A META-ANALYSIS OF CORPORATE GOVERNANCE AND FIRM PERFORMANCE

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Abstract

This research provides a systematic picture on the topic of "How corporate governance influences on firm performance?" through the application of meta-analysis on over 251 studies covering 24,867 businesses of 37 distinguished published papers. Using meta-analysis, by proceeding HOMA procedure, it is statistically evidenced that better corporate governance index and more board independence significantly enhance firm performance. By contrast, business' financial value would be harmed as raise management shares proportion. Not only providing a general relationship direction, the paper also contributes an insight of potential sources of heterogeneity among collected samples as endogeneity problems; and selection of financial performance base. Moreover, significant changes through the sampling period are investigated in the connection of business' worth and board size, board independence (declining trend); state ownership and institutional ownership (rising tendency).

Keywords: Corporate Governance, Meta-Analysis, HOMA Procedures, MARA Procedures

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1. INTRODUCTION

Corporate Governance is a growing important topic is accompanied by the development of the business world. Asian nations, especially, show increasing challenges for designing a suitable and meaningful mechanism framework to enterprises in order to support the economy as a whole both in research and in practices. Systematic as a consequence of necessary to investigate the links between corporate governance and firm performance in Asian countries as well as the importance and necessity for having meta-analysis in this field. This paper is conducted with a mission of bringing an overall view on governance topic influencing firm performance for Asian countries.

Based on the mission, the researcher has collected 42 papers studying on the link corporate governance – firm performance in Asia from different trusted online publishers such as Elsevier, Science Direct, Wiley Online Library or Research Gate. Through the filtering process, several studies were abandoned from the sample size due to a lack of information or irrelevant.

Finally, data yields at 36 research papers and 251 studies on 24,692 firms with each study's variable number range from five to twenty in the period of 2001 till recent. The tested companies are fully listed and non-financial organizations because financial firms are very different from non-financial ones.

Since research in global and Asian literature on corporate governance's influences on firm performance, this paper has found four main gaps that it can fulfill based on two dimensions. First, in comparison with traditional primary researches, this

meta-analysis would provide more systematic insights on the topic.

Secondly, differentiate from another meta-analysis on the association of business administration and its performance, there are three distinctive that this study offers named ROA, ROE and Tobin's q. In detail, the study has selected a niche approach which deals with a medium number of predictors (seven) and diversified examinations on hypothesis testing, moderator analysis, and temporal effects analysis. In fact, this paper is fairly different from other scholars because most of the scholars analyze on about 4 independent variables but with detailed tests (Heugens, van Essen, & van Oosterhout, 2009; van Essen, van Oosterhout, & Carney, 2011) while the other offer an overview of many relationships (16 explanatory variables) yet proceed basic analysis solely (Lukviarman & Johan, 2018).

While concern on corporate governance role in society and economy, Nicolas Berggruen has stated that:

"The biggest determinant in our lives is culture, where we are born, what the environment looks like. But the second biggest determinant is probably governance, good governance or a certain kind of governance makes a huge difference in our lives" (Post Courier, 2019).

This paper is structured with major sections. First, the introduction part gives an overview of the topic and main points in the research, which is followed by a literature review that raises a variety of scholars' opinions on the topic. After that, there is the segment of hypothesis development in which vital questions and hypotheses are stated in order to execute tests later. The fourth part describes how the data was collected and gives a piece of general information on sample size and so on. Moreover, the methodology is then demonstrated in detail for the next section in order to run the tests. Those results of tests are discussed further in the sixth division: findings and ended with the conclusion.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Literature review on corporate governance

The term 'Corporate Governance' is "an important global topic" (Aggarwal & Goodell, 2014, cited by Gregoriou & Chuen, 2014) that there have been several studies and researches in a variety of fields such as finance or management covered the topic. Nevertheless, it is difficult to define the concept universally the same. According to International Finance Corporation (World Bank Group, 2019), indeed, corporate governance is described as a mechanism and framework in which firms will be monitored and directed based on. Additionally to that, as stated by Shleifer and Vishny (1997), "Corporate governance deals with the ways in which suppliers of finance to corporation assure themselves of getting a return on their investment" (pp. 737). Another viewpoint of Aoki (2000) with a wider perspective considered it as the right and responsibility arrangement amongst multiple sides including employees, employers, and capital sources.

Due to the difference in viewpoint, it can be separated into three main schools of thought: *Agency theory, Stakeholder theory,* and *Stewardship theory.* Amongst that, the agency approach is a traditional one but most widely used by researchers. The theory focuses on the core relationship between "agents and principals" (Jensen & Meckling, 1976) and its problem will arise as there is a conflict of different parties in terms of interest. *Stakeholder theory,* on the other hand, stated that an organization should be considered as a group of various parties which are defined as stakeholders (Friedman, 2006), furthermore, emphasizes the manager's role in arranging different sides' benefits while safeguards company's existence in long-term. Last but not least, *Stewardship theory* assumes the executives as a person that protect the shareholders' interest so that they have only the aim to create and sustain a firm successfully (Davis, Schoorman, & Donaldson, 1997).

All three above approaches have advantages and disadvantages; thus, the answer for a "right" theory is not absolutely clear. In fact, that decision may vary from a company to one another and depend largely on each firm's industry, structures regulation and especially the executives' characteristics. However, because of a limitation in time and requirement of the paper, the central focus of this paper will be based on the agency theory.

Since 1999, the Organization for Economic Co-operation and Development (OECD) established Asia Roundtable, corporate governance has been discussed in the roundtable. Through the time, the White Paper of the Asian Roundtable on corporate governance has been continuously developed, which possibly implies for the growing importance of this topic in the context of Asia as specific.

According to Gambhir (2019), Asian markets are increasingly noticed for investors due to its growth rate of return as well as its complicacy.

Specifically, regards to high potential, the article also mentioned that the growth rate in Asia is currently higher than the average, which drove certain Asian nations into some of the most contributors in the global economy. In terms of market complexities, the Asian market is well-known for possessing a diversified characteristic. In particular, it not only comprises a mixture of various economies of scale (State-owned companies, SMEs or Conglomerates) but also different development degrees (CFA Institute, 2019). Aggarwal and Goodell (2014), for instance, specified that Asia had both (1) least developed countries (LDCs) or emerging countries such as China, Hong Kong, Singapore, Taiwan or South Korea (2) and developed or mature economies such as Japan. Together with rapid development, Asia confronts globalization trend that it affects those countries' business environment, people's perspectives, and business. As a result, corporate governance appears to play a significant role in Asian countries.

While confronting considerable challenges from both internal and external environment, Asian businesses possess a variety of studies on corporate governance. They explore meaningful and statistical insights from those papers in order to prove for their administration decision or designing related regulations (for policymakers). Among Asian literature on corporate governance, there are various interesting and worthy topics. However, one of the

largest segments among that research pool are papers investigating the impacts of corporate governance on firm performance.

In the late 1990s, most South-East and East Asian nations endured a financial crisis that influenced every emerging country (Johnson, Boone, Breach, & Friedman, 2000). Particularly, some opinions considered macroeconomics and banking issues mainly caused the financial crash in the 1997-1998 period. However, from Johnson et al. (2000) viewpoint, the major reason leading to the problem was poor corporate governance. Furthermore, they believed that the Asian economy has evolved significantly due to their attempts to transform corporate governance (Johnson et al., 2000). Contrary to those opinions, there also exist various researches that showed an insignificant relationship between governance and the company's financial performance. For instance, Leung, Richardson, and Jaggi (2014) induced that board independence did not affect Hong Kong firms in general. Similar to that, in the paper of Detthamronga, Chancharata, and Vithessonthic (2017), they examined certain variables in terms of corporate governance such as board size or board independence in Thailand firms and deducted that the impacts of governance on company's performance are not significant.

Because of a variety of studies on the link between corporate mechanism and business performance, it implies that many scholars have an interest and desire to explore this aspect of business administration. Nevertheless, there is a lack of research on Asian corporate governance situation as a whole picture whereas the Asian markets are becoming more dynamic than ever. That is why this research uses the meta-analysis to investigate the association between corporate governance and firm performance in Asia as a whole picture systematically.

With that objective, multiple steps were executed to implement the test and conclude the outcomes. First of all, after defining the topic, theory approach was selected and be based on to determine several suitable variables in the model. In general, based on corporate governance literature review especially those of agency theory, there are three key groups of independent variables that will be used in this research as: (1) *board composition*: board size, board independence, CEO duality; (2) *ownership identity*: state ownership, management ownership, and institutional ownership; and (3) *overall corporate governance score*: corporate governance index.

Together with that, two categories will be used to represent for firm performance are accounting (ROA, ROE, ROI, etc.) and market performance (Tobin's q, Market to Book value).

2.2. Literature review on meta-analysis

Indeed, among extant literature, a great amount of those has discovered and analyzed the influences of corporate governance on firm performance globally. For instance, there are several studies on (1) the impacts of corporate governance index from Beiner, Drobetz, Schmid, and Zimmermann (2006), Black, Jang, and Kim (2006) and Brown and Caylor (2006) or diversified board effects on organization performance of Carter, Simkins, and Simpson (2003), Liu, Wei, and Xie (2014) and Conyon (2017). Also, Asian market specialized papers are increasing

recently in scholars' world such as *"Corporate governance in Asia: A survey"* (Claessens & Fan, 2002) or *"Corporate governance in emerging economies: A review of principal-principal perspective"* (Young, Peng, Ahlstrom, Bruton, & Jiang, 2008).

Nevertheless, the answer to this topic is yet controversial and depends largely on which variable category of governance are considered. Therefore, this paper is inspired to execute a meta-analysis on corporate governance and firm performance in the Asia region.

Recently, Asian economies have been changing dramatically that it becomes a 'hot' market around the globe. However, accompanied by fast growth, several dilemmas also occur and challenge Asian countries. One of the foremost issues that businesses nowadays concern about is corporate governance.

Furthermore, there exist gaps among current meta-analysis studies concerning the topic and thus the paper will fill in certain gaps to add further three unique values to the meta-analysis researches pool.

Particularly, regarding this topic, Lukviarman and Johan (2018) recently have conducted a meta-analysis that covers a huge number of variables (16 predictors) but applies only HOMA procedure to test the significance relation. By contrast, a few meta-analyzes provide further findings such as moderator analysis (Dalton, Daily, Johnson, & Ellstrand, 1998) or MASEM results (Essen et al., 2011) but deal with smaller corporate governance variables (about 4 explanatory variables). Therefore, firstly, this paper selects the niche in the current meta-analysis literature. In detail, it covers a medium number of variables (7 predictors) and executes not only the basic hypothesis test for the interested relationship but also further assessments on moderator analysis and temporal effects.

Moreover, although there exists a meta-analysis regarding examine on time impacts on the association between governance and business value (Mutlu, van Essen, Peng, Saleh, & Duran, 2018), it recently solely covers a regional scope (China). As a result, this paper may yield a distinctive contribution to a meta-analysis through the investigation whether the link between corporate governance and organization performance varies over time in terms of Asian countries.

The last observed gap in recent meta-analysis on corporate governance and firm performance in Asia is moderator analysis. While there is meta-analysis investigating moderator effects, such as the paper of Dalton et al. 1998, it is rarely found researches on the study's characteristics influence on the connection of corporate governance and firm performance. Hence, this paper will examine whether individual study's features moderates the concerning relationship; also, it implies the source of heterogeneity dilemmas if it exists.

2.3. Hypothesis development

With an aim to fill in gaps among several meta-analyzes, this paper will analyze corporate governance in terms of seven variables. Particularly, existent papers have worked with several types such as leverage (McConnell & Servaes, 1995) or policy of dividend (Gugler & Yurtoglu, 2003). Nevertheless, as discussed previously, agency theory is implemented in this paper; therefore, board composition (board

size, board independence, and CEO duality), ownership identity (state ownership, management ownership, and institutional ownership) and corporate governance index as a general aspect.

H1: Board size positively affects firm performance.

H2: Board independence positively affects firm performance.

H3: CEO duality positively affects firm performance.

H4: State ownership negatively affects firm performance.

H5: Institutional ownership positively affects firm performance.

H6: Management ownership negatively affects firm performance.

H7: Corporate governance index positively affects firm performance.

3. SAMPLING AND METHODOLOGY

3.1 Sampling

To choose the sample for this study, we have ferreted out both published and unpublished sources which uploaded on some prestigious and professional research networks such as Elsevier, Science Direct, Research Gate, Wiley Online Library and Emerald Insights.

The paper initially collects 42 papers concern corporate governance and firm performance in Asia scope. Nevertheless, there exist certain studies providing insufficient and/or irrelevant information among the sample pool and thus it has been filtered out of sample size. As a result, the study finally yields a data sample of 36 papers covering 12 different Asian countries with a total of 251 studies of 24,867 corporate from 2005 to 2018. In addition to that, the sample data of collected papers occurs from 2000 to 2014 and the entire data sample is investigations on listed companies and published studies.

Dependent Variables

The study analyses two main business performance forms: accounting and market performances. Firm accounting performance can be measured by an index such as return on asset (ROA), return on equity (ROE) and profit after tax. Regarding market performance, Tobin's q is the proxy used in the evaluation. These aspects of corporate performance were used as the dependent variables in analysis and would be described more as the table.

Independent Variables

The explanatory variables of this study are seven corporate governance dimensions covering the firm's board structure, ownership concentration, and the overall index. To analyze the first dimension, board structure, several variables are examined: board size, board independence, and CEO duality. Moreover, different types of firm ownership are also concerned in this study while examining the link between firm management and performance: state ownership, institutional ownership, and management ownership.

Lastly, the corporate governance index, an overview metric reflecting governance status, is utilized in the paper to recommend a more general picture of the interested relationship. Overall, these three aspects of corporate governance which include board structure and ownership concentration have

contributed to supporting us to come up with some conclusions about their affection on the performance of firms. In short, this paper uses seven explanatory variables in accordance with two main groups of dependent variables, which are described specifically in Table A.1 (see Appendix A).

In conclusion, the research strategies have yielded a final sample of 36 papers covering 12 different Asian countries with a total of 251 studies on 24,867 businesses from 2005 to 2018. Additionally, those papers' sample data ranges from 2000 to 2014.

3.2. Methodology

3.2.1. Methodology overview

In the book *"Modern methods of clinical investigation: Medical innovation at the crossroads"*, Thacker (1990) states that meta-analysis is a quantitative of literature review. Indeed, the method synthesizes, aggregates and analyzes findings of several studies on the examined field to generate a more systematic result (Smith & Glass, 1977; DerSimonian & Laird, 1986; Hunter & Schmidt 1990; Ahn & Kang, 2018).

Therefore, the technique will support researchers dramatically with concluding results from a huge, complex and even contrast literature world and offer overviews to the fields (Haidich, 2010). The main reason that meta-analysis could analyze quantitatively distinguished studies is a common indicator or effect size from the sample's original correlations.

Having such an important role in defining systematic results, there are two main outputs that can be expected from a meta-analysis specifically. At first, through summarize and transform empirical data from individualistic to scale-free and thus figures become comparable among a variety of studies. Furthermore, meta-analysis helps not only compute a common index but also to analyze which factors may affect the metric through meta-regression (La Rocca).

Meta-analysis is mainly applied in the medical field, however, it has been expanding to several other fields recently such as psychology, science or business. In this paper, both two main outcomes of meta-analysis in general and meta-regression will be offered on the relationship between corporate governance and firm performance in Asia. In order to generate conclusions, *Hedges and Olkin Meta-Analysis (HOMA)* and *Meta-Analytical Regression Analysis (MARA)* procedures will be implemented.

3.2.2. Hedges and Olkin Meta-Analysis (HOMA) Procedure

As been mentioned by Glass (1976), a common metric (or effect size in the case) is conducted from individual study's statistical figures into a scale-free number. By definition, according to Coe (2002), effect size (denoted as ES) simply represents the difference in size between two categories. Moreover, it is also stated to play an important role as Z-score distribution (Coe, 2002), therefore, it allows researchers to compare results among several different papers. In other words, effect sizes can be applied in meta-analysis because it standardizes several empirical studies' quantitative results into a

'universal' benchmark to compare them together and thus achieve more systematic conclusions.

In this paper, Hedges and Olkin Meta-Analysis (HOMA) (1985) will be applied due to two main reasons. Firstly, the methodology provides a relatively completed procedure to run hypothesis testing regarding meta-analysis. Moreover, it possibly utilizes partial correlation, a unit-less measurement, to generate effect sizes.

Particularly, partial correlation, in fact, is a practical and suitable metric because it can be computed from the beta coefficients presented in the whole sample studies. Indeed, Copper and Hedges (1994) proposed a technique to compute correlation from *t-Student* statistics according to Equation (1). Moreover, it is vital to add a negative or positive sign into the results in accordance with corresponding effect sizes (Copper & Hedges, 1994).

Subsequent to determine partial correlation, based on the second formula, HOMA (1985) method transforms it into equivalent Fisher Z_r score (or Effect size in this paper). According to several scholars (Hedges & Olkin, 1985; Rosenthal, 1991; Hedges & Vevea, 1998), this process is suggested to fix certain issues regarding partial correlation such as skewness. Indeed, it is investigated that the unconverted coefficient misleads to the incorrect conclusion than the converted one (Silver & Dunlap, 1987).

Last but not least, the effect size Z_r thereafter be utilized to compute the mean of effect sizes or $\overline{Z_r}$. However, based on Hedges and Olkin (1985), the effect size is stated as a combined effect illustrating a general relationship between two variables. Thus, it is better in application to weight the effect size according to distinguished studies' characteristics. In addition, the ES mean or $\overline{Z_r}$ is also more precise as weight factor is taken into account in the model as described in Equation (3) (Hedges & Olkin, 1985).

$$r = \sqrt{\frac{t^2}{t^2 + df}} \qquad (1)$$

$$Z_{r_i} = \frac{1}{2}\ln\left(\frac{1+r_i}{1-r_i}\right) \qquad (2)$$

$$\overline{Z_r} = \frac{\sum_1^k w_i z_i}{\sum_1^k w_i} \qquad (3)$$

In the third formula, w_i means the weight of the study i^{th} in accordance with its Z_r. Particularly, the weight factor concern with how much a study contributes to the whole sample as compared to other k studies.

Regarding compute the weight factor w_i, two models are usually considered in terms of meta-analysis: *fixed effect model* (FEM) and *random effect model* (REM). These models are basically different due to their assumption on heterogeneity issue among studies. In detail, whereas the fixed model supposes that studies are homogenous, the random model assumes that heterogeneity may exist in sample size and thus, two models will lead to a distinguished method to calculate the weight factor. Firstly, because the supposition *fixed effect model* is no heterogeneity among selected studies results, the weight is believed to experience solely because of the information which the study itself possesses. As a result, a random error inside a study is considered to be the only error cause for a combined effect. According to HOMA, the weight w_i is generated from the inverse of within study's variance or SE^2, which is demonstrated in Equation (4) and (5) as a specification. On the other hand, some scholars compute w_i base on each study's sample size as shown in Equation (6).

$$w_i = \frac{1}{v_i} \qquad (4)$$

$$v_i = Se_i^2 \text{ or } \sigma^2 \qquad (5)$$

$$w_i = n - 3 \qquad (6)$$

Nevertheless, the inverse variance is applied in this paper as a weight (or Equation (4) and (5)) because it is suggested to be more suitable and precise (Hedges & Olkin, 1985).

Contrary to FEM, *random effect model* assumes the existence of heterogeneity among the collected sample, which induces two layers of error. Specifically, the inner-study error is the first level whereas the second to be concerned with is an error from a study to one another. As a result, in order to compute the weight factor, REM considers not only within the study's variance v_i but also the between-study variance τ (DerSimonian & Laird, 1986). According to Lipsey and Wilson (2001), the following Equation (7) and (8) are mentioned to generate τ and Q test, which is then followed by Equation (9) with an aim to calculate REM's weight factor.

$$\tau = \frac{Q_T - (k-1)}{\sum w - \left(\frac{\sum w^2}{\sum w}\right)} \qquad (7)$$

$$Q_T = \sum(w * ES)^2 - \frac{[\sum(w*ES)]^2}{\sum w} \qquad (8)$$

$$w_i = \frac{1}{v_i + \tau} \qquad (9)$$

For both approaches, after having weighted ES by multiply unweighted effect size by its weight, a calculation of Z-test and confidence interval at 95% will be produced based on Equation (10) and (11) respectively in terms of meta-analysis case.

$$z \text{ test} = \frac{\overline{ES}}{Se_{ES}} \qquad (10)$$

$$CI_{95\%} = \overline{ES} \pm 1.96(Se_{ES}) \qquad (11)$$

In this paper, both models are executed in order to investigate possible differences and similarities, however, *H1* to *H7* are concluded solely relied on Random Effect Model due to its realistic assumption of heterogeneity.

3.2.3. Meta-Analytical Regression Analysis (MARA) procedure

While simple meta-analysis aims at synthesizing effect sizes from various studies, meta-analysis regression can be applied to analyze factors influencing on the interested relation, which is also called moderator analysis. Hence, accompanied by HOMA procedure, this paper will proceed Meta-Analytical Regression Analysis (MARA) with two main outcomes: (1) analyze moderators' influence on the main studied relation and (2) testing for temporal effects.

In particular, through the process, meta-regression not only tests the direction change of each governance criteria's link to firm performance over the time period but also analyzes factors moderating the connection. Furthermore, examining the moderator's interaction with interested relation, meta-regression possibly induces potential sources of heterogeneity problems (if exists) which can be study-related characteristics (Thompson & Higgins, 2002).

Recently, there has been a variety of views regarding apply which regression model for a meta-regression as well as other statistical related problems (Thompson & Higgins, 2005). Ordinary Least Square regression is possibly proceeded, however, Variance Weighted Least Square (VWLS) is likely to be more powerful in terms of a meta-regression scenario. In detail, VWLS regression employs unweighted effect size as the explained variable because through the weighting process further, the model actually results in weighted effect sizes.

Having chosen the regression model, it is necessary to select a statistical method in order to run MARA. There are two popular methods for regressing a meta case as similar to meta-analysis: *Fixed effect meta-regression* and *Random (or Mixed) effect meta-regression.*

In the *Fixed effect regression model (FEM)*, it is assumed that there exists solely within variance, therefore, entire sample heterogeneity could be defined by covariate variables such as study features. As a result, if there is probably unexplained heterogeneity, the regression model may cause *Type I* error and thus, it is not generally suggested to apply the Fixed effect regression model.

By contrast, the *Random effect regression model (REM)* supposes the existence of both within and between variance. In other words, it accepts the occasion in which heterogeneity cannot be described by moderators, which is more conservative as compared to the FEM. Hence, to sum up, this paper will apply REM to proceed with meta-analytical regression.

As mentioned previously in this section, this paper aims at two main results while planning to apply the MARA procedure. First, it is meaningful to investigate which study characteristic factors moderates the relationship between governance and corporate performance or, i.e., searching for heterogeneity sources among various studies. Moreover, the second outcome is desired to be achieved through this paper is to explore whether that association change over time. To gain those goals, there are three main corresponding regression models will be examined as followed:

Model 1.1

$$y_i = \beta_0 + \beta_1 S_i + u_i \qquad (12)$$

Model 1.2

$$y_i = \beta_0 + \beta_1 S_i + \beta_2 D_i + u_i \qquad (13)$$

Model 2

$$y_i = \beta_0 + \beta_1 S_i + + \beta_2 D_i + \beta_3 R_i + u_i \qquad (14)$$

Regarding all models, unweighted ES is utilized as an explained variable in the regression and thus decreases individual study's result but concerns a more common metric. On the other side, β_0 is a constant coefficient whereas β from one to three mean coefficients corresponding to its multiply covariate variables.

In order to test moderating effects, several dummy variables are added into the regression as moderators. Specifically, those dummies mainly related to study characteristics such as the sample data types (*d_panel*) or the econometric techniques used in studies (*d_endo*) and so on (detail describes in Table 1). In the models, vector S_i is defined as study characteristic variables with an aim to test for moderating effects.

Table 1. Dummy variable definition

Name	Description
d_perform	A dummy variable that takes value of 1 for Market performance and 0 for Accounting performance
d_panel	A dummy variable that takes value of 1 for Panel data and 0 for Cross-sectional data
d_endo	A dummy variable that takes value of 1 for Using endogeneity restricted methods such as two-stage least squares (2SLS) and three-stage least squares (3SLS) and so forth, and 0 for Otherwise
d_2009	A dummy variable that takes value of 1 for Data from the beginning of 2009 until recently and 0 for Otherwise
Median year	The median year of a study's sampling period

Moreover, vector D_i is also included in the model (1.2) while exploring moderating effects. In detail, D_i is the vector of dummy variable *d_2009* studying the influence of financial crises in 2019 across Asia (Glick & Spiegel, 2010). Especially, model (2) adds the median year of study's sample period R_i to test for temporal effects of the link between corporate governance and firm performance. Regards to a statistical method to be applied relied on Thompson and Sharp (1999), *restricted maximum likelihood (REML)* is recommended to be applied for weighting the variance in terms of moderator analysis.

In short, this paper will implement REML for the model (1.1) and (1.2) to test for moderating effects and variance least square regression on *Stata Software* to examine temporal effects through model (2).

4. META-ANALYSIS OF RESULTS ON CORPORATE GOVERNANCE IN ASIA

4.1. Descriptive analysis

4.1.1. Traditional descriptive analysis

To achieve a general picture of the collected sample, a traditional descriptive summary analysis with variables of overall, SIZE, INDEP, DUAL, STATE OWN, MGT OWN, INST OWN, CG INDEX respectively is conducted that includes beta coefficient mean, 1st and 3rd quartile and median figures. Also, the percentage over total studies concluding positive, negative and insignificant result are measured.

Table 2. Descriptive analysis

	Overall	*SIZE*	*INDEP*	*DUAL*	*STATE_OWN*	*MGT_OWN*	*INST_OWN*	*CG_INDEX*
Beta Coefficient (Mean)	0.02	0.05	-0.19	0.10	-0.05	-0.28	0.17	0.77
1st quatile	-0.06	-0.02	-0.18	-0.01	-0.07	0.00	0.00	0.01
Median	0.01	0.01	0.00	0.05	-0.02	0.00	0.01	0.15
3rd quartile	0.11	0.13	0.17	0.17	0.01	0.02	0.08	1.42
# positive coefficient	71	9	16	8	5	4	16	13
% of positive coefficient on total studies	28.29%	16.98%	28.57%	22.86%	17.86%	13.79%	47.06%	81.25%
# of negative coefficient	26	3	4	1	7	7	4	0
% of negative coefficient on total studies	10.36%	5.66%	7.14%	2.86%	25.00%	24.14%	11.76%	0.00%
# of insignificant coefficient	154	41	36	26	16	18	14	3
% of insignificant coefficient on total studies	61.35%	77.36%	64.29%	74.29%	57.14%	62.07%	41.18%	18.75%
Total studies	251	53	56	35	28	29	34	16

The traditional descriptive analysis may yet provide potential findings on the concerning topic, it can also probably be biased and thus, it is difficult to sum up generally determined conclusions. The source of the problem mainly due to the fact that this paper applies meta-analysis. In detail, a meta-research will combine different researches with diversified characteristics such as sample scale, econometric techniques, the model used and so forth, which induces potential heterogeneity.

Another descriptive of effect sizes, hence, is conducted in order to demonstrate more reliable results.

4.1.2. Descriptive analysis of effect sizes

As been discussed earlier in the methodology part, due to the probability of heterogeneity issues among studies, intermediate known as effect size is calculated based on partial correlation.

Table 3. Descriptive analysis of effect size

Independent Variables	*Calculation method*	*Number of studies*	*Mean*	*Standard Error*	*Confidence interval at 95%*
SIZE	Partial correlation	53	0.04	5.10	-1.37/ 1.45
	Unweighted ES	53	0.07	3.90	-1.01/ 1.14
	Unweighted ES (only significant studies)	12	0.25	2.00	-1.02/ 1.52
	ES (FEM with inverse variance)	53	1.92	0.00	1.92/ 1.92
	ES (REM with inverse variance)	53	0.06	0.24	0.00/ 0.13
INDEP	Mean correlation	56	0.05	4.60	-1.19/ 1.28
	Unweighted ES	56	0.05	4.28	-1.09/ 1.20
	Unweighted ES (only significant studies)	20	0.21	2.20	-0.82/ 1.24
	ES (FEM with inverse variance)	56	0.56	0.00	0.56/ 0.56
	ES (REM with inverse variance)	56	0.11	0.03	0.10/ 0.12
DUAL	Mean correlation	35	0.08	3.55	-1.14/ 1.30
	Unweighted ES	35	0.05	4.55	-1.51/ 1.61
	Unweighted ES (only significant studies)	9	0.00	14.98	-11.51/ 11.52
	ES (FEM with inverse variance)	35	0.53	0.00	0.53/ 0.53
	ES (REM with inverse variance)	35	0.04	0.19	-0.02/ 0.11
STATE_OWN	Mean correlation	28	-0.06	4.20	-1.69/ 1.57
	Unweighted ES	28	-0.07	3.87	-1.57/ 1.43
	Unweighted ES (only significant studies)	12	-0.11	3.03	-2.03/ 1.82
	ES (FEM with inverse variance)	28	-0.26	0.00	-0.26/ -0.26
	ES (REM with inverse variance)	28	-0.07	0.09	-0.11/ -0.04
MGT_OWN	Mean correlation	29	-0.06	4.12	-1.62/ 1.51
	Unweighted ES	29	-0.07	3.82	-1.52/ 1.39
	Unweighted ES (only significant studies)	11	-0.17	2.43	-1.80/ 1.46
	ES (FEM with inverse variance)	29	0.01	0.00	0.01/ 0.01
	ES (REM with inverse variance)	29	-0.06	0.01	-0.06/ -0.06
INST_OWN	Mean correlation	34	0.06	4.02	-1.34/ 1.47
	Unweighted ES	34	0.06	3.99	-1.33/ 1.45
	Unweighted ES (only significant studies)	20	0.13	2.82	-1.19/ 1.45
	ES (FEM with inverse variance)	34	-0.58	0.00	-0.58/ -0.58
	ES (REM with inverse variance)	34	0.07	0.12	0.03/ 0.11
CG_INDEX	Mean correlation	16	0.14	2.68	-1.29/ 1.57
	Unweighted ES	16	0.14	2.66	-1.27/ 1.56
	Unweighted ES (only significant studies)	13	0.18	2.38	-1.26/ 1.61
	ES (FEM with inverse variance)	16	0.24	0.00	0.24/ 0.24
	ES (REM with inverse variance)	16	0.19	0.03	0.17/ 0.20

4.2. HOMA results

4.2.1. Overview

To test the relationship between several corporate governance factors and firm performance, the collected data is synthesized and analyzed according to HOMA procedure based on partial correlation, which is demonstrated in the Table B.1 to B.3. As been discussed whether to apply the *Fixed Effect Model (FEM)* or *Random Effect Model (REM or Mixed Model)*, it is more preferable to manipulate the later one rather than the former. The paper, therefore, will test the previous hypothesis based on *Random Model*.

However, the descriptive analysis on effect size also induced certain predictors are likely to suitable for both methods so that data will be additionally applied HOMA procedure following FEM solely to provide further comparisons between two method's results but not to be officially used to conclude the hypothesis's consequences.

The tables report number of studies (K), observation figures (N) in terms of sample overall characteristics. Especially, meta-analytic mean (or mean of effect size) is indicated together with its standard errors, confidence interval at 95% level; moreover, Z-test is also recorded to support the paper to observe the previous hypothesis. However, due to the possible existence of heterogeneity problems among studies, Chi-squared Q test and I^2 scale-free index are proceeded. Whilst Table B.1 in Appendix B shows an overall relation of each criterion to the business's economical value, two other charts (B.2 and B.3) imply their particular relation to accounting performance and market performance valuation respectively.

4.2.2. Corporate governance and firm performance: hypothesis testing

Overall, four main variable groups can be extracted according to their sign and (in)significant conclusions which are shown in Table B.1 to B.3 in Appendix B. First of all, it is noticeable that the association between a company's performance with both board independence and corporate governance index experience an evidently positive signal.

Regarding board independence, it generally has a positive and significant relation to firm performance at a 5% significance level (with REM mean ES = 0.11, p-value of 0.00 < 0.05), which supports *H2*. Through investigate deeper into results according to accounting performance and market performance, the number of independent directors on board also affects positively on business's accounting value (positive mean of effect size and p-value = 0). Nevertheless, witnesses a negative mean ES and a zero p-value, Table B.3 indicates a negative relation between *INDEP* and market performance base. Overall, the independent director number on board positively and significantly influences on business performance as a whole but also experiences certain occasions having a negative sign.

Similarly, the corporate governance index has the same tendency of impacts on firm value as board independence. While *CG_INDEX* possesses a significantly positive mean around 0.19 (p = 0.00) in terms of the whole and market performance base, its relationship with the accounting base cannot be concluded with a negative or no impacts due to insignificant p-value (0.11). It is, therefore, can be concluded that *CG_INDEX* generally has positive effects on the firm's value and thus providing significant evidence in proof of *H7*.

On the other hand, there are a significant negative influence of management ownership (*MGT_OWN*) on most of the considered firm's value types (two over three examined groups). In specific, it is calculated that management ownership has negative mean ES ranging from -0.06 to -0.08 and all of its Z-tests show significant results with p-value smaller than 0.05 in terms of general and accounting base for company worth. As a result, it is significant enough to back for *H6* that there is a negative impact of management ownership on the company's value.

Furthermore, the third variable group including *INST_OWN* and *DUAL* experiences only one significant result in one of two sub-categories of financial performance: accounting and market-based. Therefore, it is difficult to lead in a general conclusion for testing hypothesis.

Regarding institutional ownership, the predictor does not have strong data in approving of a positive association with general firm performance (p-value = 0.28 > 0.05). Moreover, in terms of accounting base, Table B.2 reports an insignificant relation between *INST_OWN* due to a p-value of 0.5 (higher than 5% level of significance). Nevertheless, according to Table B.3, *INST_OWN* significantly and positively influences on market performance due to a positive mean ES (0.15) and small p-value (0.04). Hence, in general, the collected data does not support *H5* (i.e., institutional ownership possesses an *insignificant* effect on firm performance).

Similar to CEO duality, considerable differences are explored among its p-values. Whereas the value in the Z-test in terms of overall and accounting performance is fairly high with 0.41 and 0.32 (insignificant) respectively, that value for the market base solely stands at 0.00 (significant). Hence, the findings are unable to prove for *H3: CEO duality positively affects firm performance.*

It is notable that although two predictors in the third group possess different sign of relation, they are all recorded as significance while analyses solely market value indicators such as Tobin's q or Market-to-Book value. In fact, those metrics normally have a higher range as compared to accounting ones (ROA, ROE, etc.) and hence, it can probably result in this situation. Also, it can possibly imply that those criteria may impact more or mainly on market performance. Based on the above analysis, this paper would recommend another researcher could consider working specialized on these interactions further.

Last but not least, there is insignificant influence of board size and state ownership on entirely considered firm's value types. In detail, Table B.1 to B.3 show an insignificant p-value of *SIZE* ranges around 0.36 in all performance types. As a result, there is not enough statistical evidence to

prove that board size affects positively on firm performance (Reject *H1*).

Regarding state ownership predictor, it witnessed the same picture in comparison with board size. STATE_OWN is reported with a relatively similar p-value (approximately 0.23) in general and accounting measurement. Especially, while considering market metrics, this figure jumps to almost double (p = 0.43). In general, *H4* is not significantly proved, which means there is not enough statistical evidence to conclude a negative relation between firm performance and STATE_OWN.

Regarding Chi-squared Q test and scale-free index I^2, according to BMC Medical Research Methodology, there probably exists bias results as interpret Q test I^2 due to small scale meta-analysis. Indeed, regarding accounting performance, *CG_INDEX* witnessed a distinguished I^2 of over 350 points, which matches an example in BMC's research. In particular, BMC stated that the index could get extremely negative in case the number of sample size is relatively small. As a result, this paper suggests a more conservative perspective while concluding about those metrics and thus interprets solely results of overall firm performance.

As been illustrated in Table B.1, in Fixed effect model, the entire of seven predictors experience significant Q test p-value, i.e., these variables possibly have heterogeneity among their sample size. On the other hand, just board size and management ownership are reported in REM to be not homogeneity (p-value = 0.00 < 5%).

In conclusion, through apply the HOMA procedure to test *H1* to *H7* (as stated in the hypothesis development section), there are some remarkable notes on the relationship between corporate governance and firm performance.

Hypothesis testing on the impacts of corporate governance on firm performance (at 5% level of significance):

- *Hypothesis 2, 6* and *7* are significantly statistically evidenced;
- Board independence and corporate governance index significantly positively affect firm performance;
- Management ownership significantly negatively influences on business value.

4.2.3. Comparison of FEM and REM

Based on three tables (Table B.1 to B.3), Table 4 is synthesized to offer a more simple way to compare hypothesis results following *Fixed Effect Model* (FEM) and *Random Effect* Model (REM). Table 4 recorded sign of significant relationships with positive (+) or negative (-) link but also insignificant associations (~) at a 5% level of significance.

Table 4. Comparison hypothesis results of FEM and REM

	Firm performance		*Accounting performance*		*Market performance*	
	FEM	REM	FEM	REM	FEM	REM
CG_INDEX	+	+	+	~	+	+
INDEP	+	+	+	+	-	-
MGT_OWN	+	-	+	-	-	~
DUAL	+	~	+	~	+	+
INST_OWN	-	~	+	~	+	+
STATE_OWN	-	~	-	~	+	~
SIZE	+	~	+	~	-	~

The table demonstrates that except for *CG_INDEX* and *INDEP*, most of the predictors (5 over 7) have distinguished results in FEM and REM. In fact, Fixed model is a fairly simple prototype to apply and especially among cases that are lack of needed data to use *REM* or restriction of time. Therefore, it is meaningful if other researchers could analysis on both models to explore whether *Fixed Model* could be an acceptable model to apply with certain predictors in not only corporate governance topic (Asia in specific) but also other fields.

4.3. MARA results

4.3.1. Moderating Effects

Moderator analysis plays a considerable role in finding sources of heterogeneity as well as discover factors affecting the main studied relations. Formerly discussed in methodology, unweighted effect sizes are selected as a dependent variable and the paper analyzes two sub-groups in each model corresponding to model (1.1) and (1.2) as stated.

Whereas the first category focuses mainly on study characteristics, the other not only takes account of study characteristics but also considers whether the sample's collected data is before or after the economic crisis event in Asia *(d_2009)*. The Table 5 (Part 1 and Part 2) below shows the results on moderator analysis.

Table 5. Moderating analysis on the relationship between corporate governance and firm performance
(Part 1)

	Model 1: SIZE – Firm performance			Model 2: INDEP – Firm performance			Model 3: DUAL – Firm performance			Model 4: INST_OWN – Firm performance		
	(1.1)	*(1.2)*	*Max VIF*	*(1.1)*	*(1.2)*	*Max VIF*	*(1.1)*	*(1.2)*	*Max VIF*	*(1.1)*	*(1.2)*	*Max VIF*
d_perform	-0.13 (0.26)	-0.13 (0.30)	1.27	-0.11 (0.06)	-0.09 (0.14)	1.2	0.01 (0.97)	-0.00 (0.98)	1.37	0.16 (0.09)	0.16 (0.09)	1.15
d_panel	-0.15 (0.22)	-0.15 (0.24)	1.21	-0.01 (0.82)	-0.03 (0.68)	1.15	0.09 (0.61)	0.10 (0.61)	1.17	0.02 (0.85)	0.04 (0.78)	1.25
d_endo	-0.01 (0.93)	-0.01 (0.93)	1.02	-0.10 (0.08)	-0.10 (0.07)	1.02	0.09 (0.60)	0.10 (0.59)	1.13	0.07 (0.45)	0.07 (0.49)	1.11
d_2009		0.00 (0.99)	1.16		-0.08 (0.45)	1.17		0.03 (0.91)	1.29		0.03 (0.76)	1.19
Constant	0.21* (0.05)	0.21* (0.05)		0.15* (0.01)	0.16* (0.00)		-0,04 (0.78)	-0,05 (0.76)		-0.07 (0.61)	-0.09 (0.57)	
p-value	0.25	0.4		0.09	0.13		0.92	0.97		0.39	0.55	

*Notes: * significant at 5% level*

Table 5. Moderating analysis on the relationship between corporate governance and firm performance
(Part 2)

	Model 5: STATE_OWN - Firm performance			Model 6: MGT_OWN - Firm performance			Model 7: CG_INDEX- Firm performance		
	(1.1)	*(1.2)*	*Max VIF*	*(1.1)*	*(1.2)*	*Max VIF*	*(1.1)*	*(1.2)*	*Max VIF*
d_perform	0.15* (0.05)	0.16 (0.07)	1.19	0.06 (0.51)	0.10 (0.34)	1.33	-0.12 (0.15)	-0.12 (0.16)	1.12
d_panel	0.06 (0.57)	0.05 (0.66)	1.09	-0.14 (0.13)	-0.19 (0.08)	1.39	-0.15 (0.16)	-0.16 (0.17)	2.12
d_endo	0.25* (0.00)	0.23* (0.01)	1.24	0.02 (0.78)	-0.01 (0.89)	1.35	-0.09 (0.50)	-0.09 (0.52)	1.75
d_2009		0.06 (0.63)	1.36		0.13 (0.37)	1.7		0.03 (0.73)	1.25
Constant	-0.33* (0.01)	-0.32* (0.02)		-0.01 (0.95)	0.01 (0.91)		0.35* (0.01)	0.35* (0.01)	
p-value	0.02	0.05		0.46	0.5		0.36	0.54	

*Notes: * significant at 5% level*

Overall, considering p-value of the entire model's sub-groups, with a 5% level of significance, the category concerning only study characteristics is possibly better significant than group including *d_2009*. However, the Table 5 indicated that only the relation between *STATE_OWN* and firm performance is significantly affected by tested variables (p-value = 0.02 and 0.05 for group one and two respectively).

Further details on group 1 of *Model 5* shows a significant and positive link of *d_perform* and *d_endo* on the effect sizes covering the impact of *STATE_OWN* on corporate value (coefficient = 0.15; p-value = 0.05). Particularly, studies on firm performance and several topics normally utilize accounting or market-based, which is not differentiate in governance researches. This meta-regression investigates that papers, which used market-based indicator, have higher effect size than those applying accounting one.

Similarly, the methodology model that studies used affect positively on the relationship between corporate governance and firm performance in both sub-groups of *Model 5* (p-value of 0.00 and 0.01 for category one and two correspondingly). It implies that there is a significant difference ES results based on whether sample applied endogeneity restricted tests (such as 2SLS, 3SLS and so on) or not. Also, Table 5 (Part 2) describes that the former method option caused by higher ES as compared to the later model.

On the other hand, the dummy expresses data types, *d_panel* (cross-sectional or panel data) and collected sample size before or after the crisis

(*d_2009*) show no significant effects on moderating the link between governance and firm performance as a whole.

Furthermore, in order to test whether moderator variables have a correlation to each other, variance inflation factors (VIF) are computed and reported max VIF in both sub-groups in Table 5. Overall, VIF of all covariate variables in entire models are relatively small (under 2.5). As a result, studied moderator factors do not experience multicollinearity issues.

In short, it can be induced that performance base and examined models are potential sources of the heterogeneity among studies concern the association of governance and corporate value.

4.3.2. Temporal Effects

As mentioned previously, there is a high demand for researches concerning with corporate governance issue in Asia. Especially, the fact that most of the Asian nations develop later than other continents such as the United States, the United Kingdom or European countries, so that Asian recently face with increasingly differences in the business environment. Therefore, in addition to examine the direction and significant status in governance's connection with firm performance, it is probably a necessity to have certain studies on how the governance's relation to corporate value has changed through time.

As a result, MARA procedure is executed, in which partial correlations are treated as a dependent variable and several dummy and substantially the

median year variable are selected for being predictors. Furthermore, matching with the above studies on the relationship between various categories to firm performance, the paper examined seven models in correspondence to seven chosen governance criteria. Table C.1 in Appendix C below describes the results in detail.

Overall, a majority of seven models are likely to change significantly through the period, which is fairly consistent with the current development stage of Asia: Transformation phase. Indeed, as mentioned in Asian Roundtable (CFA Institute, 2019), because the region is in a fast-growing phase, its countries are not able to form suitable business mechanism regulations to raise the economy in an optimistic direction. There are, in particular, four relationships witnessed a significant divergence over time: *Model 1, 2, 4 and 5.*

As been illustrated in the Table C.1, *Model 1* shows that the median year figure is remarkably negative (p-value = 0 < 0.05). Therefore, it is evidential to state that the connection between the number of directors on board and corporate value were decreasing over the sampling period. Similarly, the relation of board independence and firm performance is reported to become more negative through time. In detail, *Model 2* has a negative and significant coefficient (-0.05 at p-value = 0.00).

On the other hand, models covering state and institutional ownership's impacts on business worth express positively significant change. Particularly, both models have zero p-value in accordance with a positive coefficient (0.06 and 0.03 corresponding to *STATE_OWN* and *INST_OWN*'s correlation to firm performance). As a result, it can be concluded that those two ownership factors increasingly positively influenced corporate's results.

To sum up, through the sampling period of collected papers' data (2000 to 2014), several business mechanism dimensions had changed significantly, which means for considerable temporal effects. In detail, whereas it is witnessed a decreasing trend on the link between board structure (*SIZE and INDEP*) to firm performance, the association of organizational value and ownership concentrations (*STATE_OWN* and *INST_OWN*) is rising over time.

5. CONCLUSION

It has been inspired by both literature and practical researchers, this meta-analysis was conducted in order to offer a more systematic overview of the corporate governance and firm performance in Asia.

Particularly, through hypothesis testing, the paper proved that *'good' corporate governance may generally enhance firm performance (CG_INDEX)*. Regarding specific governance criteria, outside directors are investigated to result in better business value, which induces a similar scenario in Asia context in comparison with global governance trend (Farient Advisors in conjunction with the Global Governance and Executive Compensation Group – GECN, 2018). On the opposite side, it is significantly evidenced that the higher the ownership amount owned by CEO, top executives and board members, the lower the corporate value is especially in terms of accounting results.

Moreover, this paper has yielded distinctive insights regarding investigating whether the link between corporate governance and organization performance varies over time in terms of Asian countries.

In detail, a majority of covered relationships are suggested to change through studies' sampling period. Whereas the link of ownership types – firm performance (state and institutional ownership) witnessed an increasing tendency over time, board structure – firm performance seems to have a vice versa implication.

It is remarkable at two points: first, according to Farient advisors, institutional ownership is a higher development level in accordance with stronger governance. Therefore, the increase in the association of institutional and corporate value expresses a growth in governance and firm performance. Secondly, as mentioned formerly, independent directors help improve corporate value, however, through the temporal effect test, it is noted that this relationship has declined through time or, i.e., having a decreasing trend. Nevertheless, both groups of time impacts shown significant but minor coefficient, which shows that the changing trend is considerable but relatively small as time flew.

Regarding the moderator analysis, only the relation between state ownership and business value shows many significant figures. In detail, it is recommended that this connection is moderated considerably by the calculation method that the studies used. If regression methods concerning about endogeneity bias are applied, the studied relationship would be affected positively, which is similar to measurement base selection. From another perspective to these findings, it is probable that sample studies may differ in terms of defining select market or accounting performance base and designating regression methodology to examine their models.

In short, there are three main insights that the study has raised covering the topic: corporate governance and firm performance in Asia. First of all, statistical pieces of evidence on the relationship are provided with three significant results in the overall index, board independence, and management ownership. Besides, *d_econ* (i.e., whether a sample study utilizes regression method concerning endogeneity dilemmas among data or not) considerably moderates the association. Moreover, meta-analytical regression is also applied to induce several temporal effects among selected links.

Practical applications. The above findings not only contribute statistical evidence to the literature world but also suggest potential practical exercises in the business' world especially for policymakers.

Since been established in 1999, OCED Roundtable in Asia region has mentioned corporate governance issues as well as suggestions on improving governance. In addition to that, individual Asian nations also concern about this topic that they develop business regulations and articles covering corporate governance such as Vietnamese Decree 71/2017 on corporate governance of public joint-stock companies or Indian Companies Act, 2013 related to board constitution, independent directors, etc.

Indeed, through examine CG_INDEX variable, 'good' governance is statistically proved for

improving corporate performance as a whole picture. Hence, Asian countries seem to have put efforts into the right place and should investigate deeper into corporate governance dilemmas due to its significantly positive impacts on firm performance. In fact, this study delivers a distinguished finding on the relation to policymakers due to its systematic nature. As a result, for people who formulate policies, it is possibly valuable to possess statistical results on the whole structure rather than a small or restricted sample scale.

However, whereas having a general picture of 'good' governance's benefits to business values, the problem becomes making a decision on which governance dimensions regarding the features that should be more focused on. Fortunately, based on HOMA results as well as temporal effects analysis on separated criteria of corporate governance, this paper can probably propose the second helpful findings for policymakers: potential dimensions to be enhanced.

Particularly, previous tests in the paper indicated that besides an overall metric (CG_INDEX), more independent directors or outside directors raise firm performance. Nevertheless, according to the analysis on time impacts, this association declines over the period, however, it does not directly imply that more outside directors will decrease corporate's value in the future. Indeed, it can simply suggest that although the relationship between INDEP and firm performance is positive (which is parallel with HOMA results), its effect sizes were lessened over the sampling period.

Hence, Asian nations are recommended to notice more on governance related to independent directors in accordance with analyzing the trends over the world and Asia in specific to conduct suitable laws. Asian countries, for example, could consider regulations defining a minimum number of outside directors on a board. Additionally, the business value is statistically investigated to be higher as a decrease management ownership amount. Thus, this meta-analysis suggests that to some extent, managerial incentives through offer managers share amount does not result in their good performance on behalf of shareholders.

Furthermore, as analyzed formerly, whereas state ownership potentially has negative impacts on business' market performance (a huge issue among various Asian countries due to their reforming stage – Asian Development Bank, 2018), institutional ownership probably experiences a contrasting picture. Accompanied by that, their links with firm performance are proved to increase through the sample's period. Therefore, Asian nations could consider promoting institutional ownership proportion whereas decline state ownership to an appropriate level that is significant enough to enhance firm performance.

In short, this meta-analysis advises policy creators what are potential dimensions regarding corporate governance for improving business' value to be focused on while design national regulations.

Limitation and future research. Several findings and applications could be induced from this meta-analysis as discussed, however, there are yet various constraints in the paper. First of all, the studies sample pool regarding the corporate governance

index is relatively in small-scale (16 studies) as compared to other explanatory variables (more than 28 researches) due to the time limitation on conducting the study. It can, therefore, possibly result in bias while analyzing further in terms of accounting and market-based performance relationship, which exists in this meta-analysis. Hence, to build more conservative and meaningful results on this association, other scholars are recommended to gather more studies working on the link between the index and firm performance.

Moreover, regarding HOMA results, this paper solely raised an overall of the distinguished between two main performance bases: accounting and market. Indeed, it is possibly a more significant relationship results on the later rather than the former. However, due to the small sample size on certain variables for each valuation method especially the market-based, interpretations of their differences may not be trustable totally. As a result, other researchers are suggested to investigate a further comparison between two main performance categories: accounting and market on the basis of sufficient data.

Besides, according to Ancona, Goodman, Lawrence, and Tushman (2001, p. 647), it is hard to study on temporal impacts. Indeed, this analysis is recently conducted on the basis of moderator analysis, however, for more complex situations, there is a lack of appropriate methodology to solve the issue. It is, thus, proposed to explore further suitable tests for temporal effects.

Furthermore, although the findings of moderator analysis have mentioned a potential source of heterogeneity such as its testing methods concern with endogeneity problems or not, the model does not have many significant results. Therefore, a further meta-analysis could modify the model with more diversified independent variables to discover deeper.

Last but not least, the whole paper has worked solely on Asia but given none of the comparison between its sub-region groups. As a result, it is probably to gain interesting insights while dividing Asian countries into smaller categories such as South-East Asia or Asian emerging countries and so forth.

In conclusion, meta-analysis is selected as the main approach in this paper while studying the relationship between corporate governance on firm performance in Asia. In particular, the research has applied both Hedges and Olkin Meta-Analysis (HOMA) and Meta-Analytical Regression Analysis (MARA) procedures to test for hypothesis testing, moderator analysis and inspection of temporal effects.

Generally, it is statistically supportive that good corporate governance will enhance firm performance. Moreover, several dimensions are also studied to offer suggestions on how is good governance. It is remarkable that factors significantly contributing to an 'ideal' administration are having independent directors and not abusing managerial incentives in terms of management ownership.

Furthermore, the paper has investigated a potential reason for heterogeneity dilemmas among sample studies is researches' used methodology. Particularly, a utilization of methods concerning

endogeneity issues such as two-stage least squares or three-stage least squares may lead to higher results in the interested relationship.

On the one hand, there is a variety of findings and applications that are provided through this study. It also, on the other hand, possesses limitations due to the constraint of time and is accessible to more diversified data sources for executing the paper. Therefore, other scholars are recommended to conduct further examinations in order to give a widen view on the topic in terms of meta-analysis studies.

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APPENDIX A

Table A.1. Variable definition and measurements

No.	Predictor	Symbol	Description	Measurement	Number of study	Total number of study
I. Independent Variables						
1	Board Size	SIZE	Board size is the number of directors on a board	The number of all board directors	12	53
				The natural logarithm of total number of directors on the board	41	
2	Board Independence	INDEP	Independent is defined as one who "has no direct or indirect material relationship with the Company other than membership on the board" (IFC - World Bank Group)	The ratio of the number of independent directors to the number of all directors	51	56
				If more than one-third of the members on the board are independent directors (dummy)	4	
				If the board is dominated (larger than 50%) by independent directors (dummy)	1	
3	CEO Duality	DUAL	CEO Duality means the Chairman of the board also sits the position CEO	If the CEO is also the chair person of the board (dummy)	35	35
4	State Ownership	STATE_OWN	State ownership is defined as ownership that government or its agencies possess in a corporate (Le and O'Brien, 2010)	Percentage of state shareholdings to total share amount	16	28
				If the firm's ultimate owner is directly or indirectly controlled by government (dummy)	12	
5	Institutional Ownership	INST_OWN	Institutional ownership represents the amount of company's shares that are held by institution investors	Percentage of institutional shareholdings to total share amount	34	34
6	Management Ownership	MGT_OWN	Management ownership means share amount of executives in the company	The proportion of a firm's total number of outstanding shares held by directors and executive officers	26	29
				The log of shareholding by the top three most highly paid executives or directors	3	
7	Corporate Governance Index	CG_INDEX	Corporate governance index is the metric measures mechanism level of a firm as a whole through combine several dimensions of business administration features	Unweighted corporate governance index score	16	16
II. Dependent Variables						
8	Accounting Performance	ACC	Financial performance metrics of a firm that are expressed as accounting-based measurements	Return on Equity (ROE)	24	138
				Return on Assets (ROA)	105	
				Profit after tax (PAT)	9	
9	Market-based performance	MKT	Financial performance metrics of a firm that are expressed as market-based measurements	Tobin's q	101	113
				Adjusted Tobin's q	1	
				Market-to-Book value	11	

APPENDIX B

Table B.1. HOMA results: Corporate governance and firm performance

Predictor	K	N	Mean ES	SE	CI 95%	Z test (p-value)
SIZE	53	4,194	0.06	0.24	0.00/ 0.13	0.27 (0.39)
INDEP	56	31,337	0.11	0.03	0.10/ 0.12	3.38* (0.00)
DUAL	35	21,935	0.04	0.19	-0.02/ 0.11	0.23 (0.41)
STATE_OWN	28	35,599	-0.07	0.09	-0.11/ -0.04	-0.78 (0.22)
INST_OWN	34	35,673	0.07	0.12	0.03/ 0.11	0.59 (0.28)
MGT_OWN	29	14,298	-0.06	0.01	-0.06/ -0.06	-10.59* (0.00)
CG_INDEX	16	3,492	0.19	0.03	0.17/ 0.20	6.12* (0.00)

*Notes: * significant at 5% level*

Table B.2. HOMA results: Corporate governance and accounting performance

Predictor	K	N	Mean ES	SE	CI 95%	Z test (p-value)
SIZE	29	2,232	0.15	0.31	0.03/ 0.26	0.47 (0.32)
INDEP	32	10,924	0.16	0.04	0.15/ 0.17	4.27* (0.00)
DUAL	20	7,852	0.12	0.25	0.00/ 0.23	0.46 (0.32)
STATE_OWN	17	18,887	-0.07	0.10	-0.12/ -0.02	-0.72 (0.24)
INST_OWN	18	15,789	0.00	0.12	-0.06/ 0.06	-0.01 (0.50)
MGT_OWN	18	6,731	-0.08	0.01	-0.09/ -0.08	-12.07* (0.00)
CG_INDEX	4	489	0.28	0.23	-0.08/ 0.65	1.23 (0.11)

*Notes: * significant at 5% level*

Table B.3. HOMA results: Corporate governance and market performance

Predictor	K	N	Mean ES	SE	CI 95%	Z test (p-value)
SIZE	24	1,962	-0.04	0.11	-0.09/ 0.00	-0.39 (0.35)
INDEP	24	20,413	-0.04	0.01	-0.04/ -0.03	-3.95* (0.00)
DUAL	15	14,083	0.06	0.02	0.05/ 0.07	3.14* (0.00)
STATE_OWN	11	16,712	0.00	0.01	-0.12/ -0.10	-0.18 (0.43)
INST_OWN	16	19,884	0.15	0.09	0.11/ 0.20	1.78* (0.04)
MGT_OWN	11	7,567	-0.01	0.02	-0.02/ 0.00	-0.51 (0.31)
CG_INDEX	12	3,003	0.18	0.03	0.16/ 0.20	5.65* (0.00)

*Notes: * significant at 5% level*

APPENDIX C

Table C.1. Result of Mixed-Effect WLS Regression for Temporal Effects

	Model 1 SIZE – Firm Performance	Model 2 INDEP – Firm Performance	Model 3 DUAL – Firm Performance	Model 4 STATE_OWN – Firm Performance	Model 5 INST_OWN – Firm Performance	Model 6 MGT_OWN – Firm Performance	Model 7 CG_INDEX – Firm Performance
Constant	49.54* (0.00)	103.35* (0.00)	-13.53 (0.58)	-126.79* (0.00)	-63.79* (0.00)	488.74 (0.15)	44.35 (0.73)
d_perform	-0.01* (0.00)	-0.08* (0.00)	0.02 (0.20)	0.12* (0.00)	0.01 (0.52)	-0.07* (0.00)	-0.04 (0.75)
d_panel	0.21* (0.00)	0.28* (0.00)	-0.24* (0.00)	0.02 (0.34)	0.23* (0.00)	-0.07 (0.46)	-0.08 (0.63)
d_endo	-0.02* (0.00)	-0.00 (0.65)	-0.00 (0.77)	0.23* (0.00)	0.15* (0.00)	-0.21 (0.22)	-0.09* (0.04)
d_2009	0.34* (0.00)	0.41* (0.00)	-0.22* (0.00)	-0.34* (0.00)	-0.39* (0.00)	1.28 (0.24)	0.28 (0.62)
Median year	-0.03* (0.00)	-0.05* (0.00)	0.01 (0.58)	0.06* (0.00)	0.03* (0.00)	-0.24 (0.15)	-0.02 (0.73)
Goodness of fit Chi squared	1,332.68	268.89	5.03	4.84	13.25	-	-
p-value (model)	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*

*Notes: * significant at 5% level*