

ANALYSING THE TECHNICAL EFFICIENCY OF GENERAL TAKAFUL INDUSTRY IN MALAYSIA: A NON-PARAMETRIC APPROACH

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ABSTRACT

This paper aims to examine the technical efficiency level of the general takaful operators in Malaysia from 2013 to 2017. The focus on the general takaful industry is made after taking into account the recent regulatory developments, i.e. phased liberalisation of motor and fire tariff, and Islamic Financial Services Act 2013 (IFSA 2013) - conversion of composite license to single licenses. This paper employs Data Envelopment Analysis (DEA) and Malmquist Productivity Index (MPI) in order to measure the relative technical efficiency and the total factor productivity (TFP) change of eight general takaful operators in Malaysia respectively. The findings suggest that the main source of inefficiency of the general takaful operators in Malaysia is scale inefficiency, rather than managerial inefficiency. Meanwhile, technological regress has dampened the TFP growth of the general takaful industry in Malaysia. Therefore, it suggested the general takaful operators improve their productivity by improving their technical innovation.

Keywords: General takaful, Data Envelopment Analysis (DEA), Malmquist Productivity Index, efficiency

INTRODUCTION

Takaful industry is an integral component of the Malaysian Islamic financial system, and its growth momentum is expected to continue and further strengthen the nation's position as the leading takaful market in ASEAN. The positive development of the Malaysian takaful industry is believed to be the result of various efforts undertaken by the Bank Negara Malaysia (BNM), and supported by other government initiatives in order to turn Malaysia into a global hub for Islamic finance. In addition, the Malaysian takaful industry is also diverse with a growing community of both domestic and international operators as a result of the rapid liberalisation of the nation's Islamic financial industry.

Malaysia has been identified as the leader in takaful market contributions in the ASEAN region, making

up a total of 76% of the market share in 2014 (Ernst & Young, 2015). Owing to the country's regulatory clarity and proven model, Malaysia has also emerged as the world's largest family takaful market. However, its market share is still small in comparison to its conventional counterpart. In fact, Malaysia's target to achieve at least 20% takaful contributions out of the total insurance premiums by 2010 was not achieved, given its current standing at only 16.7% (Bank Negara Malaysia, 2018). Furthermore, given the current low market penetration, i.e. 15.2% of the total population, the industry is expected to have good prospects of future growth and development (Lim, 2019).

Generally, the takaful industry has two business components, namely family takaful and general takaful. Pursuant to certain developments in the takaful industry landscape, this paper focuses only on the general takaful operators. The following sub-

sections will discuss the two latest developments which have an impact on the general takaful operators in Malaysia, i.e. phased liberalisation of motor and fire tariff, and IFSA 2013 - conversion of composite license to single licenses.

Phased Liberalisation of Motor and Fire Tariff

The liberalisation of motor and fire tariff was introduced by the Bank Negara Malaysia in March 2016 with the objective to establish pricing for the motor and fire insurance that is more reflective of the customers' risk profile. In this new policy, the underwriting systems of the insurers and takaful operators will basically evolve from tariff-based to risk-based decision making. The factors that could be taken into account range from gender, occupation, driving experience, car make and model, place of residence and even the claims history. Generally, consumers with better risk profile will enjoy lower premium rates. Ultimately, this policy is aimed at inculcating better driving behaviour among Malaysians.

The first phase kicked off on 1 July 2016 whereby insurers and takaful operators were allowed to progressively offer new products at market rates as opposed to tariff rates. A year later, the second phase of liberalisation took place whereby the tariff rates in the Motor Comprehensive and Motor Third Party Fire and Theft (TPFT) class were gradually lifted. Meanwhile, the premium rates for Fire class remain to be tariff-based regulated with gradual adjustments to tariff rates for identified risk groups until a review is made. A comprehensive review on the liberalisation progress will be reviewed in 2019 in order to assess the state of readiness of the industry and consumer to proceed for full liberalisation.

The liberalisation is expected to lead to competitive pricing, product innovation, and customised coverage limits which would all benefit the consumers. However, it is noteworthy that this process could also lead to the risk of upward premium adjustments and hence reduced affordability of consumers to the basic protection or compulsory lines. Overall, the phased liberalisation of the industry is anticipated to further

increase market growth and gradually achieving the BNM's target for 75% market penetration by 2020.

IFSA 2013 – Conversion of Composite License to Single Licenses

The Islamic Financial Services Act 2013 (IFSA 2013) which came into effect in June 2013 requires the takaful operators to relinquish their composite licenses and operate their general and family businesses under separate entities. A similar requirement is applicable to their conventional counterpart under the Financial Services Act 2013 (FSA 2013). However, the impact is expected to be felt more deeply by the takaful operators, given the fact that there are more composite licenses issued to them compared to the conventional insurers. The takaful operators were given a period of five years to implement the new policy.

The objective of this requirement is basically to enforce greater focus on core areas of expertise among the takaful operators and hence reducing the risks coming from the less expert business area. Ultimately, it is aimed to establish a stable takaful industry consists of sound and efficient industry players.

PROBLEM STATEMENT

Recent statistics indicate positive development in the general takaful market in Malaysia, with a 6.4% increase in its gross written contributions (GWC) from the year 2016 to 2017. In particular, there was a 9.47% and 4.1% increase in the gross written contributions for the non-motor and motor takaful respectively (ISM Insurance Services Malaysia Berhad, 2017). However, despite the encouraging growth, statistics indicate a significant decrease in the operating profit of the general takaful market, i.e. RM301.2m in 2017 to RM201.8m in 2018, an approximate 33.0% drop. This is in line with the increase in the claim ratio from 51.2% to 56.1% in the same period (Bank Negara Malaysia, 2018).

General takaful accounted for 12.8% of the overall general insurance market in the first half of 2017, up from 12.2% in the same period in 2016 (Singh, 2018). In comparison, the growth rate for general takaful growth continues to outpace its conventional counterpart. The gross written premium for general insurance has demonstrated a flat growth trend, compared to the 6.4% increase for general takaful. It is found that motor class, and followed by fire, accounted for the largest share of total gross written contributions/premiums for both the general takaful and insurance. It is believed that these two business classes will remain to lead the expansion of general takaful in Malaysia and hence an improved market penetration (ISM Insurance Services Malaysia Berhad, 2017).

The statistics also indicates that the market penetration rate for general takaful is lower than that of family takaful. Furthermore, despite its steady growth compared to its conventional counterpart, the market penetration of takaful is still much lower than conventional insurance. Research indicates that the current market penetration is heavily attributed to the more affluent group of society. In view of the lack of market penetration, it represents potential growth for the general takaful business in Malaysia by focusing on the needs of the predominantly Muslim market in this country (Ismail et al., 2017).

Generally, the takaful industry has to face various challenges, including solvency risks, competition, as well as changing regulations. Therefore, it is imperative to determine the efficiency of this particular industry because by examining the inputs and outputs, it allows the market to identify how the insurers and takaful operators respond to the challenges (Lee et al., 2018). To date, the general takaful market in Malaysia has yet to accomplish as significant impact as its conventional counterpart. Statistics indicate that the earned contribution income for general takaful is only RM1,863.8m, as opposed to the general insurance's net premium income of RM16,365.9m (Bank Negara Malaysia, 2017). Nevertheless, the potential of general takaful market in Malaysia, coupled with its recent changes and development (i.e. phased liberalisation

of motor and fire tariff, and IFSA 2013 – conversion of composite license to single licenses), have made it particularly interesting to study.

RESEARCH OBJECTIVE

In view of the above discussion, the general objective of this paper is to examine the technical efficiency level of the general takaful operators in Malaysia for the period from 2013 to 2017. Meanwhile, the specific objectives of this paper are,

- i. to examine the overall technical efficiency (OTE) of the general takaful operators in Malaysia for the period from 2013 to 2017.
- ii. to examine the pure technical efficiency (PTE) of the general takaful operators in Malaysia for the period from 2013 to 2017.
- iii. to examine the scale efficiency (SE) of the general takaful operators in Malaysia for the period from 2013 to 2017.
- iv. to examine the total factor productivity (TFP) of the general takaful operators in Malaysia by measuring their respective change in the efficiency level during the period from 2013 to 2017.

By achieving these research objectives, concomitantly, the source of inefficiencies of the general takaful operators in Malaysia could also be identified and therefore, be addressed for further improvement. The findings from this study could be used as the point of reference in evaluating the impact of the two policy changes mentioned above, and therefore will be of interest to regulatory authorities, industry and participants/policyholders.

LITERATURE REVIEW

The performance of takaful industry was mixed in 2017. While the family takaful recorded an increase of profits by 27.2% from 2016 to 2017, the general takaful market experienced a decrease by 28.3% in the same period. The decrease is attributed to the higher management expenses and claims pay-out (Bank Negara Malaysia, 2017), which calls for better initiatives to improve firm efficiency. On another

note, there has also been initiatives to enlarge the underwriting capacity which is aimed to reduce the share of general takaful gross contributions being ceded to the conventional re-insurers (Bank Negara Malaysia, 2017). Meanwhile in 2018, although the takaful sector remained profitable, the operating profits for each of the family and general takaful has declined by 14.0% and 33.0%, respectively. The profits decline in family takaful business is recorded to be due to higher costs and benefit payments to takaful participants, while the profits decline in general takaful is due to the increased competition in the industry (Bank Negara Malaysia, 2018).

The significance of general takaful business in the takaful industry is undeniable. In 2017 and 2018, its business grew by 6.3% and 9.0%, respectively. The concentration of the general takaful market in these two years is coming from the motor and fire classes which command 80.7% and 82.4% of total gross contributions, respectively (Bank Negara Malaysia, 2018). With the recent implementation of the phased liberalisation of motor and fire tariff policy, the general takaful business is expected to flourish even more in the future years. However, the short implementation period to date makes it difficult to really evident the impact of this new policy at the industry level at the moment. Furthermore, the industry players are still generally cautious about making major changes to pricing.

In comparison to its conventional counterpart, general takaful sector has performed better in terms of the underwriting profitability. This is, however, balanced by the inherent underwriting volatility given its lower market penetration. Nevertheless, the steady encroachment of general takaful into the general insurance market suggests its potential for further growth in the long-run; supported by the Muslim-majority population in this country (ISM Insurance Services Malaysia Berhad, 2017).

The financial performance of the general takaful operators is found to be statistically and significantly related to the firm size, retakaful dependence, and solvency margin (Ismail, 2013). For instance, the result

indicates that an increase in retakaful dependence improves financial performance. Another research by Liu, Shiu and Liu (2018) finds that insurers with higher liquidity have higher tendency to purchase reinsurance. Given the short-term nature of the general insurance products, the general insurance business is deemed to be riskier than its life insurance counterpart, especially due to the uncertainty in the timing and number of claims. This results in general insurers to be more inclined to rely on reinsurance and hence reducing the underwriting and liquidity risks.

On another note, BNM has raised its concern over the increasing proportion of contributions ceded to foreign retakaful operators for the period from 2013-2017, i.e. 15.5% and 24.4%, respectively. This is because the increase in the foreign retakaful dependence is basically reflecting the industry's lack of interest to locally retain larger and complex risks. In view of this situation, it indicates a crucial need for domestic retakaful operators to increase its capacity to underwrite complex risks by strengthening its technical expertise (Bank Negara Malaysia, 2017).

There are numerous ways to measure firm performance, whereby it could be examined from the perspectives of profitability, liquidity, efficiency, etc. However, Ismail et al. (2012) highlighted that efficiency has become the critical aspect of performance measurement in the financial services sector. According to Bikker (2008), efficiency is important to this sector because it mainly determines the price as well as the quality of the financial products offered by firms. The use of efficiency as the proxy for the financial performance measure of the general takaful operators in this paper is also motivated by its relevance in the operational and strategic decision-making process (Kader et al., 2010).

The use of conventional financial ratios in measuring the efficiency has slowly become obsolete with the introduction of frontier efficiency methodologies (Cummins and Weiss, 1998; Noreen and Khan, 2014). Research have suggested the application of frontier efficiency techniques (Kuo et al., 2015).

As highlighted by Berger and Humphrey (1997), the frontier analysis is the more sophisticated way to perform the efficiency benchmark. The two most common methods under this analysis are the parametric Stochastic Frontier Analysis (SFA) and the non-parametric Data Envelopment Analysis (DEA). Out of the many frontier efficiency techniques, Data Envelopment Analysis (DEA) is found to be the most frequently used in the study of insurance industry efficiency (Eling & Luhnen, 2010). In comparison to SFA, the main advantage of DEA method is that it does not require more information other than the input and output quantities. Furthermore, unlike SFA, it does not require “an implicit imposition of a particular parametric functional form representing the underlying technology and also an explicit distributional assumption for the inefficiency terms” (Hossain et al., 2012, p.1).

Generally, the Data Envelopment Analysis combines the information of multiple inputs and outputs into a single measure of efficiency, which ranges between zero and one. Existing research in the insurance and takaful industry have mostly proposed the use of management expenses, net claims, labour, debt capital, equity capital, fees and commission expenses as the inputs; while net investment income and net contributions/premiums earned as the outputs (Abduh et al., 2012; Md. Saad, 2012; Nourani et al., 2016, Kaffash et al., 2019).

quantities in order to enhance the managerial ability. On the other hand, research by Lee et al. (2018) finds that the inefficiency in the takaful operations is attributed to the scale of operations rather than managerial inefficiency. Therefore, it is important for the takaful operators to give more attention to the actuarial estimation of the provisions for outstanding claims, as well as to better control the commission’s expenses to the agents.

In view of the preceding discussion, Figure 1 presents the research model based on Data Envelopment Analysis for this paper. The model outlines the inputs and outputs that are selected to examine the efficiency of the general takaful operators in Malaysia for this study.

DATA AND METHODOLOGY

As at the end of 2017, there were eleven takaful operators in Malaysia. Three of them were family takaful operators while eight were composite operators, running both the general and family takaful businesses. However, this number changed significantly in 2018 pursuant to the IFSA 2013 requirement for the operators to split the composite business into separate family and general takaful entities. Table 1 encapsulates the changes that have taken place in the Malaysian takaful market. This



Figure 1 Research Model

In their frontier projection analysis, Nourani et al. (2016) find that the deteriorating performance of the general insurers is attributed to the deficiencies in the managerial efficiency. Therefore, it is suggested for the general insurers to substantially reduce input

paper examines the technical efficiency of all eight takaful operators in Malaysia which run the general takaful business spanning the period from 2013 to 2017. The list of takaful operators is as follows,

- | | |
|---|---|
| 1. Etiqa Takaful Berhad (Etiqa Takaful) | 5. Sun Life Malaysia Takaful Berhad (Sun Life Takaful) |
| 2. Hong Leong MSIG Takaful Berhad (HLMSIG Takaful) | 6. Syarikat Takaful Malaysia Berhad (STMB) |
| 3. HSBC Amanah Takaful (Malaysia) Sdn. Bhd. (HSBC Amanah Takaful) | 7. Takaful Ikhlas Berhad (Takaful Ikhlas) |
| 4. Prudential BSN Takaful Berhad (Prudential BSN) | 8. Zurich Takaful Malaysia Berhad (formerly known as MAA Takaful Berhad) (Zurich Takaful) |

Table 1 Changes in the takaful operators due to the IFSA 2013 requirement for a single license

Before conversion	After conversion
Etiqa Takaful Berhad	A family takaful business licence is granted to Etiqa Takaful Berhad under a new name of Etiqa Family Takaful Berhad (EFTB) as a holding company to manage the Family Takaful business. A new company by the name of Etiqa General Takaful Berhad (EGTB) is established to manage the general takaful business; effective 1 January 2018.
Hong Leong MSIG Takaful Berhad	Remain company name. Ceased composite license effective 1 July 2018. Exit general takaful business, and focus on family takaful business only.
HSBC Amanah Takaful (Malaysia) Sdn Bhd	Remain company name. Ceased composite license effective 3 November 2018. Exit general takaful business, and focus on family takaful business only. All of its general takaful business transferred to Zurich General Takaful Malaysia Berhad.
Zurich Takaful Malaysia Berhad	Zurich Takaful Malaysia Berhad. Focus on family takaful business only. Transfer all general takaful business to a newly-incorporated entity, i.e. Zurich General Takaful Malaysia Berhad. Effective 1 June 2018.
Prudential BSN Takaful Berhad	Remain company name. Ceased composite license with BNM approval 29 June 2018; High court order 12 September 2018. Exit general takaful business, and focus on family takaful business only. All of its general takaful business transferred to Syarikat Takaful Malaysia Am Berhad (STMAB).
Sun Life Malaysia Takaful Berhad	Remain company name. Focus on family takaful business only, effective 1 July 2018.
Syarikat Takaful Malaysia Berhad	A family takaful business licence is granted to STMB under a new name of Syarikat Takaful Malaysia Keluarga Berhad (STMKB) as a holding company to manage the Family Takaful business. A new company which is a wholly-owned subsidiary of STMKB by the name of Syarikat Takaful Malaysia Am Berhad (STMAB) is established to manage the General Takaful business; effective 1 July 2018.
Takaful Ikhlas Sdn Bhd	A family takaful business licence is granted to Takaful Ikhlas Berhad under a new name of Takaful Ikhlas Family Berhad. Its general takaful business is being managed by a new company, Takaful Ikhlas General Berhad; effective 30 November 2018.

The efficiency of the general takaful operators is measured by using the Data Envelopment Analysis (DEA). DEA is basically a non-parametric programming technique that can be used to measure the relationship between the produced goods and services and their respective resources, and subsequently to obtain the efficiency scores as the result of optimisation. The term 'data envelopment analysis' was first coined by Charnes, Cooper and Rhodes (1978), which subsequently gained wide attention in the academic literature. As described by Charnes et al. (1978), DEA is a 'non-parametric programming technique that develops an efficiency frontier by optimising the weighted output/input ratio of each provider, subject to the condition that this ratio can equal, but never exceed, unity for any other provider in the data set'.

One of the advantages of using DEA is that it does not impose any functional form on the data. Therefore, this method could use multiple inputs and outputs simultaneously in its analysis. This study opts for the input-oriented approach, which seeks to reduce the inputs in order to improve efficiency. In other words, it addresses the question: "By how much can input quantities be proportionally reduced without changing the output quantities produced?" In this study, we assume that the takaful operators have more control over the inputs rather than the outputs, hence the use of this approach. The input and output variables are explained in Table 2.

By running the DEA under the variable returns to scale (VRS) assumption, the overall technical efficiency (OTE) score which is obtained from the constant returns to scale (CRS) assumption is decomposed into two components, i.e., pure technical efficiency (PTE) and scale efficiency (SE). PTE measures the technical efficiency without scale efficiency, and therefore it purely reflects the managerial performance in the input-output organisation. Thus, PTE is often used to capture the managerial efficiency. Meanwhile, SE indicates whether the firm is operating at optimal scale size which will attain the expected output level. Inappropriate firm size could also lead to technical inefficiency (Kumar & Gulati, 2008). If the OTE scores between the CRS and VRS models are the same, it means scale inefficiency is absent. On the contrary, if they are different, the scale inefficiency can be measured by using the technical efficiency scores of both models. Note that: $OTE = PTE \times SE$. The following is the VRS linear programming problem,

$$\begin{aligned} \text{st } & -y_i + Y\lambda \geq 0, \\ & \theta x_i - X\lambda \geq 0, \\ & N1'\lambda = 1 \\ & \lambda \geq 0, \end{aligned}$$

where θ is a scalar and λ is a $N \times 1$ vector of constants, and $N1$ is an $N \times 1$ vector of ones. By having fewer constraints than the multiplier form ($K+M < N+1$), this envelopment is basically the ideal form to

Table 2 List of DEA Inputs and Outputs

Item	Variables
Input	1. Net claims paid 2. Commissions paid 3. Management expenses
Output	1. Net contribution income 2. Net investment income

solve. According to Farrell (1957), the value of θ , i.e., the efficiency score, will satisfy the $\theta \leq 1$ condition, whereby the value of 1 indicates a point on the frontier which represents technical efficiency. In this case, the linear programming is solved for N times before the θ value for each firm is obtained. The addition of N1 results in a convex hull of intersecting planes that better envelope the data points than the conical hull under the CRS assumption. Therefore, the VRS model provides equal or greater technical efficiency scores in comparison to those of the CRS model.

In addition, the Malmquist Productivity Index (MPI) is used to evaluate the total factor productivity growth of the general takaful operators. Based on Fare et al. (1989), the MPI is written as follows:

$$M^t = \frac{D^{t+1}(x^{t+1}, y^{t+1})}{D^t(x^t, y^t)} \left\{ \left[\frac{D^t(x^{t+1}, y^{t+1})}{D^{t+1}(x^{t+1}, y^{t+1})} \right] \left[\frac{D^t(x^t, y^t)}{D^{t+1}(x^t, y^t)} \right] \right\}^{\frac{1}{2}}$$

where the notations $D^t(x^{t+1}, y^{t+1})$ represents the distance from the period t+1 observation to the period t technology. The whole notation comprises of two parts, namely technical efficiency change, and technical change. Essentially, the former reflects how well the firm process converts inputs into outputs, while the latter reflects technological improvement.

RESULTS AND DISCUSSION

The results indicate that Etiqa Takaful and Prudential BSN Takaful remain efficient for the whole period of 5 years. This good performance is followed by Sun Life Takaful and STMB who managed to remain efficient for 4 and 3 out of 5 years, respectively. Meanwhile, MAA Takaful records the lowest efficiency from 2013 to 2015. Renamed to Zurich Takaful a year later, it was still the least efficient general takaful in 2016. However, its performance bounced positively in 2017 to be better than STMB and Takaful Ikhlas. The overall

results also indicate that MAA (Zurich) Takaful and Takaful Ikhlas were never on the efficiency frontier line throughout the whole 5-year period. The efficiency scores from the year 2012 to 2017 is presented below in Table 3.

The results prove that there is no surprise for Etiqa Takaful winning multiple awards for its services. Among the recent awards are "Best Islamic Takaful Institution for General Takaful in Malaysia" at the Asset Triple A Islamic Finance Awards 2018, and "Best Takaful Company – Malaysia" at the International Takaful Awards 2018. Similarly, Prudential BSN has also bagged home various awards for its excellent performance such as "Best Takaful Company – Asia" at the International Takaful Awards 2018, and "Excellence in Takaful Insurance Services" at the 2018 Malaysia Excellence Business Awards.

Figure 2 presents the mean efficiency scores of the general takaful operators from 2013 to 2017. The mean OTE ranged from a low of 0.865 in 2015 to a high of 0.977 in 2017. The first three years indicate half of the takaful operators in this study are efficient. The number decreased in 2016, but it increased in 2017 with 5 out of 8 are efficient. The overall results point out to one striking findings. Each of the five years indicates that the source of inefficiency for the inefficient takaful firms is mainly the scale size. The figures indicate that these firms are mostly managerial efficient, but scale inefficient. In fact, the figures indicate that in 2017, all takaful operators are managerial efficient. Except for 2013, each of the other sample years indicates a higher PTE than SE. This highlights that scale inefficiency has a higher bearing than the managerial inefficiency on the efficiency level of the Malaysian takaful industry. It shows that the general takaful operators in Malaysia are mainly not operating at the most productive scale.

Table 3 Efficiency Scores of the General Takaful Operators from 2013-2017

Year	Takaful Operators	OTE	PTE	SE
2013	Etika Takaful	1	1	1
	HLMSIG Takaful	0.824	0.825	0.999
	HSBC Amanah Takaful	0.925	1	0.925
	MAA Takaful	0.384	0.469	0.818
	Prudential BSN	1	1	1
	Sun Life Takaful	1	1	1
	STMB	1	1	1
	Takaful Ikhlas	0.885	0.968	0.915
	MEAN EFFICIENCY SCORES	0.877	0.908	0.957
2014	Etika Takaful	1	1	1
	HLMSIG Takaful	0.879	1	0.879
	HSBC Amanah Takaful	0.856	1	0.856
	MAA Takaful	0.548	0.888	0.617
	Prudential BSN	1	1	1
	Sun Life Takaful	1	1	1
	STMB	1	1	1
	Takaful Ikhlas	0.95	0.981	0.968
	MEAN EFFICIENCY SCORES	0.904	0.984	0.915
2015	Etika Takaful	1	1	1
	HLMSIG Takaful	0.977	1	0.977
	HSBC Amanah Takaful	0.731	1	0.731
	MAA Takaful	0.533	0.803	0.663
	Prudential BSN	1	1	1
	Sun Life Takaful	1	1	1
	STMB	1	1	1
	Takaful Ikhlas	0.683	0.896	0.762
	MEAN EFFICIENCY SCORES	0.865	0.962	0.892

Table 3 (Cont.)

2016	Etika Takaful	1	1	1
	HLMSIG Takaful	1	1	1
	HSBC Amanah Takaful	0.965	1	0.965
	Prudential BSN	1	1	1
	Sun Life Takaful	0.925	1	0.925
	STMB	0.936	1	0.936
	Takaful Ikhlas	0.854	1	0.854
	Zurich Takaful	0.622	0.768	0.809
	MEAN EFFICIENCY SCORES	0.913	0.971	0.936
2017	Etika Takaful	1	1	1
	HLMSIG Takaful	1	1	1
	HSBC Amanah Takaful	1	1	1
	Prudential BSN	1	1	1
	Sun Life Takaful	1	1	1
	STMB	0.931	1	0.931
	Takaful Ikhlas	0.887	1	0.887
	Zurich Takaful	0.997	1	0.997
	MEAN EFFICIENCY SCORES	0.977	1	0.977

Note: OTE (Overall Technical Efficiency); PTE (Pure Technical Efficiency); SE (Scale efficiency)

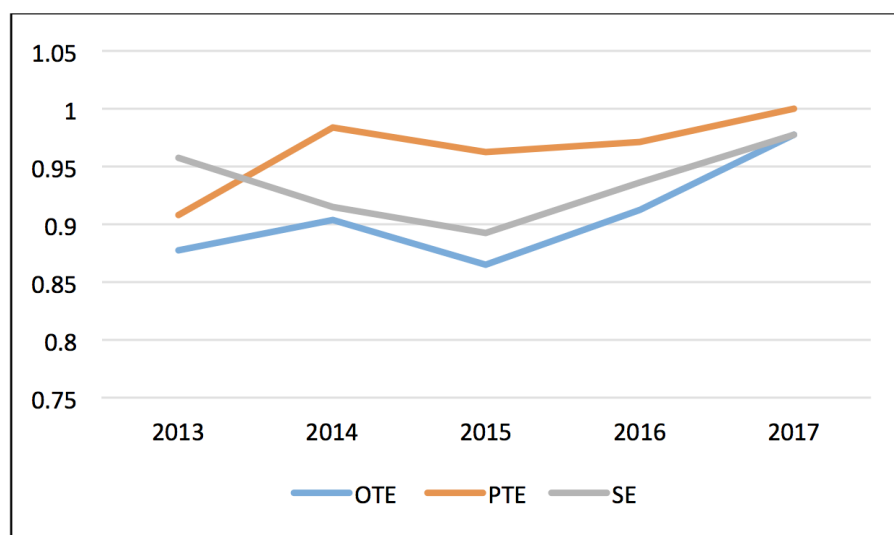


Figure 2 Mean Efficiency Scores of the General Takaful Operators from 2013-2017

Table 4 presents the Malmquist Index summary for the general takaful operators from the year 2013 to 2017. The mean efficiency scores indicate that the total factor productivity (TFP) of general takaful business has regressed by 5.3%, attributed by both the regress in the technological change and progress in efficiency change. The 3.7% progress in the efficiency change is mostly contributed by pure efficiency (3.2%), and further added by the scale efficiency (0.6%). The substantial regress in the technological change suggests that general takaful operators could improve their productivity by improving their technical innovation.

22.3%. However, despite the positive progress, it is confounding to note that both Hong Leong MSIG and HSBC Amanah Takaful had exited the general takaful business following the single license requirement by IFSA 2013. On another note, the move by HSBC Amanah Takaful to transfer its general takaful business to Zurich General Takaful Malaysia Berhad is seen to be a smart decision, given the significant productivity growth of Zurich Takaful during this period. Meanwhile, Sun Life Malaysia Takaful denotes no change between the periods, while four other operators experienced TFP regress, with STMB being

Table 4 Malmquist Index Summary of Firm Means (2013-2017)

Takaful Operators	EFFCH	TECHCH	PECH	SECH	TFPCH
Etika Takaful Berhad	1	0.964	1	1	0.964
Hong Leong MSIG Takaful Berhad	1.050	0.975	1.049	1	1.023
HSBC Amanah Takaful (Malaysia) Sdn Bhd	1.020	1.023	1	1.020	1.043
Prudential BSN Takaful Berhad	1	0.966	1	1	0.966
Sun Life Malaysia Takaful Berhad	1	1	1	1	1
Syarikat Takaful Malaysia Berhad	0.982	0.572	1	0.982	0.562
Takaful Ikhlas Sdn Bhd	1.001	0.943	1.008	0.992	0.943
Zurich Takaful Malaysia Berhad	1.27	0.963	1.208	1.051	1.223
MEAN EFFICIENCY SCORES	1.037	0.913	1.031	1.006	0.947

Note: EFFCH (Efficiency change); TECHCH (Technical Efficiency change); PECH (Pure Efficiency change); SECH (Scale efficiency change); TFPCH (Total Factor Productivity change)

In terms of the individual operators, the results suggest that only three out of eight operators have made progress in their TFP. They are Hong Leong MSIG, HSBC Amanah Takaful, and Zurich Takaful; with the latter recording the highest growth of

the most regressed operator, i.e. by 43.8%. Overall, the results presented in Figure 3 indicate that the total factor productivity of the general takaful operators is mainly contributed by its efficiency change, but dampened by its technical change.

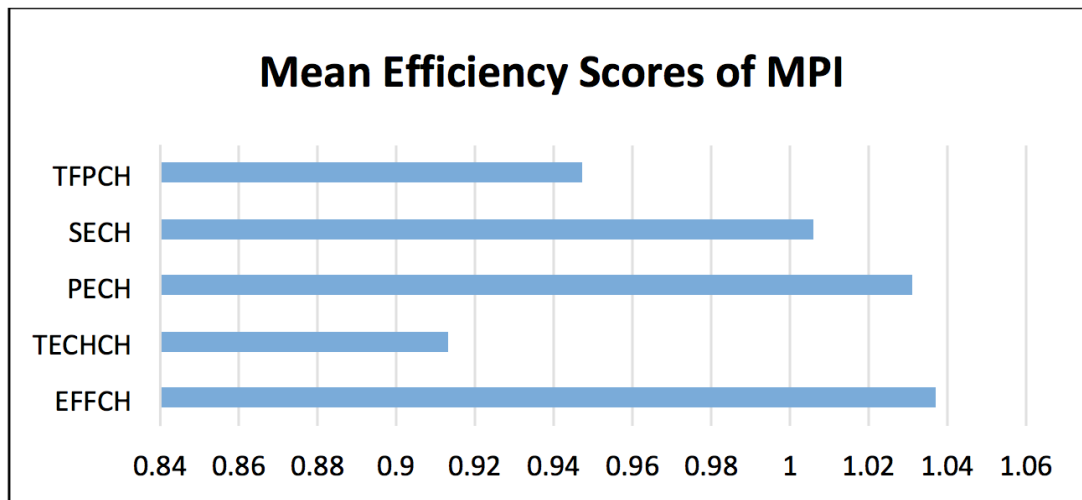


Figure 3 Malmquist Productivity Index (MPI) summary (2013-2017)

CONCLUSION

The findings indicate that the annual industry average efficiency has been improving with 62.5% and 100% are efficient under the CRS and VRS assumption, respectively in the year 2017. The analysis points out that the main source of inefficiency is the scale inefficiency rather than managerial inefficiency. It shows that the general takaful operators in Malaysia are mainly not operating at the most productive scale. It is noteworthy that during the study period, all takaful operators in this sample are composite takaful operators, meaning that they are also running family takaful alongside the general takaful business. Therefore, it is uncertain as to how would the IFSA 2013 requirement for the separate single insurance/takaful license affect the efficiency of the takaful operators in the future. On the one hand, there will be additional costs should the operators decide to keep both general and family licenses. While on the other hand, greater focus could be given to the general takaful business, which is currently lagging behind the family takaful business in Malaysia. On another note, the total factor productivity (TFP) analysis indicate an overall regress by 5.3%, which is dampened by the decrease in the technological change. It is therefore suggested for the general takaful industry to better embrace the technology and digital reform in its future blueprint in order to improve the industry efficiency. As a

conclusion, efficiency is indeed essential because it enables competitive pricing and hence benefits both the takaful operators and consumers. However, it is important to note that these findings on efficiency do not represent, in any way, the firm profitability (for investment purpose) and the quality of the takaful products offered by the respective takaful operators (for takaful subscription purpose).

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