



Technical Efficiency of Firms, A Comparison Study for Family and Non-Family-Owned Businesses in Southeast Asian Countries

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ABSTRACT

This is a comparative study on firm efficiency, a proxy for firm performance, between family-owned business (FOB) and non-family-owned business (non-FOB). This study aims to determine a firms' efficiency by comparing FOB and non-FOB in Southeast Asia countries. The efficiency ratios for five Southeast Asian countries were estimated using Data Envelopment Analysis (DEA), before a two-sample T-test to determine the differences between FOBs and non-FOBs. Hence, secondary data research techniques from each country from 2007 to 2016 were used to conduct the comparison. The data were gathered from various sources. The findings did not archive any comparison in performance among FOBs and non-FOBs. This finding is fundamental for the Board of Director (BOD), senior management of the firms, researchers, policymakers, scholastics, and the overall population., *Ceteris paribus*, both FOB and non-FOB, ought to work at a similar efficiency even out and have the option to produce comparative returns for their shareholders. Subsequently, stakeholders can compare treatments to assist in alleviating the dependency on two unique treatments or strategies when managing FOB and non-FOB. In short, it could expand the BOD and management efficiency.

JEL Classification: M11, M12

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INTRODUCTION

Research on family-owned business (FOB) is popular in Europe (Colli and Rose, 1999; Surdej and Wach, 2012; Corbetta and Salvato, 2004) and America (Gersick et al., 1997; Delmas and Gergoud, 2014). Such studies are limited in the Southeast Asia region (Amran and Ahmad, 2010). Since FOBs in the Southeast are still managed by family members, it will be intriguing to compare the findings with their American and European counterparts. Large Southeast Asian corporations run by families in Southeast Asia include Genting Group, YTL, Berjaya Group, and the OCBC Group. These firms survived through generations and exhibited sustainable business trends. They survived through multiple economic or financial crises, such as the mid-1970s oil crisis, the 1980s economy recession, the 1997/98 Asian financial crisis, and, more recently, the United States subprime crisis.

Most analyses on firm performance including publicly-run companies used three (3) normal intermediaries, namely Return on Assets (ROA) and Return on Equity (ROE) that are profitability ratios to assess accounting performance, together with Tobin's Q which measures the value creation or "market performance." Meanwhile, other accounting and marketing performance proxies like the Return on Sales (ROS), Earning before Interest, Taxes, Depreciation and Amortization (EBITDA), Earning before Interest and Taxes. (EBIT), free cash flow, profit margin, and market to book ratio are used less frequently for research.

Problem Statement

According to a previous study, ROA, ROE, and Tobin's Q that were used as proxies in accounting or financial measurements, particularly for stock valuations were employed to determine the firm's efficiency or productivity (Mosbah et al., 2017). Proxies for accounting and financial measurements can usually be influenced by other factors such as economic cycles or government policies, protection, and patronage, which usually occur in developing countries (Hassan et al., 2012).

The higher stock valuation due to high ROA, ROE, or Tobin's Q would not be able to clarify the underlying drivers for the superior performance of certain firms compared to others during an economic slump or downturn. Thus, it remains vague whether ROA, ROE, and Tobin's Q are the accurate proxies for determining firm performance. Also, there is no consistency in estimating firm performance using ROA, ROE, and Tobin's Q to date (Mosbah et al., 2017). Therefore, this study is performed to identify an alternative proxy that might yield a superior and consistent estimation of firm performance. The absence of observational proof to quantify firm performance dependent on efficiency or usefulness by utilising technical efficiency has given a chance to direct such research. Technical efficiency (TE) is the essential property for a firm to endure, extend, develop, and support, regardless of the economic conditions (Tan et al., 2019).

Research Question, Objective, and Hypothesis

The research question derived for this study is:

Does FOB outperform non-FOB?

The main objective of this study is to investigate the relationship between FOB and their firm performance compared to non-FOB. In this study, firm efficiency (TE) was used as the proxy for firm performance instead of the traditional proxies used in previous literature such as ROA, ROE, Tobin's Q, and sales growth which yielded mixed and inconsistent results. Based on FOB's unique and different settings including longer CEO's tenure, family assets, legacies, reputation and fewer agency issues (Ghee, Ibrahim & Abdul-Halim, 2015), this study hypothesised that:

H1: FOB will yield a better firm performance than non-FOB.

Significant of the Study

This study involved five Southeast Asian countries (Malaysia, Singapore, Indonesia, Philippines, and Thailand) with remarkable economic development (Cubbage and Brooks, 2012). The chosen nations are at various phases of economic turn of events; Singapore is a developed country, while the rest are in different phases of development. Since each country is in different phases of development, this study would be able to assess the impact of country improvement on the performance of publicly-owned companies (Tan et al.,

2019). Moreover, this study wishes to contribute to the current literature gaps in terms of two aspects. Firstly, this study depends on five Southeast Asian countries for a later time post the Asian Financial Crisis. Also, it advances the current literature on firm performance by presenting TE as a proxy for firm performance.

This study is organised as follows. Section 2 provides a review of the literature and the relevant theories. Section 3 provides an overview of the framework and hypothesis. The methodology and data collection are presented in section 4. Meanwhile, section 5 presents the results and discussion, as section 6 concludes the study.

LITERATURE REVIEW

Theoretical Framework

This study employed the three renowned theories namely Agency Theory, Stewardship Theory, and Stagnation Theory. The principal-agent problem in the economy and social science leads to agency issues. Principals are the shareholders of the firms, while the agents are the management that is entrusted by the shareholders to run the daily operations of the firm. Problems arise when the principal-agent face a conflict of interest. A conflict arises when the agent is motivated to act in his/her best interests due to information asymmetry which is an example of a moral hazard. However, since the voting rights and ownership are held among family members, the risk of free riding and the cost associated with it is likely to diminish (Shleifer and Vishny, 1997). Moreover, Jensen and Meckling (1976) and Fama and Jensen (1983) supported that a family's involvement in ownership and management could eliminate the possibility of exploitative behaviour of the agent towards the principal and minimise supervision costs. Meanwhile, Gorriz and Fumas (1996) added agency costs are minimised or reduced when shareholdings are concentrated among a few shareholders as they are the ultimate decision-makers.

The Stewardship Theory is the opposite of Agency Theory. This theory states that managers (agents) protect the interests of the owners or shareholders (principals) and take decisions on their behalf based on their best judgment. The agents' sole objective is to create and maintain a successful and healthy firm to ensure shareholders enjoy reasonable returns from their investment. Firms that usually embrace stewardship place the responsibilities of CEO and Chairman under one executive as the board is mostly comprised of internally appointed board members. Such appointment allows intimate knowledge of the organisational operation and a deep commitment to success (Ward, 2016).

Meanwhile, in corporate governance, the Stewardship Theory has a clear objective of satisfying shareholders. Appointing a single leader (one executive holding the responsibilities of CEO and Chairman) creates a single channel to communicate the business needs to the shareholders and vice versa. Such an appointment also avoids confusion as to the person in charge when a firm needs to weather an economic crisis. The Stewardship Theory of governance requires a CEO to be honest, the highest integrity, trustworthy, and is willing to put aside his/her gains for the benefit of the firm and its shareholders.

On the other hand, the Stagnation Theory is the direct opposite of the Stewardship Theory. The proponents of this theory suggest that FOB is less superior and may be subjected to several critical weaknesses resulting in stagnation. The weaknesses include (but are not limited to); a) sentimental and conflict-ridden (Gersick et al., 1997), b) conservatism and cronyism (Bertrand and Schoar, 2006), c) resource-starved (Chandler et al., 2009), d) slow-growth, and short-life (Grassby, 2000). Based on the perspective of the Stagnation Theory, many scholars posited that FOB is prone to failure and is not sustainable.

FOB

The term 'Family-Owned Business' has various definitions developed based on the research topics or issues that are being investigated. There is so far no consensus on the definition of FOB in teaching/research, consulting or the general public. As a distinct field of study, the FOB phenomena was under the research radar for the past three decades in the United States and approximately a decade in Europe (Neubauer and Lank, 2016). Since it is a relatively young field, a lack of consensus on the definition is perceivable. However, some of the more prominent definitions can be found in intergenerational transition, strategic control, financial commitment, and ownership (Colli and Rose, 2008). Meanwhile, Barry (1975) and Lansberg (1988) defined FOB based on the percentage of ownership and management by family members. While Davis (1983) and

Beckhard and Dyer (1983) defined the concept of family business based on the percentage of involvement of the family members. In addition, the generation transfer concept as a FOB is opined by researchers (Ward, 2004; Churchill and Hattern, 1997).

In 2015, the Global Family Business Index redefined FOB based on the percentage of voting rights. Hence, a private firm is considered a FOB if a family holds 50% of the voting rights in the firm. As for public firms, a family must hold a minimum of 32% of the voting rights. However, for this study, a business entity is family-owned if it meets any of the following criteria:

- a) The founder or his descendant is the CEO or Chairman of the board (Churchill and Hattern, 1997).
- b) If one of the board members comes from the founder's family member (Churchill and Hattern, 1997).
- c) Family members hold 32% of voting rights (Global Family Business Index, 2015).

Firm Efficiency (TE)

TE is the most common efficiency measurement among the different concepts of efficiency measurements, which include allocative efficiency and cost-efficiency. TE can be defined as the conversion of inputs (i.e. capital and labour) into outputs (i.e. finished products) relative to the firms' best practices. Hence, given the current best practice in technology and knowledge, there will be no wastage in producing the desired outputs (in terms of quantity). Therefore, a firm with best-practice operates at 100% TE. Any operation below the best-practice level is deemed inefficient (Bhagavath, 2006). Moreover, TE is also used for a variety of applications, such as evaluating the performance of different types of entities, such as hospitals, business firms, universities, courts, and even cities (Cooper et al., 2011). Currently, there is minimal firms' TE literature based on a multi-country context as most of the firms' TE studies have been conducted in the context of a single country (Charoenrat et al., 2013; Demirbag et al., 2016).

Firm efficiency (TE) in this context is the ratio between the production of outputs against inputs. In a nutshell, it represents the efficiency of a firm in converting the given inputs such as financial capital, raw material, labour, and office space into outputs such as sales revenue, profits, or finished goods. As the rule of thumb, the inputs should be minimised and the outputs must be maximised. For instance, based on a given fixed financial capital, a firm that can generate more sales revenue is deemed to be more efficient than a firm that generates less. Alternatively, a firm is deemed more efficient if it can produce the same amount of end products by using the least raw material compared to another firm. Hence, a more efficient firm is more likely to grow and expand during an economic uptrend and survive during a recession or economic downtrend.

The conventional methods to measuring efficiency include regression analysis and stochastic frontier analysis (SFA). However, the two techniques are proven to be insufficient due to the varying multiple inputs and outputs that are related to different resources, environmental factors, and activities (Bhagavath, 2006). Hence, this study employed a more proven and accurate method which is the Data Envelopment Analysis (DEA).

FOB' Firm Performance

Since a FOB is passed down to the subsequent generations, the survival of the FOB depends on most founders and family members in the management is striving to grow the firm in terms of value and performance so that the next generation inherits a firm with higher net worth. Studies conducted in Malaysia using Tobin's Q (Amran and Ahmad, 2010) and ROE (Ibrahim and Samad, 2010) as proxies for firm performance, revealed that FOB performed better compared to non-FOB. Contrarily, Ibrahim and Samad (2010) demonstrated that FOB's performance was lower compared to non-FOB if Tobin's Q was used as a proxy. Meanwhile, Mohd Sehat and Abdul Rahman (2005) indicated that FOBs who invested the majority of their assets in specific firms cashed out to invest in lower risk and lower return firms where the return is less profitable.

According to a study by Ab Razak and Palahuddin (2017), family ownership leads to lower performance than non-FOB on accounting measurement (ROA and ROE) and market measurement (Tobin's Q) after controlling several company-specific characteristics. Contrarily, the concentration of family ownership has a positive impact on the firm performance in Turkey (Ciftci et al., 2019). Studies from different parts of the world also demonstrated inconsistent and mixed results like in Chile (Martinez et al., 2007), the

United States (Delmas and Gergoud, 2014), Israel (Lauterbach & Vaninsky, 1999), Europe (Miller et al., 2008), and Poland (Surdej and Wach, 2012). Table 1 represents a rundown of the findings.

Table 1 Summary of Past Studies on Family Owned Business and Firm Performance

| Author | Findings |
|--------------------------------|---|
| Ibrahim and Samad (2010) | Family-owned business showed superior firm performance if measured using ROE, inferior if using ROA and Tobin's Q as a proxy |
| Amran and Ahmad (2010) | Family-owned business showed superior firm performance if measured using Tobin's Q as a proxy |
| Martinez et al. (2007) | Family-owned business showed superior firm performance if measured using ROA and ROE but inferior if using Tobin's Q |
| Delmas and Gergoud (2014) | A family-owned business in the winery industry will perform better if there is a tendency for transgenerational succession |
| Lauterbach and Vaninsky (1999) | A family-owned business has a poorer firm performance if measured using Tobin's Q |
| Miller, et al. (2008) | The family-owned business might not have better performance due to stagnation theory |
| Lee (2004) | Family-owned business performance is better if ROA is used as a proxy |
| Surdej and Wach (2012) | Polish family-owned business has a better firm performance if ROA is used as a proxy. |
| Allouche et al. (2008) | Japanese family-owned businesses perform better when ROA and ROIC are used as proxies |
| Ab Razak and Palahuddin (2017) | Family ownership leads to lower performance than non-family owned firms on accounting measurement (ROA and ROE) and market measurement (Tobin's Q) after controlling company specific characteristics |
| Miroshnychenko et al. (2021) | Family control has an economically significant impact on growth rates on firm performance |

The irregularity of the previous outcomes (Table 1) could be fortuitous. For instance, when the country is experiencing an outstanding economy up pattern development, most firms will record a positive development. These organisations will, for the most part, ride on the economic waves without having to worry about their development, innovation, and create efficiency. However, when the country faces a financial slump or downturn, most of such firms will be badly affected.

Framework and Hypothesis

The primary assumption of this study is that FOB performs better than non-FOB mainly because FOBs conduct and manage their daily operation differently compared to non-family peers based on unique characteristics. Some of the unique characteristics of the FOB include longer CEOs' tenure, altruism, succession planning, open and cohesive communication channel, less formal, protecting the main family asset, and protecting and safeguarding the good family name in the society. For instance, a CEO with a longer could have longer-term plans, apart from executing, and implementing innovative and sustainable ideas for their firm's long-term survivability and sustainability. Meanwhile, based on the Agency Theory's point of view, FOBs reduce their agency cost because the principals and agents are from the same family. Hence, the family owners (principals) can be assured that the agents (managers) are going to use the shareholders' funds efficiently to generate a reasonable return as the owners closely monitor the agents. Besides that, voting rights and ownership are tightly held by the family members in FOBs. Hence, free riding risk is most likely reduced (Shleifer and Vishny, 1997). Therefore, the agents will strive to ensure a more productive and efficient firm, leading to higher performance.

Meanwhile, from the Stewardship Theory's point of view, family owners with their reputations, family social standings, self-esteem, and self-concept could greatly enhance the performance of their firms (Tsui-Auch, 2004). Family members often have a deep emotional attachment to their investment as their family's fortune, assets, self-satisfaction, legacies, and public reputation are bound to the family business (Ward, 2016). Hence, the founder CEO, BOD, and family managers are driven not only by financial self-interest but by the firm's vision, mission, longevity, survivability, and sustainability.

The proponents of these theories suggest that FOB perform better than non-FOB (Amran and Ahmad, 2009; 2010; Ibrahim and Samad, 2010; Gersick et al., 1997; Delmas and Gergoud, 2014; Colli and Rose, 2008; Allouche et al., 2008; Martinez et al., 2007; Lee, 2004; Shukeri et al., 2012; Miroshnychenko et al., 2021). Based on these findings, this study hypothesised that:

H1: FOBs yield better firm efficiency performance compared to non-FOBs.

METHODOLOGY AND DATA COLLECTION

This study utilised secondary data from the respective countries. The data were collected from numerous sources. Most of the data were obtained from the stock exchange of each country. Table 2 depicts the complete list of exchanges. Annual reports of the firms for the same duration were also retrieved from the respective firms' websites to assess the characteristics of the BODs and to supplement missing information drawn from each stock exchange.

Table 2 Five Southeast Asia countries stock exchange

| Country | Exchange Indices |
|-------------|---|
| Malaysia | FTSE Bursa Malaysia Top 100 Index |
| Singapore | Straits Times Indexes (STI) and FTSE ST All-Share Index |
| Philippines | PSE All Shares Indexes |
| Thailand | SET 100 Indexes |
| Indonesia | Indonesia SE Kompas 100 & LQ 45 |

Source: <http://www.bloomberg.com/markets/stocks/world-indexes/asia-pacific>

Data collected from 2007 to 2016 on the economic performance of the firms were standardised into USD. This period was chosen because the data were free from the compounded effects of the Asia Financial Crisis. Moreover, it assured that the same firms were listed during the said period. The information drawn from each exchange included the numbers of employees (labour), capital (paid-up capital), and operating expenses (inputs). Meanwhile, sales revenues and net profit before tax were used as outputs for the DEA analysis. The selection complied with the rules of thumb selection (Cooper et al., 2000).

Data Analysis Method

In DEA, the decision-making unit (DMU) is a set of peer entities that are used for performance evaluation by converting multiple inputs into multiple outputs. The most efficient producers in DEA determine the function which is different from the Ordinary Least Squares (OLS) technique which is based on comparisons relative to an average producer. If a firm can produce a certain output from specific inputs, similar firms of equal scale should be able to perform the same. Therefore, DEA can identify an 'efficient frontier' similar to that of Stochastic Frontier Analysis (SFA). Moreover, when the most 'efficient producers' form 'composite producers', they can compute an efficient solution for every level of input or output (Berg, 2010).

One of the main advantages of DEA is its ability to accommodate multiple inputs and outputs. DEA can also increase or decrease efficiency based on size and output level, which takes the consideration returns to scale in calculating efficiency. Whereas, the major drawback of this method includes its sensitivity to model specification and inclusion/exclusion variables that affect the results (Berg, 2010).

According to Cooper et al. (2000), DEA has been proven to determine new insights and findings into activities (and/or entities) that have been previously evaluated by other methods. For example, numerous inefficiency sources have been identified in some of the world's most profitable firms where DEA serves as a benchmark to firm profitability.

DEA was used to analyse the panel dataset of up to 500 firms/year (up to 100 firms per country/year) for the period 2007-2016. The selected 100 firms from each country are the largest in terms of market capitalisation. Therefore, they represent the country's economy. The study involved data spanning from 2007 to 2016 because the period consisted of the most recent data where firms adhered to stricter and up-to-date reporting procedures and were less influenced by the compounded effects of the Asian Financial Crisis (Gul and Tsui, 2004). The convenient sampling method was conducted due to the limitation of obtaining the relevant data, including annual reports over 10 years from five countries. However, due to data limitations, the actual number of firms from each country was much lower than the whole population, as depicted in Table 3. The dataset consisted of FOB and non-FOB firms of varying sizes, ownership structures, and product mix. All the firms operate from the five Southeast Asian countries and are listed on each country's stock exchange.

Table 3 Number of samples collected from each stock-exchange

| Country | Total Listed Firms (2016) | Sample Collected |
|-------------|---------------------------|------------------|
| Malaysia | 931 | 99 |
| Singapore | 287 | 99 |
| Philippines | 274 | 75 |
| Thailand | 726 | 93 |
| Indonesia | 505 | 95 |

In the present study, all firms (FOBs and non-FOBs) were assumed to use identical inputs, such as labour, capital, and operating expenses to produce identical outputs (sales revenue and profit). Labour was proxied as a number of employees in the firm. While the capital was proxied by the firms' paid-up capital, and the operating expenses were proxied by the annual cost of operation. Meanwhile, the net profit before tax was the proxy for firm profit (output) with sales revenue being another output. The selection of these inputs and outputs are based on the production perspective and rules of thumb selection (Charoenrat et al., 2013; Cooper et al., 2000). Each DMU in DEA that were selected took turns to become the focal DMU, while a separate optimisation process was performed for each of the selected DMUs. The optimisation included the selection of weightage used to calculate the relative efficiency of each DMU. A DMU's efficiency was calculated as the ratio of the sum of weighted outputs divided by the sum of weighted inputs. During the optimisation process, a set of weights was selected for the focal DMU to yield the highest possible efficiency. A common set of constraints was shared among these separated optimisation processes, in which, the rating of efficiency must not exceed one when the set of weights is applied to any DMU (Sale and Sale, 2013). The TE ratios for the firms in each country were calculated separately based on the selected periods.

To test the significance of the DEA's results, a 2-sample t-statistic for means was conducted. This method was preferred because only the normally distributed datasets were utilised in the analysis. The DEA's results were divided into two different groups, FOB efficiency ratios and non-FOB efficiency ratios. If μ_f and μ_{nf} represent the efficiency ratio means for FOB and non-FOB, respectively, then the null hypothesis (H_0) is $\mu_f = \mu_{nf}$. The rejection region was set at 0.05, hence α is 0.05. Therefore, μ_f is significantly different from μ_{nf} . If the μ_f value is higher than μ_{nf} , it can be concluded that FOB's (with a higher efficiency ratio) firm performance was better or vice versa if the μ_f value is lower than μ_{nf} .

RESULTS AND DISCUSSION

Descriptive Statistic (TE of Malaysian Firms)

Table 4 to Table 9 summarise the descriptive statistic results and T-Test of TE for FOBs and non-FOBs from each country for specific years. The results of TE ranged from 0 (least efficient) to 1 (most efficient).

Table 4 10 Years Technical Efficiency's Descriptive Statistic

| Country | Mean | Std Deviation | Skewness | Z value | Kurtosis | Z value |
|---------------------------|----------|---------------|----------|----------|----------|----------|
| Family Owned Business | | | | | | |
| Malaysia | 0.674102 | 0.185244 | 0.0657 | 0.194955 | -0.0347 | -0.05242 |
| Singapore | 0.480278 | 0.318137 | 0.5386 | 1.688401 | -0.9707 | -1.5457 |
| Indonesia* | 0.425357 | 0.337854 | 0.653 | 1.937685 | 0.9045 | -1.36631 |
| Philippines | 0.542253 | 0.277503 | 0.2999 | 0.793386 | 0.9184 | 1.239406 |
| Thailand** | 0.566434 | 0.190607 | 0.512 | 1.646302 | 0.4872 | 0.79478 |
| Non-Family Owned Business | | | | | | |
| Malaysia | 0.636453 | 0.225256 | 0.0484 | 0.142353 | -0.4889 | -0.73189 |
| Singapore | 0.44727 | 0.338557 | 0.5854 | 1.621607 | -0.9648 | -1.36079 |
| Indonesia* | 0.439353 | 0.348674 | 0.529429 | 1.495561 | -1.07986 | -1.55375 |
| Philippines | 0.525191 | 0.356831 | 0.0628 | 0.159796 | -0.9353 | -1.21784 |
| Thailand** | 0.616198 | 0.202755 | 0.489 | 1.2134 | -0.6202 | -0.78706 |

Note: Indonesia* for FOB, we omitted the period 2013 to maintain the data normality. If include the year 2013, FOB's average Z value for skewness and kurtosis is 2.122086 and -1.22292, respectively. Thailand** for 5 periods, 2008,2009,2010,2014,2015 to maintain the data normality. The FOB's average Z values for skewness and kurtosis are 4.830868 and 9.085481 respectively for ten years. The average skewness and kurtosis for ten years are 2.172208 and 0.555203 respectively for non-FOB.

The 10 years of TE data calculated for Malaysia's FOBs and non-FOBs were a little skewed and kurtotic. The FOB's TE average Z value for skewness and kurtosis were 0.194955 and -0.05242, respectively. Both the values were within -1.96 and +1.96 indicating that they did not diverge significantly from normality.

Meanwhile, the skewness and kurtosis (average Z value) for non-FOB's TE were 0.142353 and -0.73189, respectively. These values did not diverge significantly from normality too.

Overall, the mean TE for Malaysia's FOBs over 10 years was 0.674102 with a standard deviation of 0.1852442. Hence, it can be concluded that Malaysia's FOBs can produce the same amount of outputs by using 67.4102% of the inputs. Alternatively, the same FOBs could also reduce the inputs by 32.5898% to produce the same output quantities.

Whereas, the mean TE over 10 years for non-FOBs was 0.636453 with a standard deviation of 0.225256. These values depicted that Malaysian non-FOBs can produce the same amount of outputs by using 63.6453% of the inputs. Alternatively, the non-FOBs reduced 36.3547% of the inputs to produce the same output quantities.

T-Test For TE Of Malaysia Firms

Table 5 Summary of T-test for Technical Efficiency

| Family Owned Business | | Non-Family Owned Business | | N | t-value | p-value |
|-----------------------|---------------|---------------------------|---------------|----|---------|---------|
| TE Mean | Std Deviation | TE Mean | Std Deviation | | | |
| 0.71218 | 0.232568 | 0.58733 | 0.305666 | 49 | 0.021 | 0.024 |
| 0.74434 | 0.145278 | 0.67855 | -0.199288 | 49 | 1.88 | 0.063 |
| 0.69138 | 0.19352 | 0.62414 | 0.224524 | 49 | 1.597 | 0.114 |
| 0.68704 | 0.181192 | 0.65076 | 0.205377 | 49 | 0.933 | 0.353 |
| 0.64156 | 0.222276 | 0.6259 | 0.207946 | 49 | 0.362 | 0.718 |
| 0.74378 | 0.163826 | 0.7428 | 0.181991 | 49 | 0.028 | 0.977 |
| 0.68514 | 0.168178 | 0.6669 | 0.218053 | 49 | 0.467 | 0.642 |
| 0.68782 | 0.16342 | 0.67088 | 0.202399 | 49 | 0.459 | 0.647 |
| 0.68514 | 0.155856 | 0.65033 | 0.209864 | 49 | 0.938 | 0.35 |
| 0.46264 | 0.226328 | 0.46694 | 0.297452 | 49 | -0.081 | 0.936 |

In 2007, the FOBs and non-FOBs in Malaysia recorded a significant difference in terms of TE (T-statistic = 0.021, p-value is 0.024 (< 0.05)). Hence, the null hypothesis was rejected, and the alternate hypothesis was accepted. The TE's mean for FOB (0.71218) was higher than that of the non-FOB (0.58733). Therefore, it can be concluded that FOBs operate more efficiently compared to non-FOBs. In the subsequent years, the p-value demonstrated no significant differences partly due to the progress and advancements in the economy, science and technology, local corporate laws, and national regulations including enforcement, monitoring, and regulating financial and legal frameworks. This results in most firms operating under the same business environment without having any special privileges such as patronage from the government. Meanwhile, corporate governance is likely to be observed and practised according to the best practices available (Claessens et al., 2000). In terms of management, FOBs in Malaysia are more likely to be slower in adapting to managerial supervision, which allows the operations of their firms to be run by professional managers, similar to non-FOBs. However, the family members would still have the controlling stake at the board level. This is progression to mature tightly regulates the corporate scenes as observed in developed countries. These arguments support the Stagnation Theory, where the FOBs are not growing as fast as they should be due to agency issues such as earnings expropriation (Liew et al., 2015).

Overall, the TE's mean for FOBs fluctuated from 0.74434 in 2008 to 0.46264 in 2016. The year 2016 was an odd year for FOB's TE because of the low mean, whereas the other nine years recorded TE means ranging from 0.64156 to 0.74434. The non-FOBs also exhibited a similar phenomenon. The TE mean for the year 2016 was 0.46694, which was much lower compared to other years (0.58733 in 2007 to 0.7428 in 2012). The low mean TE for both FOBs and non-FOBs could partly be due to the lower GDP in 2014 (6.0%), followed by 5.0% in 2015, and 4.2% in 2016 (World Bank, 2017). The contraction of the GDP was due to several internal and external factors. The internal factors were notably 1MDB's scandal, together with the Department of Justice the United States of America (DOJ) suit led to the depreciation of Ringgit and unstable local political climate. Meanwhile, the external factors include the United States (US) presidential election, Brexit, terror attacks around the world, North Korea cruise missile testing, and the failure of the Trans-Pacific Partnership. These internal and external factors created a negative perspective on the country's economic image.

On the other hand, the overall foreign direct investments (FDI) also decreased by 5% in the year 2016 (The Edge, 2017). Hence, the diminished demand for finished goods and services reduced the GDP growth from 6.0% in 2014 to 4.2% in 2016 (World Bank, 2017). With lesser demand for finished goods or services,

firms were not operating at their full capacity. It was primarily because input DMUs (labour and paid-up capital) do not usually fluctuate as much as the outputs (profits and revenues) which were significantly reduced due to slow demands. Therefore, a reduction in the overall efficiency of a firm was observed. Furthermore, a negative image of the country could hinder FDI and inbound foreign tourists which decreased to 26.7 million in 2016 from 27.4 million in 2014. (DOSM, 2019). Also, foreign firms will not have the confidence to invest in the country (DOSM, 2019). Coupled with the depreciation of Ringgit against USD, local firms had to generate high-value outputs such as revenues and profits to maintain the efficiency when the outputs are converted from the Ringgit to USD.

Descriptive Statistic (TE of Singapore Firms)

The 10 year TE data calculated for Singapore’s FOBs and non-FOBs were a little skewed and kurtotic. The FOB’s TE average Z values for skewness and kurtosis were 1.688401 and -1.5457, respectively. Since both values fall within -1.96 and +1.96, they did not differ significantly from normality. Meanwhile, for non-FOB, the TE average Z values for skewness and kurtosis were 1.621607 and -1.36079, respectively. Hence, these values also did not diverge significantly from normality.

Overall, Singapore's 10 years TE’s mean for FOBs was 0.480278 with a standard deviation of 0.318137. In other words, Singapore's FOBs could produce the same amount of outputs using 48.0278% of inputs. Alternatively, the FOBs could reduce the inputs by 51.9722% to produce the same amount of outputs. Meanwhile, non-FOBs recorded a 10 year TE’s mean of 0.44727 with a standard deviation of 0.3385567. So, Singapore's non-FOBs can produce the same amount of outputs using 44.727% of inputs. Alternatively, the non-FOBs could reduce the inputs by 55.273% to produce the same amount of outputs.

T-Test For TE Of Singaporean Firms

Table 6 Summary of T-test for Technical Efficiency

| Year | Family Owned Business | | | Non-Family Owned Business | | | t-value | p-value |
|------|-----------------------|---------|---------------|---------------------------|---------|---------------|---------|---------|
| | N | TE Mean | Std Deviation | N | TE Mean | Std Deviation | | |
| 2007 | 56 | 0.50968 | 0.310115 | 43 | 0.47467 | 0.327056 | 0.544 | 0.588 |
| 2008 | 56 | 0.54573 | 0.325066 | 43 | 0.43574 | 0.431169 | 1.633 | 0.106 |
| 2009 | 56 | 0.51611 | 0.303293 | 43 | 0.46305 | 0.287901 | 0.882 | 0.38 |
| 2010 | 56 | 0.54384 | 0.308765 | 43 | 0.54942 | 0.358945 | -0.083 | 0.934 |
| 2011 | 56 | 0.4583 | 0.336873 | 43 | 0.39726 | 0.346291 | 0.883 | 0.379 |
| 2012 | 56 | 0.5027 | 0.333998 | 43 | 0.494 | 0.335348 | 0.128 | 0.898 |
| 2013 | 56 | 0.45604 | 0.331237 | 43 | 0.40007 | 0.305704 | 0.861 | 0.391 |
| 2014 | 56 | 0.42977 | 0.298457 | 43 | 0.39449 | 0.300576 | 0.581 | 0.562 |
| 2015 | 56 | 0.4832 | 0.315348 | 43 | 0.46302 | 0.311291 | 0.317 | 0.752 |
| 2016 | 56 | 0.35741 | 0.318218 | 43 | 0.40098 | 0.381286 | -0.619 | 0.537 |

For Singaporean firms, the entire 10 years did not manifest any significant difference between FOBs and non-FOBs in terms of their TE mean T-test. The results for all the years yielded a p-value of more than 0.05. Such occurrence could be partly due to the maturity of Singapore’s capital and equity market. Singapore is the only developed country in the Southeast Asian region. Hence, Singapore has the financial and legal framework to conduct a business with well-regulated with good corporate governance. Both FOBs and non-FOBs are operating within the same boundaries and limitations where neither the FOBs nor non-FOBs has an advantage over the other (Gul and Tsui, 2004). For example, in a less developed country, FOBs are likely to have some advantages from the personal relationship between the firms' owners and the government of the day. A good example was the relationship of the late Tan Sri Lim Goh Tong with Malaysia’s first Prime Minister (Weidenbaum and Hughes, 1996). However, in a developed country, such advantages usually no longer exist, and the operations of both FOBs and non-FOBs will converge instead of two distinct paths. In this scenario, the Stewardship Theory falls in place where both owners and management are on the same page not only to safeguard the firms’ assets, reputation, or legacies but also to create a higher firm value for the future.

Meanwhile, the TE’s mean for FOBs fluctuated from a higher value of 0.54573 in 2008 to a lower value of 0.35741 in 2016. The extremely low mean in 2016 was similar to the occurrence in Malaysia. As for the non-FOBs, the mean ranged from 0.54942 in 2010 to as low as 0.39449 in 2014. The mean for the year 2016 was 0.40098, which was close to the reading estimated in 2014. The low mean values in 2016 for FOBs and non-FOBs could be due to the slowing down of Singapore's economy. The data from the Ministry of

Manpower (MOM) indicated an overall unemployment rate of 2.1% as of June 2016, the highest mid-year rate since 2010.

The mid-year job vacancy was at its lowest (2.4%) since the 2009 recession (MOM, 2018). The high unemployment rate and low job vacancy were reasonable indications that a country's economy is slowing down. Hence, the demand for finished goods and services decreased. Similar to Malaysia, the DMUs' inputs such as paid-up capital and labour were relatively unchanged. Nevertheless, the outputs (revenues and profits) significantly decreased due to the low demands. Consequently, the overall efficiency of firms is reduced. This scenario was reconfirmed by the data from the Ministry of Trade Singapore (MTI), which illustrated a downgrade in growth to 1.0% to 1.5% from 2.0% in the year 2015 (MTI, 2018). Moreover, the high unemployment rate and low job vacancy could be likely due to Singapore's exposure to external regional and global issues. However, the country has strong resilience because of the country's stable monetary reserves, operation efficiency in government and private sectors coupled with sound fiscal policies, and corporate governance.

Descriptive Statistic (TE of Indonesian Firms)

This study managed to collect data from seven years (2010 to 2016) for Indonesia. The data calculated for Indonesia's FOBs are skewed but slightly kurtotic. The FOB's TE average Z values for skewness and kurtosis were 2.122086 and -1.22292, respectively. Since only the kurtosis value fell well within -1.96 and +1.96, the data for the year 2013 was omitted. The new TE average Z values for skewness and kurtosis were 1.937685 and -1.36631 (within -1.96 and +1.96), respectively, confirming that they did not differ significantly from normality. Meanwhile, the average non-FOB's TE Z values for skewness and kurtosis were 1.495561 and -1.55375, respectively, which did not diverge significantly from normality.

Overall, Indonesia's FOBs yielded a mean TE value of 0.425357 over six years with a standard deviation of 0.337853. So, Indonesia's FOBs can produce the same amount of outputs using 42.5357% of the inputs. Alternatively, the FOBs could reduce the inputs by 57.4643 % to produce the same amount of outputs. Meanwhile, non-FOBs exhibited a mean TE of 0.439353 over seven years with a standard deviation of 0.348674. In other words, Indonesia's non-FOBs can produce the same amount of outputs using 43.9353% of inputs. Alternatively, the same FOBs could reduce the inputs by 56.0647% to produce the same amount of outputs.

T-Test For TE Of Indonesian Firms

Table 7 Summary of T-test for Technical Efficiency

| Year | Family Owned Business | | | Non-Family Owned Business | | | t-value | p-value |
|------|-----------------------|---------|---------------|---------------------------|---------|---------------|---------|---------|
| | N | TE Mean | Std Deviation | N | TE Mean | Std Deviation | | |
| 2010 | 50 | 0.39282 | 0.315718 | 45 | 0.438 | 0.339466 | -0.672 | 0.503 |
| 2011 | 50 | 0.32394 | 0.316594 | 45 | 0.35653 | 0.348142 | -0.478 | 0.634 |
| 2012 | 50 | 0.39344 | 0.362375 | 45 | 0.43358 | 0.370051 | -0.534 | 0.595 |
| 2013 | 50 | 0.31974 | 0.340442 | 45 | 0.34542 | 0.358878 | -0.358 | 0.721 |
| 2014 | 50 | 0.53592 | 0.342837 | 45 | 0.37647 | 0.305096 | 2.384 | 0.019 |
| 2015 | 50 | 0.4514 | 0.32653 | 45 | 0.54978 | 0.347616 | -1.422 | 0.158 |
| 2016 | 50 | 0.45462 | 0.363069 | 45 | 0.57569 | 0.371469 | -1.605 | 0.112 |

According to the T-test analysis, the significant difference between FOB and non-FOB in terms of TE means analysis was only demonstrated in the year 2014. The T-statistic was recorded at 2.384, with a p-value of 0.019. Hence, the null hypothesis was rejected. Also, FOB's mean was 0.53592 which was higher than that of the non-FOB's, 0.37647. Hence, it can be concluded that the FOBs are more efficient compared to non-FOBs. Contrarily the other years did not indicate the presence of significant differences.

The TE's mean for FOB fluctuated from a low value of 0.31974 in 2013 to a higher value of 0.53592 in the year 2014. Meanwhile, for non-FOB, the mean fluctuated from a low value of 0.34542 in 2013 to a higher value of 0.57569 in the year 2016. The low means for both FOBs and non-FOBs for the year 2013 could partly be due to the slowdown of Indonesia's economic growth, high inflation, and depreciation of the Rupiah. The year 2013 represents the third consecutive year of slow economic growth in Indonesia. From a 6.5% growth in 2011, the country's GDP growth slowed to 6.2% in 2012 and to 5.7% in 2013 (World Bank, 2017). Such a slowdown in a nation's economic growth could harm the demand for finished goods and services.

Although the input DMUs such as paid-up, capital and labour remain unchanged, the outputs such as revenues and profits were significantly reduced, hence, reducing the firm's efficiency. Moreover, the depreciation of the Rupiah by almost 21% influenced the reduction of efficiency as the firms now need to earn more in Rupiah to generate the same amount in USD after conversion. Thus, the Agency Theory is supported here, where during an economic downturn, family owners will be more inclined to expropriate earnings for their consumption (Cheong and Kim, 2014).

Nevertheless, Indonesia's inflation rose to almost 9% following the government's move to cut fuel subsidies in June 2013. The measure was taken to curb the overheating of Indonesia's economy. Nevertheless, the Indonesian government stepped in by raising the interest rate from 5.75% to 7.50% to curb the high inflation at the expense of economic growth (World Bank, 2017). Higher inflation tends to moderate economic growth. They will cause a reduction in borrowing, curb spending or consumption, and lower investments. Subsequently, the demand for finished goods and services will reduce, hence, the firm's efficiency will be negatively affected as the input DMUs such as paid-up capital and labour hardly changed, but outputs such as revenues and profits are reduced.

Descriptive Statistic For TE Of Philippines Firms

The TE data collected over 10 years for the FOBs and non-FOBs of the Philippines were a little skewed and kurtotic. The FOB's TE average Z values for skewness and kurtosis were 0.793386 and 1.239406, respectively (within -1.96 and +1.96). Hence, they did not differ significantly from normality. Meanwhile, as for non-FOB, the TE average Z values for skewness and kurtosis were 0.159796 and -1.21784, respectively. They also portrayed no significant divergence from normality.

Overall, the mean TE over 10 years for the Philippines's FOBs was estimated at 0.542253 with a standard deviation of 0.2775031. Thus, the Philippines' FOBs can produce the same amount of outputs using 54.2253% of inputs. Alternatively, the same FOBs could reduce the inputs by 45.7747% to produce the same amount of outputs. Meanwhile, the 10 years mean TE for non-FOBs was 0.525191 with a standard deviation of 0.3568308. In other words, the Philippines' non-FOBs can produce the same amount of outputs using 52.5191% of inputs. Alternatively, the same FOBs could reduce the inputs by 47.4809% to produce the same amount of outputs.

T-Test For TE Of Philippines Firms

Table 8 Summary of T-test for Technical Efficiency

| Year | Family Owned Business | | | Non-Family Owner Business | | | t-value | p-value |
|------|-----------------------|---------|---------------|---------------------------|---------|---------------|---------|---------|
| | N | TE Mean | Std Deviation | N | TE Mean | Std Deviation | | |
| 2007 | 39 | 0.33946 | 0.341738 | 36 | 0.60753 | 0.383788 | -3.199 | 0.002 |
| 2008 | 39 | 0.69156 | 0.262429 | 36 | 0.51214 | 0.368577 | 2.443 | 0.017 |
| 2009 | 39 | 0.52823 | 0.351054 | 36 | 0.62969 | 0.399684 | -1.17 | 0.246 |
| 2010 | 39 | 0.12213 | 0.261703 | 36 | 0.27139 | 0.32458 | -2.2 | 0.031 |
| 2011 | 39 | 0.27959 | 0.320943 | 36 | 0.42053 | 0.367654 | -1.772 | 0.081 |
| 2012 | 39 | 0.79097 | 0.242665 | 36 | 0.58297 | 0.352996 | 2.993 | 0.004 |
| 2013 | 39 | 0.62026 | 0.274268 | 36 | 0.50622 | 0.359033 | 1.553 | 0.125 |
| 2014 | 39 | 0.77033 | 0.189818 | 36 | 0.66008 | 0.338802 | 1.756 | 0.083 |
| 2015 | 39 | 0.66315 | 0.264152 | 36 | 0.57053 | 0.334873 | 1.335 | 0.186 |
| 2016 | 39 | 0.61685 | 0.266261 | 36 | 0.49083 | 0.338321 | 1.8 | 0.076 |

Of the 10 years, the Philippines demonstrated four years of significant difference in T-statistics between FOBs and non-FOBs. The T-statistic in 2007 was -3.199 (p-value = 0.002), 2008 was 2.443 (p-value = 0.017), 2010 was -2.2 (p-value = 0.031), and lastly in the year 2012, the T-statistic was 2.993 (p-value = 0.004). However, all four years did not display a high mean for FOBs. FOBs with mean values of 0.69156 and 0.79097 in the year 2008 and 2012, respectively, were higher than non-FOB, with mean values of 0.51214 and 0.58297. Whereas, the non-FOBs yielded a higher mean (0.60753) in 2007 compared to the mean of FOBs of 0.33946 in 2007; non-FOBs indicated a mean of 0.27139 in 2010 compared to a lower mean for FOBs of 0.12213 in 2010. Such inconclusive findings make it difficult to determine whether FOBs or non-FOBs have the better TE. Perhaps future studies with more time points can help conclude such analysis.

Meanwhile, the mean T-statistic for FOB fluctuated from a low value of 0.12213 in 2010 to a higher value of 0.79097 in 2012. As for non-FOB, the values fluctuated from a low value of 0.27139 in 2010 to a

higher value of 0.66008 in 2014. The consistent low mean for FOBs and non-FOBs for the year 2010 could be partly due to the worldwide recession during 2008-2009 triggered by the subprime crisis in the US. The US is the second-largest trading partner with the Philippines, where the FDI was accounted for 33% before the crisis. However, the US investment in the Philippines decreased substantially post-crisis era. During the same period, another source of Philippines' income which was the Overseas Filipino Workers (OFWs) was also at risk due to the global recession. Hence, the remittances from the OFWs were substantially lower. Last but not least, the Philippines' tourism industry was also severely affected by the crisis. Tourism receipts were low due to the weak demand from the US and other countries (Worldstopexport, 2018). These factors reduced the demand for finished goods and services for the Philippines, thus, leading to a negative effect on the firms' efficiency. As the input DMUs such as paid-up capital and labour remained unchanged, the outputs were reduced. Consequently, led to the reduction of firms' efficiency. The plunge in the Philippines economy could be supported by the Agency Theory as owners and management act accordingly to their self-interests.

Descriptive Statistic For TE Of Thailand Firms

The 10 years of TE data collected for Thailand were skewed and kurtotic for FOBs. The FOBs' average TE Z values for skewness and kurtosis were 4.830868 and 9.085481, respectively. Hence, the years with the skewness and kurtosis values within the acceptable range of -1.96 to +1.96 were chosen for further analysis. Five years (2008, 2009, 2010, 2014, and 2015) demonstrated no significant divergence from normality. Collectively, these years yielded average skewness and kurtosis Z values of 1.646302 and 0.79478, respectively.

Meanwhile, non-FOB also demonstrated similar distribution as FOB. The average TE's skewness and kurtosis over 10 years were 2.172208 and 0.555203, respectively. Although the average TE's kurtosis Z value fell within the allowable range of -1.96 to +1.96, the skewness Z value demonstrated otherwise. Therefore, similar to FOBs, only five similar periods (2008, 2009, 2010, 2014, and 2015) that can provide a data distribution that does not differ significantly from normality were selected. Overall, the average skewness and kurtosis Z values were 1.2134 and -0.78706, respectively.

Whereas, Thailand's FOBs yielded a mean TE value of 0.566434 with a standard deviation of 0.1906072 for the five years. Thailand's FOBs can produce the same amount of outputs using 56.6434% of inputs. Alternatively, the same FOBs could reduce the inputs by 43.3566% to produce the same amount of outputs.

Concurrently, non-FOBs exhibited a mean TE of 0.616198 with a standard deviation of 0.2027554 for the five years. In other words, Thailand's non-FOBs can produce the same amount of outputs using 61.6198% of inputs. Alternatively, the same non-FOBs could reduce the inputs by 38.3802% to produce the same amount of outputs.

T-Test For TE Of Thailand Firms

Table 9 Summary of T-test for Technical Efficiency

| Year | Family Owned Business | | | Non-Family Owned Business | | | t-value | p-value |
|------|-----------------------|---------|---------------|---------------------------|---------|---------------|---------|---------|
| | N | TE Mean | Std Deviation | N | TE Mean | Std Deviation | | |
| 2007 | 59 | 0.19658 | 0.177769 | 34 | 0.32779 | 0.299424 | -2.656 | 0.009 |
| 2008 | 59 | 0.36439 | 0.225726 | 34 | 0.39532 | 0.276592 | -0.585 | 0.56 |
| 2009 | 59 | 0.59766 | 0.201905 | 34 | 0.67556 | 0.186908 | -1.84 | 0.069 |
| 2010 | 59 | 0.56925 | 0.188755 | 34 | 0.62032 | 0.173132 | -1.294 | 0.199 |
| 2011 | 59 | 0.44493 | 0.223182 | 34 | 0.54203 | 0.231271 | -1.994 | 0.049 |
| 2012 | 59 | 0.43414 | 0.206437 | 34 | 0.50365 | 0.228631 | -1.503 | 0.136 |
| 2013 | 59 | 0.46778 | 0.212775 | 34 | 0.52497 | 0.200366 | -1.275 | 0.206 |
| 2014 | 59 | 0.62014 | 0.16879 | 34 | 0.69026 | 0.180975 | -1.879 | 0.063 |
| 2015 | 59 | 0.68073 | 0.16786 | 34 | 0.69953 | 0.19617 | -0.489 | 0.626 |
| 2016 | 59 | 0.05917 | 0.134894 | 34 | 0.11274 | 0.218452 | -1.463 | 0.147 |

The T-statistic of the five selected years did not demonstrate significant differences in their means (p-value > 0.05). For FOBs, the mean value fluctuated from a low value of 0.36439 in 2008 to a higher value of 0.68073 in 2015. Meanwhile, for non-FOB, a similar trend was observed the mean was lower (0.39532) in 2008 compared to a higher mean of 0.69953 recorded in 2015.

The low mean TE for FOBs and non-FOBs in 2008 could be due to several economic and political factors, especially during the second half of the year. The first six months were relatively stable, where the commodity prices reached record highs. During this period, the rural Thai farmers were enjoying a much higher income. Overall, the Thai export value growth was more than 20%. The GDP growth remained above 5% despite intermittent political uncertainties. However, during the second half of the year, the scenarios took a sudden and drastic change for the worst. In July 2008, crude oil prices rose dramatically to a record high of USD147 a barrel. Coupled with the US subprime crisis, Thai exports declined during the second half of the year. The seizure of the Government House and the two most important airports (Suvarnabhumi and Don Muang) by The People's Alliance for Democracy (PAD) greatly affected tourism and its related industries.

In November 2008, Thai exports fell 17.7% for the first time in 6 years due to the shutdown of airports. Subsequently, the economic outlook for Thailand was downgraded from stable to negative by several credit rating agencies. Then, the SET index plunged 50% from the beginning of the year with the confidence indices of consumers and investors at the lowest levels after many years (Kungsri Research, 2009). These factors harmed the overall demand for finished goods and services. Hence, firms' efficiency will be compromised when they struggle to meet the forecasted outputs (revenues and profits), with constraints in operating with relatively unchanged inputs (paid-up capital and labour). These arguments supported the Agency Theory because, during the economic crunch, owners would particularly expropriate earnings for their use (Cheong and Kim, 2014).

Nevertheless, Thailand made a full recovery from the slump in 2008, where it recorded the highest mean for TE for FOBs and non-FOBs in 2015. A massive flood in 2011 and a military coup in 2014 led to severe repercussions on the country's economy. For instance, the GDP growth was only 0.84% and 0.984%, respectively, for 2011 and 2014 (World Bank, 2017). As the country was recovering from the flood and political turmoil, backlog infrastructure projects worth 700 billion Baht resumed in late 2014, thus, generated a GDP growth of 3.02% in the year 2015 (The Nation, 2014). These backlog projects created a higher demand for finished goods and services. When the value of outputs (revenues and profits) increased with relatively unchanged inputs (paid-up capital and labour), the overall firms' efficiency increased as other factors remained constant. Thus, it was the main contributing factor for the high TE. The recovery of Thailand's economy was supported by the Stewardship Theory as both the owners and management are on the same page to safeguard the firms' assets, reputation, or legacies and also to create higher firm value for the future.

In general, the t-statistics analyses for FOBs and non-FOBs for different countries documented varied findings. For example, the FOBs in Malaysia were more efficient than non-FOB only in 2007. A similar trend was also observed for Indonesia. The year 2014, FOB documented a more significant firm efficiency compared to the non-FOBs. Meanwhile, The Philippines documented four years of significant differences between FOBs (2008 and 2012) and non-FOBs (2007 and 2010). Lastly, Singapore and Thailand did not document significant differences between FOBs and non-FOBs in terms of TE.

Summary: Results and Findings

Overall, the current study did not document significant evidence to support the hypothesis. The results and findings were inconclusive, thus, the FOBs and non-FOBs were operating at the same efficiency and generating a similar return for their shareholders.

The hypothesis was not supported probably due to several reasons or limitations. Firstly, the data collected were relatively recent (from 2007 until 2016). Most countries in Southeast Asia had undergone commercial and legal framework reforms after the 1997-98 Asian Financial Crisis (Claessens et al., 2000). Therefore, most firms (FOBs or non-FOBs) were highly regulated, monitored, and practised good corporate governance. Secondly, the traditional methods of conducting business for the FOBs, which mostly depended on the relationships with each country's government was gradually being replaced by more transparent and above-board business conduct (Weidenbaum and Hughes, 1996). FOBs were no longer under special patronage and receiving special privileges from the government. Thirdly, the family owners were increasingly engaging in professional managers to manage their firms (Claessens et al., 2000). Despite having involved professional managers to run the daily operations, the family owners are still in control of their firms' BOD. Fourthly, this study assumed that all firms have the same weights for their selected inputs and outputs. Finally, based on the Agency Theory, the FOBs may not perform and grow as rapidly as a non-FOB.

A FOB may face several agency issues such as profit expropriation for own consumption and higher remuneration for family executives which would contribute to increasing agency costs (Cheong and Kim, 2014). These moves would have direct implications to firms' shareholders and senior management, stakeholders, practitioners, analysts, investors, academics, researchers, and the general public. However, this study enriched firm efficiency literature by documenting empirical evidence revealing that both FOBs and non-FOBs in the five Southeast Asian countries were operating at the same efficiency. The findings also indicated that if all aspects were treated equally for both FOBs and non-FOBs, the businesses would be able to operate at the same efficiency to generate similar returns for their shareholders. In short, the research hypothesis was not supported.

CONCLUSION

This study examined the TE for FOBs and non-FOBs in five Southeast Asian countries. Based on the findings, the T-test results for the TE between FOBs and non-FOBs documented the lack of evidence that FOBs were more efficient than non-FOB, thus, supporting the Stagnation Theory (Miller et al., 2008) and Agency Theory (Jensen and Meckling, 1976) instead of the Stewardship theory for firm performance.

These findings are fundamental for the BOD, the senior administration of the organisation, researchers, policymakers, scholastics, and the overall population. Ceteris paribus, both FOBs and non-FOBs ought to work at a similar efficiency to produce comparative returns for their investors. Hence, stakeholders can expect comparable treatment when managing family and non-family-owned companies. It also assists with lessening the reliance on utilizing 2 unique treatments or strategies when managing any kind of business (family or non-family). Consequently, the BOD and management efficiency can be expanded.

As for future research, it is recommended that a similar study could be conducted for the period during the pre-Asian Financial Crisis (pre-1997) to ascertain if there are any significant differences in terms of TE for FOBs and non-FOBs. Future studies can factor in weightage for the selected inputs and outputs for the TE analysis based on different industries or sectors to minimise non-standardised biases that may occur as various industries may have different weights for the same inputs and outputs.

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