Efficiency of Telecommunication Companies in ASEAN: Corporate Mergers and Acquisitions

Wan Anisabanum Salleh[1], Wan Mansor Wan Mahmood[1],Fadzlan Sufian[2], Muhammad Hanif Othman[1],NajihahMarha Yaacob[3], Gopala Krishnan Sekharan Nair[4]

[1]Faculty of Business Management
[3]Faculty of Accountancy
[4]Academy of Language Studies
Universiti Teknologi MARA, Dungun, Terengganu, Malaysia
[2]Taylor's Business School, Taylor's University, Subang Jaya, Selangor, Malaysia

ABSTRACT

Traditionally, acquiring companies have an expectation of synergy in the coming years as a result of mergers and acquisitions (M&As). Instead of using traditional financial ratios from accounting statements such as return on assets in terms of measuring performance, this study intends to provide a broad view of the effects of M&As and asset utilization on technical efficiency. In light of the foregoing, this study was done by taking into account the consequences of multiple M&As undertaken by the telecommunication companies in the Association of Southeast Asian Nations (ASEAN)region using year-by-year projections. The study employed the Data Envelopment Analysis (DEA) approach which calculates the technical efficiency using the total asset of companies during the period between 2000 until 2011. Subsequently, regression analysis was employed to examine the factors that influenced the efficiency of the companies. The empirical findings indicate that there exists a significant relationship, of negative value, between sequence of M&A and technical efficiency (TE). The findings also indicated that the relationship between size and TE are significant and negative. This paper also discussed the importance of having a merger control under Competition Law and suggested that there is a need for improvement of merger control regulations to sustain the relative efficiency of companies.
KEYWORDS: Data Envelopment Analysis, Mergers and Acquisitions, Telecommunication Industry, ASEAN Countries.

INTRODUCTION

Asia was one of geographic areas most affected by mergers and acquisitions (M&As) activities after America and Europe [11]. Initially, M&As were a popular strategy for many firms in North America only. Subsequently, starting from the 5th merger wave of the 20th century, M&As spread to Europe, Asia and Latin America [11]. Due to the fact that the telecommunication sector holds the highest involvement in M&As globally [9] and very limited papers are available on the technical efficiency of telecommunication companies following M&As [22, 29], this paper examined the efficiency of public listed telecommunication companies based in Association of Southeast Asian Nations (ASEAN) countries over a 12-year period i.e. from 2000 to 2011.

LITERATURE REVIEW

Studies in the telecommunication sector which by [31] concludes that such acquisitions represent manifestations of agency problems and were undertaken for empire-building purposes, while [21] stated that the relative efficiency measures do not perform very much better and showed negative trends sometimes.Another researcher,in [8] who applied efficient frontier analysis suggest that more research is needed focusing on emerging markets and international comparisons in order to throw light on factors which drive efficiency results. Thus, this study entailed the evaluation of the efficiency of 264 public listed telecommunication companies based in 5 ASEAN countries such as Malaysia, Singapore, Indonesia, Philippines and Thailand over a twelve-year period, from 2000 to 2011.

Table 1 shows the selected ASEAN countries with the number of telecommunication companies involved in M&As. ASEAN is a grouping of 10 South East Asian countries, however only 5 countries are actively involved in M&As. Therefore, this sample consists of Malaysia, Indonesia, Philippines, Thailand and Singapore. Out of these 5 countries, almost 267 telecommunication companies were identified as the population of this study. About 264 companies were selected as the sample for this study. Companies which have an insufficient set of data for a one-

Corresponding Author: Wan Anisabanum Salleh, Faculty of Business Management, UniversitiTeknologi MARA, Dungun, Terengganu, Malaysia. E-mail: wananisa@tganu.uitm.edu.my

year period are omitted. The term merger is commonly defined as a combination of two equal sized companies to form one company, while acquisition is the purchasing by a large company of a smaller company.

Table 1. List of selected ASEAN countries

Countries	Population*	Sample	M&A Companies	Completed M&A Deals**
Malaysia	89	88	46	113
Indonesia	48	46	9	10
Philippine	31	31	8	16
Thailand	31	31	6	7
Singapore	68	68	32	55
Total	267	264	101	201

*Based on General Industrial Classification Standard (GICS) description under Osiris
**Identified from Thomson M&A Database, Osiris M&A database and Alacra store M&A time line

In [18] stressed that an acquisition is one part of an overarching sequence of acquisitions cumulatively targeted at executing a corporate strategy but not an isolated event. Generally, most researchers who have studied on acquisitions have a tendency to view the acquisition as a distinct remote occurrence when in fact it may be one part of a series of events. They believe that when the acquirer is considered as the unit of analysis, strategy is conceptualized as a sequence of decisions and actions taken one at a time over a period of years [17]. As a result, a sequence of acquisitions leads to the collection of organizational inefficiencies.

In many cases, M&A intensity and M&A sequencing have negative impact on performance [6] and technical efficiency [22, 29]. Hence, for the first objective of this study, the researcher examines the technical efficiency of telecommunication companies which have been involved in M&As during the time period between 2000 to 2011. While the second objective is to evaluate the impact of M&A intensity, M&A sequencing and size of companies on the technical efficiency.

METHODOLOGY

The efficient frontier approaches appear to be better compared to the use of conventional financial ratios from accounting statements such as return on assets to measure performance [7, 8 30]. In [8] stress that the frontier approaches provide an overall objective numerical score and ranking and an efficiency proxy as well as the optimization mechanism.

Thus, the aim of this paper is to provide a broad view of the effects of M&A using two stages of analyses. In stage 1, the data envelopment analysis has been applied by using the Charnes-Cooper-Rhodes (CCR)Banker-Charnes-Cooper (BCC) models to calculate the technical efficiency using the total asset model. Stage 2 involves the regression analysis to examine the effect of the M&A characteristics such as intensity, sequence and size of the companies on the technical efficiency (TE).

In[19, 22, 29] who measured mergers and acquisitions in the telecommunication industry, employed revenue as an output, while current asset and fixed asset or property, plant and equipment are considered for inputs. Companies carry out M&A's in order to strengthen themselves by acquiring increased input in the form of additional assets which they hope would result in improved revenue. Hence, revenue is the best measure of output.

Meanwhile, current asset and fixed asset or property, plant and equipment are suitable for inputs because M&As appears to be favored in the telecommunication industry as a means of consolidating assets, thereby sharpening the competitive edge through asset fortification. Therefore, this study contends that the chosen variables for input and output are suitable as the findings of this study and do explain M&As in the telecommunication industry.

In general, the choice between the input oriented type and the output-oriented type can be conveniently according to the users' preferences [30]. For the total asset model which includes fixed assets, the CCR-output (CCR-O) oriented models are favored as it enables freedom in output projections [19].

In finance, the total asset model is rather similar to return on assets (ROA) known as an orthodox profitability measure. In contrast to ROA, Data Envelopment Analysis (DEA)can show the impact of each individual asset category on profitability. For the total asset model, the asset utilization of the companies is examined based on two asset categories namely current assets and property, plant and equipment or fixed assets [19, 22, 29]. Therefore, in a decision-making framework for M&As telecommunication companies, it is logical to consider the output-oriented version as the companies aim to maximize the output. In other words, companies would make enormous efforts to utilize the assets and maximize the revenue in order to remain competitive in the market.The mathematical expression of the DEA for the output-oriented DEA models as stated below:

1) CCR model [12]

$$Maximize \quad E_k$$

$$Subject \quad to \quad \sum_{i=1}^{m} U_j x_{ij} \geq x_{ik} \quad , \quad i = 1, 2, ..., m;$$

$$\sum_{j=1}^{n} U_j y_{rj} \geq E_k y_{rk} \quad , \quad r = 1, 2, ..., s;$$

$$U_j \geq 0, \quad \forall_j.$$

Consider a set of nobservation on the Decision Making Unit (DMU).Each DMU_j(j= 1,2, … n) uses m inputs, x_{ij} (i=1,2, … m)to produces outputs, y_{rj}(r=1,2, ... s).

2) BCC modelin [4] is defined by adding Equation (2)into Equation (1).

$$\sum_{j=1}^{n} U_j = 1$$

$$\sum_{j=1}^{n} U_j < 1 \quad\quad\quad\quad\quad (2)$$

$$\sum_{j=1}^{n} U_j > 1$$

where n is number of DMU, Ek is the efficiency of the kth DMU, x_{ij} are ith inputs of the jth DMU, y_{rj} are the outputs of jth DMU and Uj is weight of jth DMU. The DEA-technique needs a big number of medium-sized linear programming problems to be answered.

By relying on the available corpus of data, it can be hypothesized that the higher acquisition intensity and sequencing of acquiring firms may result in lower technical efficiency. Intensity denotes the number of M&As in any particular year, whereas sequence (seq.) refers to the accumulated number of M&As over any given period of years. Based on [6], when the M&A intensity is higher, the acquirer would have less time to search and plan winning strategies before engaging in the next acquisition, thereby reducing the acquirer's performance. Hence, the hypothesis can be summarized as follows:

H1: The higher the M&A intensity of telecommunication firms, the lower the technical efficiency.
H2: The higher the sequencing of M&As of telecommunication firms, the lower the technical efficiency.

In [20] has introduced the concept of market power as another source of synergy; suggesting that the firm's size influences the company's ability to dictate prices and exercise market power. There are a number of yardsticks for computing the size of a firm. For instance, in [2, 33] measured the companies' size by the logarithm of the total asset. Whereas, in[10, 27, 28] found that size is negatively related to relative production efficiency. Thus, the hypothesis on the relationship between the technical efficiency and size of firms is:
H3: The size of telecommunication firms are negatively related to the technical efficiency.

FINDINGS AND DISCUSSION

As aforementioned, in fulfilling the first objective of this study, the CCR model which has been developed by [12] is adopted to analyze the trend of technical efficiency of telecommunication companies for the period from 2000 to 2011.

As can be seen from Table 2, the crs value is low to begin within the year 2000, after undergoing marginal increases and decreases in the subsequent years. The value after 12 years in 2011 is only 0.189, which lower than the commencing crs of 0.193 on a scale where the maximum possible value of crs is denoted by 1. Thus, overall it is a decreasing trend.

Table 2: The technical efficiency

Mean/ year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
crs	0.193	0.296	0.116	0.121	0.176	0.284	0.248	0.132	0.025	0.020	0.018	0.189
vrs	0.432	0.416	0.376	0.364	0.308	0.364	0.351	0.317	0.320	0.308	0.319	0.269

Besides the constant return to scale (crs), this study also employs the DEA approach based on variable return to scale (vrs) which proposed by [5]. It is a superior measure of the efficiency evaluation in the real world because companies face an imperfect competition market which is controlled by government laws and financial limitations preventing them from operating at their optimal scale level [13].

In reference to Table 2, the trend of vrs is decreasing from the starting value of 0.432 in 2000 to 0.269 at the end of 2011 in spite of the increasing number of M&As. In fact, the value was highest at the start in 2000 compared to the succeeding years although in the interim there were slight increases followed by corresponding decreases.

In fulfilling the second objective of this study,the regression analysis was used in order to analyze3 different independent variables namely size, M&A intensity and sequence of M&As (seq. M&As) by using EVIEWS 6 software. With reference to Table 3, the first sample consists of unbalanced data of 264 companies which are collected mainly from Osiris and some from the data stream and public report.

Table 3:Effects specification of cross-section fixed for sample 1

Sample			1
Year			2000-2011
Periods included			12
No. of cross-sections			264
Observations			2489
R-squared			0.360239
Adjusted R-squared			0.283652
F-statistic			4.703650
Prob(F-statistic)			0.000000
Durbin-Watson statistic			1.242980
Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	0.558747	0.052189	10.70626	0.0000
Seq. M&A	-0.016011	0.004214	-3.799866	0.0001
M&A intensity	-0.005127	0.009969	-0.514321	0.6071
Size	-0.035535	0.004560	-7.792282	0.0000

a. Predictors: (Constant), Sequence of M&As, Size, M&A intensity
b. Dependent Variable: TE

In order to obtain a robust sample, the second sample chosen comprises completed or balance data commencing from the year 2005 and these data are collected only from Osiris. It is felt that 2005 was a relevant and pertinent starting point as M&As market recovered and flourished from 2005 [11].

Table 4:Effects specification of cross-section fixedfor sample 2

Sample			2
Year			2005-2011
Periods included			7
No. of cross-sections			196
Observations			1372
R-squared			0.605547
Adjusted R-squared			0.538965
F-statistic			9.094652
Prob(F-statistic)			0.000000
Durbin-Watson statistic			1.791468
Variable	Coefficient	Std. Error	T-Statistic	Prob.
C	1.007485	0.087948	11.45543	0.0000
Seq. of M&A	-0.010901	0.005458	-1.997162	0.0460
M&A intensity	0.001844	0.009375	0.196719	0.8441
Size	-0.070858	0.007746	-9.148140	0.0000

a. Predictors: (Constant), Sequence of M&As, Size, M&A intensity
b. Dependent Variable: TE

The analysis considers3 types of models which are pooled ordinary least square, random effects model and fixed effects model(FEM), however based on Redundant Fixed effects tests and Hausman test,FEM has been chosen as the final model to analyze the TE. In reference to Table 3 and 4, the results of the R-squared values show that sample 1 in the total asset model registered values of 36% and sample 2 showed 60.6% variance in TE respectively. Meanwhile the adjusted R-squared value shows that in the total asset model, sample 1 registered values of 28.4%, and sample 2 indicated 53.9% variance in TE respectively. Therefore, the total asset model is a robust and viable model in examining the effect of the variance of the three independent variables on TE.

In terms of the Durbin Watson statistic, sample 1 returned a rather weak value of only 1.24. Whereas, sample 2 returned a stronger value of 1.79 which is greater than the threshold value of 1.6 thereby putting the value in the acceptable range.

In reference to Table 4, in testing H1 for sample 1 and 2, the coefficient of M&A intensity obtained is negative and insignificant ($p>0.01$). Thus, the relationship is weak.

Meanwhile, in testing H2 for sample 1 and 2, the sequence of M&As was found to be inversely related to TE. The relationship is strong and significant as indicated by the probability values shown in the table above, although it is a negative relationship ($p<0.05$). Thus, H2 is strongly supported. The higher the sequence of acquisitions, the lower the TE. It is consistent with the findings by[6, 23, 29]. Hence, this study suggests that when a company involved in a sequence of acquisitions, it needs to capitalize on the total asset model in order to reduce relative assets or increase revenue or be efficient in both.

In testing H3 for sample 1 and 2, Size was found to have a significant ($p<0.001$) negative relationship with TE. The result indicates that that the bigger the size, the lower will be the TE. Thus, H3 for sample 1 and 2 are strongly supported. The finding of this study (H3) is consistent with the studies conducted by [10, 24, 25] that size was negatively related with relative efficiency. Similarly, in [14, 26, 27] also found that the sequence of M&A and size were the significant variables that effect TE (negative relationship).

In summary, the coefficients computed for the two samples are similar whereby the sequence of acquisitions and size are negatively influenced TE while M&A intensity is insignificant and also negatively influences TE. Thus, this proved that the samples chosen are robust models as samples which demonstrate consistent results.

CONCLUDING REMARKS

As mentioned earlier, conventionally, acquiring companies have an expectation of synergy in the coming years as a result of M&As. Instead of using traditional financial ratios from the financial statements such as return on assets to measure performance, this study intends to provide a broad view of the effects of M&As and asset utilization on technical efficiency.

The findings indicate that the sequence of M&As and size of the telecommunication companies results in lower efficiency. Thus, a combination of companies should create efficiency through managing size more efficiently and effectively after M&A by appropriately utilize scarce resources [32]. In addition, the companies should spread out the M&As over a certain period of time or delay subsequent M&As. This would enable the companies to resolve any inefficiency or prevent the inefficiency from worsening. In [6] suggested that the time interval between M&As can be increased to lower the number of M&A deals in a certain period and seek to increase the companies' performance in the interim.

This paper could be extended to investigate the other industries pertaining to effect of M&As on TE. Despite of the limitations of this study, the findings are expected to contribute significantly to the existing knowledge pertaining to M&A intensity and sequencing and the TE antecedent within the telecommunications industry.

The acquisition of power is a popular strategy among the players in various industries. It has brought about the passing of the Merger Guidelines by the United States (US) government [3]. In [1, 16] have suggested the efficiency criterion as the crucial element of antitrust policy, in the US, to judge whether an M&A deal will or will not be in the best interest of the public. Merging firms should possess complementary assets and skills in order to produce a viable bigger entity. These would enhance the operational performance of the company [15].

Therefore, the governments of ASEAN countries need to review takeover and merger controls relating to M&A deals which could enhance efficiency [22, 24]. This would facilitate directions for sustainable competitiveness of future telecommunication companies in Asia, which are actively involved in M&As.

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