

Modeling the Heterogeneity of Corporate Governance Mechanisms Across Industries: A Multi-Group Analysis Using PLS Path Modeling

Goh Chin Fei, Amran Md. Rasli
Universiti Teknologi Malaysia
cfgoh2@live.utm.my

Sia Shi Xuan
Kolej Universiti Tunku Abdul Rahman

Abstract

The aim of this research is to examine the heterogeneity of corporate governance mechanisms (i.e., ownership concentration, board independence and CEO duality) across technology-based and mature industries. Our research extends existing corporate governance literature by conceptualizing that the effectiveness of corporate governance mechanisms is contingent upon industry settings. Specifically, the performance of technology-based firms depends on management capacity to respond to rapid market and technological changes. In mature industries, on the contrary, firms generally face a relatively stable business environment and producing standardized products. We employed multi-group analysis in the Partial Least Squares (PLS) path modeling to analyze the heterogeneous effects of corporate governance mechanisms on firm performance. Multi-group analysis in PLS path modeling is more powerful than linear regression because the former can detect multi-group difference-effect and handle violation of normality assumption in causal inference for archival financial accounting research. Using a sample of publicly listed firms from manufacturing and plantation sectors in Malaysia, we found that ownership concentration and board independence (but not CEO duality) are heterogeneous with respect to corporate governance and firm performance. We conclude that a fine-grained industry setting offers more insights on the effectiveness of corporate governance mechanisms.

Keywords Corporate governance, agency theory, industry settings, heterogeneity

INTRODUCTION

Recent studies of corporate governance have demonstrated that the impact of corporate governance mechanisms on firm performance vary across countries due to different institutional contexts (Carney & Child, 2013; Rasli, Goh, & Khan, 2013; van Essen, van Oosterhout, & Carney, 2012). Concerning Asian emerging economies, prior studies have found ample of empirical evidence of expropriation of minority shareholders by controlling shareholders. In general, this phenomenon occurs in emerging economies with high levels of ownership concentration that leads to conflicts between controlling shareholders and other shareholders, namely, principal-principal conflicts in agency theory (Villalonga & Amit, 2006).

A great deal of empirical studies has focused on the impact of corporate governance mechanisms based on the assumption that good corporate governance will lead to better firm performance. However, prior empirical studies on ownership concentration, board independence and CEO duality have found inconsistent and inconclusive evidence (Heugens, Van Essen, & van Oosterhout, 2009; Ramdani & Witteloostuijn, 2010; van Essen *et al.*, 2012). While institutional settings have attracted much attention from researchers recently (Heugens *et al.*, 2009; van Essen *et al.*, 2012), however, it is unclear why prior evidence has been inconsistent in single-country studies. One explanation could be that heterogeneity of corporate governance mechanisms exists across industries (Grosfeld, 2009; Le, Walters, & Kroll, 2006; Rasli *et al.*, 2013). For instance, it is conceivable that firms in technology-based industry face unique challenges with high volatility of technological changes and product demand (Wu, Erkoç, & Karabuk, 2005). On the contrary, the product demand in mature industries is highly stable and less sensitive to technological changes.

In this research, we answer the call from Le *et al.* (2006) and Grosfeld (2009) to investigate the effectiveness of corporate governance mechanisms in different industry settings. Specifically, this study is devoted to examining whether the impact of governance mechanisms, i.e., ownership concentration, board independence and CEO duality, are heterogeneous across technology-based and mature industries. As such, we expect to shed some light on continue debate on the causal effect of governance mechanism on firm performance.

Our research is distinctively differs from the accustomed statistical method, i.e., regression, applied by a prior corporate governance study (Grosfeld, 2009) that aimed to identify the different impact of governance mechanism. Grosfeld (2009) inferred such differences by comparing the statistical significance of regression estimates between two group of samples, i.e., technology-based and mature industries. Such approach does not take into account for sample size and standard errors of data and thus potentially lead to unreliable interpretation. Our study, however, adopts multi-group analysis in Partial Least Squares (PLS) path modeling to identify the heterogeneity of governance mechanisms across industries. Multi-group analysis, which is also known as one type of moderating analyses, can identify the heterogeneity's existence in multiple group of data (Hair, Ringle, & Sarstedt, 2011).

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Industry Settings of Technology-Based and Mature Industries

Corporate governance scholars have pointed out that the business setting of industries is a determinant of the effectiveness of corporate governance practices (Cui & Mak, 2002; Grosfeld, 2009; Le *et al.*, 2006; Rasli *et al.*, 2013). Specifically, the business setting of technology-based industries significantly differ from those industries that producing standardized products or commodity-based products.

In the context of technology-based industries, top management has to adapt to a sophisticated business environment in market competition (Le *et al.*, 2006; Wu *et al.*, 2005). One is that it is difficult to forecast the demand of technology-based products. In other words, such demand can be characterized by high volatility and thus firms must respond to market changes rapidly. In order to meet the market changes, technology-based firm generally require large investment to increase manufacturing capabilities and to adopt product differentiation in manufacturing strategies to sustain competitive advantages in the market. For example, technology-based firms need to continue to invest in product development and manufacturing assets to instill firm capability to react to new demands in the markets. Stated differently, the failure of management capacity to respond to the market changes and poor investment strategies in capital intensive industries can quickly exacerbate the firm's prospects. Uncertain and turbulent economic environment also further intensifies the business challenges the with regard to firm investment and financial performance. Unsurprisingly, management capacity of technology-based firms in overcoming the threats of volatile and sophisticated environments is a prerequisite to enhance firm performance (Prahalad & Hamel, 1990).

Top management in mature industries, however, does not face the severe business challenges compared to their peers in technology-based industries. Cooper (2011) explains that product development in commodity-based industries often failed to increase firm performance because of stagnant market demand. In other words, product differentiation is rarely an effective strategy for companies to capture more market shares in mature industries. A good example can be found in the retail sector that selling products to consumers. The firm's business strategy often concentrate on pricing, product quality and customer satisfaction (Matsa, 2011). In short, in a similar vein management face different challenges and rely less on technology innovation to maintain a market niche in mature industries.

Ownership Concentration and Firm Performance

A study of corporate ownership around the world has shown a significant discovery on the ownership patterns outside the Anglo-Saxon economies (Porta, Lopez-de-Silanes, & Shleifer, 1999). Porta *et al.*, (1999) demonstrates that many wealthy countries outside the Anglo-Saxon economies are associated

with high ownership concentration, and many firms appeared to be controlled by the dominant shareholder. In a similar vein, recent studies (Carney & Child, 2013; S. Claessens, S. Djankov, & L. Lang, 1999; S. Claessens, S. Djankov, & L. H. P. Lang, 1999; Claessens & Fan, 2002) have shown that corporate ownership in East Asia such as Indonesia, Korean, Malaysia, Singapore and Thailand are concentrated in the hand of controlling shareholders.

With regard to the ownership concentration, there are two potential impact on overall corporate governance and firm performance (Claessens, Djankov, & Lang, 2000; Claessens & Fan, 2002; Jiang & Peng, 2011). One is that ownership concentration can be regarded as the economic incentive for large shareholders to engage in firm monitoring and control, thus improve firm performance (Claessens *et al.*, 2000; Claessens & Fan, 2002; Jiang & Peng, 2011). The second outcome is that the dominant shareholders are exposed to the economic incentives to expropriate other shareholders to extract private rents. Such expropriation concerns are regarded as the main corporate governance problem in emerging economies (Jiang & Peng, 2011; Liew, 2007). As a matter of fact, prior studies have found inconsistent and contradicted empirical evidence concerning the overall impact of ownership concentration and firm performance (Cui & Mak, 2002; Grosfeld, 2009; Haniffa & Hudaib, 2006). Clearly, prior studies failed to offer a conclusive explanation on the role of ownership concentration in corporate governance.

Thus far, we have considered the incentives of ownership concentration with regard to firm monitoring and expropriation concerns. Another perspective is that the impact of governance mechanisms may be differ across industries and contingent upon business settings (Cui & Mak, 2002; Grosfeld, 2009; Le *et al.*, 2006; Rasli *et al.*, 2013). In this regard, we suggest that concentrated ownership allows controlling shareholders to involve in management or appoint their proxies to fully control firm management. In turn, controlling shareholders are well positioned to determine or influence firm's business strategies, business transactions and daily business operation. Thus, controlling shareholders are more likely to have effective control and thus accelerate firm decision making process. Given the fact that the survival of technology-based firms heavily rely on management capacity to respond to market changes, controlling shareholders are more likely to prioritize increasing firm performance rather than engaging in expropriation. That is, one should not dismiss the fact that the wealth of controlling shareholders is attached to the firm value. As a result, the controlling shareholders are unlikely to extract private rents because such benefits are small in comparison to having an effective firm monitoring in the long term. On the contrary, in mature industries, controlling shareholders essentially have significantly lower risks of losing their wealth. As a result, controlling shareholders may adopt opportunistic behaviors with regard to their controlling powers. Such controlling shareholders will instill a firm monitoring to protect personal interests, but also may engage in expropriation to extract private rents. Based on above explanations, we can formulate the following hypotheses:

- H1a: Ownership concentration is positively related to firm performance in technology-based industries.
- H1b: Ownership concentration is not related to firm performance in mature industries.
- H1c: The impact of ownership concentration on firm performance is heterogeneous across technology-based and mature industries.

Board Independence and Firm Performance

The monitoring role of board independence in corporate governance is rooted in agency theory (Fama, 1980; Ramdani & Witteloostuijn, 2010). Agency theory depicts that the execution of expropriation is contingent upon the effective control of the boards. Thus, board independence is regarded as an important governance mechanism to mitigate such expropriation issues. In this regard, outside shareholders normally view that outside directors are more independent compared to insiders. Outside (or independent) directors are entrusted with monitoring responsibility to scrutinize the decision making of insiders. Additionally, the presence of independent directors on the boards are also considered as an important instrument to prevent the insiders to have full discretionary control over the boards (Combs, Ketchen, Perryman, & Donahue, 2007). We suggest that independent directors, who have the legal responsibility of firm monitoring, would scrutinize the firm's decisions because they may not share private rents extracted by insiders. As a result, independent directors would cast a vote to disapprove potential illegal business transactions.

With regard to the monitoring role of independent directors in Asian emerging economies, there is one school of thought that suggest domestic outside director are the "gray outsiders" (Choi, Sul, & Min, 2012; Goh, Khan, & Rasli, 2014; Kim, 2006). This can be explained by the fact that outside directors are generally appointed through the recommendation by the controlling shareholders (or insiders). Thus, the independence of such outside directors is questionable because they may be closely connected to controlling shareholders (or insiders). This argument can also be detected in a recent study in Malaysia that shows family businesses tend to appoint independent directors that who can solicit political patronage rather than fulfilling firm monitoring objective (Goh *et al.*, 2014).

There is also a fair amount of studies on the effectiveness of independent directors in Asian emerging economies, however, the empirical evidence was mixed (Choi *et al.*, 2012; Kusnadi, 2011; Ramdani & Witteloostuijn, 2010; Wahab, Haron, Lok, & Yahya, 2011). We believe these empirical results are the testament to show that the impact of independent directors in corporate governance systems may be heterogeneous across industries. We first observe how industry setting may shape the governance role of independent directors.

First, outside (or independent directors), who lack of high level of specialized knowledge, may be ineffective in the firm monitoring in technology-based industries (Coles, McWilliams, & Sen, 2001). As discussed previously,

technology-based industries are generally capital intensive and firms have to respond to rapid market and technological changes in order to sustain their competitive advantage. However, it is conceivable that independent directors generally do not have sufficient specialized knowledge to assess the managerial decisions. Furthermore, independent directors are not involved directly in building core competencies of technology-based products. Thus, independent directors are more likely to accept the proposals from firm management that involves firm investment in building technological capabilities and long-term strategies. In short, we suggest that the independent directors are generally ineffective in firm monitoring.

On the contrary, we suggest that independent directors may play a significant role in mature industries. This argument is consistent with the fact that the business setting of mature industries is relatively simple and are more commoditizing. Thus, it is perfectly possible that independent directors have sufficient knowledge in exercising effective monitoring. Given that independent directors are entrusted with legal responsibility to monitor illegal misbehavior of firms, we can expect independent directors have to perform effective firm monitoring. This brings us to the following hypothesis.

- H2a: Board independence is not related to firm performance in technology-based industries.
- H2b: Board independence is positively related to firm performance in mature industries.
- H2c: The impact of board independence on firm performance is heterogeneous across technology-based and mature industries.

CEO Duality

International regulators have suggested to separate the position of Chief Executive Director (CEO) and Chairman on the board of directors to instill good corporate governance (FCCG, 2000; OECD, 2004). The rationale for this is that boards of directors are fully controlled by CEO when he becomes the Chairman of the board. This is also known CEO duality in the firms (Finkelstein & D'Aveni, 1994). The CEO duality leadership structure confers a strong structural power to the CEO thus a unified leadership structure was formed.

There are two school of thought on CEO duality leadership on firm performance. The first school focuses on the belief that as a rational individual, who is characterized as self-serving, will make decisions to maximize his utility according to agency theory (Jensen & Meckling, 1976). Such CEO duality structure raises expropriation concern if the CEO is a self-serving and thus CEO may abuse his power dominate the board agendas (Daily & Johnson, 1997; van Essen *et al.*, 2012). Meanwhile, outside directors are unlikely to be able to instill effective monitoring on CEO who possesses excessive power on business operations and board agendas. In turn, the CEO has the capability to extract private rents through expropriating firm resources. In short, a CEO

duality leadership structure will adversely affect the monitoring mechanisms on firm management or CEO (Finkelstein & D'Aveni, 1994; He & Wang, 2009).

Conversely, the second school of thought emphasizes that CEO (or executive manager) is a self-actualizing and collective serving individual who intend perform well in a firm according to stewardship theory (Barney, 1990; Lex Donaldson, 1990; L. Donaldson & Davis, 1991). Specifically, CEO (or executive management) is solely influenced by his inherent psychologically mechanisms and possess higher order needs to grow and achieve aspirations. The implication of the stewardship theory is that the focal point of strategic management is shifted to understanding to what extend the CEO (or executive manager) could perform according their aspiration (Davis, Schoorman, & Donaldson, 1997). Stewardship theory suggests that CEO can acquire full power and mobilize firm's resources to maximize firm performance. The variation of corporate performance is, therefore, interpreted as a result of diverse corporate structure actions such as authority, empowerment structure and clear role and expectation in supporting and facilitating executive (L. Donaldson & Davis, 1991). L. Donaldson and Davis (1991) suggest that a good steward normally is a feature of society with the culture of collectivism and low power distance. However, we believe that there is a low likelihood that the CEO could become a good steward in Malaysia context. The rationale for this is that Malaysian culture are associated with collectivism and a high power distance (Jogulu & Ferkins, 2012). Additionally, Liew (2007) reported that expropriations of minority shareholders is a major corporate governance issue in Malaysia. Thus, it is reasonable to assume the CEOs are generally not the good steward that depicted in stewardship theory.

Clearly, the impact of CEO duality on firm performance is equivocal in agency and stewardship theories. Likewise, prior studies have discovered inconclusive empirical evidence on the relationship between CEO duality and firm performance in Asian emerging economies (Bayrakdaroglu, Ersoy, & Citak, 2012; Haniffa & Hudaib, 2006; Ramdani & Witteloostuijn, 2010; van Essen *et al.*, 2012). In order to offer a competing perspective, we examine whether the impact of CEO duality on firm performance vary across industry settings.

We first examine the potential impact of CEO duality in technology-based firms. As discussed previously, management capacity to respond to rapid market changes and building core competencies in technology-based firms are the main drivers of firm success (Le *et al.*, 2006; Prahalad & Hamel, 1990; Wu *et al.*, 2005). So, it is conceivable that CEO duality leadership structure is preferable in technology-based firms so that firm's management can respond to rapid market changes. We could expect that CEO duality leadership structure renders a consistency in leadership to management function and board of directors as depicted in stewardship theory. This is particularly important because the CEO has specialized knowledge to understand the essences of firm's technological capabilities and weakness in market competition (Wu *et al.*, 2005). As a result, the CEO can operate the firm effectively with clear and

uncontested authority in structuring business operations. On the contrary, we expect CEO duality structure has an adverse impact on firm performance in mature industries. The reason is that the business model of firms in mature industries is largely homogenous and geared toward to sustain a market position in commodity-based products. Thus, a unified leadership structure is likely not a significant driver of firm success in mature industries.

Given the fact that expropriation of minority shareholders remains a significant problem in Asian emerging economies (Liew, 2007; van Essen *et al.*, 2012), a CEO duality leadership structure would compromise good corporate governance and detrimental to firm performance. However, technology-based firms can derive benefits from the CEO duality leadership structure to enhance firm performance. We expect the benefits of CEO duality is likely greater than potential negative effects. However, we expect CEO duality is less likely to deliver potential benefits to firms in mature industries. Therefore:

- H3a: CEO duality is positively related to firm performance in technology-based industries.
- H3b: CEO duality is not related to firm performance in mature industries.
- H3c: The impact of CEO duality on firm performance is heterogeneous across technology-based and mature industries.

RESEARCH METHOD AND DATA

Our sample consists of firms listed on industrial products and plantation sector indices traded on the main board of Bursa Malaysia from 2003 to 2006. We used manufacturing firms in the industrial products sector index as a proxy to represent technology-based industries. On the other hand, we chose firms in the plantation sector index to represent mature industries. The rationale is that manufacturing firms generally associate with manufacturing technology-based products, whereas plantation firms mainly producing commodity-based products. In the case of Malaysian, the core business of plantation firms mainly involves producing palm oil, rubber and food processing (Pemandu, 2010). We then collected the data on corporate governance mechanisms from firms' annual reports that available on Bursa Malaysia's online database. The financial and market price data were collected from Datastream. In total, our sample consists of 33 plantation firms and 192 manufacturing firms over the 4-year period.

Drawing on prior corporate governance studies, we included predictor variables and control variables to avoid model specification errors. Specifically, we chose Tobin's Q (Q_{it}) as the proxy of firm performance (dependent variable) because market investors would mark down their perceived firms' fair value based on expropriation concerns in emerging economies (Claessens & Fan, 2002; Young, Peng, Ahlstrom, Bruton, & Jiang, 2008). Our model included ownership concentration ($Conc_{it}$), CEO duality ($Dual_{it}$) and board independence ($IndB_{it}$) as main predictor variables. We also included firm investment ($CAPEX_{it}$),

firm's leverage (Lev_{it}) and firm size ($Size_{it}$). Table 1 shows the definitions of variables. Specifically, we utilized the following empirical model as shown in equation (1):

$$Q_{it} = \beta_0 + \beta_1 Conc_{it} + \beta_2 Dual_{it} + \beta_3 IndB_{it} + \beta_4 CAPEX_{it} + \beta_5 Lev_{it} + \beta_6 Size_{it} + \varepsilon_{it} \quad (1)$$

In this study, we employed Partial Least Squares (PLS) path modeling to examine the relationship between corporate governance mechanisms and firm performance. We modelled all predictor and endogenous constructs as single-item constructs (hereafter: variable) in this study. Consequently, we do not need to perform assessments on measurement models because only single-item constructs have been included. To examine difference effect of corporate governance mechanisms with regard to firm performance, we performed multi-group analysis in PLS path modeling. The multi-group analysis differs from traditional statistical tests to examine mean level differences, e.g., Student t-test and Wilcoxon–Mann–Whitney test, in descriptive analysis. Instead, multi-group analysis is used to determine whether the difference of path coefficients in two groups is statistical significance.

Table 1 Definition of variables

Variable	Measure	Reference
Firm Performance (Q)	(Market Value of Preferred Shares + Market Value of Common Stocks + Book Value of Liabilities) / Book Value of Total Assets	(Haniffa & Hudaib, 2006)
Ownership Concentration (Conc)	Voting rights of the largest shareholder	(Grosfeld, 2009)
CEO duality (Dual)	Dummy variable takes value of '1' if CEO occupied the Chairman position of the boards, '0' otherwise.	(Ramdani & Witteloostuijn, 2010)
Board Independence (IndB)	Number of independent directors/ Total number of directors	(Ramdani & Witteloostuijn, 2010)
Firm Investment (CAPEX)	Total capital expenditure/ Total Sales	(Cheng, 2008)
Firm's Leverage (Lev)	Total debt/ Total Asset	(Cheng, 2008)
Firm Size (Size)	Total Assets (in million)	(Cheng, 2008)

RESULTS

Table 2 reports the descriptive analysis for the predictor variables and dependent variables. The mean of ownership concentration is 38.20 per cent, suggesting that the largest shareholders possess large voting rights in the ownership structures. On average, about 32 per cent of firms adopted CEO duality structure. Interestingly, firms on average has 40 per cent of independent directors on the boards. This result suggests firm tend to appoint more independent directors compared to stipulated threshold (i.e., 33.3%) according to the Malaysian Code of Corporate Governance (FCCG, 2000). Finally, we noticed that four variables (i.e., Tobin's Q, firm investment, firm's leverage and firm size) are not normally distributed because the (unreported) statistical z value for skewness (or kurtosis) of four variables outside the range of ± 2.58 (Ho, 2014). Since we used PLS path modeling, which is a non-parametric approach (Hair *et al.*, 2011), we do not perform data transformation, for example log-transformation, prior to path analysis.

Table 3 shows the correlation analysis of all variables. It is worth to mention that some variables are significantly correlated with each other. For example, ownership concentration is correlated with CEO duality, board impendence and firm's leverage at 1 per cent significant level. We performed a diagnostic of variance inflation factor (VIF) to detect potential multicollinearity in the model. Our results show that all VIFs are less than 3.3, suggesting no multicollinearity in the model.

Table 2 Descriptive analysis

Variable	Min	Max	Mean	S.D.
Tobin's Q	0.01	13.78	0.75	0.84
Ownership concentration	5.77	89.19	38.20	15.09
CEO Duality	0.00	1.00	0.32	0.47
Board Independence	0.00	0.86	0.40	0.11
Firm investment	0.00	2.78	0.09	0.15
Capital structure	0.00	3.67	0.23	0.25
Firm size	2.01	103155.49	731.70	3692.60

Table 3 Correlation matrix

Variable	1	2	3	4	5	6	7
1. Tobin's Q	1	-	-	-	-	-	-
2. Ownership concentration	0.098**	1	-	-	-	-	-
3. CEO Duality	-0.018	0.079*	1	-	-	-	-

Continue... (Table 3)

4. Board Independence	0.014	-0.068*	-0.089**	1	-	-	-
5. Firm investment	-0.048	-0.050	0.039	0.118**	1	-	-
6. Capital structure	0.227**	-0.038	0.068*	-0.050	-0.040	1	-
7. Firm size	-0.022	0.068*	-0.022	0.042	-0.020	0.013	1

**/*/+ denotes significant at the 0.01/ 0.05 / 0.10 level

Table 4 PLS path modeling and multi-group analysis

Variable	<u>Path Coefficient (T-value)</u>			p-value of Smith-Satterthwaitet test (2-tail)
	Entire sample (n=900)	Industrial Products (n=768)	Plantation (n=132)	
Ownership concentration	0.113** (5.127)	0.127** (4.900)	-0.067 (0.739)	0.040*
CEO Duality	-0.038 (1.347)	-0.042 (1.410)	-0.023 (0.3103)	0.817
Board Independence	0.039 (1.020)	0.049 (1.085)	-0.138+ (1.668)	0.048*
Firm investment	-0.038 (1.260)	-0.022 (0.551)	-0.195** (3.260)	0.016*
Capital structure	0.236+ (1.816)	0.239+ (1.712)	-0.013 (0.170)	0.115
Firm size	-0.034 (2.042)*	-0.028 (1.270)	-0.098 (1.619)	0.28
Fixed Year Effect	Yes	Yes	Yes	-
R-Squared	0.071	0.077	0.099	-
Q-Squared	0.073	0.078	0.113	-

**/*/+ denotes significant at the 0.01/ 0.05 / 0.10 level

The estimates of PLS path modeling and difference-effect are shown in Table 4. The validity of the research model was assessed by using the Q-Squared of the dependent variable (Hair *et al.*, 2011). We find the Q-Squared of all models including entire samples, industrial products firms and plantation firms are above zero, suggesting predictor variables have sufficient predictive relevance for the dependent variable in this research.

We used multi-group analysis to differentiate the impact of predictor variables across multiple groups (Sarstedt, Henseler, & Ringle, 2011). Stated differently, we hypothesize the impact of corporate governance mechanisms differ across industry groups. In the first step, we divided the sample into two groups (i.e., industrial products and plantation firms) followed by obtaining

the results of structural model. Next, we identified that data in this study were not normally distributed in our sample (see Table 2). Thus, we used Smith–Satterthwaitet test to examine the difference effects of corporate governance mechanisms. The Smith–Satterthwaitet test is more appropriate because it is asymptotically t-distributed (Sarstedt *et al.*, 2011).

We find that ownership concentration is statistically significant and positively related in with firm performance (Tobin's Q) in the entire sample. This finding, however, contradicts with prior studies that using sample firms from Malaysia (Haniffa & Hudaib, 2006; Sulong & Ahmed, 2011). Consistent with hypotheses H1a and H1b, our results indicate that ownership concentration was only statistically significant for industrial product firms, but not for plantation firms. Finally, we confirm that the impact of ownership concentration on firm performance is heterogeneous across industries because the Smith–Satterthwaitet test is statistically significant. Thus, the findings generally support hypothesis H1c, suggesting the existence of multi-industry difference-effect for ownership concentration.

With regard to the relationship between board independence and firm performance, we found that board independence exhibits a non-significant relationship on firm performance for entire sample. This is in line with prior empirical evidence in Malaysian studies (Haniffa & Hudaib, 2006; Wahab *et al.*, 2011). Specifically, board independence exhibits a non-significant relationship in industrial product firms, but a significant relationship in plantation firms with negative direction. These results suggest hypothesis H2a is supported, whereas hypothesis H2b is rejected. We argue that independent directors in plantation firms are not performing effective monitoring. Additionally, they seem to be cooperative with controlling shareholders and thus strengthening the controlling position of the latter. Finally, the results of Smith–Satterthwaitet test is statistically significant, revealing that multi-industry difference for the relationship between board independence and firm performance; thus hypothesis H2c is supported.

Interestingly, we find CEO duality exhibits a non-significant impact on firm performance in the entire sample and two subgroups. In addition, we find that Smith–Satterthwaitet test is statistically non-significant, suggesting the absence of multi-group difference in industrial products and plantation firms. These findings only support hypothesis H3b and reject hypotheses H3b and H3c. Our results are similar to a prior study using Malaysian samples (Haniffa & Hudaib, 2006). Overall, our results rule out the heterogeneity of CEO duality on firm performance across industries.

We also found a few interesting results for control variables. That is, the results of Smith–Satterthwaitet test suggest the presence of multi-group difference between industrial products and plantation firms in firm investment. In other words, the impact of firm investment on firm performance is heterogeneous across industries. The results support the traditional notion that technology based industries are essentially capital intense, therefore, firms require high levels of investment to sustain market position. On the contrary,

plantation industry (or mature industries) relies less on capital investment in market competition. Finally, the findings show that there are no multi-group difference for the impact of firm leverage and firm size on firm performance.

CONCLUSIONS

This article examines the impact of corporate governance mechanisms on firm performance across 225 firms manufacturing and plantation firms in Malaysia. We contend that the impact of corporate governance mechanisms is heterogeneous across industries. This research differs itself from prior corporate governance studies by examining the difference effect of corporate governance mechanisms by using multi-group analysis in PLS path modeling. In particular, we found the links between ownership concentration-firm performance and board independence-firm performance are heterogeneous across technology-based and mature industries. However, we find no such evidence of heterogeneity for CEO duality.

Our main findings suggest that using a broad-based sample across industries is not useful for the understanding of the effectiveness of corporate governance mechanism. This can be seen from our broad-based samples (includes industrial products and plantation firms) conceal the effect in fine-grained industry samples. Our analysis of heterogeneity further suggests that corporate governance literature should consider the theory development and empirical studies based on the complexity of industry settings and business models.

Our article is subject to two limitations. First, our analysis is based on manufacturing and plantation firms and thus the generalizability may be limited to such industry contexts. Extending this research to other industry contexts remain an avenue for future studies. Second, we do not consider ownership type of controlling shareholders such as family, state and institutional investors in this analysis. Future studies may include the impact of ownership type to offer a better understanding of corporate governance mechanisms.

REFERENCES

- Barney, J. B. (1990). The debate between traditional management theory and organizational economics: Substantive differences or intergroup conflict? *Academy of Management Review*, 15(3), 382-393.
- Bayrakdaroglu, A., Ersoy, E., & Citak, L. (2012). Is there a relationship between corporate governance and value-based financial performance measures? A study of Turkey as an emerging market. *Asia-Pacific Journal of Financial Studies*, 41(2), 224-239.
- Carney, R. W., & Child, T. B. (2013). Changes to the ownership and control of East Asian corporations between 1996 and 2008: The primacy of politics. *Journal of Financial Economics*, 107(2), 494-513.
- Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics*, 87(1), 157-176.

- Choi, H. M., Sul, W., & Min, S. K. (2012). Foreign board membership and firm value in Korea. *Management Decision*, 50(2), 3-3.
- Claessens, S., Djankov, S., & Lang, L. (1999). Corporate ownership and valuation: Evidence from East Asia. In A. Harwood, R. E. Litan & M. Pomerleano (Eds.). *Financial markets and development: The crisis in emerging markets* (pp. 159-178). Washington DC: Brookings Institution Press.
- Claessens, S., Djankov, S., & Lang, L. H. P. (1999). Who controls East Asian corporations—and the implications for legal reform. *World Bank Public Policy for the Private Sector Note*, 195, 1-8.
- Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian Corporations. *Journal of Financial Economics*, 58(1-2), 81-112.
- Claessens, S., & Fan, J. P. H. (2002). Corporate governance in Asia: A survey. *International Review of Finance*, 3(2), 71-103.
- Coles, J. W., McWilliams, V. B., & Sen, N. (2001). An examination of the relationship of governance mechanisms to performance. *Journal of Management*, 27(1), 23-50.
- Combs, J. G., Ketchen, D. J., Perryman, A. A., & Donahue, M. S. (2007). The moderating effect of CEO power on the board composition–firm performance relationship. *Journal of Management Studies*, 44(8), 1299-1323.
- Cooper, R. G. (2011). Perspective: The innovation dilemma: How to innovate when the market is mature. *Journal of Product Innovation Management*, 28(1), 2-27.
- Cui, H., & Mak, Y. T. (2002). The relationship between managerial ownership and firm performance in high R&D firms. *Journal of Corporate Finance*, 8(4), 313-336.
- Daily, C. M., & Johnson, J. L. (1997). Sources of CEO power and firm financial performance: A longitudinal assessment. *Journal of Management*, 23(2), 97-117.
- Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a Stewardship theory of management. *The Academy of Management Review*, 22(1), 20-47.
- Donaldson, L. (1990). The ethereal hand: Organizational economics and management theory. *The Academy of Management Review*, 15(3), 369-381.
- Donaldson, L., & Davis, J. H. (1991). Stewardship theory or agency theory: CEO governance and shareholder returns. *Australian Journal of Management*, 16(1), 49-64.
- Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, 88(2), 288-307.
- FCCG. (2000). *Malaysian code of corporate governance*. Ministry of Finance (Malaysia).
- Finkelstein, S., & D'Aveni, R. A. (1994). CEO duality as a double-edged sword: How boards of directors balance entrenchment avoidance and unity of command. *The Academy of Management Journal*, 37(5), 1079-1108.
- Goh, C. F., Khan, S.U.R., & Rasli, A. (2014). CEO duality, board independence, corporate governance and firm performance in family firms: Evidence from the manufacturing industry in Malaysia. *Asian Business & Management*, Advance Online Publication April 9, 2014; doi:10.1057/abm.2014.4.
- Grosfeld, I. (2009). Large shareholders and firm value: Are high-tech firms different? *Economic Systems*, 33(3), 259-277.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice*, 19(2), 139-152.
- Haniffa, R., & Hudaib, M. (2006). Corporate governance structure and performance of Malaysian listed companies. *Journal of Business Finance & Accounting*, 33(7-8), 1034-1062.
- He, J., & Wang, H. C. (2009). Innovative knowledge assets and economic performance: The asymmetric roles of incentives and monitoring. *The Academy of Management Journal*, 52(5), 919-938.

- Heugens, P. P., Van Essen, M., & van Oosterhout, J. H. (2009). Meta-analyzing ownership concentration and firm performance in Asia: Towards a more fine-grained understanding. *Asia Pacific Journal of Management*, 26(3), 481-512.
- Ho, R. (2014). *Handbook of univariate and multivariate data analysis with IBM SPSS (2nd Ed.)*. Boca Raton: CRC Press.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Jiang, Y., & Peng, M. (2011). Principal-principal conflicts during crisis. *Asia Pacific Journal of Management*, 28(4), 683-695.
- Jogulu, U., & Ferkins, L. (2012). Leadership and culture in Asia: The case of Malaysia. *Asia Pacific Business Review*, 18(4), 531-549.
- Kim, C.-S. (2006). Outside directors and firm value in Korea. *The Korean Journal of Finance*, 19(2), 105-153.
- Kusnadi, Y. (2011). Do corporate governance mechanisms matter for cash holdings and firm value? *Pacific-Basin Finance Journal*, 19(5), 554-570.
- Le, S. A., Walters, B., & Kroll, M. (2006). The moderating effects of external monitors on the relationship between R&D spending and firm performance. *Journal of Business Research*, 59(2), 278-287.
- Liew, P. K. (2007). Corporate governance reforms in Malaysia: The key leading players' perspectives. *Corporate Governance: An International Review*, 15(5), 724-740.
- Matsa, D. A. (2011). Competition and product quality in the supermarket industry. *The Quarterly Journal of Economics*, 126(3), 1539-1591.
- OECD. (2004). *OECD principles of corporate governance*. Paris: OECD Publications.
- Pemandu. (2010). "Chapter 9 - palm oil," in *Economic transformation programme handbook*. Kuala Lumpur: Pemandu.
- Porta, R. L., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate Ownership around the World. *The Journal of Finance*, 54(2), 471-517.
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79-91.
- Ramdani, D., & Witteloostuijn, A. v. (2010). The impact of board independence and CEO duality on firm performance: A quantile regression analysis for Indonesia, Malaysia, South Korea and Thailand. *British Journal of Management*, 21(3), 607-627.
- Rasli, A., Goh, C. F., & Khan, S.U.R. (2013). Demystifying the role of a state ownership in corporate governance and firm performance: Evidence from the manufacturing sector in Malaysia. *ZbornikRadovaEkonomskogFakulteta u Rijeci-Proceedings of Rijeka Faculty of Economics*, 31(2), 233-252.
- Sarstedt, M., Henseler, J., & Ringle, C. M. (2011). Multi-group analysis in partial least squares (PLS) path modeling: Alternative methods and empirical results. In M. Sarstedt, M. Schwaiger & C. R. Taylor (Eds.), *Advances in International Marketing* (Vol. 22, pp. 195-218). U.K.: Emerald Group Publishing Limited.
- Sulong, Z., & Ahmed, P. K. (2011). Ownership structure, board governance, dividends and firm value: An empirical examination of Malaysian listed firms. *International Journal of Business Governance and Ethics*, 6(2), 135-161.
- van Essen, M., van Oosterhout, J., & Carney, M. (2012). Corporate boards and the performance of Asian firms: A meta-analysis. *Asia Pacific Journal of Management*, 29(4), 873-905.
- Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, 80(2), 385-417.
- Wahab, E. A. A., Haron, H., Lok, C. L., & Yahya, S. (2011). Does corporate governance matter? Evidence from related party transactions in Malaysia. In J. Kose, M. Anil

& P. F. Stephen (Eds.), *International Corporate Governance (Advances in Financial Economics)* (Vol. 14, pp. 131-164). United Kingdom: Emerald Group Publishing Limited.

Wu, S. D., Erkoc, M., & Karabuk, S. (2005). Managing capacity in the high-tech industry: A review of literature. *The Engineering Economist*, 50(2), 125-158.

Young, M. N., Peng, M. W., Ahlstrom, D., Bruton, G. D., & Jiang, Y. (2008). Corporate governance in emerging economies: A review of the principal-principal perspective. *Journal of Management Studies*, 45(1), 196-220.