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Productivity analysis of family takaful in Indonesia and Malaysia: Malmquist productivity index approach

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Abstract

Purpose – This study aims to investigate the productivity level of family takaful in Malaysia and Indonesia from 2014 to 2019. Productivity can support corporate sustainability, which is one of the company's goals.

Design/methodology/approach – The measurement of the productivity level in this study involved applying the Malmquist Productivity Index (MPI) method. The input variables used consisted of equity, total expenses and total investment. The output variables consisted of total profit and investment income. In addition, this research used the orientation of the output and intermediation.

Findings – Throughout the study period, the Indonesian family takaful had an average total factor productivity change (TFPCH) of about 0.945. In other words, it did not reach optimal productivity. It is more due to the low value of technological change (TECHCH). On the contrary, family takaful companies in Malaysia had called productivity, showing a TFPCH of about 1.041. Again, this is mainly due to an increase in TECHCH and efficiency change, but it is still low in pure technical efficiency change.

Research limitations/implications – This study focuses on factors that exist in internal takaful companies. Neither micro- nor macroeconomic variables that can affect productivity levels have been measured. In addition, this study only analyzed two countries out of the 11 countries in the Southeast Asian region.

Practical implications – Family takaful companies can use the productivity index as one of the bases of evaluation in managing their resources to enhance optimal output. Furthermore, the management of family takaful companies in Indonesia needs to focus more on technological innovation and delivery of services to increase productivity. Meanwhile, family takaful companies in Malaysia can maintain their technology usage and efficiency to operate productively. The government in both countries is expected to actively accelerate the growth of family takaful companies by producing regulatory products that strengthen the industry. Specifically, the government in Indonesia needs to make regulations that support technology improvement.

Originality/value – There is still not much research that examines family takaful's productivity level using the MPI. The MPI is an appropriate tool to evaluate the productivity of family takaful companies. Thus, family takaful companies can improve their quality by assessing the productivity index value.

Keywords Total factor productivity, Productivity, Corporate sustainability, Malmquist Productivity Index, Family takaful

Paper type Research paper

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1. Introduction

Islamic finance and takaful are growing global phenomena, contributing positively and substantially to the world economy. The demand for takaful is also in line with the increasing popularity of Islamic finance after the global financial crisis (Akhter *et al.*, 2017). Insurance is a pillar in the financial system that can manage individual and organizational risks to sustain the operational and economic environment (Alshammri *et al.*, 2018). Although still about 5% of the global financial industry, the assets of Islamic financial institutions stood at nearly US$1tn in 2009. These assets have grown fivefold since 2003. It took 40 years for the Islamic finance industry to reach this size, but it is likely to take only five years to double (Bhatty, 2010) (Figure 1).

The figure above illustrates the takaful gross contribution to the global economy with a compound annual growth rate that reached 6.9% during 2011–2017. Meanwhile, the total global takaful contribution in 2017 amounted to US$26.1bn, an increase of 4.3% from the previous year. The average asset growth of global takaful during 2012–2017 amounted to 6%, with total assets reaching US$46m in 2017 and real takaful operators including as many as 324 companies. In 2018, the Southeast Asian region had the most significant number of takaful companies, about 30% globally. As a result, the contribution of Islamic insurance in Southeast Asia has reached US$3.86bn in 2017. Three countries contributing to this achievement are Malaysia at 70%, Indonesia at 25% and Brunei at 5% (IFSB, 2019).

The development of takaful in the Southeast Asian region was dominated by family takaful companies, which made up more than three-quarters of the Southeast Asian Market in 2017 (IFSB, 2019). This development was due to the increasing income of middle- and lower-class Muslims. Therefore, it indicates that the development of family takaful is much better and more attractive to the public (Salfia and Suprayogi, 2020).

This research focuses on family takaful companies in Indonesia and Malaysia with the highest growth in Southeast Asia. Moreover, the family takaful that provides Islamic concepts is essential for customers who intend to avoid non-halal finance. In the concept of Islam, conventional insurance was prohibited because it contained *Gharar*, *Maisir* and *Riba*. So, to facilitate the customers intending to use the Islamic insurance, the performance of family takaful companies needs to develop.

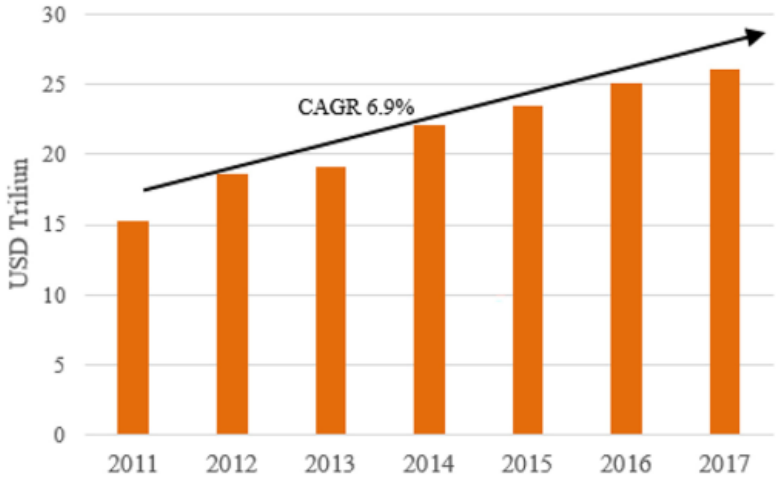

Figure 1.
Takaful global gross contribution (IFSB, 2019)

Market penetration and the market share of insurance as a whole are still low. In 2019, the market share of takaful in Indonesia was 3.31%, with a penetration of 0.113% (Financial Services Authority, 2019). Meanwhile, in Malaysia, the family takaful market share reached 10.5%, with a penetration of 15.9% (Malaysian Family Takaful Association, 2019). The ascending number of family takaful companies in Indonesia and Malaysia has brought about tighter business competition. Thus, every company must formulate the right strategy in this market situation and improve the quality (Ardianto and Sukmaningrum, 2020).

Some of the causes of low market penetration of takaful include, first, the lack of product development where the public still argues that the business lines managed are still not following Islamic law (Alshammri *et al.*, 2018). Second, the low channel distribution that depends on agents and brokers needs to start using online networks. Third, there has been no development of regulations where some countries still consider it a secondary business.

Improving the quality of family takaful companies can be done by refining the company performance. The performance itself is a person's level of success in carrying out their duties during a specific period (Veitzal and Basri, 2005). One of the assessments that can be used to measure the performance of a family takaful company is by testing its productivity level. Productivity is the most critical factor in creating a company's success and is one of the indicators that can assess a company's competitive ability (Pitaloka *et al.*, 2018). Good productivity is obtained when the number of outputs grows, but the number of inputs is constant, or the outcome with input is less (Tarwaka and Dkk, 2005).

Research focusing on performance and efficiency in takaful companies has been conducted by several previous researchers (Norma *et al.*, 2006; Ardianto and Sukmaningrum, 2020; Naushad, Faridi and Faisal, 2020; Karbhari *et al.*, 2018; Saad, 2012; Islam *et al.*, 2013; Baharin and Isa, 2013; Yakob *et al.*, 2014; Al-Amri, 2015). However, to the best of our knowledge, some research has been done so far to investigate productivity changes in takaful companies (Yusof, 2020; Akhtar, 2018; Taib, Ashraf and Razimi, 2018; Lim *et al.*, 2021; Suryoaji and Cahyono, 2019; Iskandar *et al.*, 2020). Therefore, the current study fills the gap within the existing literature on family takaful in Indonesia and Malaysia using the Malmquist Productivity Index (MPI) method.

A nonparametric MPI approach was used in this study. MPI is part of productivity and efficiency in the data envelopment analysis (DEA). It looks explicitly at the productivity levels of each business unit so that changes in efficiency and technology levels will be seen based on predetermined inputs and outputs (George Assaf *et al.*, 2011; Rani *et al.*, 2020). Another exciting feature of MPI is the total factor productivity change (TFPCH), divided into the technical efficiency change (EFFCH) and the technological change (TECHCH). Therefore, changes in productivity can be attributed to differences in EFFCH or TECHCH. Changes in technical efficiency break down into pure technical efficiency (PTECH) and scale efficiency change (SECH). PTECH refers to a company's ability to avoid waste by producing optimal output by using existing inputs. SECH refers to a company's ability to work according to its optimal scale (Bassem, 2014).

This study aims to analyze the productivity of family takaful in Indonesia and Malaysia. This study focused on a new period, so these research results are by current conditions. The research period uses 2014–2019, and we exclude 2020 because that year, the state of all financial industries was unstable due to the pandemic condition. To avoid biased results and get the best results regarding efficiency, this research chose the era before the pandemic. Therefore, they can be applied to takaful companies using five years to see the movement of the productivity level of the sample companies. To focus on this, the objectives of this study are given below:

- to evaluate the value of TFPCH, TECHCH, EFFCH, PTECH and SECH of family takaful in each country; and
- to investigate the specific level of productivity in individual family takaful companies.

This research contributes to empirical literature for many stakeholders. First, the results of this study are beneficial for regulators (Bank Negara Malaysia and Bank Indonesia) in producing regulations that strengthen the family takaful industry. Second, the results of this study can be a guide for companies to determine the potential for improvement of aspects that can increase productivity. Third, this research can be literature for the public interested in productivity analysis and the development of the Takaful industry.

The remainder of this paper consists of five sections. Next, the literature review section provides an overview of the concept of family takaful, the industry of family takaful in Indonesia and Malaysia and productivity. The third section includes research methodology, data sources and empirical models. The fourth section contains the findings and analysis, describing the results and analyzing each problem formulation. Then, the last section discusses conclusions and research suggestions.

2. Literature review

2.1 Takaful

The existence of takaful in the community represents the principle of mutual help based on Surah Al-Ma'idah 5: 2. Takaful has a more positive impact on society than conventional insurance, where takaful participants always practice the concept of helping each other to develop a caring, humble and caring community for their environment (Abduh and Zein Isma, 2017). Takaful is very relevant to the principles of *ukhuwah* (brotherhood) among Muslims because it has shared values in social life. That is, one community member always helps another (Mapuna, 2019). Apart from being a risk hedging service, Takaful also has a role in deriving finance, generating liquidity and facilitating long-term investment in the Islamic economy (Ardianto and Sukmaningrum, 2020). Moreover, takaful has the concept of sharing risk among fellow participants to become the bearers of the dangers that arise. In determining the principles, practices and operations of takaful, the parameters that constantly refer to the principles of Sharia are derived from the Qur'an, hadith and Islamic jurisprudence (Rohmah and Abidin, 2017).

Takaful consists of family takaful and general takaful. The object of family takaful is human beings, while general takaful is property. More specifically, in family takaful, protection is provided financially to face death and possible accidents that befall participants in the future (Purwaningrum and Filianti, 2020). This type of insurance prevents the insured from material losses if he reaches his final age or dies before retirement. The liability is at the risk of death in life insurance, resulting in losing the family's income. In addition, this insurance provides liability, such as guarantees for offspring where when the father dies prematurely, the child will not be neglected in his life (Antonio, 1999, p. 150). In addition, the working mechanism of the two takaful is different. However, it generally has the same principle: *ta' awun* or helps others (Sula, 2004).

The Fatwa from the National Sharia of the Indonesian Moslem Scholar Council (DSN-MUI) number 21/DSN-MUI/X/2001 explains takaful (*Ta, min, Family takaful or Tadhamun*) is an effort to protect and help each other. Investment in assets and *tabarru'* provides a return pattern to confront certain risks through an agreement by Sharia. In other words, the essence of Islamic insurance is to protect and help each other (*ta' awun)*. The principle of

ta'awun in takaful makes the insurer and the insured inseparable. Therefore, the participant becomes both the insurer and the insured.

The family takaful operational system must avoid *gharar, riba* and *maisir*. Family takaful uses two main contract types: tabarru contracts and mudharabah (profit sharing) contracts to avoid these elements. In its operations, the company prepares two accounts. The first is a *tabarru* fund account to accommodate contributions deposited by all participants who have the intention of helping fellow participants. If a participant is exposed to the risk of illness, accident or death, the claim will be taken from the *tabarru's* account. Through this mechanism, each participant contributes to other participants who are at risk. Second, the participant's personal account or *tijarah* fund is invested under a *mudharabah* contract. On the other hand, the insurance company only acts as an operator that accepts participants' mandates to manage the customer contribution funds (Sula, 2004; Mapuna, 2019).

2.2 Family takaful industries in Indonesia and Malaysia

Family takaful or family takaful in Indonesia continues to experience good development. The Sharia Non-Bank Financial Industry (IKNB) statistics show that the family takaful asset reaches 37,887bn and has grown 14.91% over the last five years (OJK, 2019). The pace of development of family takaful in Indonesia is quite good, driven by government regulations that continue to strengthen the sharia insurance industry in Indonesia. One of the many regulations issued is Law No. 40 of 2014 on insurance, which improves Law No. 2 of 1992 on the Insurance Business. Based on data from the IKNB Syariah Department in 2019, the number of family takaful companies in Indonesia reached 30 companies consisting of 7 full fledge family takaful companies and 23 business units of family takaful companies (OJK, 2019).

The development of family takaful in Malaysia is also experiencing excellent development. Even the growth of family takaful in the country in 2017 reached 10% by surpassing the growth of conventional life insurance, which only grew by 3.9% from the previous year (Middle East Insurance Review, 2018). Family takaful demand in Malaysia is also influenced by the Muslim population, community income, quality of education and dependency ratio (Sherif and Azlina Shaairi, 2013). The role of the government through Bank Negara Malaysia, which continues to give birth to regulations related to the position of Takaful in the country, is an essential factor in the rapid growth of Malaysian family takaful. In May 2018, Bank Negara Malaysia issued a revision of the Takaful Operational Framework to strengthen the governance of takaful operators and protect the interests of sharia insurance participants. Based on data from Bank Negara Malaysia, the number of family takaful operators in Malaysia to date has reached 11 companies.

2.3 Productivity

Every company requires a strategy to increase customer satisfaction and reduce costs in related activities. Increased productivity is also expected to accelerate company value. In addition, productivity is an essential factor as it can reflect its economic performance. The economic performance of a company consists of operational performance and financial performance. Operational performance is assessed from the input and output flows. Meanwhile, financial performance is judged by the outflow and inflow of funds (Utami, 2002).

Productivity is an indicator used to measure the performance of a company. It reflects how a person or organization optimizes its resources to create goods and services. Increased productivity is expected to improve company performance, competitive prices, service quality and resource allocation growth (Koutsomanoli-Filippaki *et al.*, 2009). High

productivity levels will serve broad implications for the company, including cost savings in the company's day-to-day operations. These cost savings will result in a business profit elevation (Pitaloka *et al.*, 2018). The simplest definition of productivity is the ratio between output and input. Meanwhile, the productivity criteria are related to the added value in production (Nurfikasari *et al.*, 2019). The productivity gained from combining the expected output according to the target (effectiveness) and the minimum use of input resources will yield maximum results (efficiency).

The concept of productivity describes input and output (Rani *et al.*, 2017; Rusydiana, 2018). In terms of quantity, the input factor of service companies is relatively the same as the manufacturing industry, namely, raw materials, labor and capital. However, in in-service companies, the workforce plays a dominant role. At the same time, the service company output factor refers to the number of services offered. In the quality dimension, the service company output factor is reflected in how consumers perceive services after purchasing them (Utami, 2002).

3. Methodology

3.1 Data and samples

The data used in this study is a financial statement report of family takaful companies in Indonesia and Malaysia between 2014 and 2019. These data can be accessed through each post-audit company website. The population in this study are all family takaful companies in Indonesia, registered in the Financial Services Authority and those in Malaysia, which is registered with Bank Negara Malaysia.

The sample was chosen using purposive sampling. Furthermore, the criteria for the desired selection were family takaful companies with complete positive data regarding variables used over 2014 to 2019. Therefore, the samples used in this study were ten family takaful companies in Indonesia and five family takaful companies in Malaysia.

3.2 Malmquist Productivity Index

The research approach was a quantitative approach using the MPI method. In testing the MPI, the researchers applied the output orientation to assume that family takaful companies preferred to obtain more output with a stable input (Bjurek, 1996; Kamarudin *et al.*, 2017; Pitaloka *et al.*, 2018). In addition, the intermediation approach was used since it can describe the actual function of financial institutions (Ascarya *et al.*, 2008). This approach sees financial institutions as intermediaries. These financial institutions convert and transfer financial assets from overfunded units to underfunded units. This approach measures output through credit loans and financial investments, while institutional inputs are labor and capital costs and interest payments on deposits (Ascarya and Yumanita, 2006).

The MPI functions to test the productivity level of a company or organization. Cooper *et al.* (1999) explained that MPI is a bilateral index used to compare the production technology of two economic elements. Färe *et al.* (1994), at first, introduced the MPI to measure changes in factor productivity total for a particular company in two periods. Meanwhile, according to Suzuki and Sastrosuwito (2011), the MPI measures the difference in total factor productivity (TFP) between two data points by calculating the distance of each relative data point toward standard technology requires input and output from one time period. MPI has three main advantages. First, it does not require profit maximization or cost minimization assumptions. Second, it does not require information on input and output prices. Third, if the researcher has panel data, it allows the breakdown of productivity into two components, namely, changes in technical efficiency or catching up to technological changes or changes in best practice (Färe *et al.*, 1994; Suzuki and Sastrosuwito, 2011; Jahan, 2019; Otaviya and Rani, 2020).

The MPI is part of the DEA method, which can process nonparametric panel data. As stated above, productivity measurement applies MPI. Sten Malmquist created this index in 1953. Then, the MPI was developed by Caves, Christensen, Diewert (CCD) in 1982 (Bahrini, 2015; Bjurek, 1996; Kamarudin *et al.*, 2017; Rani *et al.*, 2017; Rusydiana, 2018). Moreover, MPI is often used to measure changes in the productivity of a *decision-making unit* (DMU). Additionally, MPI can be decomposed into changes in technology and changes in inefficiency. Thus, an incline or decline of MPI can be induced by two matters, changes in technology or changes in efficiency (Rusydiana, 2018). MPI comprises several components. Fukuyama (1995) and Kamarudin *et al.* (2017) described the features of the MPI as follows:

- TFPCH is the final value that determines a DMU to experience increased productivity and decreased productivity.
- TECHCH is an indicator that shows the use of technology and innovation during the production process.
- EFFCH is an indicator that reflects the company's ability to maximize the output produced with several available inputs.
- PTECH is an indicator that visualizes the company's managerial ability to operate.
- SECH is an indicator that represents the most efficient company condition.

MPI is adopted to measure the TFP and its components. A takaful company is considered productive if the TFP is more than 1, unproductive if the TFP is less than 1 and stagnant if the TFP is equal to 1. Fukuyama (1995) and George Assaf *et al.* (2011) explained productivity as follows:

$$M_o\left(x^{t+1}, y^{t+1}, x^t, y^t\right) = \frac{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_o^t\left(x^t, y^t\right)} X \left[\left(\frac{D_o^t\left(x^{t+1}, y^{t+1}\right)}{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)} X \frac{D_o^t\left(x^t, y^t\right)}{D_o^{t+1}\left(x^t, y^t\right)} \right) \right] 1/2 \quad (1)$$

Notes:

M_o = *Malmquist productivity index* (MPI);
D_o = distance function;
x^t = input from technology for the current period;
x^{t+1} = input from the next period technology;
y^t = output of technology for the current period; and
y^{t+1} = output of the next period technology.

The distance function of $D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)$ measures the maximum proportionate change required to make (x^{t+1}, y^{t+1}) feasible for the technology at time t. As for the distance function $D_o^t\left(x^t, y^t\right)$, it measures the maximum proportional change in output required to make $\left(x^t, y^t\right)$ feasible in technology at time $t+1$ (Bassem, 2014; Färe *et al.*, 1994).

3.3 Empirical model

The empirical model describes the relationship between total capital, expenses and investment as input variables, with real profit and total investment income as output variables. First, the five variables were tested using the MPI to determine the productivity level of Islamic insurance companies in Indonesia and Malaysia. Then, further testing was carried out to find out the EFFCH, TECHCH, PTECH and SECH (Figure 2).

3.4 Input and output variables

An input variable is a collection of processed resources to produce an output (Putri, 2020). This study has three input variables: equity, total expenses and total investment. As shown in Table 1, equity is a form of estimation that reflects the portion of the rights or interests of the company owner in the company's assets. The Statement of Financial Accounting Standards in 2002, section 49, stated that equity or capital is a residual right on the company's assets after being deducted from all liabilities. Meanwhile, according to PSAK No. 21, total capital is the difference between liabilities and assets (Astuti and Suprayogi, 2017).

Expense is a cost that has benefited a person and has now been exhausted. Meanwhile, total expenses are incurred to manage company funds and participant funds. In company funds, expenses are all operating expenses recorded in the company's income statement. On the other hand, participant funding expenses are all insurance expenses recorded in the *tabarru* fund underwriting surplus report (Bustami and Nurlela, 2013, p. 8). Therefore, total expenses are the total operating expenses in the company's income statement and insurance expenses recorded in the *tabarru* fund underwriting surplus report (Astuti and Suprayogi, 2017).

On the one hand, investment is the activity of placing funds in one or more than one type of asset with the hope of obtaining a return or income or an increase in investment value in the future during a specific period. On the other hand, the total investment consists of the entire investment owned by the company, recorded in the company's balance sheet added to the investment in participant funds registered in the participant's balance of funds (Hidayati, 2017). Thus, the total investment is issued from company funds and funds itself (Astuti and Suprayogi, 2017).

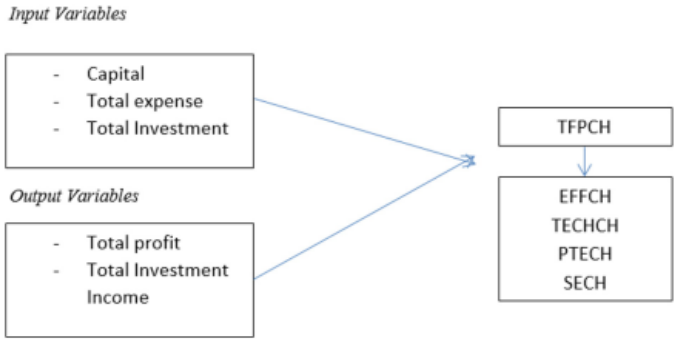

Figure 2.
Empirical model of the productivity level

Variable name	Formula
Input variables	
Equity	Total capital presented in LK
Total expenses	Total operational expenses + Total insurance expenses
Total investment	Total investments made by the company
Output variables	
Total profit	Company profit + *tabarru* fund surplus
Total investment income	Income resulting from investments made by the company

Table 1.
Input and output variables

An output variable is produced through various inputs (Putri, 2020). There are two output variables used in this study. First, the total profit represents the excess revenue over expenses during the accounting period. Meanwhile, the definition of profit observed by the current accounting structure is the difference between income and costs. It is obtained from company funds and participant funds (Astuti and Suprayogi, 2017). Second, investment income generates from all investments (stocks, *Sukuk* [sharia certificate], Sharia mutual fund time deposits and others) from company funds and participant funds. Investment income, also, is the result of investments made by placing company funds or participant funds in investment instruments, such as stocks, deposits, *Sukuk* and others (Astuti and Suprayogi, 2017).

4. Findings and analysis

Productivity measurement can be carried out by checking the value of TFPCH. TFPCH can be broken down into two forms: TECHCH to illustrate the use of technology and innovation in the production process; and EFFCH to reflect the company's ability to maximize the output produced several available inputs.

4.1 Family takaful in Indonesia

Figure 3 above shows MPI observations of family takaful companies in Indonesia between 2014 and 2019. The graph reveals that, between 2014 and 2018, family takaful companies in Indonesia had not operated productively, with the TFPCH average value being less than one due to unfavorable investment income on family takaful recorded. In addition, there was a decrease in the value of the investment in that period. Thus, the negative return on investment in family takaful can be due to the performance of falling stocks and a decline in the stock index (Kontan, 2015). Therefore, the development of the investment in family takaful generally depends on the performance of mutual funds and Islamic stocks. The lowest productivity occurred in 2017–2018, in which the TFPCH value decreased by 27.3% (0.727), whereas in previous periods, the productivity value has started to grow.

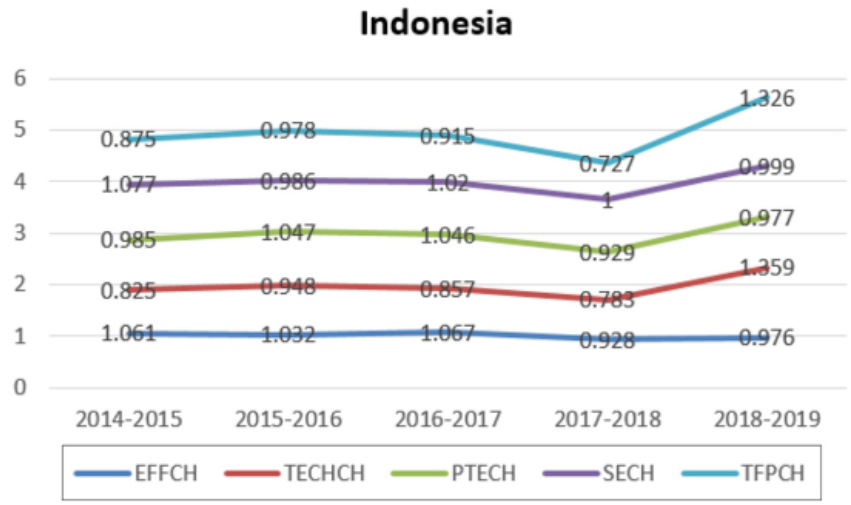

Figure 3.
MPI result of family takaful in Indonesia for the 2014–2019 period

Family takaful companies in Indonesia still have not increased innovation and used technology in their operational activities. Between 2014 and 2018, the component that needed improvement was TECHCH, with an average value of 0.85. Low utilization of technology could cause this situation as an innovative product and family takaful company services. However, the company is expected to respond to all environmental changes and adapt to technological advances that become part of today's industrial business competition (Nugraheni and Muhammad, 2019). A survey conducted by CIBAFI (2018) shows that information technology (IT) to achieve cost efficiency and productivity ranks highest in the Global Takaful Industry Top Concerns with a score of 4.09. The government in Indonesia also needs to provide support, both regulation and cooperation with other parties in improving technology in the takaful industry.

In 2018–2019, family takaful companies in Indonesia were significantly able to operate productively with the value of 1.326 and obtained an increase in the value of the highest productivity during the period of observation, which accounted for 32.6%. This increase was supported by the domination of the improvement of the indicators of technological change, which means that companies can adapt to technology and increase innovation. In addition, in 2019, the investment value (input) of Islamic life insurance company funds was Rp 7,318.56bn, an increase of Rp 347.40bn or 4.98% from the previous year, with the value of investment results (output) of company funds reaching Rp 607.98bn (OJK, 2019).

Table 2 depicts two companies in Indonesia that experienced enhanced productivity while other companies encountered decreased productivity. The family takaful companies proven to excel were AIA, which represented as much as 12.1% (1.21), and AXA Financial Indonesia made up 15.6% (1.156). One of the factors triggering increased productivity in both companies is the high-efficiency change (EFFCH). These companies were able to obtain maximum output by using their inputs.

In contrast, Great Eastern Life has the lowest productivity, which comprises −25.2% (0.748). The company is already efficiently shown, with EFFCH, PTECH and SECH reaching a score of 1. However, the company is still not optimal in using technology and innovation, evidenced by the low TECHCH value of 0.748.

Overall, in average years of observation, there is a decrement in the productivity level of family takaful companies in Indonesia, indicating the TFPCH value of < 1 (0.945). It means that the productivity level of family takaful companies in Indonesia has also decreased

Table 2.
MPI result of individual family takaful companies in Indonesia

Takaful company	EFFCH	TECHCH	PTECH	SECH	TFPCH
AIA Financial	1.141	0.983	1.099	1.038	1.121
Asuransi Allianz Life Indonesia	1.000	0.970	1.000	1.000	0.970
Asuransi Jiwa Manulife Indonesia	1.000	0.956	1.000	1.000	0.956
Asuransi Jiwa Syariah Al-Amin	0.953	0.955	0.954	0.999	0.910
Asuransi Takaful Keluarga	0.950	1.030	0.958	0.992	0.979
AXA Financial Indonesia	1.214	0.953	1.061	1.144	1.156
BNI Life Insurance	0.892	1.012	0.899	0.993	0.903
Great Eastern Life	1.000	0.748	1.000	1.000	0.748
Panin Dai-Ichi Life	1.000	0.906	1.000	1.000	0.906
Prudential Life Assurance	1.000	0.868	1.000	1.000	0.868
Mean	1.011	0.935	0.996	1.016	0.945

Source: Processed data

by −5.5% (0.945). The decline was due to lower indicators of TECHCH decreased by −6.5% (0.935). Therefore, family takaful companies in Indonesia need to develop their IT systems and increase products, services and marketing innovation. In addition, it is to anticipate the rapid advances in technology for the insurance industry.

The value of technical efficiency (EFFCH) increased by 1.1% (1,011). Although the EFFCH value reached the efficiency level, the PTECH value was still 0.996. Companies need to improve managerial capabilities in operating companies. Efforts that can be made to optimize the level of efficiency are the development of human resources/skills of personnel working in the insurance industry to follow the changes of this industry. It is not easy to compete without a competent workforce, especially in this type of knowledge-based industry (Mansor and Radam, 2000).

4.2 Family takaful companies in Malaysia

Figure 4 presents the productivity level of the Malaysian takaful companies, which fluctuated throughout the observation period. However, almost all periods reached the level of productivity that is TFPCH > 1. In 2014–2015, the TFPCH accounted for 8% (1,080), which became the highest point. Efficiency change (EFFCH) significantly contributed to the productivity of family takaful companies in Malaysia, with an average value of 1.038. This research is in line with findings from other studies (Saad and Idris, 2011), which state that changes in efficiency contribute positively to TFPCH. In addition, the difference in efficiency is mainly due to the efficiency of scale. It shows that the size of the family takaful impacts TFPCH performance. The larger the company's size, the higher the likelihood of companies becoming more efficient at using their inputs to produce more output. The increased allocation efficiency of Islamic insurance companies indicates that the industry chooses the optimal combination of inputs (Khan and Noreen, 2014).

The lowest productivity occurred in 2016–2017, with TFPCH at −2.3% (0.977). It happened due to the decline in the EFFCH indicator. In this period, the companies experienced a decrease in maximizing output with inputs owned. In addition, there is a managerial decline in operating the company by reducing the value of PTECH. In addition, SECH also decreased by 0.994.

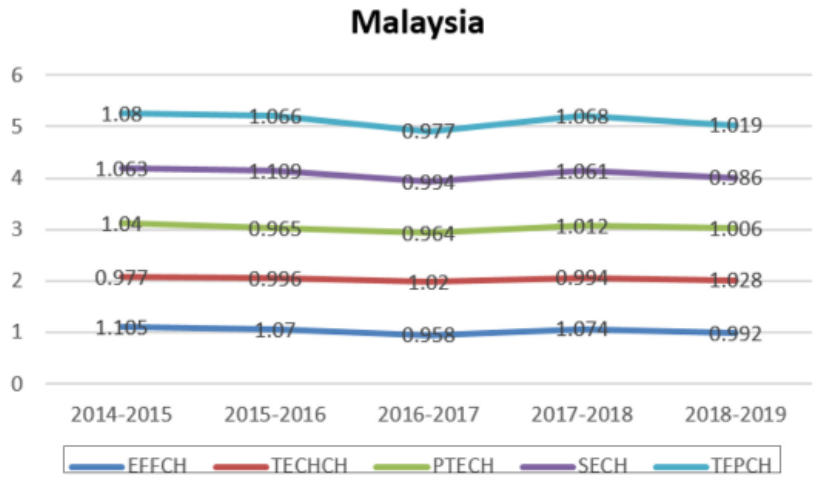

Figure 4. MPI result of family takaful in Malaysia for the 2014–2019 period

In the following recent year, the Malaysian takaful companies managed to operate productively again with an increase in productivity level in which the TFPCH reached 6.8% (1.068) in 2017–2018. Still, the productivity value of the Malaysian takaful companies turned to 1.019 in 2018–2019. Therefore, the family takaful industry in Malaysia has great potential in increasing its productivity by using information and communication technology to provide better service to customers (Saad and Idris, 2011). As a result, companies can improve the quality of their efficiency, use technology and innovate.

Table 3 reveals the productivity of five family takaful companies in Malaysia. Three companies that reached productivity levels were Great Eastern Takaful Berhad, Prudential BSN Takaful Berhad and Sun Life Malaysia Takaful Berhad. The company that underwent the highest productivity increase was Great Eastern Family Takaful Berhad at 16.9% (1.169). This was more due to the rise in the value of technical efficiency by 15% (1.150).

Two companies that did not reach productivity levels were Etiqa Family Takaful Berhad and Syarikat Takaful Malaysia Keluarga Berhad. The company with the lowest productivity was Etiqa Family Takaful Berhad at −0.3% (0.997). The cause of the low productivity is the nonoptimal utilization of technology and innovation, as evidenced by the value of TECHCH < 1. One of the problems in life insurance is paying a substantial commission on agents. Therefore, companies need to start innovating by converting distribution channels that previously used agents to online that use information technology (Lim *et al.*, 2021).

Overall, the productivity of family takaful companies in Malaysia increased by 4.1% (1.041). The value of technological change also increased by 0.3% (1.003). This resulted from an increase in the value of technical efficiency by 3.8% (1.038). Its pattern also derives from a rising value of changes in the efficiency scale of 4.1% (1.041) and a decrease in PTECH by −0.3% (0.997).

One component that needs to be improved in family takaful companies in Malaysia is PTECH, where the average score is still below one. In addition, there needs to be an increase in managerial ability to optimize all company activities. Companies need to implement solid corporate governance (CG) in all their activities. CG is one way to create a conducive relationship between stakeholders to realize the improvement of the company's performance. Strengthening CG has an essential role in disclosing the necessary information for all stakeholders. Takaful companies in Southeastern Asia (SEA) and Gulf Cooperation Council (GCC) countries need to adopt accounting standards by accounting and auditing organization for Islamic financial institutions (AAOIFI) to ensure that their annual reports become more transparent (Zain *et al.*, 2021).

Table 3.
MPI result of individual family takaful companies in Malaysia

Takaful company	EFFCH	TECHCH	PTECH	SECH	TFPCH
Etiqa Family Takaful Berhad	1.000	0.997	1.000	1.000	0.997
Great Eastern Takaful Berhad	1.150	1.016	1.000	1.150	1.169
Prudential BSN Takaful Berhad	1.039	0.985	0.985	1.056	1.024
Sun Life Malaysia Takaful Berhad	1.009	1.020	1.000	1.009	1.028
Syarikat Takaful Malaysia Keluarga Berh ad	1.000	0.998	1.000	1.000	0.998
Mean	1.038	1.003	0.997	1.041	1.041

Source: Processed data

Malaysia takaful companies can use Shariah compliance as a competitive advantage to increase market penetration. They can increase the disclosure of Shariah compliance to the Shariah committee to enhance Islamic business identity (Aziah Abu Kasim, 2012). Otherwise, human resource development and regulators need to improve the quality and monitoring of spirituality in the workplace, Islamic spirituality, organizational commitment and organizational citizenship behavior in Malaysia (Djafri *et al.*, 2018). Therefore, this study concludes that the increased value of technical efficiency was more due to the increased value of the efficiency scale.

5. Conclusion

This study aimed to measure the productivity level of family takaful companies in Indonesia and Malaysia in 2014–2019. The sample used in this study included as many as 12 family takaful companies in Indonesia and five in Malaysia. Productivity measurements were carried out using the MPI method, proxied by TFPCH. The TFPCH value was then decomposed into EFFCH and TECHCH. Finally, EFFCH value divides into PTECH and SECH. The selected input variables were equity, total expenses and total investment. The variable outputs used were total profit and total investment income.

In Indonesia, the average family takaful did not reach productivity during the observation period. The leading cause is that TECHCH is still 0.935, so companies need to improve innovation and use technology in products and services. Surprisingly, the companies achieved high productivity levels at the end of the research period, 2018–2019. Meanwhile, family takaful companies in Malaysia achieved productivity. Only in the middle of the research period, 2016–2017, was there a decrease in productivity. In that period, companies experienced a decline in efficiency, whose components decreased the managerial quality and economies of scale. However, the average PTECH in family takaful companies in Malaysia has not achieved productivity, so it is necessary to improve executive quality. Therefore, human resources have a vital role in the company's operations.

Indonesian family takaful needs to improve companies' productivity, especially in using technology. This research implies that the technological approach in the insurance industry is a crucial factor that could increase efficiency, whether it increases operational, marketing or claim process efficiency. Meanwhile, the implication for Malaysian family takaful, improving their human resources skills was necessary because companies need human resources, as business actors who can run businesses, so that company goals are achieved. In addition, professional resources and performing well have become a key element in business activities for Malaysian family takaful companies.

The Indonesian and Malaysian Governments are expected to actively encourage the acceleration of family takaful growth by producing regulatory products that can strengthen their industry. The government also needs to build program integration with the family takaful sector to optimize the functions of government institutions in increasing public awareness of the importance of family takaful. In addition, it helps in widening the source of capital for family takaful companies.

This study only analyzed two countries from ten association of Southeast Asian nations (ASEAN) members, so further research is needed that comprehensively examines the level of productivity of family takaful companies throughout all 11 ASEAN countries. In addition, this study still has not measured both micro- and macroeconomic variables that can affect productivity levels. Therefore, two-stage Malmquist productivity research is highly recommended for future researchers.

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