller the companies' size, the higher their probability of being more efficient in utilising the inputs to generate more outputs. They also found scale efficiency to be the primary source of efficiency change rather than pure efficiency.

A recent study by Kantakji et al. (2020) examines performance drivers. The study's findings reported that company size, GDP per capita, equity returns, and interest rate are positively related to performance. In contrast, liquidity and re-takaful dependence are negatively associated with performance. However, the focus was on the Takaful firms and no further comparison being devoted to comparing those factors with conventional insurance.

Although some of the prior researches have investigated the case of Malaysia (for instance, Hussein et al., 2014; Ismail, 2013; Ismail et al., 2011); however, the focus of these either were focusing on the Takaful firms separately or using a narrow sample size. None of the above studies for Malaysia's case has examined the market structure hypothesis and ownership in a comparative way between Takaful and conventional insurance operators. Moreover, studies like Ismail et al. (2011) have further examined the business model. However, their focus was on 19 firms. As such, this study examined both Takaful and conventional operators of Malaysia. The larger sample size is used in this study to increase the likelihood of concurring on the population trends. Hitherto, prior studies did not evaluate Takaful for conventional insurance in Malaysia concerning their performance, market structure, and ownership.

3. Hypotheses development

The literature of finance and banking documents that Islamic finance and Islamic banking or Islamic insurance (Takaful operators) may stimulate business performance due to the differences in their underlying structure and business norms (Ariff & Shawtari, 2019; Beck et al., 2013; Shawtari, 2018). The Islamic mode of transactions is it banking or Takaful (Islamic insurance) is new and hence less efficient than the well-established conventional business mode of transactions (Shawtari et al., 2019; Shawtari, Ariff et al., 2015). Among the plausible reasons for this argument is that the transaction costs in conventional insurance are lower than Takaful operators as the conventional insurance is well-established, well-developed, and well-executed (Ariff & Shawtari, 2019). This renders it more efficient compared to the new business line of the Takaful operators. Moreover, conventional insurance is well-equipped and capable of using various techniques to minimise their risks. Much of these tools are not widely available for

Takaful business. Takaful business firms are bound by Shariah rules (Islamic laws) in using the existing conventional tools of insurance, which would result in facing challenges in risk management, diversification and the related investment opportunities (ISRA, 2011). Therefore, it is more likely that conventional insurance operators would outperform *Takaful* operators. We argue that conventional insurance may outperform the Takaful operators as these are very well-established and may exhibit an economy of scale (Shawtari et al., 2018; Shawtari, Saiti et al., 2015).

Furthermore, they would have a better way of managing their risks and hence outperform Takaful operators even though Takaful operators may have increased demand, particularly among Muslims (Hassan et al., 2019). It is expected that those operators abide by the principles of *Shariah* (Islam) in their operations and hence may attract many participants, it faces increased monitoring costs with small size. This increases their overall cost and affects the demands for their services (Benlagha & Hemrit, 2018) and the subsequent result of the operations. Therefore, we hypothesise:

H1: Conventional insurance outperforms the Takaful operators in both measures of performance.

Second, the ownership types categorised into local and foreign ownership are investigated. The role of ownership in Takaful operators and conventional insurance performance is undeniable in corporate governance and finance literature. Its relevance is recognised in conventional insurance literature (Lee et al., 2019). The Takaful business literature is still investigating the relevance of ownership type to Takaful operators' performance. With the liberalisation of the financial system, the local market may attract foreign investors or firms to operate in the same market with the domestic one (Lee et al., 2019; Shawtari et al., 2019). The entry may bring massive capital to the market, and hence superior performance would be expected from all firms to remain competitive (Lee et al., 2019, 2018). For Lee et al. (2019), this may become disadvantageous for local firms in the sense that foreign firms may have better skills and knowledge of the market and as a result, their performance would be at best compared to local firms. They find a support that Takaful operators with foreign ownership positively impact the revenues because the support for those firms from parents is substantial in terms of financial resources, skills, and risk management techniques. Some argue that foreign operators might face difficulties in complying with local rules and regulations, the existence of the complexity of management, cost of synchronisation and cultural differences between local and the foreign markets, which all are expected to reduce the efficiency of operators (Biener et al., 2016; Jeng, 2015).

H2: Foreign companies outperform local insurance in both measures of performance.

The third determinants chosen in this study are the market structure, which has been used as one factor influencing the banking sector's performance (Al-Muharrami et al., 2009; Tregenna, 2009). However, few studies have been utilising the market structure in the insurance and Takaful studies (for example, Alhassan et al. 2015). According to Alhassan et al., (2015), market structure plays a significant role in the pricing policy, contributing to evaluating the risk and hence on the premium earned. High-risk clients are expected to pay high premiums and vice versa. This is determined by the market structure where the pricing and therefore, the premium is determined by the market's structural features within which it operates.

Further, a highly concentrated industry is characterised by collaboration among the few large firms in setting prices to achieve abnormal profits. Traditionally, the market structure under the Structure Conduct Hypothesis (SCH) of Bain (1951) affirms that a firm's pricing is determined by the market in which they operate and hence in highly concentrated industry, a collision may occur. High prices are targeted, and abnormal profits are achieved. The other view of this concept is called the efficient structure (ES) hypothesis of Demsetz (1973) and Peltzman (1977), which

suggests that efficient producing firms can generate higher sales and as such the profits by setting up lower prices. Subsequently, higher market share is expected and thus, achieving industry concentration. Alhassan, Addisson, & Asamoah (Alhassan et al., 2015) find little support for structural conduct hypothesis. However, efficient structure hypothesis is supported. Thus, we believe this factor is an essential factor in determining conventional insurance and Takaful operators' performance. The literature is in disagreement on which hypothesis is prevailing. Thus, we formulate the following hypothesis to guide this study:

$H3_a$: *Market concentration has a positive and significant relationship with performance.*

$H3_b$: *Market efficiency has a positive and significant relationship with performance.*

4. Data and research methodology

4.1. Data collection

The study uses data that comprises a sample of 44 companies, of which 33 were from conventional insurance and 11 Takaful undertakings. A total of 11 Takaful operators could be identified in Malaysia as of December 2017. Similarly, there were 33 insurers in Malaysia's conventional insurance industry in total as of 2017 excluding reinsurers. However, only those insurers offering both life and general insurance services like Takaful operators have been included in our sample. Due to the inaccessibility of data for some insurance companies, we decided to include a combination of composite, life, and general insurance, which we could match with the Takaful operator data from 2011 to 2016. All the data are extracted from the respective companies' annual report under the Malaysian accounting and auditing standards, namely the original audited financial statements. These are in-line with international standards and disciplines. There are some gaps in the selected companies' data, either due to late entry into the market, merger, and accounting period change. By choosing the 44 companies over 6 years, there is a total of 255-year observations for the Takaful and conventional selected companies. Table 1 panel overlaid firms' distribution and categorisation of those firms, and Table 2 Panel B shows the sample distribution over the years.

Table 1. Panel A: distribution of the insurance and Takaful companies		
Category of insurance and Iakaful	**No. of companies**	**% of the whole industry**
Life insurer	11	25
General Insurer	19	43.2
Compste insurer	3	6.8
Family Takaful operator	3	6.8
General Takaful operator	8	18.2
Total	44	100

Table 1 Panel B: distribution of sample by years.

Year	Insurance	Takaful	Total observations
2011	30	8	38
2012	33	11	44
2013	32	11	43
2014	33	11	44
2015	32	11	43
2016	32	11	43
Total	192	63	255

Table 2. Definitions of the variables		
Indicators	**Acronym**	**Operationalisation**
(1) Takaful dummy	TAKDUM	Represent the business model that is given 1 for Takaful and 1, otherwise
(1) Ownership	OWNDUM	Represent a dummy ownership type, given 1 for foreign and 0, otherwise
(1) Market concentration	MKT	The concertation index representing the largest four operators in in the industry to measure structure conduct hypothesis
(1) Technical Efficiency (DEA estimation)	EFF.	Estimated using DEA Techniques with inputs and output indicators to measure the efficient structure hypothesis.
(1) Investment Income (%TA)	INV	Indicates the investment income deflated by assets by either conventional insurance or Takaful
(1) Net Premium earned (% of TA)	NPE	The contributions by the policyholders or the participants as ratio to assets
(1) Net claimed paid (%TA)	NCI	All claimed paid to the policyholders or participants for the losses to total assets
(1) Gen and Admin Exp (% TA)	GA	Total general and administrative expenses paid for the period as percentage of total assets
(1) Fees and Comm. Exp (% TA)	FEE	Fees paid as part of the insurance and takaful operations to the brokers, agents and others as percentage of total assets
(1) Log Total Assets.	TA	The logarithm of total assets
(1) Leverage	LEV	Liabilities to assets ration
(1) Gross domestic product	GDP	To Measure the market condition and economic growth of the country.

4.2. Variables measurements and model

We use two dependent variables to compare the performance of insurance and Takaful companies. First, the net premium earned is used in the literature to measure the performance, and it indicates the premium earned as the time of policy passes (Hemrit, 2020; Hussein et al., 2014). All premiums paid by the policyholders are part of earned profit if these premiums have not filed claims. Second, we compare the performance of the sample firms based on investment income. Investment income is a significant performance indicator, which has been utilised in the literature to gauge insurance and Takaful companies' ability to perform their activities (Kantakji et al., 2020). Mainly, it reflects the fundamental role of the industry, in which the insurance and Takaful operators have to play a vital role in the mobilisation of the funds (premiums and contributions) received from the participants or insured parties to generate enough and additional income to meet the future claims and compensations. It is considered the profit driver for the insurance companies (Akotey et al., 2013). Kantakji et al. (2020) argue that the management of investments is considered a key driver as high investment returns add to companies' accumulated capital that can be used against unexpected severe losses and fortify against risks.

Even though both are financial measures, we believe that these two measures better reflect the insurance and Takaful operations' performance than other financial measures (i.e. ROA and ROE). These might be subjected to discretion in some of the items used to derive them, and hence a manipulation of the earnings might occur, thus, distorting the real performance of the firms (Shawtari, Mohamad et al., 2015; Shawtari et al., 2017).

Next, we use several variables to regress against performance measures. We believe that those factors may contribute to the performance of Takaful and conventional insurance firms. We begin with the first important variable that constitutes our focus, which is the business model. We measure this variable by a dummy variable to compare the Takaful operator vs conventional insurance ((Ismail et al., 2011). Second, in line with other literature, the local vs foreign ownership is used to measure the ownership (Lee et al., 2019). Third, following Alhassan et al., 2015), we measure market structure using concentration index (CONC) represented by the largest four firms in the industry to test the traditional SCP hypothesis, and we adopt the technical efficiency score to measure the ES hypothesis.[2]

This study also uses other control variables besides the main variables. These are firm (Fama & Jensen, 1983); net claimed (Akotey et al., 2013); leverage ((Abidin et al., 2009; Alhassan et al., 2015); fees and commission and general and administrative expenses ((Akotey et al., 2013); GDP (Alhassan et al., 2015). Table 2 shows a summary of the variables definitions and their operationalisation, and based on that, the following regression model is tested:

$$PER_{it} = \alpha + \beta_1 TAKDUM_{it} + \beta_2 OWNDUM_{it} + \beta_3 NCI_{it} + \beta_4 MKT_{it} + \beta_5 GA_{it} + \beta_6 FEE_{it}$$
$$+ \beta_7 lnTA_{it} + \beta_8 LEV_{it} + \beta_9 GDP\varepsilon_{it} \qquad \text{(Equation 1)}$$

PER is a performance indicator representing one of two performance measures: net investment incomes, the net premium earned in insurance, or Takaful (i) in year (t). β is the beta for each variable defined in Table 2, and ε is a white-noise error term or "disturbance term".

4.3. Statistical technique

Panel data are used to test the model of the study. Since different panel techniques fit in different situations, this study used panel standard error corrected method. The code is based on Xtpcse as installed in STATA. It calculates panel corrected the standard error (PCSE) estimates for linear cross-sectional time-series model where the parameters are estimated by either OLS or Paris-Winsten regression. Doing so computes the standard errors and the variance-covariance estimates. PCSE assumes that the disturbances are, by default, heteroskedastic and contemporaneously correlated across panels. The technique is adopted because it helps produce an estimation free from autocorrelation, accurate standard error estimate, and less sensitivity to outlier estimates.

Moreover, the PCSE technique is used when working with dynamic heterogeneous panel data (Bailey & Katz, 2011). PCSE is used to overcome serial correlation and heteroscedasticity. Second, the estimated results become valid to avoid the problem of endogeneity, which is commonly an issue with the random-effect model. Whenever the sample is finite or small, Beck and Katz (1995) reported that OLS with panel corrected errors provided more efficient estimation than generalised least square. It is argued that with the presence of serial correlation and heteroscedasticity, the PCSE tool can be used as a tool to resolve the issue and hence to provide more robust results.

5. Empirical results

5.1. Descriptive analysis

Table 3 reports the variables' descriptive statistics, particularly mean, standard deviation, minimum and maximum, and the mean for conventional insurance and *Takaful* firms for each of the

Table 3. Descriptive statistics

Indicators	Full sample					Insurance operators	Takaful Operators	Test of difference (p-value of
	Mean	Std Dev.	Min	Max		Mean	Mean	
(1) Technical Efficiency (DEA estimation)	0.886	0.127	0.312	1.00		0.90	0.86	(0.049)**
(1) Investment Income (%TA)	0.032	0.031	0.009	0.500		0.034	0.026	(0.023)**
(1) Net Premium earned (% of TA)	0.246	0.121	0.003	0.757		0.223	0.313	(0.000)*
(1) Investment and management fees (%Inv. Income)	0.003	0.005	0.000	0.034		0.002	0.005	(0.000)*
(1) Net claimed paid (%TA)	0.155	0.056	0.025	0.447		0.15	0.169	(0.023)**
(1) Gen and Admin Exp (% TA)	0.053	0.035	0.005	0.191		0.045	0.078	(0.000)*
(1) Fees and Comm. Exp (% TA)	0.044	0.033	0.009	0.216		0.062	0.038	(0.000)*
(1) Log Total Assets.	14.744	1.393	10.240	19.199		14.842	14.433	(0.048)**
(1) Leverage	5.415	5.023	0.032	61.573		5.850	4.056	(0.014)**
(1) Market Structure								

Notes: *Panel standard errors in parentheses, *p* < 0.1, **panel standard errors in parentheses, *p* < 0.05, ***panel standard errors in parentheses, *p* < 0.01.

variables indicated in the model with their correspondent *p*-value of a two-sided *t*-test. As shown in Table 3, the efficiency score of *Takaful* operators was 86% and lower than the counterpart of conventional insurance by 4%. The investment incomes differ between conventional insurance and *Takaful* operators, where the results showed that Takaful operators had significantly statistically lower investment income (2.6%) compared to the conventional operators (3.4%). While the net premium earned for both conventional insurance and *Takaful* operators stands at an average of 24.6% and *Takaful* operators earned a higher premium than conventional insurance.

The net claim paid varies between 2.5% and 44.7% with an average of 15.5%, and the conventional insurance has a significantly lower net claimed paid than *Takaful* operators with a difference of approximately 2%. An average of investment and management fees was 0.03%, and the *Takaful* companies' investment and management fees were reported to be significantly higher at 0.05% compared to.0.02% for the counterpart conventional insurance. Net claims paid varies from 2.5% to 45% in our sample, with an average of approximately 16%. Conventional insurance firms were able to pay less claim, and it is significantly different by almost 2% compared to *Takaful* operators.

As an expenses indicator, we use the general and administrative expenses ratio to the total assets, and the higher ratio may indicate that cost-efficiency is lower. Overall, this indicator ranges from 0.05% to 19.1% out of total assets, with an average of 5.3%. *Takaful* companies showed a higher and significant expense ratio by 3% than insurance operators, which might indicate their cost inefficiency. Conversely, fees and commission expenses of *Takaful* operators (3.8% out total assets) were lower than conventional insurance (6.2%). Size of the company as measured by total assets is a logged variable and shows an average growth of 14.744%. The *Takaful* operators were having an average size of 14.433, which is significantly lower than the size of conventional insurance (14.842). Finally, the firms' leverage shows that the ratio on an average asset was fives time than the liabilities, with insurance companies having a higher and significant ratio than *Takaful* operators.

5.2. Regression estimation

In this part, we run different baseline regression models to meet the objectives of the paper. First, we run regression models 1 and 2 including the *Takaful* operator dummy variable and ownership dummy variable. This examines whether business models (*Takaful* vs conventional insurance) and ownership (foreign vs local ownership) could lead to a different performance outcome. Following the baseline regression models, we further run robustness model (Table 4, models 3 and 4) to see whether the various variables included in the model may behave and shape differently when they interact with two dummies namely *Takaful* vs conventional insurance (Table 4, models 3 and 4) as well as foreign vs local ownership (Table 5, models 1 and 2). This broadens the investigations and offers insights into the behaviour of those variables.

The results in Table 4 provide evidence on the impact of various determinants outlined in equation one on performance measures, i.e. net premium earned and investment income models 1 and 2). The evidence in models 1 and 2 suggests that the dummy Takaful operator is not significantly different from conventional operators in terms of their net premium earned, which imply that neither *Takaful* operators nor conventional insurance perform better than others. They are almost performing at par in their ability to attract customers and hence manage the policy and earn the premiums that are not claimed by the holders. However, the Takaful operators were shown to be lagging in terms of producing investment income compared to conventional insurance, as shown in Table 4 (See models 2 and 4). These findings are in-line with the results in Table 3. One plausible reason is that Takaful operators might have less investment channel for their funds as they abide by *Shariah* principles when they invest (Beck et al., 2013). Thus, it is less likely to produce incomes compared to conventional insurance.

Moreover, the economies of scales and risks tool evaluations are more apparent for conventional insurance than Takaful firms. Few studies have found that performance of companies that follow

Table 4. Regression results (baseline results and interaction of dummy Takaful				
	Model 1	**Model 2**	**Model 3**	**Model 4**
VARIABLES	NPE	INV	NPE	INV
TAKDUM	0.0022	**−0.004***	−0.0312	**−0.0243***
	(0.0111)	**(0.0010)**	(0.0901)	**(0.0127)**
OWNDUM	0.0064	−0.0006	0.000641	−0.00177
	(0.0046)	(0.00119)	(0.00410)	(0.00148)
lnMKT	0.00707	**0.0066***	−0.0231	0.00301
	(0.00671)	**(0.00184)**	(0.0149)	(0.00333)
EFF.	**0.189***	**0.089***	**0.139***	**0.178***
	(0.091)	**(0.031)**	**(0.047)**	**(0.079)**
lnNCI	**0.105***	**−0.0019***	**0.0738***	**−0.0041***
	(0.0119)	**(0.0010)**	**(0.0189)**	**(0.00174)**
lnGA	**1.029***	**0.056***	**1.119***	0.0534*
	(0.260)	**(0.021)**	**(0.345)**	(0.0278)
lnFEE	**1.659***	**0.0476***	**1.824***	**−0.0813***
	(0.222)	**(0.0227)**	**(0.315)**	**(0.0252)**
lnTA	**−0.110***	**−0.0531***	**−0.0746***	**−0.00341***
	(0.0129)	**(0.027)**	**(0.0194)**	**(0.00166)**
lnLEV	**0.0944***	**0.0051***	**0.241***	**0.0177***
	(0.0470)	**(0.00180)**	**(0.0599)**	**(0.00828)**
lnGDP	**0.0661***	**0.0265***	**0.0759***	**0.009***
	(0.0151)	**(0.00486)**	**(0.0192)**	**(0.004)**
TAKDUM*MKT			0.256	−0.0313
			(0.179)	(0.0305)
TAKDUM*NCI			**0.400***	0.0156
			(0.156)	(0.0162)
TAKDUM*EFF				
TAKDUM*GA			0.00331	−0.00174
			(0.0131)	(0.00142)
TAKDUM*FEE			**−0.0218***	**0.000984***
			(0.00934)	**(0.000252)**
TAKDUM*TA			**0.0251***	**0.0265***
			(0.0115)	**(0.0139)**
TAKDUM*LEV			**−0.357***	**0.0102***
			(0.0636)	**(0.00945)**
Constant	0.207	0.207	−1.994***	0.263
	(0.155)	(0.155)	(0.535)	(0.170)
Observations	255	255	255	255
R-squared	0.518	0.518	0.768	0.534
No. of firms	43	43	43	43

Notes: *Panel standard errors in parentheses., < 0.1; **panel standard errors in parentheses, $p < 0.05$; ***panel standard errors in parentheses, $p < 0.01$

and practice the Islamic principles underperform their counterpart, the conventional firms be a banking or insurance (Ariff & Shawtari, 2019; (Beck et al., 2013). In a sum, both Takaful and conventional insurance operate in stiff competition. Their premiums are not far from each other; however, investment capacity is better for conventional insurance as the results indicated.

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Table 5. Interaction between variables and dummy ownership		
	Model 1	**Model 2**
VARIABLES	NPE	INV
TAKDUM	0.00769	−0.00894
	(0.00825)	(0.0127)
OWNDUM	**0.296***	−0.00130
	(0.0905)	(0.00135)
lnMKT	0.00564	**0.00392**
	(0.00575)	(0.00182)
lnEFF.	**0.112***	**0.107**
	(0.062)	**(0.051)**
lnNCI	**0.0834***	−0.00393
	(0.0170)	(0.00981)
lnGA	**1.049***	0.00337
	(0.250)	(0.00318)
lnFEE	**1.817***	**0.0531***
	(0.193)	**(0.0286)**
lnTA	**−0.0893***	**−0.0613**
	(0.0171)	**(0.0282)**
lnLEV	*0.0651*	**0.00308***
	(0.0472)	**(0.00177)**
lnGDP	**0.0602***	**0.0178**
	(0.0156)	**(0.00791)**
OWNDUM *MKT	−0.00672	**0.0637***
	(0.00756)	**(0.0218)**
OWNDUM *EFF.	**−0.031***	**−0.029***
	(0.017)	**(0.0168)**
OWNDUM *NCI	**0.397***	−0.00789
	(0.128)	(0.00645)
OWNDUM *GA	**0.0256**	−0.0326
	(0.0116)	(0.0283)
OWNDUM *FEE	**−0.0351***	0.000814
	(0.00720)	(0.00136)
OWNDUM *TA	**−0.025**	**−0.001***
	(0.00913)	**(0.000)**
OWNDUM *LEV	**−0.084**	**−0.0036**
	(0.0478)	**(0.0014)**
Constant	−1.277***	0.225
	(0.433)	(0.173)
Observations	255	247
R-squared	0.843	0.549
No. of firms	43	43

Notes: *Panel standard errors in parentheses, $p < 0.1$; **panel standard errors in parentheses, $p < 0.05$; ***panel standard errors in parentheses, $p < 0.01$.

Table 4 also shows that dummy ownership has no influence on net premium earned nor investments incomes (Models 1 and 2). Our results do not provide support for the study conducted by Lee et al. (2019), which suggest that foreign firms benefit more from the support provided by

the parent firms in meeting all requirement and managing their risks properly thereby improving their efficiency and performance.

Concerning the market structure as a measure of traditional SCP hypothesis, the result partially offered support for the traditional view of market structure. It is only significantly and positively related to the performance as measured by investment income. However, the results provide more robust support for the alternative efficient structure hypothesis of Demsetz (1973) and Peltzman (1977) as measured by efficiency (eff.). The results are in sync with Alhassan, Addisson, & Asamoah (Alhassan et al., 2015) and Ansah-Adu et al. (2012), where they suggest that efficient structure hypothesis is more powerful than the traditional structure. It is well-conceived that efficiently producing firms can generate higher sales and optimise profits through lower prices. They suggested that insurance companies would build on market concentration to improve their efficiency and performance. More concentration exhibits additional pressure on the firms to be more efficient and perform better in terms of premiums and appropriate investment to face stiff competition in the market.

By looking at the effects of control variables included in the models 1 and 2 (Table 4), the reported findings indicate that net claims incurred are positively and significantly related to the net premium earned (models 1) and negatively and significantly associated with investment income (model 2). On one side, this might suggest that firms are expected to charge higher premiums to cover the expected losses as the claims increase. On the other side, the more claims incurred indicate less excess funds used for investment, which leads to lower investment incomes (Akotey et al., 2013).

Moreover, administrative expenses and management fees have a positive impact on the premiums earned. This is very logical since other studies suggest an increase in expenses leads to an increase in the premium earned, indicating two possibilities. The first is that management spent more expenses to gain more premiums. The second is that the management is engaging in many activities that maximise the earned premiums. This includes investing, choosing, and managing these premiums' risks ((Akotey et al., 2013). However, an increased expense might reduce the operating efficiency where more general and administrative expenses, the lesser the efficiency; however, it can be offset with more output.

However, total assets (Table 4, models 1 and 2) are negatively and significantly related to the NPE and investment incomes, indicating companies with larger assets underperform the smaller companies. This contradicts the economies of scale, where larger firms are more likely to perform better (Ansah-Adu et al., 2012; Hemrit, 2020). The results are partially consistent with (Akotey et al., 2013), who found that investment income is negatively related to total assets, and they suggested that when the management is not efficient in underwriting and managing the premiums, the assets of firms are financed by the money supposed to be invested. Cummins and Xie (2013) argued that larger firms tend to have greater management coordination and agency costs because of the complexity of administering large and complex institutions. This underscores their inefficiency of investment and inefficiency in attracting the expected premiums.

Leverage is positively and significantly related to the NPE and investment income. Most probably, levered firms can efficiently deal with their liabilities and convert them into profitable investment and earnings more assets. This, in turn, would enable them to meet the customer's expectations more efficiently and attract more premiums that are translated into more investment income. The results are consistent with Adams and Buckle (2003) and Akotey et al. (2013). Finally, GDP is positively and significantly related to the performance measures, which is in harmony with the theoretical underpinnings that economics is cyclic. The growth in the economy is expected to stimulate the demands for insurance and Takaful services to cover the business expansion (Alhassan et al., 2015).

5.3. Robustness results

5.3.1. The interaction of the business model with the determinants
Apart from the baseline results shown in models 1 and 2 in Table 4, the bottom part of Table 4 (Models 3 and 4) shows the influence of specific factors when the business model (Takaful vs conventional insurance) is taken into consideration (interaction) to get more insights into the behaviour of these determinants are unique across the Takaful and conventional operators or their effects on the performance are not alike. The results show that the influence of these variables on the performance is shaped in a very similar way except that Takaful operators benefit less from the leverage and the fees and commission paid. The significant negative relationship in models 3 and 4 indicates that Takaful operators have fewer benefits from increasing their paid fees and commissions to generate investment incomes and premiums. At the same time, the positive effects are larger for conventional insurance companies. Leverage also shows similar results where an increase in the performance due to the rise in leverage ratio found in models 3 and 4 is less for Takaful operators than conventional insurance companies. In particular, the leverage of Takaful operators' influence on the performance measured by premium earned is less by 35.7% compared to their effects on conventional insurance (Model 3, Table 4). In contrast, the total assets of models 3 and 4 in Table 4 show that the total assets interaction with dummy Takaful operators has a negative impact on performance. It suggests that any increase in the total assets would lead to decrease in the performance of the firms, and that effect appears to be more by 2.5% and 2.6% (model 3 and 4, respectively) in conventional firms compared to Takaful firms. This supports the early findings that larger firms performed less. Thus, we expect that conventional insurance to be affected more negatively.

5.3.2. The interaction of ownership type with the determinants
Table 5 (models 1 and 2) shows the effects of various determinants on net premium earned and investment incomes conditional on ownership types. The results in model 1 of Table 5 indicate that various determinants are different across the local and foreign firms, particularly for the net premium earned. Models 1 and 2 suggest that efficiency influences the net premium and investment income positively. However, the foreign firms exhibit a lesser effect of efficiency on performance indicators (net premium earned and investment performance) by 3.1% and 2.9% compared to local firms. Furthermore, the findings indicate that claims incurred have a significant and positive influence on the net premium. It is 30.3% for foreign firms than the local firms indicating that foreign firms benefit more from claims incurred. It suggests that foreign firms benefit more than local firm operators, where increased general expenses affect the performance of foreign firms positively and more than 2.5% compared to local firms. However, local firms benefit more from leverage and increased total assets compared to foreign firms. Foreign firms take less advantage of leverage by 8.4% compared to local firms. Also, the total assets on the net premium are less for foreign firms by 2.5% compared to local firms. The results are consistent over investment income when used as a performance indicator as in model 2. The influence of the remaining variables on the investment income between local firms and foreign insurers looks identical.

6. Conclusion
This paper examined the conventional insurance and Takaful operator determinants of various performance indicators for 44 firms in Malaysia covering the period from 2011 to 2016. To date, little has been done in the comparison between Takaful and conventional insurance based on performance indicators, market structure, banking model and ownership types. As competition deepens in the industry, it is significant to assess Takaful operators' performance compared to conventional insurance. This is particularly important as the industry is growing rapidly.

This study attempts to substantiate the progress of the industry empirically, and its competitors as the health and enhancement of performance contribute to the sound financial system the country strives to achieve. The study reports that there are differences among different types of insurance. Conventional banks and Takaful operators, where the findings show that Takaful

operators performed better than conventional insurance in terms of investment income, mainly when the Takaful is smaller in size and their investment fees and commission less compared to others. Furthermore, the results indicate net premium earned is identical among conventional and Takaful operators. It is a good indicator for the Takaful operators, despite their short history, that they can compete with well-developed conventional insurance market in all aspects and perform better in terms of investment. Although the traditional market structure hypothesis does not strongly shape the net premium earned, it influences Takaful and conventional insurance's investment income.

Furthermore, the alternative measure of market power, namely efficient hypothesis, shows a more substantial impact on the performance measures suggesting that firms have been subjected to more pressures to be efficient. Hence, in the long run, it might be translated into lower prices. Thus, firms that can do so will benefit more than others in terms of market share.

Firm size does have a negative influence on the financial measures of performance. We also provide evidence that various predictors' impact differs between conventional insurance and Takaful operators, conditional on the business model and ownership type. Generally, the firm's size and leverage differ in their effects on the performance between conventional insurance and Takaful operators. As indicated in the analysis, the Takaful operators compete forcefully with conventional insurance in terms of their performance in all measures despite the fact that conventional insurance in some indicators has the upper hand. Overall, Takaful contributes to the growth of the industry and enhances competition in a dual financial system. The implications are expected to help improve and develop the Takaful and insurance sector as an efficient industry in line with regulation changes. This paper contributes to the literature by assessing and providing supporting evidence on the industry's overall performance and its segments. It is well-documented that Takaful operators face significant competition from the well-established and well-capitalised conventional insurance. It contributes to the debate on the differentiation between Takaful and insurance business in various aspect, including the performance and its determinants. The results of the study provide implications for regulators in Malaysia. Structural conduct hypothesis was not supported, and hence regulators are recommended to promote the healthy competition in the industry. Despite the merits of the study, the study suggests future research. This study can be expanded to include various countries with a dual system to provide more generalisation to the industry. From a methodological perspective, further research may adopt a dynamic panel estimation to improve the study's findings and consider the potential of endogeneity related to panel data models.

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Notes
1. Takaful is a system in which the participants regularly contribute their funds and intend to guarantee each other jointly and compensate any participants or contribution who are inflicted with risks (ISRA, 2011).
2. Technical efficiency score is estimated the Data Envelopment Analysis (DEA) approach.

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