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Technical Efficiency of Takaful Industry: A Comparative Study of Malaysia and GCC Countries

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Abstract

The present study empirically investigates the technical efficiency of takaful industry operations in Malaysia and the Gulf Cooperation Council (GCC) countries. Data Envelopment Analysis (DEA) was employed to estimate the technical efficiency of using Constant Returns to Scale (CRS) and Variable Return to Scale (VRS) during the period 2006-2009. The study reveals that takaful companies operating in GCC countries are more efficient than Malaysian operators that are encouraged to have aggressive marketing and wider distribution channels to capture more demand.

Keywords: Takaful Industry, DEA, Efficiency, Malaysia, GCC.

1. Introduction

Takaful is the Islamic version of conventional insurance. It is based on the concept of cooperation and mutual assistance, whereby a group of participants agree to support one another jointly against a specified loss. The participants make voluntary contributions (Tabarru) to a fund (participants' fund), which in turn provides financial aid to those that suffer a loss. The conventional insurance is an exchange contract between policyholders and insurance company in which the premiums paid by policyholders for protection against risk with no voluntary contribution. Dorman (2003) described conventional insurance as a contract in which one person (the insured) pays the agreed premium to another person (the insurer) expecting to receive a sum of money (indemnity) in any specified event.

The emergence of Takaful system is very much in line with Islamic values concerning socioeconomic principles for the benefit of individuals and society as a whole. Abdul Rahim, Lewis & Kabir (2007) posit that the acceptance of takaful is based on co-operation among policyholders for the common good. In fact, the main principle of takaful system is mutual co-operation, taawun (brotherhood), and solidarity. This illustrates the implementation of the risk sharing principle in the takaful system. Zuriah, Rosylin & Faizah (2008) assert that takaful is acceptable in Islam on the basis of risk sharing under the principle of taawun through the creation of the tabarru fund.

Globally, Gulf Cooperation Council (GCC) takaful industry commenced with the establishment of the Saudi Arabia takaful operator as the first takaful in 1979. It is reported that the GCC Takaful industry has been growing rapidly and has continued to grow faster than conventional insurance¹. The GCC Takaful industry is characterized by a small number of large players and a large number of small or newly incorporated companies. Saudi Arabia is the largest market, accounting for approximately 79% of gross Takaful contributions in 2008. The Company for Cooperative Insurance (Tawuniya) is the largest player, with roughly one quarter of the GCC market. All other players account for less than 6.0% of the market. The growth potential of the industry remains strong, particularly in view of very low insurance (Takaful and conventional) penetration levels in the region.

In the context of Malaysia, the takaful industry has experienced strong growth and transformation since its inception 25 years ago. The industry started with one Takaful operator known as Syarikat Takaful Malaysia in 1984 and has currently increased to twelve after Bank Negara Malaysia issued four new family takaful licenses. They are local composite takaful operators involved in general takaful and family takaful business. All takaful operators are regulated by Takaful Act 1984 under the supervision of Bank Negara Malaysia (BNM). It is noted that Malaysia is the first country to implement regulations specific to Takaful Act 1984. In supporting the development of the takaful industry, Bank Negara Malaysia issued a comprehensive concept paper concerning the Takaful Operational Framework (TOF) in late 2009.

¹ Alphen Capital 2010

For GCC countries, no Takaful law came into existence until UAE issued the Islamic Insurance Law in June 2010. Though not having any specific Takaful laws, GCC countries show a higher operating efficiency of 72%, compared to Malaysia, which has 53% as reported in the Ernst & Young Takaful Report (2010). A further report revealed that Malaysia and Saudi Arabia were the top two takaful markets in the world with contributions of US\$0.9 billion and US\$ 2.9 billion, respectively, in 2008. As noted, Malaysia remained the largest Takaful market in Southeast Asia and the second largest after Saudi Arabia. It is reported that yields for GCC operators are high and volatile compared to Malaysian operators, which have been shown to have stable returns driven by underwriting results.

Interestingly, it is doubtful whether there are any legal implications of the difference in operational efficiency between GCC countries and Malaysia. In this regard, the study of efficiency of takaful operators becomes important for GCC countries and Malaysia. Therefore, the purpose of this study is to investigate any significant difference in technical efficiency of takaful operators between GCC countries and Malaysia. This study is very crucial to analyzing the influence of the difference in the legal environments on efficiency.

The rest of the paper is organized as follows. Section 2 presents the relevant literature related to insurance and takaful efficiency. Section 3 introduces our empirical methodology. Section 4 discusses the empirical results. Finally, Section 5 summarizes the findings and presents a perspective for further research.

2. Literature Review

Conceptually, efficiency is considered to be an important aspect of performance measurement in which an individual firm is evaluated in terms of cost, technical aspects, and revenue against the best practice firms. Cummins, Weiss, Xie, and Zie (2010) elaborate technical efficiency as the ratio of input usage of a fully efficient firm producing the same output to input usage as the firm under consideration. In simple terms, technical efficiency measures the ability to generate the maximum outputs from a given number of inputs.

Analyzing the performance of Takaful firms has become an appealing research area due to recent developments in the Islamic finance industry. To the author's knowledge, this is the first study to compare and analyze efficiency between GCC countries and Malaysia.

Eling and Luhn (2009) evaluated the efficiency in the international insurance industry consisting of 36 countries using both DEA and the Stochastic Frontier Approach (SFA). The findings for DEA indicate that developed countries have higher average technical efficiency than developing and less developed countries.

In addition, Hao (2009) examined the efficiency of the life insurance industry in Taiwan and Mainland China. They utilized a sample of 19 firms in Taiwan and 24 firms in China between 2003 and 2005. The study applied the Wilcoxon rank test, Meta frontier, and DEA for analysis of business performance. Based on the Wilcoxon rank test, it was discovered that

there was a significant difference in business efficiency between life insurance in Taiwan and China. Apparently, the average technical efficiency showed a continuous decline in Taiwan and an even bigger one in Mainland China. As for Meta frontier, the technical efficiency for Taiwan was higher than in China. Overall, the production of technology of whole life insurance in Mainland China has developed faster than that in Taiwan. However, these two studies focused on the conventional insurance industry.

Abdul Kader et al. (2009) examined the cost efficiency of Takaful operators in ten Islamic countries using DEA with a sample of 78 firms. This study attempted to investigate the relationship between cost efficiency and corporate governance and other firm specific variables. The findings showed that the mean of overall cost efficiency score was 0.70 comparable to the average levels of cost efficiency. They also found no economies of scope were achieved by Takaful insurers as the cost efficiency emerged from specialized products rather than diversified outputs.

The Malaysian financial system has undergone major structural changes in the era of globalization with various liberalization measures being introduced during the last decade. These factors are expected to have an impact on the efficiency of the life insurance companies and the takaful operators (Saad et al., 2006). Following this, Norashikin et al. (2011) examined technical and scale efficiency for seven takaful operators, including eleven life insurers between 2004 and 2009 in Malaysia. The DEA result reveals that the Takaful industry has lower technical efficiency and scale efficiency than the insurance industry.

However, in the global takaful and retakaful market, Malaysia and GCC countries are seen as leaders in the field in both the complexity of products they offer to customers as well as the ability of the industry to be recognized as a “normal” and real alternative to conventional insurance products (Beg, 2008). In this regard, , the authors are encouraged to examine the efficiency position of takaful operators in GCC in comparison to Malaysia.

3. Methodology

3.1 Data

An unbalanced set of 12 takaful operators were chosen as the sample population over the period 2006 to 2009. This sample consisted of three takaful operators in the UAE, two in Saudi Arabia, two in Qatar, one in Bahrain, and four in Malaysia. Financial data was obtained from the annual report of individual firms including their financial statements and balance sheets. Essentially, firms with positive value of all inputs and output were taken as a sample for efficiency measurement. An input orientation using VRS was applied to estimate technical score for both regions. Following Leverty and Grace (2009), the flow approach was applied to select inputs and outputs.

There are two inputs used in this study, namely general and administration expenses and total assets. For output, only gross contribution is chosen following by many researchers, such as Hwang and Kao (2008), Barros and Obijiaku (2007), Klumpes (2004), and Diacon (2002).

3.2 The Method

A vast literature has attempted to study the efficiency of financial institutions. In insurance, certain investigators have considered the econometric frontier method (Gardner & Grace, 1993; Greene & Segal, 2004); and Cummins & Weiss, 1998). Others have applied DEA (Diacon, Starkey & O'Brien, 2002), Mahlberg & Url, 2003; and Cummins et al., 2004). Recently, Eling and Luhn (2010) reviewed 95 previous studies on efficiency measurements and found that 55 out of the 95 used DEA. This implies that the acceptance and popularity of DEA cannot be denied.

DEA was introduced by Charnes et al. (1978), and it is recognized as a benchmarking technique for efficiency measurement and evaluating the performance of organizations involved in a wide range of contexts, including: banking (Avkiran, 2009); hospitals (Banker, 1984); airports (Lam, 2009); tourist hotels (Yu, 2009); educational institutions (Carrico et al., 1997; Celik et al., 2009); electricity sector (Hrovatin, 2009); and the transportation and construction contractors (El-Mashaleh, 2009).

DEA is a nonparametric approach with linear programming to measure the relationship of produced goods and services (outputs) to assigned resources (inputs) and determine the efficiency score. The application of DEA is also consistent with the numerous researchers like Fukuyama (1997), Cummin (1999), Diacon (2001), Brouckett (2005), Cummins and Rubio Misas (2006), and Eling and Luhn (2008).

The flexibility of DEA does not require a functional form to estimate an efficiency score. Furthermore, DEA has the capacity to incorporate multiple inputs and outputs. In this study, DEA efficiency analysis will be carried out using DEA Excel Solver developed by Zhu (2002). Using the duality in linear programming, one can derive an equivalent envelopment form of this problem for variable return to scale (VRS):

$$\begin{aligned}
 & \min_{\theta, \lambda} \theta \text{ subject to} \\
 & - y_i + Y\lambda \geq 0 \\
 & \theta x_i - X\lambda \geq 0 \\
 & N \mathbf{1}' \lambda = 1 \\
 & \lambda \geq 0,
 \end{aligned} \tag{1}$$

where θ is a scalar, and λ is $N \times 1$ vector of constraints. This envelopment form involves fewer constraints than the multiplier form ($K + M < N + 1$) and is generally the preferred form to solve. The estimated value of θ obtained is the efficiency score for each of N firms, or DMU. The estimate will satisfy the restriction $\theta \leq 1$ with a value of $\theta = 1$ indicating cost

efficient insurers, according to the Farrell (1957) definition. The linear programming must be solved N times--once for each DMU or firm to derive a set of N cost efficiency scores.

The convexity constraints ($\sum \lambda = 1$) ensure that an inefficient firm is benchmarked against firms of similar size, and the projected point of firm on the DEA frontier will be a convex combination of the observed firm.

Since this study involved a small sample, the Mann Whitney test was employed to examine any significant difference in technical efficiency between GCC countries and Malaysia. A Pearson correlation was applied to investigate any significant correlation between legal environment and technical efficiency for both regions.

4. Results Discussion

In this section, analyses of the technical efficiency for takaful operators in GCC countries and Malaysia are discussed. An input-oriented measure under the DEA model was used to emphasize the reduction of input usage to achieve full efficiency.

Table 1 illustrates the estimation of technical efficiency using CRS for 12 takaful operators in GCC and Malaysia. The results presented in Table 1 indicate that Bahrain Solidarity was found to be fully technically efficient over the sample period. Similarly, Saudi Arabia Taawniya achieved the most technical efficiency between 2006 and 2008. On average, both takaful operators were able to achieve full technical efficiency. In UAE, Dubai Islamic Insurance's technical efficiency was 81.5% in 2006 and reached full efficiency between 2007 and 2009. However, none of Malaysia's takaful operators were able to achieve full efficiency. Overall, the findings revealed that GCC takaful operators were more efficient than Malaysian takaful operators. This result was confirmed and paralleled by the Ernst & Young annual report 2010, which reported that the operating efficiency of GCC countries is higher (72%) than Malaysia (52%). This result could be explained by the governance and transparency standards of GCC takaful operators. Indeed, the GCC Takaful industry is characterized by a small number of large players, and most of the companies are listed on regional stock exchanges. However, compared to Malaysia companies, only Syarikat Takaful Malaysia is a listed company.

On average, the technical efficiency of GCC is above 50% and ranges from 51% to 100%. In Malaysia, the average technical efficiency is below 50%, with a range of 20% to 40%, excluding CIMB Aviva Takaful. Surprisingly, the pioneer of Syarikat Takaful Malaysia has the lowest technical efficiency, with an average of 19.7%. This result is consistent with an explanation of technical efficiency under VRS.

Table 1. Estimation of Technical Efficiency using CRS from 2006 to 2009

Company Name	2006	2007	2008	2009	Average score
Abu Dhabi National Insurance	0.750	-	0.576	0.716	0.511
Dubai Islamic insurance	0.815	1.0	1.0	1.0	0.954
Islamic Arab Insurance	0.740	0.901	0.675	1.0	0.8291
Islamic Corp for Ins, of Investment	0.0609	0.104	0.038	0.019	0.10
Saudi Arabia Taawniya	1.0	1.0	1.0	-	1.0
Qatar Al Khaleej	0.688	0.754	0.495	0.561	0.625
Qatar Islamic Insurance	0.814	0.717	0.490	0.592	0.653
Bahrain Solidarity	1.0	1.0	1.0	1.0	1.0
Syarikat Takaful Malaysia	0.299	0.064	0.128	0.298	0.197
Etiqa Takaful	0.219	0.204	0.103	0.335	0.216
Takaful Ikhlas	0.612	0.477	0.240	0.287	0.404
CIMB Aviva Takaful	0.803	0.591	0.355	0.364	0.528

The estimation of technical efficiency score using VRS is depicted in Table 2. Based on Table 2, the technical efficiency score under VRS is bit higher than that of CRS. The results indicate that GCC operators have a higher technical efficiency score than Malaysian operators. For GCC countries, three takaful operators have achieved full technical efficiency, including the Islamic Corporation for Investment, Bahrain Solidarity, and Saudi Arabia Taawniya. The lowest technical efficiency is 53.45%, which was found in Abu Dhabi. Again, none of the takaful operators in Malaysia was able to reach full efficiency. Overall, the GCC takaful operators have an average technical efficiency above 50%, ranging from 53% to 100%. In Malaysia, the technical efficiency is as low as 20% (Syarikat Takaful Malaysia) and reaches to a high of 65% (CIMB Aviva Takaful). In summary, both CRS and VRS results confirmed that takaful operators in GCC are technically more efficient than Malaysian operators.

Apart from the estimation of efficiency score, statistical tests are required to investigate any significant difference in technical efficiency between GCC and Malaysia. The Kruskal Wallis and Mann Whitney tests are used to answer this objective.

Table 2. Estimation of Technical Efficiency using VRS from 2006 to 2009

Company Name	2006	2007	2008	2009	Average Score
Abu Dhabi National Insurance	0.900	-	0.7759	0.8459	0.5345
Dubai Islamic insurance	0.8987	1.00	1.00	1.00	0.9747
Islamic Arab Insurance	0.7509	0.9977	0.9060	1.00	0.9137
Islamic Corp for Ins, of Investment	1.00	1.00	1.00	1.00	1.00
Saudi Arabia Taawniya	1.00	1.00	1.00	1.00	1.00
Qatar Al Khaleej	0.7322	0.7992	0.5347	0.5844	0.6626
Qatar Islamic Insurance	0.8965	0.8202	0.5912	0.6505	0.7396
Bahrain Solidarity	1.00	1.00	1.00	1.00	1.00
Syarikat Takaful Malaysia	0.3110	0.0834	0.1436	0.3009	0.2097
Etiqa Takaful	0.2360	0.2225	0.1194	0.3838	0.2404
Takaful Ikhlas	0.7873	0.6270	0.3151	0.3182	0.5119
CIMB Aviva Takaful	1.00	0.7004	0.4413	0.4642	0.6515

Table 3 illustrates the Kruskal Wallis test results for technical efficiency from 2006 to 2009. The Kruskal Wallis test found a significant difference in technical efficiency between GCC and Malaysia. Table 3 shows that the Chi Square is 5.333, at 5% significance level.

Table 3. Kruskal Wallis Test Result between GCC and Malaysia

Technical Efficiency	Chi Square	Degree of freedom	Sig
Between Group	5.333	1	0.021*

*0.05 level of significance

Since the sample is small, the Mann Whitney test was applied to support Kruskal Wallis test result. Table 4 depicts the Mann Whitney result, indicating a significant difference in level of technical efficiency between GCC and Malaysia. Table 4 further shows that the mean rank for GCC takaful operators and Malaysian takaful operators are 6.50 and 2.50, respectively, at 5% significance level.

Table 4. Mann Whitney Test Results for Different Countries

	Countries	Mean Rank	Sum of Rank	Sig.
Takaful Operators	GCC	6.50	26.00	0.029*
	Malaysia	2.50	10.00	

*0.05 level of significant

5. Conclusion and Further Research

This paper examined and analyzed the technical efficiency of takaful industry operations in Malaysia and the Gulf Council Cooperation (GCC) countries using a non-parametric method (DEA). The Ernst & Young Annual Takaful Report (2010) has reported GCC has higher operational efficiency than Malaysia. This finding is parallel to the Ernst & Young Takaful Report, which shows that the average technical efficiency of GCC and Malaysia is 82.90% and 45.46%, respectively. Obviously, the legal framework provides no impact on the level of technical efficiency. This indicates that the Takaful Act 1984 established in Malaysia contributes no meaningful level of efficiency. UAE, however, has come up with Islamic Insurance Law 2010, and the resulting technical efficiency is better than Malaysia's. In reference to this, the Islamic insurance legislation is still new, illustrating no legal impact on the level of efficiency.

Clearly, the results highlight the fact that legal influences have no connection to the level of efficiency. Since no legal variable has been added in efficiency analysis, a further study on the impact of a legal framework on efficiency should be explored. Essentially, the nonparametric tests showed a significant difference in technical efficiency between GCC and Malaysia. As a result, Malaysian takaful operators are encouraged to have aggressive marketing and wider distribution channels to capture more demand. It is expected that pushing demand would lead to higher levels of efficiency. The success of GCC in gaining higher levels of technical efficiency has a competitive advantage. Moving forward, the Malaysian takaful industry should take this challenge to compete with GCC, especially in becoming an Islamic finance hub.

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