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Corporate diversification and efficiency of manufacturing firms listed in Bursa Malaysia

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Abstract

There is little consensus on the corporate diversification-efficiency relationship in the diversification literature. The study aims to contribute to the literature by looking jointly at two dimensions of corporate diversification as product diversification and international diversification and the relationship between them. The results show negative relationship between product diversification and efficiency, international diversification and efficiency and corporate diversification and efficiency in manufacturing firms listed in Bursa Malaysia. This study also has described main variables which have an impact on the diversification-efficiency relationship and has guided managers on how to pursue an optimal diversification strategy.

Keywords

Corporate diversification, International diversification and efficiency, Product diversification.

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Introduction

Corporate diversification continues to be an important phenomenon in the modern business world (Cernas Ortiz, 2011). From the past, scholars in management area are attracted by corporate diversification due to the lateral scope of the firm impacts financial performance of firm (Fan *et al*., 2008). However, theoretical arguments about diversification are a profitable strategy or value reducing strategy is contradictory (Patrick, 2012). Based on agency theory and free cash flow theory, manager pursues their own interest; therefore, in this view product diversification has a negative impact on performance (Berger and Ofek, 1995; Denis *et al*., 1997). On the other hand, regarding efficiency theory, resource based theory and market power theory; diversification has a positive impact on financial performance. Also, some scholars such as Errunza and Senbet (1984), Lu and Beamish (2001), Tongli *et al.* (2005) and Kotabe *et al.* (2002) found positive relationship between diversification and performance. Finally, this issue should be studied more with other aspects such as efficiency.

In addition, in the area of diversification, the first issue is how financial performance measures? Regarding the literature, there is no consensus about what are the best measure for firm financial performance (Tongli *et al.*, 2005). Therefore, to cover many aspect of firm's financial performance, this study has applied data envelopment analysis (DEA) (Jain *et al*., 2011; Lin *et al*., 2005; Rouse *et al*., 2010; Yeh, 1996).

Moreover, some researchers argued that firms in emerging market may be justified to have wider scope because market failures are more prevalent in these economies (Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Lins and Servaes, 2002). In addition, firms listed in Bursa Malaysia are likely to be diversified and Claessens *et al.* (2001; 2003) stated that approximately 70%, Ishak and Napier (2004, 2006) said 55% of firms are diversified in Bursa Malaysia. Hence, based on the high rate of number of diversified firms in Bursa Malaysia, we conduct the research in this area.

The structure of the paper is as follows. The next section develops hypothesis under study through a review of the related literature. Section 3 is about DEA. Section 4 contains the data and empirical methodology. Section 5 and 6 report results and discussion. The final section offers some concluding remarks, limitation and future studies.

Related Studies

There are some theories that support why firms diversify (Doaei *et al*., 2012). Resource-based theory (Penrose, 1959) and market power theory (Edwards, 1955) confirm positive impact and agency theory (Jensen and Meckling, 1976) and free cash flow theory (Jensen, 1986) state negative impact of diversification on firm's financial performance. Therefore, some related studies are presented briefly.

Product Diversification and Performance

Theoretical arguments about diversification are a profitable strategy or value reducing strategy is contradictory. Generally, the studies show that product diversification has a negative impact on performance (Berger and Ofek, 1995; Chakrabarti *et al*., 2007; Denis, *et al.*, 1997; Tongli, *et al.*, 2005). In addition, other researcher explored product diversification was not associated with higher performance (Muñoz-Bullón and Sanchez-Bueno, 2011). Additionally, Daud *et al.* (2009) showed firms with focused strategy can achieve high performance. In contrast, limited researchers found out not only diversification do not reduce the firm value, but also value increases when the level of diversification increases (Ishak and Napier, 2006).

As a result, based on agency theory and free cash theory, manager pursues their own interest; hence, the diversification has a negative impact on financial performance; additionally, many research proved a negative relationship between product diversification and financial performance (Anderson *et al*., 2000; Berger and Ofek, 1995; Claessens *et al*., 1999; Comment and Jarrell, 1995; Denis, *et al.*, 1997; Lang and Stulz, 1994; Lins and Servaes, 2002; Muñoz-Bullón and Sanchez-Bueno, 2011; Servaes, 1996). Finally, it can be developed first hypothesis as below:

Hypothesis 1. The firm's product diversification has influences a negative impact on the level of efficiency.

International Diversification and Performance

Some scholars such as Errunza and Senbet (1984), Lu and Beamish (2001), Tongli *et al.* (2005) and Kotabe *et al.* (2002) found positive and linear relationship between international diversification and performance. While, other scholars like Michel and Shaked (1986), Geringer *et al.* (2000) and Denis *et al.* (2002) determined negative association and Brewer (1981) and Morch and Yeung (1991) stated no relationship.

Geringer *et al.* (2000) reviewed that international diversification of Japanese firms did not create profit; however, improved other measures such as growth. Other researchers found inverted U-shape association between international diversification and performance (Buckley *et al*., 1978; Daniels and Bracker, 1989; Geringer *et al*. 1989; Haar, 1989; Hitt *et al*., 1997). Hitt *et al.* (1997) reported Product diversification monitored the association between international diversification and performance. Indeed, international diversification has a negative association to performance in focus firms, positive and curvilinear relationship in highly product diversified firms.

As a consequence, the agency theories argues that managers can take private benefits such as prestige, power, and compensation from global diversification that does not necessarily increase shareholder value (Jensen, 1986; Stulz, 1990). Once firms expand internationally, differences in culture, government regulations, economic development or currency fluctuation between countries may also have some impact on their performance (Chang and Wang, 2007; Wan, 1998). In addition, negative relationship between international diversification and financial performance is stated by Brewer (1981) and Michel and Shaked (1986). Geringer *et al*. (2000) shown that international diversification of Japanese firms does not enhance profitability. Denis *et al.* (2002) found out that the valuation effects of both geographic and industrial diversification are negative. Furthermore, scholars found the evidence reveals the existence of a negative relationship

between geographic expansion and profitability (Muñoz-Bullón and Sanchez-Bueno, 2011). To sum up, the second hypothesis is as below:

Hypothesis 2. The firm's international diversification has a negative influence on the level of efficiency.

Corporate Diversification and Performance

So far, researchers have studied the association between product and international diversification and performance separately (Contractor *et al*., 2003; Kim *et al*., 2004; Palich *et al*., 2000). Nonetheless, recent researches have also pay less attention to the impact of both kinds of diversification strategies on firm performance (Geringer, *et al*., 2000; Hitt *et al*., 1994; Sambharya, 1995). There are some similarities among the examination of the effect of the two strategies on performance; however, the mixed impact should be evaluated (Geringer, *et al*., 2000; Tallman and Li, 1996). Thus, overall understanding of corporate diversification strategies could be obtained when it included product and international diversification and how these impact performance (Kim, *et al*., 2004).

When firms doing corporate diversification (product and international), they might get better performance than firms that do not (Muñoz-Bullón and Sanchez-Bueno, 2011). In addition, the firm can enhance economies of scope from many international markets and product portfolios. Due to this cause, corporate diversification (product and international) in general matter have a positive effect on performance (Chang and Wang, 2007; Delios and Beamish, 2001; Kim *et al*., 1993). Thus, diversification in various kinds of product and present in international market cause the firm enhance its performance (Hitt *et al*., 1997).

In the contrary of these privileges, expanding in new segments and nations may also suggest a decrease in performance. Additionally, the expanding may happen to follow the personal objectives by managers, such as reducing employment risk or getting more bonuses at sacrifice of firm's profitability and growth (Kim *et al*., 2004; Seth *et al*., 2000). Therefore, more coordination is required once the firm grow in new segment and market; otherwise it may lead many costs for firm

(Chang and Wang, 2007; Hoskisson and Hitt, 1990; Jones and Hill, 1988; Williamson Oliver, 1985). In sum, it may be expensive for firms to connect between internal corporate settings and the external environment. Further, expanding in new geographic markets where the culture, regulation and habits are different, may influence the firm's performance (Chang and Wang, 2007; Wan, 1998). Nevertheless, high level of diversification can reduce performance (Jung and Chan-Olmsted, 2005).

Therefore, the third hypothesis is as below:

Hypothesis 3. The firm's corporate diversification (product and international) degree has a negative impact on the level of efficiency.

Efficiency and Data Envelopment Analysis (DEA)

DEA was presented in 1978 by Charnes, Cooper and Rhodes for measuring efficiency in public programs (Charnes *et al*., 1978), where this tool is used in many research areas. However, with respect to developing DEA models and its many advantages, Emrouznejad *et al.* (2008) pointed out the number of research increased about 360 per year after 2004. Due to its successful application as well as case studies, DEA is given more consideration and is expand by scholars (Toloo and Nalchigar, 2011).

Assume that there are n DMUs, $(DMU_j: j = 1,2, \dots, n)$ which consume m inputs $(X_{ij}: i = 1,2, \dots, m)$ to produce s outputs $(Y_{rj}: r = 1,2, \dots, s)$. The Charnes, Cooper, and Rhodes presented a fractional programming problem which measuring efficiency of DMU_0 which formulated as shown in Model (1):

Equation 1 Fractional Programming Problem

$$\text{Max } \theta = \frac{\sum_{r=1}^{s} u_r y_{r0}}{\sum_{i=1}^{m} v_i x_{i0}} \text{ Such that } \frac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{i=1}^{m} v_i x_{ij}} \leq 1 ; \quad j = 1, \dots, n$$

$$v_i \geq 0 \quad i = 1,2, \dots, m; \; u_r \geq 0 \quad r = 1,2, \dots, s \qquad (1)$$

where x_{ij} and y_{rj} are the inputs and outputs (positive) of the DMU_j, v_i and u_r represent input and output weights, respectively (also referred to as multipliers). x_{io} is the inputs and y_{ro} is the outputs of

DMU_o. Besides, the fractional program is not used for actual computation of the efficiency scores due to its non-convex and nonlinear properties. Hence, by using Charnes and Cooper (1962) transformation, Model (1) can be equivalently transformed into the linear program called CCR based on the name of Charnes, Cooper and Rhodes. However, we applied BCC (Banker, Charnes, and Cooper) model (Banker *et al*., 1984) to evaluate the efficiency of decision making units based on efficient frontier with respect to variable return to scale (VRS). BCC envelopment model for finding the degree of efficiency in this research as noted in below:

$$\text{Min } y_0 = \theta \text{ Such that } -\theta x_{io} + \sum_{j=1}^{n} \lambda_j x_{ij} \leq 0 \quad ; \qquad i = 1,2,\dots,m$$

$$-\sum_{j=1}^{n} \lambda_j y_{rj} + y_{ro} \leq 0 \quad ; \qquad r = 1,2,\dots,s \qquad (2)$$

$$\sum_{j=1}^{n} \lambda_j = 1 \quad ; \qquad j = 1,2,\dots,n \; ; \lambda_j \geq 0 \quad \text{and } \theta \text{ is free in sign}$$

where x_{ij} $(i = 1, \dots, m)$ and y_{rj} $(r = 1, \dots, s)$ (all nonnegative) are the inputs and outputs of the DMU_j while, x_{io} and y_{ro} are the inputs and outputs of DMU_o. The BCC model must be run n times, once for each unit, to get the relative efficiency of all DMUs.

As a brief, DEA has many advantages which these are listed as: (a) the power to compute many inputs and outputs for each organization such as firm and it is not necessary to identify parametric assumptions of old multivariate technique, and (b) the power for benchmarking members of the efficient set and determine a relationship with inefficient units (Cooper, Seiford, & Tone, 2006; Talluri, 2000).

Research Methodology

This study is done on manufacturing listed firms in Bursa Malaysia due to the significant role of manufacturing sector in Malaysian economy (Mahmood, 2000; Tsen, 2005). In addition, because Malaysia is kind of developing countries that as well as there are approximately 70% diversified firm in Bursa Malaysia (Ishak and Napier, 2004) and the availability of published data and the structure

of the business in Bursa Malaysia, make it an interesting research area (Ahmad *et al*., 2003).

The data is collected from the database of Bursa Malaysia from 2006 to 2010. A short research time is acceptable because strategy of firms change sometimes and very long period causes to reduce the number of firms with a fix strategy. In addition, Singh *et al.* (2003), Daud *et al.* (2009) and Hall and Lee (2010) conducted some studies with short period less than four years. Furthermore, the justification of selecting this duration is that firms seldom keep the same strategy for long time (Daud, *et al.*, 2009).

Variables Measurement

There are two parts for variables measurement in this study. The first part is related to DEA variables. We have one input and six outputs for BCC model. In DEA, it is significant to identify variables (input and output) and selecting model.

The first key issue in any DEA application is the selection of inputs and outputs. The outputs should reflect the business goals, and the inputs should be the required resources for achieving those goals (Neves and Lourenço, 2009). Therefore, return on assets (ROA), return on equity (ROE), profit margin (PM), market to book ratio (MB), Tobin's Q (TQ) and earnings per share (EPS) are chosen as outputs because these are business goals. Logarithm of total assets is as input variable because these are used for achieving the business goals.

As a result, logarithm of total assets (LTS) is applied in previous research such as Classens *et al.* (2003). Also, assets are main input for every firm. Table 1 shows DEA variables as LTS, return on assets (ROA), return on equity (ROE), profit margin (PM), market to book ratio (MB), earning per share (EPS), Tobin's Q (TQ).

Table 1. DEA Variable

Symbol	Kind of Variable	How to measure
LTS	Input	Logarithm of total assets
ROA	Output	$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}}$
ROE	Output	$ROE = \frac{Net\ Income}{Total\ Equity}$
PM	Output	$PM = \frac{Net\ Income}{Sales}$
MB	Output	$MB = \frac{Market\ Value\ per\ Share}{Book\ Value\ per\ Share}$
EPS	Output	$EPS = \frac{NetIncome}{SharesOutstanding}$
TQ	Output	$TQ = \frac{Market\ value\ of\ equity + Book\ value\ of\ liability}{Book\ value\ of\ total\ assets}$

Table 2 represents main variable for panel data model.

Table 2. Variable measurement

Name of Variable	Symbol	Kind of Variable	How to measure
total product diversification	TPD	Independent Variables	$\text{E} = \sum_{\text{i=1}}^{\text{n}} \text{P}_\text{i} \ln (1/\text{P}_\text{i})$ (6) Where, $P_i, (i = 1, \dots, n)$ is the share sale of segment *i* in total sales of the firm and n is the number of firm's segments
international diversification	ID	Independent Variables	The ratio of foreign sales to total sales.
Corporate diversification	CD	Independent Variables	Dummy variable for diversified is 1 and for focus is 0
efficiency	E	Dependent Variable	BCC model
size	Size	Control Variable	The logarithm of total sales
age	Age	Control Variable	The logarithm of the years since its establishing
leverage	leverage	Control Variable	The ratio of total assets minus total equity to total assets
liquidity	liquidity	Control Variable	The ratio of current assets divided by current liabilities
Exchange rate	EX	Control Variable	The growth rate of the U.S. dollar-ringgit exchange rate during a year
Crisis	Crisis	Control Variable	The crisis equals one for crisis period and zero for normal years.

Results

First of all, the descriptive statistics of regression variables is presented. Descriptive statistics is concerned with summarizing and describing a body of data.

The final sample included 102 total manufacturing firms, with 510 observations. As shown in Table 3 the mean of total diversification is about 0.35. The maximum amount of efficiency, product diversification and international diversification are respectively 1, 1.97 and 1. In addition, the minimum ratio of total debt is 0.03 and the maximum is 0.82. Furthermore, the maximum size of firm is 4.11. In addition, Table 4 provides the correlation matrix of all tested variables. There is a high correlation between Leverage and size with – 69%.

Moreover, three regression models are developed based on hypothesize respectively as:

$$E_{it} = \alpha + \beta_1 TPD_{it} + \beta_2 size_{it} + \beta_3 age_{it} + \beta_4 leverage_{it} + \beta_5 liquidity_{it} + \beta_6 Crisis_t + \varepsilon_{it} \quad (1)$$

$$E_{it} = \alpha + \beta_1 ID_{it} + \beta_2 size_{it} + \beta_3 age_{it} + \beta_4 leverage_{it} + \beta_5 liquidity_{it} + \beta_6 EX_t + \beta_7 Crisis_t + \varepsilon_{it} \quad (2)$$

$$E_{it} = \alpha + \beta_1 CD_{it} + \beta_2 size_{it} + \beta_3 age_{it} + \beta_4 leverage_{it} + \beta_5 liquidity_{it} + \beta_6 EX_t + \beta_7 Crisis_t + \varepsilon_{it} \quad (3)$$

where, i= the number of firms

t= the number of years

E_{it} = the degree of efficiency

α = the intercept ; β_i = the coefficient (slop)

TPD_{it} = the degree of product diversification

ID_{it} = the degree of international diversification

CD_{it} = dummy variable for diversified firm

$size_{it}$ = the size of firm; age_{it} = the age of firm

$leverage_{it}$ = the total debt ratio;

$liquidity_{it}$ =the current ratio

EX_t = the exchange rate of dollar to ringgit

Crisis_t = the dummy variable
ε_{it} = the error term

Table 3. Summary of descriptive statistics

	E	CD	TPD	ID	Leverage	Size	Liquidity	Age	EX	Crisis
Mean	0.71	0.82	0.35	0.21	0.38	2.36	2.58	3.24	-3.07	0.60
Median	0.68	1.00	0.20	0.12	0.38	2.26	1.78	3.37	-3.14	1.00
Maximum	1.00	1.00	1.97	1.00	0.82	4.11	13.90	5.18	5.66	1.00
Minimum	0.29	0.00	0.00	0.00	0.03	1.01	0.14	0.69	-8.61	0.00
Observations	510	510	510	510	510	510	510	510	510	510

Table 4. The correlation matrix of variables

	E	TPD	ID	Size	Age	Leverage	Liquidity	EX	Crisis	CD
E	1.00									
TPD	-0.22	1.00								
ID	-0.07	0.14	1.00							
SIZE	-0.23	0.19	0.05	1.00						
Age	-0.31	0.17	-0.01	0.19	1.00					
Leverage	0.22	-0.23	-0.07	-0.69	-0.28	1.00				
Liquidity	-0.15	0.01	-0.05	-0.07	0.20	0.04	1.00			
EX	-0.14	-0.01	0.05	0.00	0.00	0.02	0.00	1.00		
Crisis	-0.10	0.07	0.12	-0.06	0.08	0.03	0.09	0.28	1.00	
CD	-0.20	0.42	0.40	0.18	-0.02	-0.24	-0.01	0.02	0.10	1.00

For testing the panel models, OLS, fixed effect and random effect are done. Then, the likelihood and Hausman test are evaluated and fixed effect model is confirmed for all regressions. The results are shown on Table 5. In addition, diagnostic test for autocorrelation and heteroskedasticity are tested. Bhargava *et al*. (1982) suggest Durbin-Watson test for autocorrelation in the residuals for balanced panel data. Once a value is near 2, it means that there is no autocorrelation in the sample. Hence, there are not autocorrelation in the regression models. In addition, Greene (2003) defines the modified Wald statistic for heteroskedasticity in the residuals of a fixed-effect regression model. The results show that residuals are heteroskedastic. Then, the generalized least squares (GLS) estimator is run and the residuals will be homoskedastic (Table 6).

Table 5. The panel model

	First Model		Second Model		Third Model	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
Constant	0.64	0.00	0.75	0.00	0.78	0.00
CD					-3.45	0.05
TPD	-0.06	0.02				
ID			-0.11	0.00		
SIZE	-0.16	0.00	-0.17	0.00	-0.18	0.00
AGE	0.19	0.00	0.15	0.01	0.15	0.02
leverage	-0.35	0.00	-0.33	0.00	-0.33	0.00
liquidity	-0.01	0.17	-0.01	0.32	-0.01	0.23
EX			0.00	0.06	0.00	0.05
CRISIS	-0.03	0.01	-0.05	0.00	-0.05	0.00
Panels	Fixed effect		Fixed effect		Fixed effect	
Adjusted R-Squared	0.74		0.74		0.74	
Prob (F-statistics)	0		0		0	
Durbin Watson statistics	2.11		2.09		2.09	
Wald test	heteroskedastic		heteroskedastic		heteroskedastic	

Table 6. The GLS model

	First Model		Second Model		Third Model	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
Constant	1.01	0.0	1.05	0.0	1.03	0.0
CD					-0.09	0.0
TPD	-0.07	0.0				
ID			-.2.3	0.0		
SIZE	-0.17	0.0	-0.18	0.0	-0.18	0.0
AGE	0.02	0.004	0.02	0.01	0.02	0.004
leverage	-0.01	0.7	-0.01	0.07	-0.03	0.4
liquidity	-0.001	0.015	-0.001	0.007	-0.007	0.05
EX			-0.002	0.05	-0.002	0.04
CRISIS	-0.5	0.0	-0.07	0.0	-0.07	0.0
Panels	Homoskedastic		Homoskedastic		Homoskedastic	
Correlations	No Autocorrelation		No Autocorrelation		No Autocorrelation	

Discussion

In the first hypothesis, the regression model is stated negative impact of p-diversification, size and leverage, liquidity, crisis and positive impact of age on efficiency. Therefore, the independent variable has a negative impact on efficiency are along the most of previous research such as Lang and Stulz (1994), Berger and Ofek (1995), Comment and Jarrell (1995), Servaes (1996), Denis *et al.* (1997), Clasessens *et al.* (1999), Anderson *et al.* (2000), Clasessens *et al.* (2003), Tongli *et*

al. (2005). Also Chakrabarti *et al.* (2007). In addition, this result is based on agency theory and free cash flow theory. These theories state manager pursues their own interest not on shareholders' interest.

In second hypothesis, based on the regression model the independent variable has a negative impact on efficiency. As stated in chapter two, the agency view argues that managers can take private benefits such as prestige, power, and compensation from global diversification that does not necessarily increase shareholder value (Jensen, 1986; Stulz, 1990). In addition, the results are the same as scholars results such as Michel and Shaked (1986), Geringer *et al.* (2000) and Denis *et al.* (2002) Brewer (1981) and Michel and Shaked (1986) determined negative association.

In the final model, corporate diversification has been examined with some control variables. Muñoz-Bullón and Sanchez-Bueno (2011) assert that once firms pursue both of product diversification and international diversification strategy may get better performance than the past. Also, Kim *et al*. (1993), Delios and Beamish (2001) and Chang and Wang (2007) declare corporate diversification (product and international) in general matter have a positive effect on performance because the firm can enhance scope economies from many international markets and product portfolios.

However, based on agency theory, the expanding may be happened to follow the personal objectives by managers and expanding in new segments and nations may also suggest a decrease in performance (H. Kim, *et al*., 2004; Seth, *et al.*, 2000). Furthermore, expanding in new geographic markets where the culture, regulation and habits are different, may influence the firm's performance (Chang and Wang, 2007; Wan, 1998). Nevertheless, high level of diversification can reduce performance (Jung and Chan-Olmsted, 2005). As a result, based on the regression model the independent variable has a negative impact on efficiency.

In addition, control variables in all three regression models as size, current ratio, exchange rate and crisis have a negative impact and age has a positive effect on efficiency. Leverage is insignificant in all three models.

In this study, size of firm has negative impact on efficiency. It means large firms could not apply their resources efficiency. Also, they cannot use their sales for increasing efficiency. This result is along with Kang (2013), Bobillo *et al.* (2010), Ravichandran *et al.* (2009), Lee *et al.* (2008) and Chang and Wang (2007).

The positive impact of age on efficiency is found. Because, the old firms may be expanded easily rather than young firms. They have large assets and their profitability ratio may be better than others. This result is found out by previous studies such as Chen and Yu (2012), Muñoz-Bullón and Sanchez-Bueno (2011), Yoshida (2010), Singh *et al.* (2010), Ngah-Kiing Lim *et al.* (2009), Qian *et al.* (2008) and Lee *et al.* (2008).

Exchange rate and firm's liquidity are variables which have less attention in related studies. Firm's liquidity is significant factor of its ability to meet short-term debt obligations. The results of regression model show negative impact of liquidity on efficiency. These results are stated on Ishak and Napier (2004) studies.

The exchange rate has an overwhelmingly negative effect, indicating that home country currency (ringgit) increase, improves the efficiency of Malaysian firms.

Conclusion

In this study, firms' efficiency is measured by BCC envelopment model. One input (logarithm of total assets) and six outputs (ROA, ROE, profit margin, market to book ratio, Tobin's Q, EPS) are applied. Data from 102 manufacturing firms listed in Bursa Malaysia for five year during 2006-2010 are collected. Then, the efficiency of manufacturing firms is analyzed. And, the three panel regression models for three hypothesize are run. Regarding the results, there are linear and negative association between product diversification, international diversification and corporate diversification and efficiency. These results show the more diversification increases, the less firm's efficiency decreases.

In short, this research contributes to literature as stated below:

- The relationship between efficiency and corporate

diversification has been examined which has no attention in past.

- Diversification has been investigated by three categories as product diversification, international diversification and corporate diversification.
- The absence of research in Bursa Malaysia among manufacturing listed firms about corporate diversification and efficiency has been filled up.
- New variables (liquidity and financial crisis) that impact on efficiency and corporate diversification have been found.

As other studied, there are some limitations in this research. First of all, the data for manufacturing firms during five years are not available. Secondly, it cannot be possible to identify related and unrelated product diversification, if it would possible, the search may be completed than this research by measuring Entropy formula. Finally, it is not possible to regard all financial variables for measuring efficiency based on DEA.

For future studies, researchers should find a way to measure related and unrelated product diversification. In addition, they will compare the corporate diversification between manufacturing firms and other sectors in Bursa Malaysia. Furthermore, because of high rate of diversification in Bursa Malaysia, it is good research area for comparing with other stock exchanges. Last but not least, efficiency should evaluate by other methods and compare the results with this study.

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