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RESEARCH ARTICLE

Influence of Ownership Structure and Board Composition on Segment Disclosure in Thai Context

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This research aims to investigate the extent of segment information disclosure of listed companies in the Stock Exchange of Thailand (SET) during 2012–2013, to determine the differences in segment disclosure before (2012) and after (2013) the introduction of the International Financial Reporting Standards No. 8: segment disclosure (IFRS8). This study will also examine the influence of ownership structure and board composition on segment disclosure. Content analysis was utilized to extract segment disclosure data from annual reports according to the mandatory checklist of IFRS8 prior to the determination of segment disclosure indices. Paired sample t-test was utilized to determine the differences in the segment disclosure index before (voluntary disclosure) and after IFRS8 (mandatory disclosure). Multiple regression analysis was used to examine the influence of ownership structure and board composition on segment disclosure. The paired sample *t*-test results indicate significant differences in the segment disclosure index before and after IFRS8. The regression models show that only foreign ownership, government ownership, size of the committee, and committee's accounting background were associated with the segment information disclosure index. It is also found that segment disclosure is influenced by firm size and auditor type. The samples size and a 2-year study period are possible limitations of this research. This research is the first to look into the differences in disclosure of segment information in case of voluntary and mandatory reporting, and investigate the influence of ownership structure and board composition on segment influence disclosure in the Thai setting.

Keywords: Corporate governance, Segment disclosure, Ownership structure, Board composition, The International Financial Reporting Standards

JEL Classification*:* M14, and M41

Segment information disclosure has been shown to reduce corporate risks as public access to the segment-level financial, and operational information becomes mandatory (Jalila & Devi, 2012). In addition, the greater availability of segment information enhances the transparency in and reliability of corporate financial statements. The segment-level disclosure could include the disclosure of information on the company's principal product lines and their respective production process, geographical performances, earnings performances, and strategic goals.

Robert, Weetman, and Gordon (1998) noted that information in segment disclosure is the most interesting part of an annual report and can serve as a proxy of corporate transparency. In 2012, the International Financial Reporting Standards (IFRS) established a standard with regard to segment disclosure under IFRS No. 8 to close the gap between users and preparers of accounting information (IFRS, 2012). Thailand has adopted the segment disclosure standard and switched from voluntary to mandatory disclosure since 2013. Nevertheless, Akhtaruddin and Haron (2010) reported that mandatory segment disclosure neither improves nor increases overall corporate disclosure. This is probably because, without the mandatory disclosure, the annual reports might already contain significant amounts of segment information (Ho & Wong, 2001). However, with the imposition of mandatory disclosure, it is more likely that the preparers of accounting information would merely attempt to satisfy the minimum disclosure requirements. Although the level of segment disclosure has improved with the advent of IFRS8 (Jalila, Devi, & Ramachandra, 2016), most accounting information users remain skeptical because corporations could opt for disclosure of favorable information while concealing unfavorable information.

The so-called *Tom Yum Goong* crisis (i.e., the 1997 Asian financial crisis), which started in the Kingdom of Thailand before spreading throughout Asia, was the direct result of weak corporate governance and lack of transparency (Warr, 2007). The regional financial crisis has increased awareness among regulators, businesses, investors, and other stakeholders of the importance of corporate governance and transparency. Moreover, following the crisis, many countries in the region, including Thailand, have started promoting the adoption and implementation of corporate governance (Leung & Horwitz, 2004). In the Kingdom, corporate governance is classified into five categories: ownership structure, equitable treatment of shareholders, roles of stakeholders, disclosure and transparency, and board composition (SET, 2012). The categories of ownership structure and board composition are corporate governance tools that are applicable to identify the likelihood of wealth expropriation by top management from minority interest. Chau and Gray (2010), Jalila and Devi (2012), Eng and Mak (2003), Haniffa and Cooke (2002), Ho and Wong (2001) investigated the relationship of ownership structure and board composition to corporate information disclosure, and found varying results subject to the conditions under study.

Information disclosure is a process through which information relating to corporate performance is made available to stakeholders. However, the disclosure decision is greatly influenced by ownership structure and board composition. This is because effective ownership structure and board composition enhance corporate internal control and promote more information disclosure, which subsequently reduce the conflicts between shareholders and top management (Jensen & Meckling, 1976). Akhtaruddin and Haron (2010) and Fan and Wong (2002), however, reported a low correlation between corporate governance, transparency, and segment disclosure in Southeast Asian countries. In the Malaysian setting, there exist studies on the relationships between corporate governance and voluntary segment disclosure (Haniffa & Cooke, 2002) and between corporate governance and mandatory segment disclosure (Jalila & Davi, 2012; Wan-Hussin, 2009; Talha, Sallehhuddin, & Falltah, 2008). Nonetheless, no study on such relationships in the Thai setting exists. Besides, existing research in Thailand has made no attempt to identify such relationships but focused solely on voluntary disclosure such as corporate social responsibility disclosure (Suttipun & Nuttaphon, 2014), triple bottom line disclosure (Suttipun, 2012), and environmental disclosure (Kungkajit & Suttipun, 2014). Furthermore, research studies involving mandatory disclosure in the Thai context is very limited.

The aims of this research are to investigate the extent of segment information disclosure before (the year 2012) and after (2013) the introduction of IFRS8 based on the annual reports of the SET-listed sampled companies; to determine the differences in segment disclosure before and after IFRS8; and to investigate the influence of ownership structure and board composition on segment information disclosure. To achieve the research objectives, this study is required to answer three questions: (1) what is the extent of segment disclosure before and after the introduction of IFRS8; (2) are there differences in segment disclosure before and after IFRS8; and (3) what influences do ownership structure and board composition have on segment disclosure?

It is expected that the research findings would shed light on the segment information disclosure

in Thailand, a less advanced economy with limited relevant evidence and of different business environment from advanced economies (LaPorta, Lopaz, & Shliefer, 1999). In addition, the findings on the influence of ownership structure and board composition on segment disclosure would contribute to a better understanding of the links between corporate governance and segment disclosure of Thai firms. It is also anticipated that the discovery would drive relevant regulatory bodies to improve existing corporate governance practices for more transparency and disclosure.

This research paper has six sections. The first section discusses the introduction. The second section deals with existing relevant studies and development of hypotheses. The third section provides details on the methods for sample selection, variable measurement, and data analysis; whereas the fourth section presents the findings and discussion. The fifth section discusses sensitivity analysis, and the concluding remarks are provided in the sixth section.

Literature Review and Hypothesis Development

Two main theories are used to explain the objectives of this study—legitimacy and agency theories. They were used to explain in the prior related studies (Craig & Michaela, 2006; Leung and Horwitz, 2010). Legitimacy theory is used to explain how listed companies provide the segment information disclosure, and the different level and extent of segment disclosure before and after the IFRS8. This is because the legitimacy theory will provide actions and activities followed by social expectation, including the regulation and standard (Deegan & Gordon, 1996). Therefore, segment information disclosure of listed companies means that the companies are responding to social expectation. On the other hand, agency theory is used to explain the influence of ownership structure and board composition on segment information disclosure. It is because corporate governance is used to close the conflict between agents and principles. Moreover, corporate governance is able to reduce the agency cost and problem of information asymmetry. Therefore, when listed companies have a higher level of corporate governance, which is the ownership structure and board composition in this study, the companies will not respond only to top management, but also to the shareholders (Lakhal, 2007). The segment information disclosure is also included as the benefit of having a higher level of corporate governance.

Prior research studies on the influence of corporate governance on voluntary disclosure were undertaken for numerous countries, for example, Singapore (Eng & Mak, 2003), Hong Kong (Ho & Wong, 2001; Chau & Gray, 2010), Australia (Birt, Bilson, Smith & Whaley, 2004), and Spain (Gisbert & Navallas, 2013). With regard to the association between corporate governance and segment disclosure, existing research papers have focused exclusively on either the period before (voluntary segment disclosure) or after (mandatory segment disclosure) the imposition of IFRS8. For instance, Leung and Horwitz (2004) examined the relationship between corporate governance and voluntary segment disclosure in Hong Kong, McKinnon and Dalimunthe (1993) in Australia, and Bradbury (1992) in New Zealand. Meanwhile, Jalila and Davi, (2012), Wan-Hussin, (2009), Talha et al., (2008) studied the relationship between corporate governance and mandatory segment disclosure in less advanced economies. Nevertheless, no study has attempted a comparative study of the extent of segment information disclosure before and after the introduction of IFRS8, and investigate the influence of ownership structure and board composition on segment disclosure.

In determining the influence of corporate governance (i.e., ownership structure and board composition) on segment disclosure as stipulated in IFRS8, this research has proposed 10 hypotheses that correlate segment disclosure to family ownership, managerial ownership, foreign ownership, government ownership, size of committee, number of independent committee, CEO duality, committee's accounting background, number of independent audit committee, and accounting background of audit committee.

Unlike in many advanced economies, family ownership is the dominant business structure for most firms in Asia (Thillainathan, 1999). This form of ownership is believed to have influenced the level of segment disclosure due to the low bargaining power of general shareholders to pressure the firms for segment disclosure because substantial portions of the shares are held by a handful of family members (Jalila & Devi, 2012). Nevertheless, previous research studies on the relationship between family ownership and segment disclosure offer inconclusive results. Ho and Wong (2001) and Charles and Bikki (2000) found a negative relationship between family-controlled companies

and segment disclosure, whereas Wan-Hussin (2009) reported a positive relationship. Chau and Gray (2006) nonetheless found no relationship between both variables. This research study hypothesizes whether or not family ownership has a negative influence on the segment disclosure index (SDI). The null and alternative hypotheses are that:

H_{a0}: Family ownership has no influence on the SDI.
H_{a1}: Family ownership has an influence on the SDI.

The acquisition of a certain percentage of shares by chief executive officers (CEO) provides the managers with voting rights in addition to the management mandate. Hence, outside shareholders would increase their monitoring of the CEO's behavior to reduce the agency problem (Jensen & Meckling, 1976). The increased monitoring activity collectively pressures the CEO to implement disclosures. Nonetheless, the results of previous studies on the relationship between managerial ownership and segment disclosure are inconclusive. Eng and Mak (2003) and Chau and Gray (2010) found a negative correlation between a lower percentage of managerial ownership and voluntary disclosure. On the contrary, Claessens, Djankov, Fan & Lang (2002) reported a positive association between a higher percentage of managerial ownership and segment disclosure. This is because top management prefers to avoid the agency problem and its associated cost. This research study hypothesizes whether or not managerial ownership has a positive influence on the SDI. The null and alternative hypotheses are that:

H_{b0}: Managerial ownership has no influence on the SDI.
H_{b1}: Managerial ownership has an influence on the SDI.

Firms with foreign ownership have more stakeholders with diverse demands and are subject to more rigorous rules and regulations of the international level, including those related to disclosure and reporting. In addition, segment information disclosure promotes corporate reputation and competitive advantage (Porter & Kramer, 2006). Nonetheless, the results of prior research on the relationship between foreign ownership and segment disclosure are indefinite. Jalila et al. (2012) reported the positive relationship between foreign ownership and segment disclosure. On the other hand, Amran and Devi (2008) found no relationship between foreign ownership and corporate social responsibility disclosure of Malaysian firms. This research study hypothesizes whether or not foreign ownership has a positive influence on the SDI. Therefore, the null and alternative hypotheses are that:

H_{c0}: Foreign ownership has no influence on the SDI.
H_{c1}: Foreign ownership has an influence on the SDI.

Zhang and Ding (2006) reported that government ownership contributes to more disclosure in terms of quantity and quality of information vis-à-vis private ownership. This phenomenon could be attributed to the government's broader focus on satisfying the demands of all stakeholders in addition to near-term profit maximization. However, the findings of previous studies on the relationship between government ownership and voluntary disclosure are inconclusive. Most studies (e.g., Huafang & Jianguo, 2007; Haniffa & Cooke, 2002) reported the existence of an association between government ownership and voluntary disclosure. On the other hand, Jalila and Devi (2012) found no relationship between the two variables. This research study hypothesizes whether or not government ownership has a positive influence on the SDI. Therefore, the null and alternative hypotheses are that:

H_{d0}: Government ownership has no influence on the SDI.
H_{d1}: Government ownership has a positive on the SDI.

Size of committee is another influencing factor of segment disclosure. On the one hand, Vefeas (2000) stated that with a small committee size, the losses attributable to an insufficient workforce to monitor the management could outweigh the cost associated with a large committee size. On the other hand, Jensen (1986) reported that a small committee size functions more efficiently and induces fewer coordination problems. In addition, the small committee size is more accommodative to the discussion and decision-making on segment information disclosure. There are studies on the relationship between committee size and segment disclosure, for example, Shamil, Shaikh, Ho, and Krishnan (2014) reported a positive relationship between the two variables for listed

Chinese companies, and Wan-Hussin (2009) who found no relationship between them. This research study hypothesizes whether or not committee size has a positive influence on the SDI. Therefore, the null and alternative hypotheses are that:

H_{e0}: Committee size has no influence on the SDI.
H_{e1}: Committee size has a positive influence on the SDI.

The number of independent committee members could reduce conflicts between shareholders and top management as the demands of both groups are balanced through corporate governance and internal control, including information disclosure. On the relationship between the number of independent committee members and segment disclosure, Klein (2002) and Cheng and Courtenay (2006) found that firms with a high percentage of independent committee members disclose more segment information in the annual reports, whereas Haniffa and Cooke (2005) reported a negative relationship. Garcia-Sanchez, Rodriguez, and Gallego-Alvarez (2011), however, found no relationship between the two variables. This research study hypothesizes whether or not the number of independent committee members has a positive influence on the SDI. Thus, the null and alternative hypotheses are that:

H_{f0}: The number of independent committee members has no influence on the SDI.
H_{f1}: The number of independent committee members has an influence on the SDI.

CEO duality refers to a situation in which a CEO also holds the position of board chairperson whose responsibilities include the appointment of the CEO and monitor his performance. Thus, a CEO who is also the board chairman is very powerful in any decision-making, including the decision on segment information disclosure. Previous research studies on the relationship between CEO duality and segment disclosure, for example, Gul and Leung (2004) and Gisbert and Navallas (2013), reported a negative association between the two variables. This research study hypothesizes whether or not CEO duality has a negative influence on the SDI. Thus, the null and alternative hypotheses are that:

H_{g0}: CEO duality has no influence on the SDI.
H_{g1}: CEO duality has a negative influence on the SDI.

Board committee members with accounting background are more aware of the benefits of segment disclosure to corporate competitive advantage and reputation. Gul and Leung (2004) found a positive relationship between the committee's accounting knowledge and segment disclosure for listed companies in Hong Kong. Hence, this research study hypothesizes whether or not the committee members' accounting background has a positive influence on the SDI. Thus, the null and alternative hypotheses are that:

H_{h0}: Committee members' accounting background has no influence on the SDI.
H_{h1}: Committee members' accounting background has positive influence on the SDI.

The number of independent audit committee could lessen the agency problem and associated costs due to the improved confidence of shareholders in top management. In addition, the audit committee's independence contributes positively to segment information disclosure. On the relationship between the number of independent audit committee and segment disclosure, Klien (2002) reported that firms with a high proportion of independent audit committee provide more segment information in the annual reports. This research study hypothesizes whether or not the number of independent audit committee has a positively influence on the SDI. Thus, the null and alternative hypotheses are that:

H_{i0}: The number of independent audit committee has no influence on the SDI.
H_{i1}: The number of independent audit committee has a positive influence on the SDI.

Previous research studies on the relationship between the audit committee's accounting background and segment information disclosure offer inconclusive results. Andrea and Ya-wen (2008) reported a positive relationship between the audit committee's accounting background and segment information disclosure. On the other hand, Wan-Hussin (2009) found no relationship between both variables. This research study hypothesizes whether or not the audit

Table 1. *The Null and Alternative Form of This Study*

Hypothesis	The null and alternative form
H_{a0}	Family ownership has no influence on the SDI.
H_{a1}	Family ownership has an influence on the SDI.
H_{b0}	Managerial ownership has no influence on the SDI.
H_{b1}	Managerial ownership has an influence on the SDI.
H_{c0}	Foreign ownership has no influence on the SDI.
H_{c1}	Foreign ownership has an influence on the SDI.
H_{d0}	Government ownership has no influence on the SDI.
H_{d1}	Government ownership has a positive on the SDI.
H_{e0}	Committee size has no influence on the SDI.
H_{e1}	Committee size has a positive influence on the SDI.
H_{f0}	The number of independent committee members has no influence on the SDI.
H_{f1}	The number of independent committee members has an influence on the SDI.
H_{g0}	CEO duality has no influence on the SDI.
H_{g1}	CEO duality has a negative influence on the SDI.
H_{h0}	Committee members' accounting background has no influence on the SDI.
H_{h1}	Committee members' accounting background has positive influence on the SDI.
H_{i0}	The number of independent audit committee has no influence on the SDI.
H_{i1}	The number of independent audit committee has a positive influence on the SDI.
H_{j0}	The audit committee's accounting background has no influence on the SDI.
H_{j1}	The audit committee's accounting background has positive influence on the SDI.

committee's accounting background has positive influence on the SDI. Therefore, the null and alternative hypotheses are that:

H_{j0}: The audit committee's accounting background has no influence on the SDI.

H_{j1}: The audit committee's accounting background has positive influence on the SDI.

The 10 null and alternative hypotheses in this study are indicated in Table 1.

Methods

This section details the selection of samples, measurement of variables (i.e., dependent, independent, and control variables), and data analysis including four regression models.

The research population encompasses all SET-listed companies that published both 2012 and 2013 annual reports. In the selection of samples, some companies are excluded: (1) those in the financial industry which are subjected to monitoring by banking and financial regulatory bodies, (2) those whose fiscal yearend does not fall on 31st December, and (3) firms under rehabilitation.

Thus, there remain 197 firms for the research samples, consisting of 21 firms in the agriculture and food industry, 18 firms in the energy industry, 27 firms in the technology industry, 39 firms in the service industry, 30 firms in the industrial industry, 14 firms in the consumer industry, and 48 firms in the property and construction industry.

The 2012 and 2013 annual reports are used to quantify the SDI because 2012 and 2013 were respectively the pre- and post-IFRS8 periods in Thailand.

Content analysis is employed to extract segment disclosure according to seven categories of the checklist stipulated in IFRS8, which comprise of a total of 32 segment disclosure items. A SDI is then developed based on the mandatory disclosure checklist of IFRS8 (Wang, Sewon, & Clairborne, 2008; Jalila et al., 2012), by which a score of 1 is given for the provision of segment disclosure and 0 otherwise. By totaling the scores, the maximum score of a given company is 32. The segment disclosure index is calculated by:

Segment disclosure index = Actual scores / Maximum scores (32 scores)

In this research, independent variables are two components of corporate governance, that is, ownership structure and board composition. The ownership structure refers to family ownership (Ho & Wong, 2001; Charles & Bikki, 2000), managerial ownership (Chau & Gray, 2010; Classen et al., 2002), foreign ownership (Jalila et al., 2012), and government ownership (Huafang & Jianggro, 2007; Haniffa & Cooke, 2002). The board composition refers to the size of the board committee (Chau & Gray, 2010; Claessens et al., 2002), number of independent board committee (Eng & Mak, 2003; Haniffa & Cooke, 2002), CEO duality (Chau & Gray, 2010; Haniffa & Cooke, 2002), committee's accounting background (Gul & Leung, 2004), number of independent audit committee (Klien, 2002), and accounting background of audit committee (Andrea & Ya-wen, 2008; Wan-Hussin, 2009). The data pertaining to the independent variables of corporate governance are gleaned from the annual reports and SETSMART, a website of the Stock Exchange of Thailand (SET, 2012).

Size of company and audit type are control variables in this research. This is because previous studies (e.g., Jalila et al., 2012; Suttipun, 2012) reported the influence of the variables (i.e., firm size and auditor type) on corporate governance and the former's relationship with segment disclosure. For instance, larger firms are likely to disclose more information in the annual reports than smaller firms (Akhtaruddin & Haron, 2010). Although there are several proxies that represent the size of a company, for example, total assets and market capitalization (Deegan & Gordon, 1996; Newson & Deegan, 2002), this research study employs a dummy variable in which a score of 1 is assigned to Top50 firms (large company) and 0 otherwise (small company; Suttipun, 2012; Suttipun & Nuttaphon, 2014). With regard to auditor type, Big4 audit firms typically perform higher quality audit than non-Big4 firms (Akhtaruddin & Haron, 2010) and encourage clients to disclose more information (Inchausti, 1997). Similarly, a dummy variable in which a score of 1 is assigned to Big4 auditors and 0 to non-Big4 auditors is applied for the auditor type.

Table 2 presents the definitions, abbreviations, and measurements of all variables of this research, which

Table 2. *Summary of Variable Measurement*

Dependent variable	Notation	Measurement
1. Segment disclosure	SDI	Segment disclosure index (Scoring system) between 2012 and 2013
Independent variables:		
1. Family ownership	FAMOWN	Percentage of shares held by family members
2. Managerial ownership	MANOWN	Percentage of shares held by executive directors
3. Foreign ownership	FOROWN	Percentage of shares held by foreign firms
4. Government ownership	GOVOWN	Percentage of shares held by government bodies
5. Size of committee	CSIZE	Number of committee members
6. Number of independent Committee	PID	Proportion of independent committee members to total number of committee
7. CEO duality	DUAL	1 = dual role, 0 = single role
8. Committee's accounting Background	EXPB	Proportion of committee members with accounting background to total number of committee members
9. Number of independent audit Committee	PIDAC	Proportion of independent audit committee to total number of committee
10. Audit committee's accounting background	EXPAC	Proportion of audit committee members with accounting background to total number of committee
Control variables:		
1. Size of company	FSIZE	1 = Top 50 firms, 0 = otherwise
2. Audit type	AUDIT	1 = Big4 auditors, 0 = otherwise

consist of one dependent variable, 10 independent variables, and two control variables.

With secondary data used for ownership structure, board composition, and segment information disclosure on annual reports which were measured by latent constructs, there was no need to perform a factor analysis for validity test. However, reliability test was calculated by using Cronbach's alpha (reliability coefficient was 0.712). The Cronbach's alpha coefficient in this study was higher than 0.650 as a standard of alpha; thus, this study provided high reliability test. To test an endogeneity of variables used in this study, the previous related studies (see Akhtaruddin & Haron, 2010; Eng & Mak, 2003; Huafang & Jianguo, 2007; Jalila et al., 2012; Leung & Horwitz, 2004; Talha et al., 2008) indicated that corporate governance has influenced on information disclosure including segment disclosure. Therefore, ownership structure and board composition were used as independent variables, whereas segment information disclosure was worked as a dependent variable.

In the analysis of the data, this research utilizes descriptive analysis and multiple regression. Descriptive analysis is used to examine the extent of segment disclosure before and after the introduction of IFRS8. Paired sample *t*-test is used to determine the difference between the pre-IFRS8 and post-IFRS8 segment information disclosures. Multiple regression and correlation matrix are used to investigate the influence of ownership structure and board composition on segment information disclosure.

The influence of ownership structure and board composition on segment disclosure (SDI), controlling for company size (FSIZE), is determined using Model A, whereas Model B is for the examination of such an influence, controlling for auditor type (AUDIT). Models C and D investigate the influence of ownership structure and board composition on segment information disclosure before (the year 2012) and after (2013) the introduction of IFRS8 for further comparison.

Model A: $SDI = a + b_1 FAMOWN + b_2 MANOWN + b_3 FOROWN + b_4 GOVOWN + b_5 CSIZE + b_6 PID + b_7 DUAL + b_8 EXPB + b_9 PIDAC + b_{10} EXPAC + b_{11} FSIZE + e$

Model B: $SDI = a + b_1 FAMOWN + b_2 MANOWN + b_3 FOROWN + b_4 GOVOWN + b_5 CSIZE + b_6 PID + b_7 DUAL + b_8 EXPB + b_9 PIDAC + b_{10} EXPAC + b_{12} AUDIT + e$

Model C: $SDI\ (2012) = a + b_1 FAMOWN + b_2 MANOWN + b_3 FOROWN + b_4 GOVOWN + b_5 CSIZE + b_6 PID + b_7 DUAL + b_8 EXPB + b_9 PIDAC + b_{10} EXPAC + e$

Model D: $SDI\ (2013) = a + b_1 FAMOWN + b_2 MANOWN + b_3 FOROWN + b_4 GOVOWN + b_5 CSIZE + b_6 PID + b_7 DUAL + b_8 EXPB + b_9 PIDAC + b_{10} EXPAC + e$

Findings and Discussions

This section presents the findings on the extent of segment disclosure, the descriptive analysis, and the regression results of the four regression models, that is, Models A, B, C, and D. In addition, a summary of the hypothesis test results is provided.

In determining the extent of segment disclosure from the SET-listed sampled companies' annual reports prior to and following the IFRS8 introduction, this research utilizes descriptive analysis, and the findings are presented as means and standard deviations (Table 3). In Table 3, the means of segment disclosure index of the pre-IFRS8 and post-IFRS8 periods are 0.2256 and 0.3923, respectively. Three most commonly disclosed segment information in both periods are general information, information on products and services, and information on geographical areas. The least disclosed segment information is that on transactions with major customers for 2012 and on reconciliations for 2013.

To identify the differences between the segment disclosure indices before and after IFRS8, paired sample *t*-test is employed in the analysis. The results show the significant differences in segment disclosure of the sampled SET-listed companies between 2012 and 2013 with $t = 12.480$ and *p-value* = 0.000. This is attributable to the fact that segment disclosure was voluntary in 2012 (pre-IFRS8) but mandatory after the IFRS8 introduction the following year, giving rise to the significantly higher segment disclosure index in 2013. Specifically, the sampled SET-listed companies omitted disclosure of information on transactions with major customers in 2012 but were required to include this item in the annual reports in 2013. The

Table 3. *The Extent of Segment Disclosure*

Disclosure Category	Segment disclosure index			
	Year 2012 Pre-IFRS8 (Voluntary disclosure)		Year 2013 Post-IFRS8 (Mandatory disclosure)	
	Mean	S.D.	Mean	S.D.
1. General information	.416	.219	.775	.275
2. Revenues, expenses, assets, and liabilities	.221	.167	.350	.229
3. Measurements	.146	.196	.394	.320
4. Reconciliations	.171	.211	.194	.491
5. Information on products and Services	.401	.491	.599	.491
6. Information on geographical Areas	.321	.317	.499	.401
7. Information on transactions with major customers	.000	.000	.482	.501
Total	**.226**	**.121**	**.392**	**.188**

Table 4. *Descriptive Analysis (n = 197)*

Variables	Min.	Max.	Mean	Standard Deviation
SDI	.03	0.77	.313	.137
FAMOWN	.00	71.49	26.289	24.286
MANOWN	.00	87.64	12.176	11.164
FOROWN	.00	90.18	14.350	11.102
GOVOWN	.00	11.28	3.396	2.337
CSIZE	5	18	10.279	2.593
PID	20	85.70	41.937	10.083
DUAL	.00	1.00	.183	.187
EXPB	1.14	100.00	46.561	19.199
PIDAC	66.67	100.00	99.704	2.961
EXPAC	.00	100.00	49.442	26.922
FSIZE	.00	1.00	.147	.145
AUDIT	.00	1.00	.595	.492

legitimacy theory used in this study can explain why there were differences between the segment disclosure indices before and after IFRS8. This is because the segment information disclosure of listed companies is used as the management's tool to respond to their social expectation. Therefore, the companies that took responsibility for their social expectation provided more level and extent of segment information disclosure even before it became mandatory.

Table 4 presents the descriptive analysis results consisting of means, standard deviations, maximums and minimums of the dependent, and independent and control variables of this research. It is observed that the range in SDI is considerably wide with the lowest and highest indices of .03 and .77. The mean SDI is .3134 with a standard deviation of .13726. The number of committee members (CSIZE) varies between five and 18 persons. As previously mentioned, the three dummy

variables of this study include CEO duality (DUAL), company size (FSIZE), and audit type (AUDIT).

Table 5 presents the correlation matrix between all variables. The SDI is significantly positively correlated with FOROWN (.204), GOVOWN (.264), CSIZE (.270), PID (.141), FSIZE (.348), and AUDIT (.572). The findings support H3, H4, H5, and H6, in which foreign ownership, government ownership, size of committee, and number of independent committee are positively correlated to SDI. In addition, there is a positive correlation between SDI and the control variables: company size and auditor type. Nonetheless, the results indicate no correlation between SDI and either FAMOWN, MANOWN, DUAL, EXPB, PIDAC, or EXPAC, which is consistent with previous studies and thus provides support for the segment disclosure index in this research. In Table 5, the correlation coefficients of the variables show no problem of multicollinearity because the highest variance inflation factor of this research is 1.794, belonging to GOVOWN, which is much less than the maximum limit of 10 (Jalila & Devi, 2012).

Table 6 presents the multiple regression results of Models A and B. In Model A, the index of segment disclosure is regressed on the ownership structure variables, the board composition variables, and the control variable of company size (FSIZE). The results point to the existence of significantly positive relationships between SDI and foreign ownership (t = 2.291), government ownership (t = 2.042), committee's accounting background (t = 2.259), and size of company (t = 2.121). It is also found that SDI is positively influenced by the size of company (FSIZE). The finding on the influence of foreign ownership on segment disclosure is consistent with Jalila et al. (2012) because companies with foreign ownership are responsible for greater numbers of stakeholders with diverse demands, and are subject to more rigorous rules and regulations of the international level, including those related to disclosure and reporting. With regard to the relationship between government ownership and segment information disclosure, the result is consistent with Huafang and Jianguo (2007) and Haniffa and Cooke (2002).

Moreover, the finding pertaining to the relationship between the committee's accounting background and segment disclosure is consistent with Gul and Leung (2004), who conducted the study in the Hong Kong setting. The influence of foreign ownership, government ownership, committee's accounting background, and size of company can be explained by agency theory used in this study. This is because corporate governance is used to close the conflict between agents and principles, including the agency cost and problem of information asymmetry. Therefore, when listed companies have a higher level of corporate governance, which is foreign ownership, government ownership, committee's accounting background,

Table 5. *Correlation Matrix*

	1	2	3	4	5	6	7	8	9	10	11	12
SDI	-.005	-.109	.204**	.264**	.270**	.141*	-.077	.075	.028	-.004	.348**	.572**
FAMOWN	1	.428*	-.274**	-.283**	-.115	-.046	.088	.108	.064	.009	-.150*	-.076
MANOWN		1	-.212**	-.181*	-.274**	-.037	-.163*	.052	.071	.032	-.171*	-.147*
FOROWN			1	.043	.192**	-.027	.052	-.138	.019	-.102	.324**	.338**
GOVOWN				1	.358**	.413*	-.126	-.284*	-.129	-.223*	.406**	-.036
CSIZE					1	-.142*	-.203*	-.183*	.061	-.030	.470**	.225**
PID						1	-.068	-.021	-.218*	-.177*	.083	-.075
DUAL							1	.041	.047	.103	-.122	-.064
EXPB								1	.138	.528*	-.093	.106
PIDAC									1	.145*	.042	.034
EXPAC										1	-.074	.102
FSIZE											1	.256**
AUDIT												1

*Note * Significant at 0.05 level,*
*** Significant at 0.01 level*

Table 6. *Multiple Regression Results model A and B*
(Dependent variable was average score of segment disclosure index during 2012 and 2013)

Variable	Expected direction	Model A	Model B
Intercept		-.067 (.947)	-.455 (.649)
FAMOWN	-	1.726 (.086)	1.923 (.056)
MANOWN	+	-.449 (.654)	-.069 (.945)
FOROWN	+ , -	2.291 (.023*)	.538 (.561)
GOVOWN	+	2.042 (.043*)	3.862 (.000**)
CSIZE	+ , -	1.609 (.109)	1.208 (.229)
PID	+	1.047 (.296)	1.292 (.198)
DUAL	-	-.305 (.761)	.064 (.949)
EXPB	+	2.259 (.025*)	1.889 (.060)
PIDAC	+	.331 (.741)	.715 (.475)
EXPAC	+	-.288 (.774)	-.903 (.368)
FSIZE		2.121 (.035*)	-
AUDIT		-	9.220 (.000**)
R Square		.212	.447
Adjusted *R Square*		.165	.414
F-value		4.518 (.000**)	13.582 (.000**)
Number of sample		197	197

*Note * Significant at 0.05 level*
*** Significant at 0.01 level*

and size of company in this results, the companies will not respond only to top management, but also to shareholders (Lakhal, 2007). The segment information disclosure is also included as the benefit of having a higher level of foreign ownership, government ownership, committee's accounting background, and size of company.

In Model B, the index of segment disclosure is regressed on the ownership structure variables, the board composition variables, and the control variable of auditor type (AUDIT). The results show the significant positive relationships between the segment disclosure index and government ownership (t = 3.862) and auditor type (t = 9.220), the latter of which confirms the significant positive influence of auditor type on segment disclosure. In addition, the findings are consistent with Eng and Mak (2003), who reported a positive relationship between government ownership and the level of voluntary disclosure of Singapore's listed companies.

Table 7 compares the multiple regression results of segment disclosure before (Model C) and after (Model D) IFRS8. In Model C, the index of segment disclosure (voluntary reporting) is regressed on the ownership structure and board composition variables for the year 2012. It is found that only government ownership (t = 2.386) has a significantl positive relationship with the voluntary segment disclosure index. The result is consistent with Eng and Mak (2003), who reported a positive relationship between government ownership and the voluntary disclosure level of Singapore's listed companies. This could be attributable to the government's concern for its citizens apart from near-term profit maximization.

In Model D, SDI (mandatory reporting) is regressed on the ownership structure and board composition variables for 2013. The results show the significant positive relationships between SDI and foreign ownership (t = 2.800), size of committee (t = 2.190), and committee's accounting background (t = 2.165), which are consistent with Jalila et al. (2012) who found that foreign ownership is positively associated with the level of mandatory segment disclosure of listed companies in Malaysia. In addition, the findings of

Table 7. *Multiple Regression Results Before (the year 2012) and After (2013) IFRS8*

Variable	Expected direction	Model C	Model E
Intercept		-.458 (.647)	-.291 (.772)
FAMOWN	-	1.874 (.063)	1.125 (.262)
MANOWN	+	-1.741 (.083)	-.307 (.759)
FOROWN	+ , -	1.459 (.149)	2.800 (.006**)
GOVOWN	+	2.386 (.018*)	1.512 (.132)
CSIZE	+ , -	.786 (.433)	2.190 (.030*)
PID	+	.843 (.400)	1.035 (.302)
DUAL	-	.279 (.781)	-.854 (.394)
EXPB	+	.459 (.646)	2.165 (.032*)
PIDAC	+	.951 (.343)	.447 (.655)
EXPAC	+	-1.066 (.288)	-.421 (.674)
R Square		.122	.141
Adjusted *R Square*		.075	.095
F-value		2.581 (.006**)	3.051 (.001**)
Number of sample		197	197

*Note * Significant at 0.05 level*
*** Significant at 0.01 level*

this research are similar to those of Gul and Leung (2004), who reported a positive relationship between committee's accounting background and segment disclosure of listed companies in Hong Kong. On the relationship between the size of committee and segment disclosure, the research result is consistent with Shamil et al. (2014), who found a positive relationship between both variables for listed companies in Sri Lanka, which is a less advanced economy like Thailand.

Out of the 10 hypotheses (Ha-Hj) to examine the influence of ownership structure and board composition on the segment information disclosure, there are only four hypotheses that this study rejects the null hypothesis. The four hypotheses are foreign ownership (Hc), government ownership (Hd), size of committee (He), and committee's accounting background (Hh). On the other hand, the research study fails to reject the null hypothesis of Ha, Hb, Hf, Hg, Hi, and Hj. Therefore, there is no influence of family ownership (Ha), managerial ownership (Hb), number of independent committee (Hf), CEO duality (Hg), number of independent audit committee (Hi), and audit committee's accounting background (Hj) on the segment information disclosure.

This research performed sensitivity analysis on the company size dummy control variable in Model A by substituting the scoring system (i.e., 1, 0) with total assets and subsequently with market capitalization. The sensitivity analysis results confirm the significant positive influence of company size, as represented by total assets and market capitalization on SDI. Nonetheless, no sensitivity analysis was carried out on the other control variable of audit type due to the extensive use of only one set of proxies (Akhtaruddin & Haron, 2010; Suttipun, 2012; Suttipun & Nuttaphon, 2014).

Conclusions

This research has attempted to investigate the extent of segment information disclosure of listed companies in the SET during 2012–2013; determine the differences in the SDI before (2012) and after (2013) the introduction of IFRS8; and examine the influence of ownership structure and board composition on SDI, controlling for company size and audit type. Unlike previous research studies on the subject, this research has studied the voluntary

and mandatory segment information disclosures of Thai SET-listed companies in parallel. The three most commonly disclosed segment information in both periods are general information, information on products and services, and information on geographical areas. The least disclosed segment information are transactions with major customers for 2012 and on reconciliations for 2013. The paired sample *t*-test results indicate the significant differences in the segment disclosure index before and after IFRS8. In addition, the regression models show that only foreign ownership, government ownership, size of committee, and committee's accounting background are associated with the segment information disclosure index. It is also found that segment disclosure is influenced by firm size and auditor type.

This research is the first that attempts to determine the differences in segment information disclosure for voluntary and mandatory reporting and examine the influence of ownership structure and board composition on the disclosure of segment information in the Thai setting. Hence, it is expected that the research findings would shed light on segment information disclosure in Thailand, a less advanced economy with limited relevant evidence, and of different business environment from advanced economies. In addition, the results on the influence of ownership structure and board composition on segment disclosure would contribute to a better understanding of the links between corporate governance and segment disclosure of Thai firms. It is also expected that the findings would drive the relevant regulatory bodies to improve existing corporate governance practices for more transparency and disclosure. The result also benefits the auditors who can add more auditing activities to their partners because of the influence of some ownership structure and board composition on segment information disclosure. Listed companies can also learn how to serve their social expectation as well as their demand.

This research, nevertheless, possesses some limitations. First, the samples might not be comprehensive because only 197 SET-listed companies are examined, excluding those in the financial industry, those whose fiscal yearend do not fall on 31st December, and those under rehabilitation. Second, the study covers a period of only two years (2012–2013); thus, a longer period (i.e., longitudinal study) and comparison of segment disclosure before and after having the IFRS8 is recommended for deeper and more insightful results. Next, there are other factors that could influence segment information disclosure but are beyond the scope of this research, for example, multi-company directors, turnover of directors, turnover of audit committee, profitability, and competitiveness. As mandatory disclosure is expected, the study may appear less relevant. There are other methods to analyze the data instead of multiple regression, such as the generalized method of moment, path analysis, and time series analysis.

Thus, future research should be a longitudinal study that attempts to investigate the extent of segment disclosure of the excluded SET-listed companies, especially those in the financial industry using the other analysis method such as the generalized method of moment, path analysis, and time series analysis. In addition, other possible influencing factors of segment information disclosure should be examined. To solve the limitation of less relevance, the future study can investigate the quality of segment information disclosure.

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