Disentangling the Relationship between Ownership Concentration and Firm Performance in Emerging Markets: A Meta-Analysis

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Abstract

The relation between ownership concentration and firm performance has attracted much interest, yet yielded many inconsistent empirical results. It is still not known that whether there exists a common population correlation between ownership concentration and firm performance in countries with similar ownership structures and institutional environments, and what contribute to the conflicting empirical findings. Using meta-analysis, we construct a comprehensive database of 313 correlations and their corresponding study characteristics obtained from 27 primary studies, which investigate the relation between ownership concentration and firm performance in emerging markets. We first assess whether there is a homogeneous ownership concentration-performance correlation, and then use meta-regressions to investigate factors that may moderate the correlation.

Although the aggregated statistics suggest a modest positive relation between ownership concentration and firm performance, our homogeneity test rejects the

hypothesis of a homogenous relation between ownership concentration and firm performance in emerging countries. We use a set of meta-regression models to further explore the sources of heterogeneity of empirical results of primary studies, which generating generally consistent results. Our results indicate that study characteristics are sufficient to explain a large portion of the heterogeneity of results in our sample. Differences within- and between-regions, sample selection, (under)specification of models contribute to the heterogeneity of empirical findings. We find evidence of publication bias due to the selective publication of papers with statistically significant results. Our findings reveal that using fixed effects model to control for endogeneity generate a stronger a relationship, countering the widely used argument that the relation between ownership structure and firm performance will diminish after controlling for endogeneity. On the other hand, studies using instrumental variable approach to control for endegeneity do not report different results. Our findings highlights the need to appropriately tackle model misspecification and endogeneity problems in corporate governance area, and to further explore theoretically and empirically the factors that drive either country divergence or convergence regarding to the relation between ownership concentration and firm performance in countries that share similar governance environment.

Keywords: meta-analysis, ownership structure, ownership concentration, performance, emerging markets

1. Introduction

Concentrated ownership is a common phenomenon in emerging markets, which has persisted despite decades of economic reform and privatization.[1] The literature contains abundant studies of the relation between concentrated ownership and firm performance in emerging markets, but they yield conflicting results. It is not known if these heterogeneous empirical results merely stem from sampling error, and there exists a common population correlation between ownership concentration and firm performance in countries with similar ownership structures and institutional environments. If this is not the case, what factors contribute to the heterogeneous relations and how they influence the estimates of empirical studies? The meta-analysis presented in this paper addresses these questions.

Concentrated ownership potentially has both merits and detriments regarding to firm performance. Through concentrated ownership, large shareholders may have more incentives and power to monitor managers (Shleifer & Vishny, 1986, 1997; Stiglitz, 1999) or even to exert direct influence on management (Shleifer & Vishny, 1986), thus alleviating some agency problems (Berle & Means, 1932; Jensen & Meckling, 1976) and the potential for managerial free riders (Grossman & Hart, 1980) that are detrimental to firm performance. Furthermore, concentrated ownership can better protect shareholder interests when a country's legal system is relatively weak (La Porta et al., 1999), as is the case in most emerging markets. On this basis, a

positive relationship between concentrated ownership and firm performance is expected.

However, concentrated ownership may create a different principal - agent problem, i.e., the interest conflicts between the controlling shareholder and minority shareholders (Hansmann & Kraakman, 2004), and thus having a negative effect on firm performance. Concentrated ownership may facilitate large shareholders' extraction of substantial private benefits of control at the expense of minority shareholders (Barclay & Holderness, 1989), especially when their control rights are significantly in excess of their cash flow rights (Shleifer & Vishny, 1997; La Porta et al., 1999; Claessens et al., 1999b, 2000, 2002). In emerging markets, weaker external control mechanisms (equity and debt) and less developed institutions (Williamson, 1991; Peng & Heath, 1996; La Porta et al., 1999; Dharwadkar et al., 2000) may further exacerbate such expropriations by large shareholders.

On the other hand, Demsetz (1983) argues that ownership is an endogenous result of balancing various costs advantages and disadvantages in the process of maximizing the value of a firm, and thus ownership concentration and profit rate should be unrelated.

In addition to these conflicting theoretical predictions on the relationship between ownership concentration and firm performance, empirical evidence also

remains ambiguous. Although research on corporate governance in emerging markets is still at its early stage, evidence of the relationship between ownership concentration and firm performance has accumulated since the mid-1990s. The results, however, present highly conflicting evidence. For example, of the 27 single-country studies of the relation between concentrated ownership and firm performance we have retrieved, 3 identify a significant positive relationship, 1 finds out a significant negative relationship, 3 fail to find any significant relationship, and 20 report a mixed results, e.g., either significant positive, significant negative or no significant relationship, in a single country context.[2] The phenomenon that a vast majority of studies yield mixed results when investigate the relation in a single country context is beyond the capacity of theoretical explanation.

There is a long argument in literature that functional form (Morck et al., 1988), endogeneity problems (Demsetz & Lehn, 1983, 1985; Loderer & Martin, 1997; Demsetz & Villalonga, 2001), and sample selection, estimation methods and measures of performance (Demsetz & Villalonga, 2001) may be the potential candidates, other than theoretical factors, moderating the relationship between ownership structure and firm performance. We still have no systematic evidence, however, as to whether and how these factors moderate the relation, and whether other factors, such as country/region specific effects, model specification, publication status, contribute to the inconsistence of the empirical evidence. With the rapid expanded number of

individual studies, there is a need to integrate the large body of literature and understand the knowledge that lies in completed empirical studies.

Using meta-analysis, we first assess whether there is an underlying homogeneous association between ownership concentration and firm performance in emerging markets after adjusting for sampling errors, despite the apparently conflicting estimates. We then use meta-regressions to systematically investigate factors that may contribute to the heterogeneity of empirical evidence. Through integrating the diverse empirical findings and identifying moderators that have reliably affected research results regarding to the relationship between ownership and firm performance, we aims at explaining the inconsistencies and equivocation across empirical estimates, and highlighting fundamental differences or deficiencies in the popular approaches to testing the relation between ownership concentration and firm performance.

Meta-analysis is “the analysis of analyses”, i.e., using statistical method to analysize the results of primary studies for the purpose of integrating findings (Glass, 1976). The advantages of our meta-analytic approach is the use of statistical methods to organize and extract information from the diverse results of existing empirical studies to obtain unbiased generalizations, and avoid problems that pervade in traditional literature review and integration methods, such as reviewers’ private judgement and disposal, personal style and individual creativity (Jackson, 1978; Glass et al., 1981). Moreover, we clearly set the meta-analysis procedure, including

searching methods, sample selection, and models used, making the study replicable.

Meta-analysis has long been employed to integrate empirical findings in the areas of social, behavioral and health sciences, in which studies usually are conducted in an experimental context (Stanley et al., 2008). In our context, where studies explore multivariate relationships without the advantages of experimental design, using meta-analysis has some special challenges. In addition to multivariate relationships and the varying sets of independent variables across regressions which complicate the relationship between variables of interest, the employment of diversified and complicated estimation methods and various model specifications also add complications. Nonetheless, meta-regression analysis provides a means to investigate the complicated sources of biases in non-experimental empirical findings (Stanley & Jarrell, 1989, 1998).

The remainder of this paper is structured as follows. Section 2 presents the design of this meta-analysis. Section 3 describes the descriptive statistics and homogeneity test results. Section 4 develops hypothesized potential moderators that may influence the empirical findings regarding the relation between ownership concentration and firm performance, and presents the models used. The results of the regression tests are reported in section 5. Finally section 6 concludes the paper with an overview of findings, the study's implications, limitations and some directions for future research.

2. Method

Through integrating the empirical results of relevant literature, our primary goals are to find out whether there is a homogeneous relation between ownership and firm performance across emerging markets, and if not, what are the moderators and how they influence the empirical findings. To achieve these goals, the following process is used in this study: (1) identify relevant empirical studies, (2) code studies to extract data to represent empirical results and corresponding study characteristics from empirical studies, (3) use the empirical results collected from primary studies to compute partial correlation coefficient, an index termed as "effect size" in meta-analysis, which is used to quantify empirical findings of primary studies, (4) perform homogeneity test[3] on the partial correlation estimates to assess whether there is heterogeneity in the retrieved effect size distribution, and if homogeneity tests indicate excessive variation relative to sampling error, (5) then use meta-regressions to investigate the sources of heterogeneity.

2.1 Identification and selection of studies

We identify emerging markets using the S&P Emerging Market Database (EMDB), which classifies 36 countries as emerging markets[4]. This provides a larger set compared to the other major emerging markets index, Morgan Stanley Capital International Inc. Emerging Markets Index, which has 25 countries in its index.

A potential problem facing meta-analyses is that primary studies collected from the literature may be not a representative sample, i.e., they are a biased sample of all relevant studies. This typically occurs when meta-analyses examine only published studies, since the literature has well documented that the publication probability of a study may depends on its results, e.g., studies with statistical significant results are more likely to be published (Rosenthal, R. 1979; Duva & Tweedie, 2000; Scargle, 2000; Sutton et al, 2000). If a meta-analysis integrating only the identified published studies, it may generate biased findings (Sutton et al, 2000). Therefore, we strive to obtain a representative sample by using a set of searching strategies to exhaustively obtain all relevant studies, including both published and unpublished.

To identify relevant studies, we first searched literature databases, and identified papers listed in previous reviews and in the reference lists of each paper we obtained.[5] To increase the generalizability of the results of our meta-analysis, we followed Cooper (1989:37), starting our search with "the broadest possible conceptual definition". We use the following sets of keywords to search the databases: (ownership & performance & emerging market), (ownership & control), (ownership & firm value), (control & performance), and (large shareholder & performance). We also used the name of each of the 36 countries in the S&P emerging markets list for the following keywords searches: (ownership & performance & country name), (value & country name), and (ownership & country name). We then perused the titles and

abstracts of the retrieved papers and excluded those that are not empirical studies on emerging markets. This first process yielded an initial sample of 120 papers.

Next, we examined the full text of the 120 papers to check that they meet the following selection criteria:

(1) the paper is not an earlier version of another paper included in our initial sample;

(2) sampled firms in the study are publicly listed corporations. According to OECD, ownership concentration refers to "the extent to which shares of stock exchange listed companies are widely or narrowly (closely) held[6]", which means that ownership concentration is a concept relevant to listed firms. Restricting studies to those using listed companies, where most claim to follow international accounting standards, increases the expected comparability of the measures used across countries;

(3) the paper is an empirical study that measures ownership concentration and firm performance at firm level and investigates ownership concentration-performance relation by estimating regression(s) of firm performance on ownership concentration;[7] We adopt broad definition of "firm performance" and "ownership concentration" and do not confine the measures of these variables in regressions to some certain specific types;

(4) samples in the study are not limited to financial industries. We exclude such

studies because the valuation ratios for listed financial firms are incomparable to those of non-financial firms. We do not exclude studies include financial firms, so that we can investigate whether the inclusion of financial firms in a study's sample make its empirical results significantly different with those of studies excluding financial firms from their sample; and

(5) if the paper is a cross-country study, the countries it studied should fall into our list of emerging markets using EMDB classification. Otherwise it need to include country-specific regression results so that we can identify empirical results for emerging countries.

After applying the selection criteria, our final sample consists of 27 primary studies involving 313 regressions and covering 11 countries[8]. The final sample contains 15 refereed journal papers, 11 conference and working papers, and 1 PhD thesis.

2.2 Coding the studies

The study unit of our meta-analysis is regressions. The information retrieved from each of the 313 regressions in the 27 primary studies consists of two parts: empirical findings and their corresponding study characteristics. Empirical finding is a statistical representation of the empirical relationship between ownership concentration and firm performance. Variations in study characteristics are an

important potential source of heterogeneity for studies using multiple regression methods (Stanley, 1989; Lipsey & Wilson, 2001). We reduce potential biases of specification searches and model experimentation, which are threats to validity of meta-analysis (Stanley and Jarrell, 1998), by using a methods-description coding approach (Cooper, 1989: 70-71), in which we sought to exhaustively code the objective characteristics of each study.

We collected empirical results for 313 regression models. The case data for the empirical results is larger than the number of primary studies because, for studies using the same data, or subsets of the data, to run more than one regression with differences in model specification or measures of ownership concentration or firm performance, we retrieved relevant data for each regression.

To code all the relevant information, a comprehensive and flexible coding schema is needed. We first developed a draft of a coding manual, and tested by coding several randomly selected studies. We then revised the coding manual according to the problems encountered during the pilot testing. Because the model specifications are diverse, especially in terms of control variables, some crucial coding questions were notionally open-ended so that we could add additional measurement codes as encountered. These included the measures of ownership concentration and firm performance, types of sampled companies, estimation method, and method of controlling for endogeneity.

The main missing data situations we encountered were of three types. Some study report coefficients and hypothesis tests merely as “non-significant” or “significant” at some asserted level, say 0.05, without reporting the associated statistics[9]. In these cases, we adopted the conservative method of Cooper (1989:74) to assume a *p*-value of 0.5 (one-tailed) and correlation of zero for “non-significant” tests and a *p*-value at the relevant asserted minimum significant level for “significant” tests. Missing data also included undisclosed sample sizes for particular regressions. This occurs when a study reports additional regressions for subsets of its data. In this case, we successfully sought the missing data by contacting the authors. Some studies also fail to report the exact number of parameters estimated in their regressions, which prevents us from precisely measuring the degrees of freedom for these regressions. This typically occurred where industry dummies where used but not reported. Because the sample sizes of the primary studies are large, ranging from 71 to 5314 with a mean of 1349, this should not severely threaten the accuracy of correlations we estimate.

Some evident errors in the reports of primary studies, such as negative standard errors, were corrected when coding. In coding, we did not make a priori judgments regarding the types and categories of the measures of ownership concentration, performance and control variables used in primary studies. Each measure and control variable were coded according to their formulae. We exclude the control variables

used in primary studies that pertained to specific country context[10]. After the coding was completed, we tested for errors by comparing the summarized statistics of each variable and the logic relations between variables. Measures and variables were then combined into relevant categories according to their commonalities, yielding the final potential moderator variables to be investigated in meta-regression section.

2.3 Estimate effect size - partial correlation coefficient

We use the partial correlation coefficient r[11] as our effect size indicator. An advantage of using r as effect size estimate is that it yields a scalar-free measure with simplicity of practical interpretation, which will allow us to make meaningful comparisons across the studies (Rosenthal, 1991: 17-18). Also, it can indicate both direction and magnitude of relations (Lipsey & Wilson, 2001: 34-35).

Our estimations of r depend on the statistics reported in the various studies. For studies that report t statistics, we follow Green (2003: 101) by computing r thus:

$$r = \frac{t}{\sqrt{t^2 + df}} \tag{1}$$

where df is the residual degrees of freedom. When *t*-statistics are not reported, we compute *t* from the regression coefficient and standard error, or from the reported *p*-value.

For studies that report z statistics instead, we follow Rosenthal (1991: 25) by computing r thus:

$$r = \frac{z}{\sqrt{N}} \tag{2}$$

where N is the number of observations.

Although r has an asymptotic normal distribution, its sampling variance, which is needed in determining the inverse variance weight for testing the homogeneity of the effect sizes and for estimating a mixed-effects meta-regression model, depends on the unknown population of partial correlation coefficients ρ. For large values of $|\rho|$, the distribution of r sampled from the population is more skewed. Therefore, we transformed our effect size r into its corresponding Z_r value using Fishers' z-transformation to normalize the distribution of r and to render the variance of r independent of ρ (Hedges & Olkin, 1985: 226-228; Rosenthal, 1991: 21). The formula of Fishers' z-transformation is:

$$Z_r = \frac{1}{2}\log_e \frac{1+r}{1-r} \tag{3}$$

The variance of Z_r (Freund, Wilson & SA, 2006: 54-55, 105) is:

$$\frac{1}{n-q-3} \tag{4}$$

where n is sample size, q is the number of variables being held constant in the regressions of primary studies. When it is needed, we compute back to r from Z_r,

thus:

$$r = \frac{e^{2Zr} - 1}{e^{2Zr} + 1} \tag{5}$$

where *e* is the exponential function.

2.4 Testing the homogeneity of correlations

We test the homogeneity of correlations by testing whether the correlation estimates differ only due to sampling error, meaning there is a true correlation that is constatnt across the studies. Specifically, we use the Q test (Cochran, 1954; Lipsey & Wilson, 2001), which is the most frequently used hypothesis test for presence of heterogeneity. Viechtbauer (2007) shows that the Q test has sufficient power to detect heterogeneity when sample sizes of primary studies in meta-analysis are sufficiently large, which we show is the case for the primary studies in our meta-analysis. Viechtbauer (2007) also finds that, compared with other homogeneity tests, Q test controls best for the Type I error rate, especially when using the Fisher' transformation of r as the effect size measure.

We first compute the weighted mean effect size $\overline{Z_r}$ over k effect sizes thus:

$$\overline{Z_r} = \frac{\sum_{i}^{k}(w_i Z_{r,i})}{\sum_{i}^{k} w_i} \tag{6}$$

where $Z_{r,i}$ is individual effect size, i.e., the z-transforms of partial correlation coefficient r, for $i = 1$ to k effect sizes, w_i is the individual weight for $Z_{r,i}$. We follow Hedges and Olkin (1985) by using the inverse of variance of Z_r to account for the precision of estimates from the primary studies.

$\overline{Z_r}$ can inform us of the direction and magnitude of the averaged Z_r transformation of partial correlation between ownership concentration and firm performance, after accounting for the precision of the estimates. It is important to know, however, whether the various correlation estimates that are averaged into $\overline{Z_r}$ estimate the same population correlation. To test the homogeneity of r, we compute the Q statistic thus:

$$Q = \sum_{i}^{k} w_i (Z_{r,i} - \overline{Z_r})^2 \sim \chi^2_{(k-1)} \tag{7}$$

If the Q statistic exceeds a critical value from the chi-square distribution with $k-1$ degrees of freedom, the null hypothesis of homogeneity of the population correlations is then rejected; we then need to proceed to construct a suitable model to explore the sources of heterogeneity of r.

3. Descriptive statistics and homogeneity test results

Table 1 presents an overview of the primary studies and descriptive statistics of

the partial correlation coefficients, r, computed from their empirical findings. The sample studies cover the years 1989 to 2006. For 27 studies yielding the 313 regressions, the smallest provides 2 and the largest provides 28. The partial correlations between ownership concentration and firm performance range from -0.29 to 0.35, with positive mean 0.03 and median 0.04.

Table 1 here

Figure 1 shows that the distribution of the observations is quite symmetric and roughly normal. The resistant normality check and outlier identification (Hamilton, 1991) shows that only 2 mild outliers are presented and there is no presence of severe outlier. Since mild outliers are common in sample of any size (Hamilton, 1991), we do not exclude the 2 mild outliers from our sample.

Figure 1 here

Figure 2 is a time-series graph of the weighted mean partial correlation. The weighted mean effect size $\overline{Z_r}$ is computed first for each year using the inverse of its variance as the weight, and then is converted to the corresponding r. It shows that the time series is quite choppy, without any obvious trend over time, indicating that the heterogeneity of correlations is not contributed by year-varying effects.

Figure 2 here

Table 2 shows the heterogeneity of the estimates from the 27 primary studies. 74%

report mixed relationship in a single country context. The Q test of the pooled 313 regressions shows a high Q statistic of 2304.05, and the null hypothesis of homogeneity of the population correlations is rejected at the 1% level

[12]. Q tests of the estimates of each study further show the presence of significant within-study heterogeneity in 11 of the 27 studies. The within-study heterogeneity does not appear to be associated with the number of regressions within the study.

Table 2 here

Figure 3 presents a Galbraith plot (Galbraith, 1988), which plots the standardized Z_r against the reciprocal of its associated standard error. A large number of estimates lie outside the 95% boundaries of the overall correlation, providing a visual evidence of the amount of heterogeneity.

Figure 3 here

We further compute the intra-class correlation coefficient to explore the contribution of within-study heterogeneity and between-study heterogeneity to the total heterogeneity. The intra-class correlation coefficient measures the proportion of the total variance that is accounted for by between-cluster (each of the 27 primary studies is a cluster) rather than within-cluster variation (Gulliford et al., 2005). It is also a measure of the correlation among the individual observations within the

clusters (Rabe-Hesketh & Skrondal, 2005; Parker et al., 2005). When intraclass correlation coefficient is close to 0, it means that little of the variance can be explained by between-cluster variation, i.e., the within-cluster correlations are almost zero, and almost all of the variance is accounted for by within-cluster variation. The formula of intraclass correlation coefficient is:

$$ICC = \sigma_B^2 / (\sigma_B^2 + \sigma_W^2) \tag{8}$$

where ICC is intraclass correlation coefficient, σ_B^2 is the variance between studies, and σ_W^2 is the variance within the studies (Rabe-Hesketh & Skrondal, 2005).

Panel B of Table 2 shows that the resulting estimate of the intra-class correlation coefficient is 0.459, indicating that 45.9% of the total variance is caused by between-study variances, and the remaining 54.1% is arises from the within-study variance. Reflecting the high heterogeneity within studies, this indicates the importance of collecting all the relevant estimates from each study when exploring the source of heterogeneity. Nonetheless, the potential for correlation between observations within studies remains a concern when constructing meta-regression models.

4. Meta-regression model

Our main purpose here is to identify the sources of heterogeneity in the effect

sizes, and the relative contributions of the identified sources. We do this using a meta-regression model.

4.1 Sample selection

In meta-analysis, problems of dependent effect sizes are a major concern. Multiple effect sizes contribution by a single study is a major source of potential dependent effect size problems. Two methods are commonly used to dealing with this problem. One is to average effect sizes from a single study that contributes more than one effect size. However, this method underestimates the degree of heterogeneity (Cheung & Chan, 2004), and the average effect size is "conceptually ambiguous" when there are varying moderator variables within as well as across studies (Hunter, Schmidt & Jackson, 1982: 117-119). A previously common method is to discard effect size estimates for all but one in a single study. This obviously wastes information (Hedges & Olkin, 1985) and any decision procedure is susceptible to bias. The heterogeneity test of this study, reported in the previous section, provides evidence against these two methods of dealing with correlated effect sizes within a single study: it shows that heterogeneity exists in the pooled 313 estimates, and the within cluster variance contributes around half of the total variance. To better explore the heterogeneity sources, we use our full sample of 313 observations, while controlling for autocorrelation in our model estimation method.

Rosenthal (1991: 130-132) identifies two additional potential sources of problems of data dependence. One is that studies conducted by single research group may contribute dependent data. An examination of the full names of all authors of studies included in this meta-analysis indicated that this is not a problem in this study. Another potential source of dependent data is that studies may use the same samples. However, we argue that studies using the same dataset but conducted by different authors with different model specification are not a dependence problem because we control for countries and years when estimating the sensitivity of empirical estimates to model specifications (Stanley, 2002; Doucouliagos & Ulubasoglu, 2008).

4.2 Variables

4.2.1 Dependent variable

The dependent variable is Fisher's z transformation of partial correlation coefficient estimate r between ownership concentration and firm performance, as defined earlier.

4.2.2 Explanatory variables

We include a range of study characteristics as explanatory variables in our meta-regression, as listed in Table 2. These study characteristics are hypothesized as potential moderators that may moderate the relationship between ownership concentration and firm performance. These include (1) model specification, (2)

estimation methods, (3) sample selection, (4) measures of performance and ownership concentration, (5) publication status, and (6) region composition. All the explanatory variables are binary dummy variables, which take on value 1 if the control variable is included in the regression of primary studies, 0 otherwise. To make a meaningful statistical test for the dummy variables, a reasonable variation in the values of dummy variables is needed. Therefore, if a dummy variable has a frequency of less than 0.05 (or greater than 0.95), it is excluded in our meta-regression analysis. However, there are two exceptions to this arising from our research needs. One is in our preliminary models, the frequency of a country dummy may be less than 0.05; the other case is that in our formal model and robustness check models, although frequency of the variable *Least absolute deviation or Huber's M* in estimation method category is than 0.05, we still include it in the models to make a mutually exclusive and collectively exhaustive classification of estimation methods. But we do not rely our interpretation of regression results on variable *Least absolute deviation or Huber's M* because only one study use these method and thus the result of this variable may prone to the effect of specific study.

(1) Model specification

Model misspecification is an important potential source of heterogeneity of empirical results (Stanley & Jarrell, 1989). Model misspecification investigated in this study consists of two types: model underspecification by omitting important variables

and functional form misspecification.

A. Control for observable effects

Demsetz & Lehn (1985) and Himmelberg (1999) argue that a large number of firm characteristics and firm's contracting environment have an effect on the scope for managerial discretion, and ownership structure may be endogenously determined by these factors. In addition to ownership concentration, a wide range of firm specific characteristics may affect a firm's performance, such as financial structure (Grossman & Hart, 1982; Jensen, 1986; Stulz, 1990), Size (Hall & Weiss, 1967; Fama & French, 1995), age (Ang et al., 2000), liquidity (Lee, 2008), growth (Xu & Wang, 1997; Chen, 2001), asset structure (tangibility), capital intensity, and expenditure intensity (Himmelberg, 1999), and alternative control mechanism such as board structure and ownership identity (Agrawal & Knoeber, 1996). Furthermore, a firm's performance may be affected by industrial effects (Wernerfelt & Montgomery, 1988), and external contracting environment (Demsetz & Lehn, 1985; Himmelberg, 1999). Omitting these observable factors will result in a biased estimator of the coefficient parameter of the ownership concentration variable[13]. One method to tackle this problem is to include control variables in regression models to control for the effects of these observable factors.

In total there are 90 control variables are presented in the regressions of primary studies to control for the influence of factors other than ownership concentration on

firm performance[14], which might contribute to the variation of the correlations. We classified these various control variables into 19 groups according to their commonality. These 19 groups belong to the following three categories. For each group, we use a binary dummy variable that equal unity when it is controlled in a regression of primary studies. (1) Firm specific characteristics, including *Size*, *Age*, *Liquidity, Capital Intensity, Growth, Tangibility, Expenditure Intensity, Accounting Performance, Market Performance, Financial Structure, Board Structure, Shareholder Identity, Business Group, Discrepancy between Voting Right and Cash Flow Right.* (2) Industry-fixed effects (*Industry*) that are controlled for by using industry dummies in primary studies[15]. (3) External contracting environment, including *Year*, *Risk*, *Foreign Trade*, and *Macroeconomy.*

However, because the frequency of *Foreign Trade*, *Macroeconomy*, and *Discrepancy between Voting Right and Cash Flow Right* is less than 0.05, they are excluded from the meta-regressions. These exclusions leave 16 dummy variables being used to explore the influence of differences in control variables used (see Table 3 for the list)[16].

B. Functional form specification

It has been well documented that the specification of functional form of ownership may make a difference to ownership-performance relation (e.g. Mock et al., 1988; Mcconnell & Servaes, 1990, 1995), although there is no consistent evidence

about the nonlinear relation between ownership structure and firm performance (Denis and McConnell, 2003). Of the total sample 23% yielded from a regression that contains non-linear term of ownership concentration, making it achievable to examine the influence of the functional form of ownership concentration through a variable *Nonlinear*.

(2) Estimation methods

Since Demsetz (1983) and Demsetz and Lehn (1985) argued that ownership is endogenously determined, endogeneity problem has increasingly become a major concern in empirical studies of the relationship between ownership concentration and firm performance[17]. The endogeneity problem may result from measurement error of variables (Himmelberg et al., 1999; Earle et al., 2005), simultaneous causality that arises when ownership concentration is determined simultaneously with firm performance (Firth et al., 2002; Grosfeld, 2007), and omitted variables that may affect both ownership structure and firm performance (Himmelberg et al., 1999), such as entrepreneurial skills and managerial risk aversion (Yuan et al., 2008). In the presence of endogeneity, OLS estimation is biased and inconsistent.

As discussed earlier, to tackle omitted variables problem, one method is to use control variables in regression models to count for the confounding effects of observable effects. For omitted variable bias that results from unobserved effects, which is a major source of endogeneity, it can be eliminated or mitigated by using

fixed effects, first differencing, GMM, or 2SLS estimation methods; GMM and 2SLS can also be used to account for endogeneity resulting from simultaneous causality and measurement error (Wooldridge 2002, 2006).

There are three types of estimation methods used to account for endogeneity problems in the primary studies included in this meta-analysis, including 2SLS (Claessens & Djankov, 1999a; Kuznetsov & Muravyev, 2001; Firth et al., 2002; Na, 2002; Grosfeld, 2007; Yuan et al., 2008), GMM (Gursoy & Aydogan, 1998), and fixed effects (Bai et al., 2004; Earle, 2005; Joh, 2003; Lee 2008; Yuan et al., 2008).

However, the effects of correcting for endogeneity are mixed. For example, Firth et al. (2002) find that after controlling for endogeneity using 2SLS, ownership effect in OLS estimations disappears, while Claessens & Djankov (1999a) find that the effect of ownership concentration on firm performance are similar with and without the endogeneity correction. We include the variable *Endogeneity* to account for potential difference resulting from controlling these problems. We also investigate whether different types of method to controlling for endogeneity make a difference by using two dummy variables *Fixed effects* and *GMM or 2SLS*.

In addition to endogeneity problem, some studies (e.g., Claessens & Djankov, 1999a; Kuznetsov & Muravyev, 2001; Bai et al., 2004; Lee, 2008,) use random effects estimation method to account for unobservable effects that are assumed to be uncorrelated with explanatory variables, and account for the concern expressed by

some studies (e.g. Zhou, 2001) that ownership structure may have limited variations over time and thus the effects of ownership concentration on firm performance may not be captured by alternative models such as fixed effects model that removes time-invariant effects. There is no convincing support for this concern, however. For example, Claessens & Djankov (1999a) and Bai et al. (2004) obtain similar result when using both random effects and fixed effects estimation methods. Moreover, least absolute deviation regression and Huber's M estimation method are used by Lee (2008) to account for the effects of outliers. We use the a set of dummy variables, i.e., *Random effects, Fixed effects, GMM or 2SLS, Least absolute deviation or Huber's M* for non-OLS estimation methods, and use OLS estimation method as the base group to test whether the more sophisticated estimation methods produce research findings different to those obtained from OLS.

(3) Sample selection

A. Data year

Although the time-series graph of the weighted average partial correlations (see Figure 2) does not show time-varying effects of the correlation between ownership concentration and firm performance, there may be accumulated effects following important events. Because of potential environmental changes, including increased regulatory action, following the financial crises of the late 1990s, we use the dummy variable *2000s* to test whether the relation between ownership concentration and firm

performance has significantly changed from 2000 onwards.[18]

B. Types of sampled firms

It is well known that valuation ratios of firms in the financial sector are not comparable to those of non-financial firms due to differences in the regulatory requirements, accounting standards and interpretation of financial ratios. Consequently, most of the primary studies excluded financial firms from their sample. Only 34% of the 313 regressions are estimated from a sample that includes financial sector firms but this is sufficiently large to test for possible moderator effects. We include the variable *Non-financial firm* for this purpose.

(4) Measures of performance and ownership concentration

A. Measures of firm performance

The use of different measures of variables may also be an important source of variation in empirical findings. It has long been argued that different measures of firm performance may have an influence on ownership-performance relation (Rhoades et al., 2001). Especially a distinction is drawn between accounting performance and financial performance. Accounting performance is a type of backward-looking measure and reflecting what a firm has achieved, but is subject to managerial manipulation and differences in accounting procedures; and market performance is a forward-looking measure and reflecting the market's expectation of what the firm will

achieve, which is less susceptible to different accounting procedures and manipulation but is affected by investor sentiment (Demsetz & Villalonga, 2001). However, Demsetz & Villalonga (2001) argued that investors' expectation for a firm's future performance is based on its past accounting performance, and thus market performance and accounting performance are expected to be correlated. To date, there is no consensus on whether the different types of performance measures make a difference regarding to ownership-performance relation. A large body of literature uses both accounting measures and market measures of performance to account for the potential effect of different measures on research findings.

Our data show that a range of different measures of performance are used in the empirical studies included in this meta-analysis. These performance measures are all fall into the two broad categories of financial performance: accounting performance, which are measured by return on assets, return on equity, return on sales, employee productivity, dividend payout ratio, sales growth, and the ratio of sales to total assets, and market performance, which are measured by Tobin's Q, market-to-book ratio, market-to-sales ratio, market stock returns, and P/E ratio.[19] 13 (e.g. Kuznetsov & Muravyev, 2001; Wu & Cui, 2002; Zeitun & Tian, 2007) out of the 27 primary studies use both accounting and market measures of firm performance to account for their potential different effects on ownership-performance relation, and the remaining studies use either accounting measures (e.g. Earle, 2005; Lu & Yao, 2006)) or market

measures (e.g. Na, 2002; Bai et al., 2004). Accounting measures, from which 65% of the 313 observations are obtained, are used more frequently over market measures, though both measures have gained their popularity in empirical studies in emerging markets. A variable *Accounting measure,* is used to capture the potential difference in empirical results caused by these two types of performance measures.

B. Measures of ownership concentration

The moderating effect of different measures of ownership concentration on ownership concentration – firm value relation attracted little debate in literature. It is not clear whether different measures of ownership concentration might make a difference. We classify ownership concentration measures appeared in the primary studies into three types, i.e., concentration ratio (83%), Herfindahl index (16%), and entropy (1%)[20], and use a variable *Concentration ratio* to check the potential influence of different measures of ownership concentration.

However, the choice of ownership concentration is more complex than it appears to be, and it may be desirable to consider other alternatives. Earle et al. (2005) argue that different measures of ownership concentration could have resulted in the conflicting findings of previous empirical studies. They argue that when the largest shareholder has a dominant position, as is a common phenomenon of firms in emerging markets, it is hard to form effective coalitions among large blockholders and additional blockholders may not be able to contribute to further disciplining the

management; thus the inclusion of additional blockholders when measuring ownership concentration, will reduce the magnitude of the estimated effect of ownership concentration on performance. Maury and Pajuste (2005) find that the relative size of the large shareholders influences the relation between multiple blockholders and firm value. 14 of 27 studies included in the meta-analysis use the fractions of shares held by the largest shareholder as the measure of ownership concentration (top 1). A majority studies focus only on a particular measure of ownership concentration, while some (e.g. Chen, 2001; Earle et al., 2005; Rogers et al., 2008) also use both top 1 and alternative ownership concentration measures, such as the percentage of shares held by large blockholders (e.g. top 2, top 3, or top 5). The results are conflicting, however. Earle et al. (2005) find that the changes in ownership concentration measure make a difference, while Rogers et al. (2008) fail to find out a change in the significance of the coefficient estimates of ownership concentration when change the measures of ownership concentration. We use a dummy variable *top 1* (=1 if ownership concentration is measured as the fractions of shares held by the largest shareholder) to investigate whether the exclusion of blockholders other than the largest shareholders when measure ownership concentration make a difference.

(5) publication status

It is well documented that published studies tend to report statistically significant results (Rosenthal, R. 1979; Duva & Tweedie, 2000; Scargle, 2000; Sutton et al,

2000). We therefore include a variable *Journal* in the model to test whether studies published in refereed journals tend to report different results.

(6) Region- and country- specific effects

A large body of literature finds that countries with weak legal system and poor shareholder protection are associated with higher propensity of expropriation of minority shareholders by controlling shareholders and lower firm valuation (La Porta et al., 1999, 2000; Claessens et al., 1999b, 2000; Nenova, 2003). However, there is little evidence regarding whether there is regional or country-specific effect in terms of ownership concentration-performance relation in countries with similar ownership structures and institutional environments, as is the case in emerging markets that commonly have highly concentrated ownership and weaker legal systems and investor protection mechanisms. Claessens et al. (1999b) conjecture that it is likely that country-specific circumstances, e.g., the quality of banking systems and required financial disclosure, affect the degree to which certain ownership structures are associated with expropriation and firm value detriment.

To identify potential regional a variation of ownership concentration-firm performance relation, we use the classification of Standard & Poor's (2007) to classify the countries investigated by the primary studies into region groups: Asia (including China, Korea, Malaysia and Thailand), East Europe (including Czech, Hungary, Poland, Russia), Pan Arab (including Jordan), Latin America (Brazil), and

non-Eastern Europe (Turkey). We use a set of variables (see Region and Country Composition section in Table 3) to investigate both country-specific difference/similarity within regions and across regions in emerging markets. [21]

4.3 Regression models

4.3.1 The model and estimation method

We start to explore the heterogeneity of correlations using the following generic meta-regression model:

$$Zr_i = \beta_0 + \beta_1 S_{i1} + \beta_2 E_{i2} + \beta_3 D_{i3} + \beta_4 M_{i4} + \beta_5 P_{i5} + \beta_6 C_{i6} + u_i \qquad (9)$$

Zr_i is the computed Fisher's z-transform of partial correlation coefficient r_i between ownership concentration and firm performance, which is cumulated from each regression;

S_{i1} is a vector of 16 dummy variables for specification difference, including *Size, Risk, Age, Financial structure, Liquidity, Capital intensity, Growth, Tangibility, Industry, Board, Shareholder Identity, Expenditure intensity, Business group, Accounting performance controlled, Market performance controlled, and Nonlinear;*

E_{i2} is a vector of dummy variables for estimation method, including *Non-OLS (Fixed effects, GMM or 2SLS, Random effects,* and *Least absolute deviation or Huber's M),* and *Endogeneity (Fixed effects* and *GMM or 2SLS)*;

D_{i3} is a vector of dummy variables for sample selection including *Post-2000, and Include-financial firm;*

M_{i4} is a vector of dummy variables for measures of performance and ownership concentration, including *Accounting measure* and *Concentration ratio;*

P_{i5} is a dummy variable *Publication*, that takes on the value 1 when a study is published;

C_{i6} is a vector of (combined) country dummy variables; the country dummies included in each specific regression model may be different.

u_i is the error term.

We estimate this model using a Huber-White OLS estimation method. As discussed in previous section, our data show the presence of correlation within studies. Because the variance of the individual effect size estimates are inversely proportional to sample sizes, differences in the sample sizes across regressions will cause the individual error variances dramatically different (Hedges & Olkin, 1985: 167-168), contributing to heterogeneity in the error term. The heterogeneity and within-study correlations violate the Gauss-Markov assumption of homoskedasticity of the error term. Although this violation does not cause bias or inconsistency in the OLS estimators, it results in a biased and inconsistent covariance matrix, with invalid test statistics and faulty inferences in hypothesis testing (Green, 2003; Williams, 2000).

We use the Huber-White method to adjust the variance-covariance matrix of a fit from OLS to correct for autocorrelation within clusters (studies), and for arbitrary heteroscedasticity and thus obtain robust standard errors and *t* statistics (Williams, 2000; Wooldridge, 2002: 328-331).

One of the main objectives of the meta-analysis is to investigate whether there are region- or country- effects that moderate ownership concentration-performance relation. In total 11 countries are studied by our primary studies. Two reasons make it impractical to use one regression to investigate country effect for all the 11 countries. One is that this will consume degrees of freedom given we only have 313 observations; another important reason is that it incurs severe multi-collinearity problem if put all the country dummies in one regression, because some study characteristics, especially model specifications, have higher degrees of correlation with specific country dummy variables.

To solve these thorny problems, we use several steps to achieve our goals. First, we run regressions to test whether there is country-specific difference/similarity within each region across countries (see regression models 1 and 2 in Table 4). Second, we combine countries within each region with similar concentration-performance relation together (see regression models 3 and 4 in Table 4). Because for each of the three regions Pan Arab, Latin America and non-Eastern Europe we only have one country being studies in the primary studies (i.e., Jordan,

Brazil and Turkey respectively), we do not apply step 1 and 2 to these regions. Third, we subsequently test whether there is (combined) country-specific difference/similarity across regions (see regression model 5 in Table 4), the results of which inform us which countries across regions has similar ownership concentration-performance relation. Fourth, we then combine the (combined) countries with similar effects together, which forms our final unified model containing all countries' information in one formal model (see regression model 6 in Table 5). All our subsequent regression models for alternative tests and robustness checks are based on regression model 4.

4.3.2 Alternative estimation methods

We use alternative estimation methods to test the robustness of the regression results of our formal regression model 6: (1) Nonparametric bootstrap method. We bootstrap standard errors by resampling observations with replacement from the data until a bootstrap sample dataset equal in size to the original dataset of 313 observations is created, and repeating the sampling process for 3000 times; (2) stepwise estimation method, which begins with the model including all of the explanatory variables used in model 6, and successively remove the most statistically insignificant variable until the p-value for omission of each remaining variable is less than a chosen threshold. One major problem with stepwise estimation is that it may generate over-optimistic statistics (Kirkwood & Sterne, 2003). To account for this

potential problem, we follow Kirkwood and Sterne's (2003) advice using a higher P-value threshold of 0.3 rather than the traditional threshold for statistical significance.

4.3.3 An alternative meta-regression model

The Huber-White approach has a restrictive assumption that all variations across effect sizes are observable and can be explained by moderator variables. This assumption induces little cost when residual heterogeneity is small relative to study-specific variance, because in this case using either a fixed effect or random effect method will not yield a different conclusion (Greenland, 1987). When the unobserved heterogeneity is non-negligible, however, Huber-White approach may results in overly conservative statistics (Abreu et al., 2005).

We therefore also use the following mixed effects (ME) meta-regression model (Sharp, 1998; Thompson & Sharp, 1999) as robustness check:

$$Zr_i = \beta_0 + \beta_1 S_{i1} + \beta_2 E_{i2} + \beta_3 D_{i3} + \beta_4 M_{i4} + \beta_5 P_{i5} + \beta_6 C_{i6} + u_i + \varepsilon_i \qquad (10)$$

where $u_i \sim N(0, v_i^2)$, where v_i^2 is the within-unit variance and equal the known variance of Z_{ri}, accounting for the estimate precision of Z_{ri} and may vary across unit i;

$\varepsilon_i \sim N(0, \tau^2)$, where τ^2 is the between-unit random effects variance component assumed equal across unit i, accounting for residual heterogeneity unaccountable by

moderator variables and the estimate precision.

The parameters of the model are estimated using weighted least squares regression with weight $1/(v_i + \tau^2)$ and adjusting for standard errors using the approach suggested by Knapp & Hartung (2003). Because τ^2 is unknown, it must be explicitly estimated to perform the weighted regression. We use restricted maximum likelihood (REML) to estimate τ^2 (Thompson & Sharp, 1999).[22]

Through Monte Carlo simulation, Higgins and Thompson (2004) find that meta-regression models are prone to misleading false-positive results, i.e., Type I error, when there are few studies and many covariates. Although Type I error may not be a threat to our meta-regression results since we have a relatively large sample size, we still conduct a Monte Carlo permutation test to calculate p-values for coefficient estimates to check the robustness of the p-values of the mixed effects meta-regression.

5. Results

Table 4 reports the regression results of our preliminary models, which are mainly intended to test country/region effects on the relationship between ownership concentration and firm performance controlling for other potential moderating factors. These regressions are estimated using Huber-White estimation method to correct for autocorrelation within clusters (studies) and for arbitrary heteroscedasticity. Regression 1 and 2 investigate difference and commonality in country effect within

East Europe and Asia respectively, and regression 3 and 4 investigate whether the country dummies are appropriately combined within each of the two regions respectively, and regression 5 investigate difference/commonality in (combined) country effect across regions. Based on the country effect results of regression 5, we obtain our formal model 6 in Table 5, which combines country dummy variables across regions according to the commonality of regression results in regression 5.

Table 4 here

Table 5 reports the regression results of our formal model 6 and the subsequent robustness check models that use alternative estimation methods or meta-regression model but have the same model specification as model 6, or have different model specification by disintegrating some key variables into further groups but use the same estimation method as model 6. Regression 7 and 8 are a stepwise regression using Huber-White estimation method and a bootstrap regression respectively. Regression 9 is a mixed effects meta-regression estimated using weighted least squares method and adjusting for standard errors using the approach suggested by Knapp & Hartung (2003), the results of which is confirmed by a Monte Carlo permutation test, indicating the meta-regression findings are no prone to false-positive results problem. Regression 10, 11, 12 and 13 further investigate issues of publication bias, endogeneity, non-OLS estimation methods, and ownership concentration measures. It is shown that the results of regression model 6 are robust to these

alternative estimation methods, meta-regression model, and model specifications. The results show that our regression models have strong explanatory power, being able to explain more than half of the variation in empirical findings of primary studies regarding to ownership concentration-performance relation.

Table 5 here

The use of too many dummy variables is a typical cause for multicollinearity. Since our explanatory variables are all dummy variables, there might be some chance of the existence of multicollinearity problem in our regression models. Our primary concern is that the presence of multicollinearity may make the meta-regression model estimates of the coefficients become unstable and the standard errors for the coefficients can get wildly inflated. We use the Variance Inflation Factor (VIF) to check for multicollinearity for all regressions in Table 5 except for regression 9 (because it is a mixed effects meta-regression model and the test is not applicable to this model). As a rule of thumb, there is evidence of multicollinearity if a variable's VIF is greater than 10, which means that the variable could be considered as a linear combination of other explanatory variables (Baum 2006). The results indicate that we can be comfortable with our findings since there is no variable's VIF value greater than 10 in all of the regression models.

Regional effects

Our results show that, even within emerging markets where it is expected to share more similar governance environments, the relations between ownership concentration and firm performance are not strongly convergent. Regression 1 indicates that, within East Europe countries, the ownership concentration-performance relation in Hungary is significantly 20% stronger than non-East Europe countries, while the relation in Russia, Czech and Poland is not significantly different from non-East Europe countries. Further tests show that the coefficient on Hungary is significantly different from Russia, Czech and Poland, while the coefficients on the latter three are not significantly different from each other. Regression 2 shows that, within Asian region, the ownership concentration-performance relation in China does not significantly different from non-Asia countries, while this relationship is significantly stronger in Korea, Malaysia and Thailand than in non-Asia countries, about 14%, 11% and 24% stonger respectively. Similar as in Asia countries, our further tests show that the coefficient on China is significantly different from those on Korea, Malaysia and Thailand, while the coefficients on the latter three are not significantly different from each other.

To further investigate whether countries across regions share a similar ownership concentration-performance relation, we first combine countries with similar ownership concentration-performance relation together for East Europe and Asia

countries respectively (see Regression 3 and 4). The non-convergence ownership concentration-performance relation within each region still persists, indicating the combinations are appropriate. Next we put all the (combined) country dummy variables in regression 5 and suppress the constant term in the regression. The results of regression 5 show that, controlling for other factors, in emerging markets, although some countries share a similar ownership concentration-performance relation, but the relation does not converge across all countries. In China, Russia, Czech, Poland, Brazil, and Jordan, the ownership concentration-performance relation is not significantly different from other countries, in Korea, Malaysia, Thailand and Hungary, the relation is significantly stronger than other countries, while in Turkey, the relation is significantly weaker than other countries. Based on country effect results in regression 5, in regression 6 we further combine countries that share similar ownership concentration-performance relation, generating the final three country groups: the first group is the base group, including Brazil, Jordan, China, Russia, Czech and Poland; the second group consists of Hungary, Korea, Malaysia, and Thailand; and Turkey itself is a standalone group. The results shows that, compared to the base group *Brazil-Jordan-China-Russia-Czech-Poland*, the ownership concentration-performance relation in Turkey is significantly weaker (7.8% lower), and the relation in the country group *Hungary-Korea-Malaysia-Thailand* is significantly stronger (11.7% stronger). These results remain robust in subsequent

robustness check regressions.

Sample selection effects

Our controls for sample selection all have a significant influence on the estimated relations between ownership concentration and firm performance, indicating that sampling decisions matter.

Although the times series of the relations between ownership concentration and firm performance, graphed in Figure 2, did not exhibit a time trend, Table 4 and Table 5 show that the variable *post-2000* is significantly negative in all regressions, indicating a reduced relation between ownership concentration and firm performance. This suggests that, post-2000, concentrated ownership has a lower or weaker relation with firm performance compared to the 1990s.

Holding other variables constant, ownership concentration in non-financial firms are on average significantly associated with a performance around 6% lower than that firms including financial ones, providing firm evidence that whether or not excluding financial firms in sample make much difference.

Estimation effects

Holding other study characteristics constant, regression 6 does not provide evidence that regressions controlling for endogeneity problems generate different empirical results, a similar finding with that of Doucouliagos & Ulubasoglu's (2008)

meta-analysis on democracy and economic growth literature. But we should be cautious about this, since we do not know whether different types of method of controlling endogeneity make a difference.

Regression 11 further investigate whether specific method of controlling for endogeneity matters, the results show that different types of method of controlling for endogeneity make a difference (as in regression 6, the base group of estimation method in regression 11 is estimation methods that do not control for endogeneity, including OLS, random effects, least absolute deviation and Huber's M estimation methods). Studies using fixed effects models to control for endogeneity significantly report a stronger ownership concentration-performance relation compared with studies do not control for endogeneity. Since fixed effects model controlling for endogeneity resulting from unobserved effects, the reason for studies using fixed effects estimation method report a strong relation than those do not control for endogeneity may be that the unobserved effects are correlated with higher (lower) ownership concentration but lower (higher) firm performance, or the effects of these unobserved effects overwhelmed the effects of those affecting ownership concentration-performance in a reverse direction, failing to control for these unobserved effects would lead to an downward bias in the estimate of ownership concentration. On the other hand, studies using GMM or 2SLS method does not tend to report a different relation with that do not control for endogeneity[23].

In regression 12, we further investigate whether regressions estimated using different types of non-OLS estimation methods, including *Random effects* and *Least absolute deviation - Huber's M* (Least absolute deviation method or Huber's M method) that do not control for endegeneity, and *Fixed effects* and *GMM-2SLS* (GMM or 2SLS estimation method) that control for endogeneity, obtain different results compared with those using OLS estimation method. The base group is non-OLS estimation method. Consistently, it is shown that studies using fixed effects report a significantly stronger result than those using OLS, while studies using GMM or 2SLS estimation methods do not. Regarding to those non-OLS estimation methods that do not control for endegeneity, it is shown that studies using random effects method do not report a significantly different ownership concentration-performance relation than those using OLS method. Studies using Least Absolute Deviation method and Huber's M method report a significantly stronger relation. However, caution should be made regarding to this result since there are only 8 (2.6% of total) observations obtained from Least Absolute Deviation method and Huber's M method.

Our findings that studies controlling for endogeneity either report a stronger relation or do not report a different result counters to traditional wisdom that after controlling for endogeneity the ownership effect in OLS estimations disappears (see for example Himmelberg et al., 1999; Firth et al., 2002), indicating the complexity of controlling for endogeneity problem. Two important reasons make controlling for

endogeneity problem a tough task. First, endogeneity is a complicated problem because the sources of endogeneity, i.e., omitted variables, measurement error, and simultaneous causality, can cumulate (Kane et al., 1999) and there may also be some tradeoff between potential sources of endogeneity (Hahn & Hausman, 2003b; Bascle, 2008), thus it is impractical to predict the direction of the OLS estimates' bias when different sources of endogeneity are present (Bascle, 2008). Second, because GMM used in the primary regressions and 2SLS are instrumental variable approach, one possible reason for studies using GMM and 2SLS methods' failing to report a significantly different results with those do not control for endogeneity may be that the instruments used in these methods are invalid. Hahn and Hausman (2002, 2003b) show that in the presence of weak and not exogenous instruments, IV estimators can perform poorly. Hahn and Hausman (2003b) find that in the weak instruments situation, 2SLS estimator biased towards the OLS estimator, which is also biased. Under some conditions, such as when R^2 is below 0.1, OLS may perform better than 2SLS (Hahn and Hausman, 2003a, 2003b).

Measurement effects

Our results provide some evidence that using accounting measures of firm performance results in a stronger relationship between ownership concentration and performance. But this moderating effect of performance measures only significant in bootstrap regression and mixed effects regression. It cannot be determined here

whether this is a consequence of investor behaviour (market performance measures) or accounting practices, and is an issue requiring more detailed investigation elsewhere.

The measures of ownership concentration do not appear to alter the correlation between ownership concentration and firm performance. Compared to other ownership concentration measures, studies using concentration ratios do not report results that are different from studies using other measures, evidence that is robust across all regressions. In regression 12, we use *top 1* (=1 if ownership concentration is measured as the fractions of shares held by the largest shareholder) to investigate whether alternative dichotomy of measures of ownership concentration make a difference, which shows that studies using top 1 as ownership concentration do not report a different result with those including blockholders other than the largest shareholders in their measures of ownership concentration, further confirming that the measures of ownership concentration do not moderate research findings of primary studies.

Specifications effects

Omitting important control variables may result in omitted variable bias that affect the test relation. Our results indicate that including or omitting most of the control variables significantly contributes to the heterogeneity of estimated relations.

Table 5 shows that, the evidence for *Financial structure, Liquidity, Capital intensity, Expenditure intensity, Growth, Board, Market performance, Industry* is consistent across all regressions. The evidence for *Age, Business group, Accounting performance, Risk,* and *Year* is weaker but still persuasive. Among all of the 16 control variables, only *Size, Tangibility*, *Shareholder Identity* are consistently insignificant in all regressions.

The non-significance of *Nonlinear* in all regressions indicates that the inclusion of non-linear ownership concentration terms do not moderate the linear relation between ownership concentration and firm performance.

Publication effects

Publication bias is a major concern in meta-analysis. Our results provide strong support for the argument that publication status moderates empirical results about the relationship between ownership concentration and performance. Studies published in referred journals report a stronger ownership concentration-performance relation than working papers and conference papers. This upward bias is significant in all regressions except for mixed effects meta-regression.

To further investigate whether studies published in journals with higher rankings tend to report results differently, in regression 10, we further disintegrate published papers into two groups: *JFE or JBF publication* (=1 if published in Journal of

Banking & Finance or Journal of Financial Economics") and Other publication (=1 if published in referred journals but not JBF or JFE)[24], with non-published studies as the base group. The results show that studies published in both higher ranking journals like JFE and JBF, and lower ranking journals report a significantly stronger ownership concentration-performance relation, 6.9% and 3.7% stronger respectively. An F-test shows that there is no difference between JFE and JBF publications and other publication, indicating that publication bias is not driven by lower ranking journal publications.

6. Summary and conclusions

This study conducted a meta-analytic survey on the empirical studies on relationship between ownership concentration and firm performance. Through an exhaustive searching method, 27 studies were retrieved, yielding 313 observations. We start by computing partial correlations from empirical findings of the primary studies retrieved, and then conduct a homogeneity test to investigate whether there is a common correlation between ownership concentration and firm performance in emerging countries.

Although the aggregated statistics suggest a modest positive relation between ownership concentration and firm performance, our homogeneity test indicates that

the variation across observations is statistically significant. Consequently, we reject the hypothesis of a homogenous relation between ownership concentration and firm performance in emerging countries.

We use a set of meta-regression models to further explore the sources of heterogeneity of empirical findings of primary studies, which generating generally consistent results. We use comprehensive sets of coded study characteristics as potential moderator variables in our meta-regression models. These characteristics are derived from a comprehensive literature review and are hypothesized to affect the relation between ownership concentration and firm performance, including model specification difference (difference in control variables used in primary studies and functional form), estimation method, sample selection, measurements of performance and ownership concentration, publication status and region/country effect. Through a novel research design, we successfully tackled the potential thorny problems commonly encountered by meta-analytic studies, such as multicollenearity and short of degree of freedoms, by combining countries within and across regions with similar ownership concentration-performance relation, and combining control variables. Our research design makes it achievable to explore the effects of wide range of factors that may moderate the relation between ownership concentration and firm performance. The research findings of this study are robust to different meta-regression models, model specifications and estimation methods. Our results support many conventional

wisdoms but counter others.

Our results indicate that the investigated study characteristics are sufficient to explain a large portion of the heterogeneity of results in our sample. The meta-regression results show evidence of within-region heterogeneity and across region heterogeneity and commonality regarding to ownership concentration-performance relation in emerging markets, support Claessens et al.'s (1999b) conjecture that country-specific circumstances may affect the relation between ownership structures and firm performance.

We find that although on the surface it appears that estimation method does not make a difference, but further investigations reveal that different methods of controlling for endogeneity matter: fixed effects regressions report a significantly stronger relation than those do not control for endogeneity, while regressions using instrumental variables method do not. Moreover, studies that do not control for endogeneity generally do not tend to report significantly different results.

We also find strong evidence that underspecification of models, which fails to account for important firm-specific characteristics, industry sector, and contractual environment, contribute to the variation in estimated relations between ownership concentration and firm performance.

Our analysis reveals the existence of publication bias in published studies:

published studies report significantly stronger relation than unpublished ones. We also find that sample selection make a difference for research findings – studies use 2000 afterwards data significantly report a weaker relation, while studies include financial firms in their sample significantly report a stronger relation.

There is evidence that the use of accounting measure of firm performance may result in a stronger reported relation, but the evidence is only significant in two regressions. Our results show consistent evidence that studies using different ownership concentration measures do not report different results. We conjecture that this is because ownership is highly concentrated in the hands of the largest shareholder in emerging markets, and thus there are necessarily strong correlations between all measures of ownership concentration.

Our results have several implications for future theoretical and empirical studies as well as literature review studies in this area. First, our findings reveal that in emerging markets, the merits of concentrated ownership overweight its detriments – on average concentrated ownership associated with a positive firm performance. However, there is significant within- and across-region heterogeneity and similarity in terms of ownership concentration-performance relation. We have identified countries where the ownership concentration-performance relation convergent and where it is divergent. But some questions remain unanswered. Why in countries that are supposed to share similar ownership structure and governance environment exhibit

significant different ownership concentration-performance relation? What factors contribute to the heterogeneous relation in some countries within the same region and within emerging markets on the one hand, and what are the fundamental factors that drive convergent ownership concentration-performance relation across regions on the other hand? Future theoretical and empirical studies will further our understanding of the role of ownership structure in improve economic efficiency by identifying the underlying driving factors.

Second, this study reveals that endogeneity issues and the effects of controlling for endogeneity on empirical findings are much more complicated than expected by conventional wisdom. On the one hand, this study shows that firm specific characteristics, industry sector affiliation, and contractual environment matters when investigating ownership concentration-performance relation. Failing to control for these factors appropriatedly may result in spurious findings and endogeneity problem in models. On the other hand, for studies that try to use estimation method to resolve endogeneity problem, our findings highlight further efforts need to be made if endogeneity is to be appropriately controlled for. The forms of endogeneity supposed to be controlled for, the relevant methods need to be used, the choice of instruments, and the testing for instruments relevance and exogeneity are all important issues need to be considered when attempt to control for endogeneity problems. Future studies also need to be cautious when make sample selection decisions, as they may alter the

results significantly.

Third, this study shows that significant publication bias exist in literature, which has important implication for future literature review studies. To derive unbiased conclusion, it is necessary for future literature review studies, no matter narrative or statistical review, to investigate all relevant studies rather than confined to published ones.

Forth, to gain a comprehensive understanding of ownership structure and firm performance relation around the world, this research can be extended to explore the relation between ownership concentration and firm performance in developed markets, as well as countries where ownership is diffuse.

A major limitation of this study is that we are not able to cover all emerging markets and it regions in our sample because many emerging countries have received little research attention of empirical studies. In our sample, only 11 out of 36 emerging countries have relevant studies available, and three regions only have one country being studied. Although through a novel research design, this study makes it achievable to investigate within- and across- region heterogeneity and convergence regarding the relationship between ownership concentration and firm performance in emerging markets, this data limitation may influence the generalizability of our research findings to emerging markets that do not have primary studies available to

our meta-analysis. With increased research interests in emerging markets and the development of the capital markets in these economies, this limitation will be resolved in future meta-analytic studies with the hope that more emerging countries can catch research interests and are being investigated by primary studies.

REFERENCES

* indicates those studies included in the meta-analysis

ABREU, M., GROOT, H. L. F. D. & FLORAX, R. J. G. M. (2005) A Meta-Analysis of Beta-Convergence: The Legendary Two-Percent. *Journal of Economic Surveys,* 19 (3)**,** 389-420.

AGRAWAL, A. & KNOEBER, C. R. (1996) Firm Performance and Mechanisms to Control Agency Problems between Managers and Shareholders. *Journal of Financial and Quantitative Analysis,* 31 (3)**,** 377-397.

ANG, J. S., COLE, R. A. & LIN, J. W. (2000) Agency Costs and Ownership Structure. *Journal of Finance,* 55 (1)**,** 81-106

*ANUCHITWORAWONG, C. (2004) Ownership-Based Incentives, Internal Corporate Risk and Firm Performance. *CEI Working Paper Series No. 2004-17.* Viewed 5 August 2008, <http://cei.ier.hit-u.ac.jp/working/2004/2004%20Working%20Papers/wp2004-17.pdf>.

*BAI, C.-E., LIU, Q., LU, J., SONG, F. M. & ZHANG, J. (2004) Corporate Governance and Market Valuation in China. *Journal of Comparative Economics,* 32 (4)**,** 599-616.

BARCLAY, M. J. & HOLDERNESS, C. G. (1989) Private Benefits from Control of Public Corporations. *Journal of Financial Economics,* 25 (2)**,** 371-395.

BAUM, C. F. (2006) *An Introduction to Modern Econometrics Using Stata*, College Station, Tex. : Stata Press, c2006.

BASCLE, G. (2008) Controlling for Endogeneity with Instrumental Variables in Strategic Management Research. *Strategic Organization,* 6(3)**,** 285-327.

BERLE, A. A. & MEANS., G. C. (1932) *The Modern Corporation and Private Property*, New York: Macmillan.

*CARVALHAL-DA-SILVA, F., MAJLUF, N. & PAREDES, R. D. (2006) Family Ties, Interlocking Directors and Performance of Business Groups in Emerging Countries: The Case of Chile. *Journal of Business Research,* 59 (3)**,** 315-321.

*CHEN, J. (2001) Ownership Structure as Corporate Governance Mechanism: Evidence from Chinese Listed Companies. *Economics of Planning,* 34 (1-2)**,** 53-72.

*CLAESSENS, S. & DJANKOV, S. (1999a) Ownership Concentration and Corporate

Performance in the Czech Republic. *Journal of Comparative Economics,* 27 (3)**,** 498-513.

CLAESSENS, S., DJANKOV, S., FAN, J. P. H. & LANG, L. H. P. (1999b) Expropriation of Minority Shareholders: Evidence from East Asia. *Policy Research Paper No. 2088. World Bank, Washington DC.*

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., DJANKOV, S., FAN, J. P. H. & LANG, L. H. P. (2002) Disentangling the Incentive and Entrenchment Effects of Large Shareholdings. Journal of Finance, 57 (6), 2741-2771.

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

COCHRAN, W. G. (1954) The Combination of Estimates from Different Experiments. *Biometrics,* 10 (1)**,** 101-129.

COCHRAN, P. L. & WOOD, R. A. (1984) Corporate Social Responsibility and Financial Performance. *Academy of Management Journal***,** 27 (1), 42-56.

COOPER, H. M. (1989) *Integrating Research: A Guide for Literature Reviews,* Newbury Park, Calif. : Sage Publications.

DEMSETZ, H. (1983) The Structure of Ownership and the Theory of the Firm. *Journal of Law & Economics,* 26 (2)**,** 375-390.

DEMSETZ, H. & LEHN, K. (1985) The Structure of Corporate Ownership: Causes and Consequences. *Journal of Political Economy,* 93(6), 1155-1177.

DEMSETZ, H. & VILLALONGA, B. (2001) Ownership Structure and Corporate Performance. *Journal of Corporate Finance,* 7 (3), 209-233.

DENIS, D. K. & MCCONNELL., J. J. (2003) International Corporate Governance. *Journal of Financial and Quantitative Analysis,* 38 (1)**,** 1-35.

DHARWADKAR, R., GEORGE, G. & BRANDES, P. (2000) Privatization in Emerging Economies: An Agency Theory Perspective. *Academy of Management Review,* 25 (3), 650-669.

DOUCOULIAGOS, C. & ULUBASOGLU, M. A. (2008) Democracy and Economic Growth: A Meta-Analysis. *American Journal of Political Science,* 52 (1)**,** 61-83.

DUVA, S. & TWEEDIE, R. (2000) A Nonparametric "Trim and Fill" Method of Accounting for Publication Bias in Meta-Analysis. *Journal of the American Statistical Association*, 95 (449), 89-98.

*EARLE, J. S., KUCSERA, C. & TELEGDY, Á. (2005) Ownership Concentration and Corporate Performance on the Budapest Stock Exchange: Do too Many Cooks Spoil the Goulash? *Corporate Governance: An International Review* 13 (2)**,** 254-264.

FAMA, E. F. & FRENCH, K. R. (1995) Size and Book-to-Market Factors in Earnings and Returns. *Journal of Finance*, 50 (1)**,** 131-155

*FIRTH, M., FUNG, P. M. Y. & RUI, O. M. (2002) Simultaneous Relationships among Ownership, Corporate Governance, and Financial Performance. *Working Paper.* Viewed 21 February 2008, <http://ssrn.com/abstract=337860>.

FREUND, R. J., WILSON, W. J. & SA, P. (2006) *Regression Analysis: Statistical Modeling of a Response Variable*, Burlington, MA: Elsevier Academic Press.

GALBRAITH, R. F. (1988) A Note on Graphical Presentation of Estimated Odds Ratios from Several Clinical Trials. *Statistics in Medicine*, 7 (8), 889 – 894.

GLASS, G. V. (1976) Primary, Secondary, and Meta-Analysis of Research. *Educational Researcher*, 5 (10), 3-8.

GLASS, G. V., MCGAW, B. & SMITH, M. L. (1981) *Meta-Analysis in Social Research*, Beverly Hills: Sage

GREENE, W. H. (2003) *Econometric Analysis*, Upper Saddle River, N.J. : Prentice Hall.

GREENLAND, S. (1987) Quantitative Methods in the Review of Epidemiologic Literature. *Epidemiologic Reviews*, 9 (1)**,** 1-30.

GROSFELD, I. (2006) Ownership Concentration and Firm Performance: Evidence from an Emerging Market.. *William Davidson Institute Working Paper Number 834.* Viewed July 2008, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=924588>.

*GROSFELD, I. (2007) Large Shareholders and Firm Value: Are High-Tech Firms Different? *PSE Working Papers.* Viewed 21 May 2008, <http://www.pse.ens.fr/document/wp200726.pdf>.

GROSSMAN, S. J. & HART, O. D. (1980) Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation. *The Bell Journal of Economics*, 11 (1)**,** 42-64.

GROSSMAN, S. J. & HART, O. D. (1982) Corporate Financial Structure and Managerial Incentives. IN MCCALL., J. (Ed.) *The Economics of Information and*

Uncertainty. Chicago: University of Chicago Press.

GULLIFORD, M. C., ADAMS, G., UKOUMUNNE, O. C., LATINOVIC, R., CHINN, S. & CAMPBELL, M. J. (2005) Intraclass Correlation Coefficient and Outcome Prevalence are Associated in Clustered Binary Data. *Journal of Clinical Epidemiology,* 58 (3), 246-251.

*GURSOY, G. & AYDOGAN, K. (1998) Equity Ownership Structure, Risk-Taking and Performance: An Empirical Investigation in Turkish Companies. *International Global Finance Conference (1998), Istanbul, Turkey, and ERC/METU International Conference in Economics (1999), Ankara, Turkey.* Viewed 21 February 2008, <http://www.bilkent.edu.tr/~aydogan/OwnershipStructure.pdf>.

HAHN, J. & HAUSMAN, J. (2002a) A New Specification Test for the Validity of Instrumental Variables. *Econometrica,* 70 (1)**,** 163-189.

HAHN, J. & HAUSMAN, J. (2003a) Weak Instruments: Diagnosis and Cures in Empirical Econometrics. *American Economic Review,* 93 (2)**,** 118-125.

HAHN, J. & HAUSMAN, J. (2003b) IV Estimation with Valid and Invalid Instruments. *MIT Department of Economics Working Paper No. 03-26.* Viewed 30 July 2009, <http://ssrn.com/abstract=430061>.

HALL, M. & WEISS, L. (1967) Firm Size and Profitability. *Review of Economics and Statistics,* 49 (3)**,** 319-331.

HAMILTON, L. C. (1991) Resistant Normality Check and Outlier Identification. *Stata Technical Bulletin,* 3**,** 15-18.

*HANIFFA, R. & HUDAIB, M. (2006) Corporate Governance Structure and Performance of Malaysian Listed Companies. *Journal of Business Finance & Accounting,* 33 (7-8), 1034-1062.

HANSMANN, H. & KRAAKMAN, R. (2004) Agency Problems and Legal Strategies IN KRAAKMAN, R., DAVIES, P., HANSMANN, H., HERTIG, G., HOPT, K., KANDA, H. & ROCK, E. (Eds.) *The Anatomy of Corporate Law: A Comparative and Functional Approach.* Oxford University Press.

HEDGES, L. V. & OLKIN, I. (1985) *Statistical Methods for Meta-Analysis,* Orlando: Academic Press.

HEDGES, L. V. & VEVEA, J. L. (1998) Fixed- and Random-Effects Models in Meta-Analysis. *Psychological Methods,* 3(4) 486-504.

HIGGINS, J. P. T. & THOMPSON, S. G. (2004) Controlling the Risk of Spurious Findings from Meta-Regression. *Statistics in Medicine,* 23 (11)**,** 1663-1682.

HIMMELBERG, C. P., HUBBARD, R. G. & PALIA, D. (1999) Understanding the Determinants of Managerial Ownership and the Link Between Ownership and Performance. *Journal of Financial Economics,* 53 (3)**,** 353-384.

HUNTER, J. E., SCHMIDT, F. L. & JACKSON, G. B. (1982) *Meta-Analysis: Cumulating Research Findings across Studies*, Beverly Hills, Calif. : Sage.

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.

JENSEN, M. C. (1986) Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, 76 (2)**,** 323-329.

*JOH, S. W. (2003) Corporate Governance and Firm Profitability: Evidence from Korea before the Economic Crisis. *Journal of Financial Economics,* 68 (2)**,** 287 -322.

KANE, T. J., ROUSE, C. E. AND STAIGER, D. (1999) Estimating Returns to Schooling When Schooling is Misreported. *Working Paper, National Bureau of Economic Research, Cambridge, MA.*

KIRKWOOD, B. & STERNE, J. (2003) *Essential Medical Statistics*, 2nd Edition, Wiley-Blackwell.

KNAPP, G. & HARTUNG, J. (2003) Improved Tests for a Random Effects Meta-Regression with a Single Covariate. *Statistics in Medicine,* 22 (17), 2693 - 2710.

*KUZNETSOV, P. & MURAVYEV, A. (2001) Ownership Structure and Firm Performance in Russia: The Case of Blue Chips of the Stock Market. *EERC Working Paper Series No. 01/10.* Viewed 14 July 2008, <http://www.eerc.ru/details/download.aspx?file_id=3589>.

JACKSON, G. B. (1978) Methods for Reviewing and Integrating Research in the Social Sciences. *Final Report to the National Science Foundation for Grant no. DIS 76-20309*. Social Research Group, George Washington University, Washington, D.C.

LA PORTA, R., LOPEZ-DE-SILANES, F. & SHLEIFER, A. (1999) Corporate Ownership around the World. *Journal of Finance,* 54 (2)**,** 471-517.

LA PORTA, R., LOPEZ-DE-SILANES, F., SHLEIFER, A. & VISHNY, R. (2000) Investor Protection and Corporate Governance. *Journal of Financial Economics*, 58 (1-2), 3-27.

LA PORTA, R., LOPEZ-DE-SILANES, F., SHLEIFER, A. & VISHNY, R. (2002)

Investor Protection and Corporate Valuation. *Journal of Finance,* 57 (3)**,** 1147-1170.

*LEE, S. (2008) Ownership Structure and Financial Performance:Evidence from Panel Data of South Korea. *Working Paper.* Viewed 20 October 2008, <http://www.econ.utah.edu/activities/papers/2008_17.pdf >.

LINS, K. V. (2003) Equity Ownership and Firm Value in Emerging Markets. *Journal of Financial and Quantitative Analysis,* 38 (1)**,** 159-184.

LIPSEY, M. W. & WILSON, D. B. (2001) *Practical Meta-Analysis*, Thousand Oaks, Calif. : Sage.

LODERER, C. & MARTIN, K. (1997). Executive Stock Ownership and Performance Tracking Faint Traces. *Journal of Financial Economics*, 45 (2), 223-255.

*LU, Y. & YAO, J. (2006) Impact of State Ownership and Control Mechanisms on the Performance of Group Affiliated Companies in China. *Asia Pacific Journal of Management,* 23 (4)**,** 485-503.

*MA, X., YAO, X. & XI, Y. (2006) Business Group Affiliation and Firm Performance in a Transition Economy: A Focus on Ownership Voids. *Asia Pacific Journal of Management,* 23 (4)**,** 467-483.

MCCONNELL, J. J. & SERVAES, H. (1990) Additional Evidence on Equity Ownership and Corporate Value. *Journal of Financial Economics,* 27 (2)**,** 595-612.

MCCONNELL, J. J. & SERVAES, H. (1995) Equity Ownership and the Two Faces of Debt. *Journal of Financial Economics,* 39 (1)**,** 131-157.

MORCK RANDALL, SHLEIFER ANDREI & VISHNY W. ROBERT (1988). Management Ownership and Market Valuation: An Empirical Analysis. *Journal of Financial Economics*, 20 (1-2), 293-315.

MAURY, B. & PAJUSTE, A. (2005) Multiple Controlling Shareholders and Firm Value. *Journal of Banking and Finance,* 29 (7)**,** 1813 - 1834.

*NA, S.-K. (2002) *Ownership Structure and Firm Performance in Korea*. PhD thesis, Missouri, United States, University of Missouri - Columbia.

NENOVA, T. (2003) The Value of Corporate Voting Rights and Control: A Cross-Country Analysis. *Journal of Financial Economics,* 68 (3)**,** 325-351.

*OZER, B. & YAMAK, S. (2001) The Role of Market Control on the Relation Between Ownership and Performance. *EFMA 2001 Lugano Meetings.* Viewed 21 February 2008, < http://ssrn.com/abstract=268089>.

PARKER, D. R., EVANGELOU, E. & EATON, C. B. (2005) Intraclass Correlation Coefficients for Cluster Randomized Trials in Primary Care: The Cholesterol Education and Research Trial. *Contemporary Clinical Trials,* 26 (2), 260-267.

PENG, M. W. & HEATH P.S. (1996) The Growth of the Firm in Planned Economies in Transition: Institutions, Organizations, and Strategic Choice. *Academy of Management Review*, 21 (2), 492-528.

RABE-HESKETH, S. & SKRONDAL, A. (2005) *Multilevel and Longitudinal Modeling Using Stata*, College Station, Tex. : Stata Press.

RHOADES, D. L., RECHNER, P. L. & SUNDARAMURTHY, C. (2001) A Meta-Analysis of Board Leadership Structure and Financial Performance: Are "Two Heads Better than One"? *Journal of Corporate Governance*, 9 (4), 311–319.

*ROGERS, P., DAMI, A. B. T., RIBEIRO, K. C. S. & SOUSA, A. F. (2008) Corporate Governance and Ownership Structure in Brazil: Causes and Consequences. *Journal of Corporate Ownership & Control,* 5 (2)**,** 36-54.

ROSENTHAL, R. (1979) The File Drawer Problem and Tolerance for Null Results. *Psychological Bulletin,* 86 (3)**,** 638-641.

ROSENTHAL, R. (1991) *Meta-Analytic Procedures for Social Research*, Newbury Park: Sage.

SCARGLE, J. D. (2000) Publication Bias: The "File-Drawer Problem" in Scientific Inference. *Journal of Scientific Exploration,* 14 (2)**,** 94-106.

SHARP, S. (1998) Meta-Analysis Regression. *Stata Technical Bulletin,* 7 (42)**,** 16-22.

SHLEIFER, A. & VISHNY, R. W. (1986) Large Shareholders and Corporate Control. *Journal of Political Economy*, 94 (3), 461-488.

SHLEIFER, A. & VISHNY, R.W. (1997). A Survey of Corporate Governance. *Journal of Finance*, 52 (2), 737-783.

STANDARD & POOR'S (2007) S&P Emerging Markets Indices Methodology.

STANLEY, T. D., DOUCOULIAGOS, C. & JARRELL, S. B. (2008) Meta-Regression Analysis as the Socio-Economics of Economics Research. *Journal of Socio-Economics*, 37 (1), 276-292.

STANLEY, T.D. & JARRELL, S.B. (1989) Meta-Regression Analysis: A Quantitative Method of Literature Surveys. *Journal of Economic Surveys*, 3(2), 161-70.

STANLEY, T.D. & JARRELL, S.B. (1998) Gender Wage Discrimination Bias? A Meta-Regression Analysis. *Journal of Human Resources*, 33 (4), 947-973.

STANLEY, T.D. (2002) Comments. *Journal of Economic Perspective*, 16 (3), 227-228.

STIGLITZ, J. E. (1999) Quis custodiet ipsos custodes? Corporate Governance Failures in the Transition. *Challenge*, 42(6)**,** 26-67.

STULZ, R. M. (1990) Managerial Discretion and Optimal Financing Policies. *Journal of Financial Economics*, 26 (1)**,** 3-27.

SUTTON, A. J., ABRAMS, K. R., JONES, D. R., SHELDON, T. A. & SONG, F. (2000) *Methods for Meta-Analysis in Medical Research*, Chichester; New York : Wiley.

THOMPSON, S. G. & SHARP, S. J. (1999) Explaining Heterogeneity in Meta-Analysis: A Comparison of Methods. *Statistics in Medicine*, 18(20)**,** 2693-2708.

*TIAN, L. & ESTRIN, S. (2005) Retained State Shareholding in Chinese PLCs: Does Government Ownership Reduce Corporate Value? *IZA Discussion Paper No. 1493*. Viewed 21 February 2008, <http://proquest.umi.com/pqdweb?did=1451362821&Fmt=7&clientId=20870&RQT=309&VName=PQD>.

VIECHTBAUER, W. (2007) Hypothesis Tests For Population Heterogeneity in Meta-Analysis. *British Journal of Mathematical and Statistical Psychology*, 60(1), 29-60.

*WANG, X., XU, L. C. & ZHU, T. (2004) State-Owned Enterprises Going Public: The Case of China. *Economics of Transition*, 12 (3), 467 - 487.

*WEI, G. (2007) Ownership Structure, Corporate Governance and Company Performance in China. *Asia Pacific Business Review*, 13 (4)**,** 519-545.

WERNERFELT, B., MONTGOMERY, C.A. (1988). Tobin's q and the Importance of Focus in Firm Performance. *American Economic Review*, 78 (1), 246-250.

WILLIAMSON, O.E. (1991). Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36 (2), 269-296.

WILLIAMS, R. L. (2000) A Note on Robust Variance Estimation for Cluster-Correlated Data. *Biometrics*, 56 (2), 645-646.

WOOLDRIDGE, J. M. (2006) *Introductory Econometrics: A Modern Approach*, Mason, OH: Thomson/South-Western.

WOOLDRIDGE, J. M. (2002) *Econometric Analysis of Cross Section and Panel Data*, Cambridge, Mass. : MIT Press.

* WU, S. & CUI, H. (2002) Consequences of the Concentrated Ownership Structure in

Mainland China - Evidence of Year 2000. *EFA 2002 Berlin Meetings; EFMA 2002 London Meetings; Sauder School of Business Working Paper.* Viewed 22 February 2008, <http://ssrn.com/abstract=302336>.

*XU, X. & WANG, Y. (1997) Ownership Structure, Corporate Governance, and Corporate Performance: The Case of Chinese Stock Companies. *World Bank Policy Research Working Paper No. 1794.* Viewed 21 February 2008,< http://ssrn.com/abstract=45303>.

*YAMMEESRI, J., LODH, S. C. & HERATH, S. K. (2006) Influence of Ownership Structure and Corporate Performance Precrisis: Evidence from Thailand. *International Journal of Electronic Finance,* 1 (2)**,** 181-199.

*YUAN, R., XIAO, J. Z. & ZOU, H. (2008) Mutual Funds' Ownership and Firm Performance: Evidence from China. *Journal of Banking & Finance,* 32 (8)**,** 1552-1565

*YURTOGLU, B. B. (2000) Ownership, Control and Performance of Turkish Listed Firms. *Empirica,* 27 (2)**,** 193-222.

*ZEITUN, R. & TIAN, G. G. (2007) Does Ownership Affect a Firm's Performance and Default Risk in Jordan? *Corporate Governance,* 7 (1)**,** 66-82.

ZHOU, X. (2001) Understanding the Determinants of Managerial Ownership and the Link Between Ownership and Performance: Comment. *Journal of Financial Economics,* 62 (3), 559-571.

Table 1. Descriptive statistics of estimated partial correlation coefficient of primary studies

This table presents the descriptive statistics of partial correlation coefficients computed from the estimates of 27 primary studies. S.D. is the standard deviation.

			Partial correlation coefficient				
Study	Country	Data Year	Minimum	Mean	Median	Maxium	S.D.
Rogers et al. (2008)	Brazil	1997-2001	-0.12	0.01	0.03	0.13	0.1
Carvalhal-da-Silva (2003)	Brazil	2000	-0.29	-0.11	-0.08	0.06	0.1
Wu & Cui (2002)	China	2000	-0.02	0	0	0.02	0.03
Wei (2007)	China	1999-2002	-0.08	-0.02	0	0	0.04
Xu & Wang (1997)	China	1995	0.03	0.11	0.09	0.25	0.07
Tian & Estrin (2005)	China	1994-1998	0.05	0.07	0.06	0.09	0.01
Lu & Yao (2006)	China	2001-2002	0.06	0.07	0.07	0.07	0
Chen (2001)	China	1997	-0.1	0.06	0.07	0.18	0.12
Firth et al. (2002)	China	1998-2000	-0.02	0.02	0.02	0.05	0.02
Ma et al. (2006)	China	2004	-0.05	-0.04	-0.05	-0.04	0
Wang et al. (2004)	China	1991-2000	0.02	0.04	0.04	0.06	0.02
Yuan et al. (2008)	China	2001-2005	-0.02	0	0	0.02	0.02
Bai et al. (2004)	China	1999-2001	-0.05	0.02	0.01	0.19	0.07
Claessens & Djankov (1999a)	Czech	1992-1999	0.03	0.05	0.04	0.08	0.02
Earle (2005)	Hungary	1996-2001	0.08	0.17	0.14	0.35	0.09
Zeitun & Tian (2007)	Jordan	1989-2002	-0.03	0.03	0.03	0.09	0.03
Joh (2003)	Korea	1993-1997	-0.02	0.11	0.15	0.17	0.07
Lee (2008)	Korea	2000-2006	0.01	0.12	0.12	0.2	0.05
Na (2002)	Korea	1998-2000	-0.1	-0.03	-0.02	0.02	0.03
Haniffa & Hudaib (2006)	Malaysia	1996-2000	-0.22	-0.01	-0.01	0.14	0.12
Grosfeld (2007)	Poland	1991-2003	-0.26	0.03	0.13	0.17	0.19
Kuznetsov & Muravyev (2001)	Russia	1996-1998	-0.15	-0.03	-0.05	0.13	0.1
Yammeesri et al. (2006)	Thailand	1993-1996	0.08	0.1	0.09	0.13	0.03
Anuchitworawong (2004)	Thailand	1996 &2000	-0.1	0.07	0.09	0.13	0.06
Yurtoglu (2000)	Turkey	1990-1996	-0.26	-0.16	-0.16	-0.11	0.05
Gursoy & Aydogan (1998)	Turkey	1992-1998	-0.06	0	0	0.07	0.07
Ozer & Yamak (2001)	Turkey	1999	0	0	0	0	0
Overall		1989-2006	-0.29	0.03	0.04	0.35	0.10

Table 2. Homogeneity test for correlations

Panel A reports the heterogeneity test for estimates of the 27 studies included in the meta-analysis. *Study* indicates studies included in the meta-analysis. *N* is the number of observations. *r_posisi* is the number of estimates positive and statistically significant at the 5% level (one tail) in each study. *r_negasi* is the number of estimates negative and statistically significant at the 5% level (one tail) in each study. *r_notsi* is the number of estimates non-significant at the 5% level (one tail) in each study. The *Q* statistic tests the null hypothesis of homogeneity of the population correlations and *** and * indicate the null hypothesis is rejected at the 1% and 10% level respectively corresponding to the reported *p*-value. Panel B reports the component of total variance of pooled estimates. The *coef.* of *rho* is the estimate of intraclass correlation coefficient.

Panel A: Homogeneity test of estimates within each study and pooled estimates					
Study	N	r_posisi	r_negasi	r_notsi	*Q*
Rogers et al. (2008)	16	0	0	16	21.77
Carvalhal-da-Silva (2003)	24	0	7	17	49.56***
Wu & Cui (2002)	2	0	0	2	0.72
Wei (2007)	8	0	2	6	9.92
Xu & Wang (1997)	27	10	0	17	38.06*
Tian & Estrin (2005)	8	8	0	0	3.36
Lu & Yao (2006)	7	6	0	1	0.04
Chen (2001)	4	2	1	1	18.36***
Firth et al. (2002)	15	4	0	11	11.24
Ma et al. (2006)	3	0	3	0	0.05
Wang et al. (2004)	4	3	0	1	1.94
Yuan et al. (2008)	8	0	2	6	8.09
Bai et al. (2004)	12	6	4	2	105.44***
Claessens & Djankov (1999a)	10	10	0	0	5.16
Earle (2005)	8	6	0	2	7.91
Zeitun & Tian (2007)	24	5	0	19	17.33
Joh (2003)	12	10	0	2	209.22***
Lee (2008)	28	26	0	2	266.15***
Na (2002)	12	0	4	8	7.83
Haniffa & Hudaib (2006)	12	5	5	2	72.29***
Grosfeld (2007)	6	4	1	1	16.52***
Kuznetsov & Muravyev (2001)	15	3	6	6	36.32***
Yammeesri et al. (2006)	3	3	0	0	1.33
Anuchitworawong (2004)	25	9	1	15	21.84
Yurtoglu (2000)	8	0	5	3	2.03
Gursoy & Aydogan (1998)	4	1	2	1	14.63***
Ozer & Yamak (2001)	8	0	0	8	0
Total	313	121	43	149	2274.476***

Table 2. Continued

Panel B: Component of total variance of pooled estimates

Variance component	Coef.	S.E.	95% Conf. Interval	
Between study standard deviation	0.066	0.01	0.049	0.089
Within study standard deviation	0.072	0.003	0.066	0.078
rho	0.459	0.079	0.311	0.614

Table 3. Study characteristics (explanatory variables in meta-regressions)

This table presents the study characteristics associated correlation estimates, and their corresponding descriptive statistics. All the study characteristics are coded as binary dummy variables, and are used as explanatory variables in the meta-regressions of this study. The total number of studies and observations are 27 and 313 respectively.

Variable	Description	Frequency
Specification difference		
Control variable used in primary studies		
(1)Firm specific characteristics		
Size	= 1 if size is controlled	94.25
Age	= 1 if firm age is controlled	20.77
Financial structure	= 1 if financial structure is controlled	83.39
Liquidity	= 1 if liquidity is controlled	13.42
Capital intensity	= 1 if capital intensity is controlled	8.95
Expenditure intensity	= 1 if expenditure intensity is controlled	14.38
Growth	= 1 if growth is controlled	14.06
Tangibility	= 1 if tangibility is controlled	26.2
Board	= 1 if board structure is controlled	15.65
Shareholder Identity	= 1 if shareholder type is controlled	79.23
Business group	= 1 if business group is controlled	6.71
Accounting performance	= 1 if accounting performance is controlled	43.13
Market performance	= 1 if market performance is controlled	5.43
(2) Industry effect		
Industry	= 1 if industry sector is controlled	63.58
(3)External contracting environment		
Risk	= 1 if risk is controlled	28.43
Year	=1 if year dummies are used	29.07
Functional form of ownership concentration		
Nonlinear	= 1 if non-linear terms of ownership concentration is included	21.73
Estimation method		
Endogeneity	= 1 if endogeneity is controlled	21.41
Fixed effects model	=1 if use fixed effects model	10.86
GMM or 2SLS	= if use GMM or 2SLS estimation method	9.3
Random effects model	=1 if use random effects model	8.63
Least absolute deviation or Huber's M	=1 if use least absolute deviation or Humber's M method	2.56
Sample selection		
Post-2000	= 1 if average data year was or after 2000	34.82
Include-financial firm	= 1 if the sample is non-financial firms	33.55

Table 3. Continued

Variable	Description	Frequency
Measures of performance and ownership concentration		
Accounting measure	= 1 if use accounting performance measure	65.18
Concentration ratio	= 1 if use concentration ratio as ownership concentration measure	82.75
Top 1	=1 if ownership concentration is measured by the shareholding of the largest shareholder	41.5
Publication status		
Publication	= 1 if published in referred journals	44.41
JFE or JBF publication	= 1 if published in Journal of Finance or Journal of Banking and Finance	6.39
Other publication	=1 if published but not in JFE or JBF	38.02
Region and country composition		
Asia		
China	= 1 if use a sample of Chinese firms	31.31
Korea	= 1 if use a sample of Korean firms	16.61
Malaysia	=1 if use a sample of Malaysian firms	3.83
Thailand	=1 if use a sample of Thailand firms	8.95
Korea-Malaysia-Thailand	=1 if the sample is Korean, Malaysian or Thailand firms	29.39
East Europe		
Russia	=1 if use a sample of Russian firms	4.79
Hungary	=1 if use a sample of Hungarian firms	2.56
Czech	=1 if use a sample of Czechic firms	3.19
Poland	=1 if use a sample of Polish firms	1.92
Russia-Czech-Poland	=1 if the sample is Russian, Czechic or Polish firms	9.9
Other region/country		
Brazil	=1 if use a sample of Brazilian firms	12.78
Jordan	=1 if use a sample of Jordanian firms	7.67
Turkey	=1 if use a sample of Turkish firms	6.39
Combination of countries across regions		
Hungary-Korea-Malaysia -Thailand	=1 if the sample is Hungarian, Korean, Malaysian or Thailand firms	31.95
Brazil-Jordan-China -Russia-Czech-Poland	=1 if the sample is Brazilian, Jordanish, Chinese, Russian, Czechic or Polish firms	61.66

Table 4. Results for the meta-regression analysis – preliminary regression models

The explanatory variables are moderators, which are hypothesized to influence the estimated correlations between ownership concentration and performance of primary studies, and are defined in Table 3. The dependent variable is Fisher's z-transformation of partial correlations. *Constant* is the constant term of meta-regressions. N=313. The number of primary studies (clusters) is 27. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level. The estimation method is OLS regression with Huber-White statistics robust to heteroskedasticity and clustering on studies. t statistics robust to heteroskedasticity and clustering are reported in parentheses.

	Reg 1 H-W	Reg 2 H-W	Reg 3 H-W	Reg 4 H-W	Reg 5[②] H-W
Specification difference					
Difference in					
Control variables[①]	Yes	Yes	Yes	Yes	Yes
Functional form of ownership concentration					
Nonlinear	-0.002	-0.012	-0.005	-0.007	0.008
	[-0.04]	[-0.36]	[-0.14]	[-0.22]	[0.24]
Estimation method					
Endogeneity	-0.012	0.016	-0.009	0.017	0.011
	[-0.74]	[1.32]	[-0.65]	[1.41]	[0.86]
Sample selection					
Post-2000	-0.053	-0.04	-0.054	-0.027	-0.028
	[-3.52]***	[-2.85]***	[-3.74]***	[-1.99]*	[-1.74]*
Include-financial firm	0.053	0.061	0.067	0.077	0.030
	[1.79]*	[2.9]***	[2.83]***	[4.11]***	[0.88]
Measures of performance and ownership concentration					
Accounting measure	0.031	0.02	0.03	0.028	0.020
	[1.59]	[1.04]	[1.56]	[1.7]	[1.09]
Concentration ratio	0.014	0.004	0.01	-0.001	0.009
	[1.37]	[0.34]	[0.96]	[-0.11]	[0.99]
Publication status					
Publication	0.051	0.048	0.057	0.049	0.025
	[1.88]*	[2.64]**	[2.25]**	[2.37]**	[0.85]
Region and country composition					
Asia					
China		0.032		0.018	0.044
		[1.04]		[0.71]	[0.73]
Korea		0.144			
		[3.86]***			

Table 4. Continued

	Reg 1 H-W	Reg 2 H-W	Reg 3 H-W	Reg 4 H-W	Reg 5② H-W
Malaysia		0.105			
		[1.98]**			
Thailand		0.238			
		[3.51]***			
Korea-Malaysia-Thailand				0.142	0.140
				[4.65]***	
East Europe					
Russia	0.043				
	[0.57]				
Hungary	0.201		0.179		0.161
	[1.94]*		[1.93]*		[2.03]*
Czech	0.12				
	[1.06]				
Poland	0.076				
	[0.73]				
Russia-Czech-Poland			0.057		-0.014
Other region/country			[0.75]		[-0.24]
Brazil					0.014
					[0.25]
Jordan					0.051
					[0.66]
Turkey					-0.077
					[-2.24]**
Hungary-Korea-Malaysia-Thailand					
Constant	Yes	Yes	Yes	Yes	No
R-squred	0.49	0.55	0.49	0.54	0.6
Observations	313	313	313	313	313
Clusters	27	27	27	27	27

Note: ① In each regression, we control for model specification difference resulting from the different control variables used in primary studies. There are in total 16 variables used to account for this difference (see Table 3 for details of the 16 variables). We did not report the regression results for these variables here, which are available from the authors upon request.

② In regression 3, we have included all (combined) country dummy variables and suppressed the intercept, with the purpose of estimating country effects of all available emerging economies.

Table 5. Results for the meta-regression analysis – formal models with combined country dummies across regions

The explanatory variables are moderators, which are hypothesized to influence the estimated correlations between ownership concentration and performance of primary studies, and are defined in Table 3. The dependent variable is Fisher's z-transformation of partial correlations. Regression 6 is the formal model. Regression 7-9 are regressions using alternative estimation methods or model. Regression 10-13 are further checks on issues of publication bias, endogeneity, non-OLS estimation methods, and ownership measures. *Constant* is the constant term of meta-regressions. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level. †††, ††, and † indicate statistically significant at the1%, 5%, and 10% level for the Monte Carlo permutation test of the mixed effects meta-regression model. H-W denotes OLS regression with Huber-White statistics robust to clustering on studies and arbitrary heteroskedasticity ME denotes mixed effects meta-regression. na denotes not applicable. t statistics are in brackets.

	reg 6 H-W	reg 7 H-W Stepwise regression	reg 8 Bootstrap bootstrap regression	reg 9 ME Mixed effects regression	reg 10 H-W Publication bias	reg 11 H-W Endogeneity issue	reg 12 H-W Non-OLS estimation	reg 13 H-W Ownership measures
Specification difference								
Control variables								
Size	0.026	0.027	0.026	0.028	0.022	0.017	0.017	0.026
	[1.04]	[1.52]	[1.05]	[1.11]	[0.93]	[0.68]	[0.67]	[1]
Age	-0.031	-0.033	-0.031	-0.033	-0.023	-0.017	-0.018	-0.032
	[-1.92]*	[-2.24]**	[-1.78]*	[-2.4]**, ††	[-1.13]	[-1.03]	[-1.01]	[-2.03]*
Financial structure	0.049	0.048	0.049	0.030	0.043	0.043	0.043	0.048
	[3.02]***	[2.97]***	[2.65]***	[1.88]*, ††	[2.55]**	[3.1]***	[3.08]***	[3.08]***
Liquidity	-0.053	-0.053	-0.053	-0.069	-0.057	-0.052	-0.054	-0.053
	[-2.49]**	[-2.19]**	[-1.84]*	[-2.81]***, †††	[-2.46]**	[-2.5]**	[-2.59]**	[-2.47]**

	reg 6 H-W	reg 7 H-W Stepwise regression	reg 8 Bootstrap bootstrap regression	reg 9 ME Mixed effects regression	reg 10 H-W Publication bias	reg 11 H-W Endogeneity issue	reg 12 H-W Non-OLS estimation	reg 13 H-W Ownership measures
Capital intensity	-0.107	-0.106	-0.107	-0.091	-0.102	-0.103	-0.102	-0.107
	[-4.1]***	[-6.36]***	[-4.49]***	[-4.16]***, †††	[-3.89]***	[-3.8]***	[-3.78]***	[-4.19]***
Expenditure intensity	-0.075	-0.075	-0.075	-0.074	-0.084	-0.077	-0.076	-0.075
	[-3.86]***	[-3.82]***	[-3.16]***	[-3.53]***, †††	[-3.35]***	[-4.13]***	[-4.07]***	[-3.46]***
Growth	0.098	0.098	0.098	0.091	0.098	0.097	0.097	0.099
	[5.62]***	(6.96)***	[5.44]***	[5.38]***, †††	[5.5]***	[5.33]***	[5.23]***	[5.77]***
Tangibility	0.004	-	0.004	0.008	0.001	0.009	0.009	0.004
	[0.21]	-	[0.19]	[0.47]	[0.05]	[0.43]	[0.43]	[0.21]
Board	-0.074	-0.072	-0.074	-0.052	-0.07	-0.080	-0.078	-0.074
	[-3.55]***	[-4.23]***	[-3.65]***	[-2.61]***, †††	[-3.34]***	[-3.78]***	[-3.49]***	[-3.57]***
Shareholder identity	0.022	0.022	0.022	0.019	0.021	0.022	0.021	0.021
	[1.01]	[1.28]	[1.26]	[1.36]	[0.97]	[1.01]	[0.96]	[0.97]
Business group	-0.064	-0.064	-0.064	-0.027	-0.072	-0.071	-0.070	-0.064
	[-2.92]***	[-2.86]***	[-2.02]**	[-1.18]	[-2.88]***	[-3.18]***	[-3.12]***	[-2.84]***
Accounting performance	-0.029	-0.028	-0.029	-0.007	-0.024	-0.032	-0.031	-0.028
	[-2.14]**	[-2.05]*	[-1.32]	[-0.49]	[-1.54]	[-2.24]**	[-2.14]**	[-2.05]**
Market performance	-0.134	-0.131	-0.134	-0.102	-0.137	-0.133	-0.131	-0.133
	[-2.8]***	[-3.09]***	[-3.56]***	[-3.61]***, †††	[-2.96]***	[-2.83]***	[-2.72]**	[-2.75]**

	reg 6 H-W	reg 7 H-W Stepwise regression	reg 8 Bootstrap bootstrap regression	reg 9 ME Mixed effects regression	reg 10 H-W Publication bias	reg 11 H-W Endogeneity issue	reg 12 H-W Non-OLS estimation	reg 13 H-W Ownership measures
Industry	-0.072	-0.071	-0.072	-0.067	-0.071	-0.083	-0.082	-0.071
	[-6.93]***	[-7.81]***	[-5.67]***	[-6.79]***, †††	[-7.06]***	[-7.47]***	[-7.1]***	(-7.25)***
Risk	-0.044	-0.043	-0.044	-0.011	-0.042	-0.049	-0.049	-0.044
	[-2.16]**	[-2.51]**	[-2.2]**	[-0.63]	[-1.95]*	[-2.64]**	[-2.6]**	[-1.97]*
Year	0.037	0.039	0.037	0.053	0.031	0.023	0.025	0.037
	[2.04]*	[2.37]**	[1.64]*	[2.36]**, ††	[1.6]	[1.17]	[1.1]	[2.03]*
Functional form of ownership concentration								
Nonlinear	0.002	-	0.002	-0.013	0.003	0.004	0.005	0.002
	[0.05]	-	[0.1]	[-1.11]	[0.1]	[0.12]	[0.15]	[0.06]
Estimation method								
Endogeneity	0.018	0.017	0.018	0.016	0.015			0.017
	[1.47]	[1.52]	[1.26]	[1.46]	[1.21]			[1.45]
Fixed effects						0.053	0.053	
						[3.68]***	[3.35]***	
GMM or 2SLS						0.004	0.002	
						[0.29]	[0.09]	
Random effects							-0.005	
							[-0.35]	

	reg 6 H-W	reg 7 H-W Stepwise regression	reg 8 Bootstrap bootstrap regression	reg 9 ME Mixed effects regression	reg 10 H-W Publication bias	reg 11 H-W Endogeneity issue	reg 12 H-W Non-OLS estimation	reg 13 H-W Ownership measures
Least absolute							0.015	
deviation or Huber's M							[1.72]*	
Sample selection								
Post-2000	-0.031	-0.029	-0.031	-0.033	-0.032	-0.037	-0.037	-0.03
	[-1.98]*	-[2.28]**	[-2.13]**	[-2.48]**, †††	[-2.04]*	[-2.25]**	[-2.21]**	[-1.81]*
Include-financial firm	0.048	0.051	0.048	0.060	0.053	0.040	0.041	0.048
	[2.95]***	[3.95]***	[2.87]***	[3.52]***, †††	[2.86]***	[2.1]**	[2.06]**	[3.02]***
Measures of performance and ownership concentration								
Accounting measure	0.022	0.021	0.022	0.019	0.022	0.023	0.024	0.022
	[1.32]	[1.35]	[2.12]**	[1.95]*, ††	[1.33]	[1.34]	[1.34]	[1.29]
Concentration ratio	0.002	-	0.002	0.007	0.002	0.006	0.006	
	[0.24]	-	[0.18]	[0.53]	[0.21]	[0.68]	[0.67]	
								0
								[0.02]
Publication status								
Publication	0.045	0.045	0.045	0.020		0.038	0.036	0.044
	[3.06]***	[2.97]***	[2.23]**	[1.24]		[2.61]**	[2.43]**	[3]***
JFE or JBF publication					0.069			
					[1.9]*			

	reg 6 H-W	reg 7 H-W Stepwise regression	reg 8 Bootstrap bootstrap regression	reg 9 ME Mixed effects regression	reg 10 H-W Publication bias	reg 11 H-W Endogeneity issue	reg 12 H-W Non-OLS estimation	reg 13 H-W Ownership measures
Other publication					0.037 [2.18]**			
Region and country composition①								
Turkey	-0.078 [-2.37]**	-0.074 [-2.88]***	-0.078 [-2.05]**	-0.068 [-1.95]*, ††	-0.078 [-2.31]**	-0.100 [-2.64]**	-0.099 [-2.54]***	-0.078 [-2.19]***
Hungary-Korea- Malaysia-Thailand	0.117 [7.24]***	0.118 [13.09]***	0.117 [5.74]***	0.103 [6.6]***, †††	0.121 [6.75]***	0.105 [7.05]***	0.103 [6.85]***	0.117 [7.48]***
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squred	0.56	0.56	0.56	na	0.56	0.57	0.57	0.56
Observations	313	313	313	313	313	313	313	313
Clusters	27	27	na	na	27	27	27	27

Note: ① The base group is *Brazil-Jordan-China-Russia-Czech-Poland.*

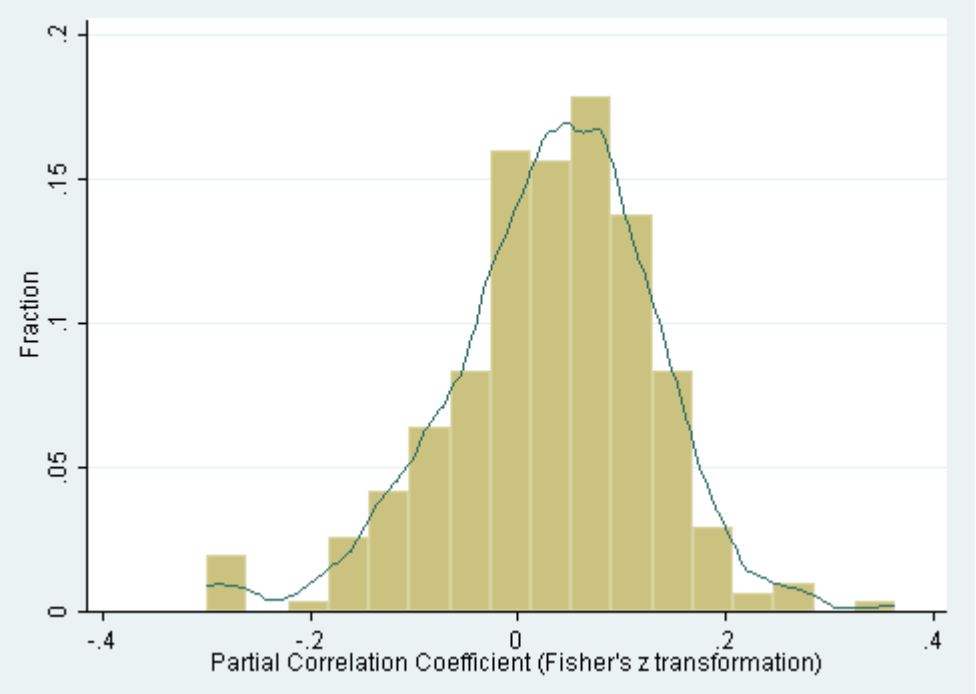

Figure 1. Histogram of estimated correlation coefficients

Each bar's height is the fraction of the number of total observations (N=313). The histogram is overlaid with a kernel density estimate of the density.

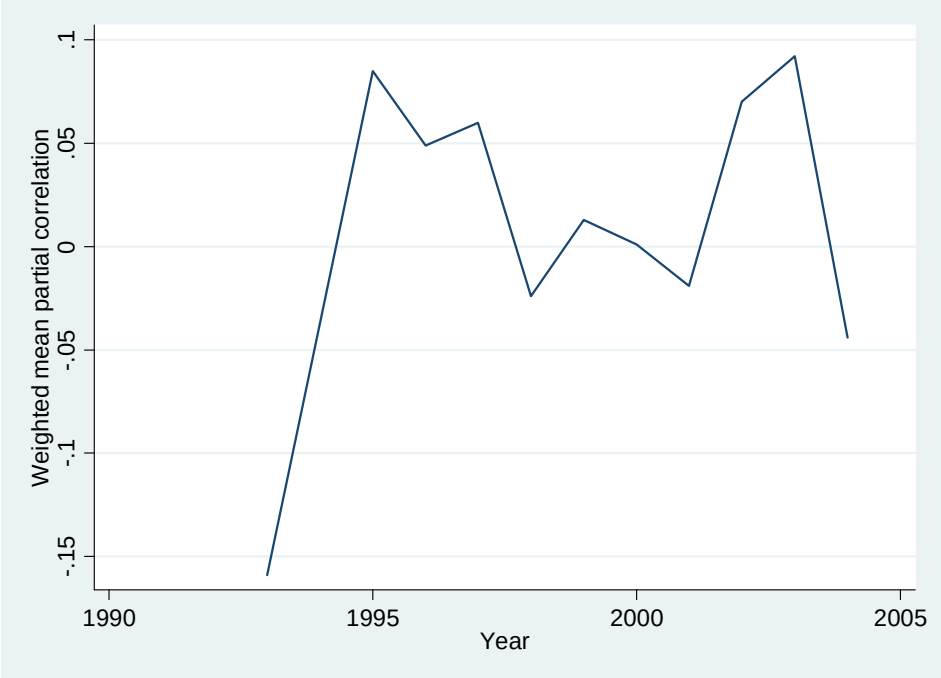

Figure 2. Time series of partial correlation between ownership concentration and firm performance 1993-2004

For a correlation estimated from cross-sectional data, *Year* is its data year; for that from multi-year data, *Year* is the average year, which equal the median year when the total number of data year is odd, and equal [(data start year + data ending year/2)+0.5 when the total number of data year is even. The weighted mean partial correlations are computed from the corresponding Z_r using equation (5).

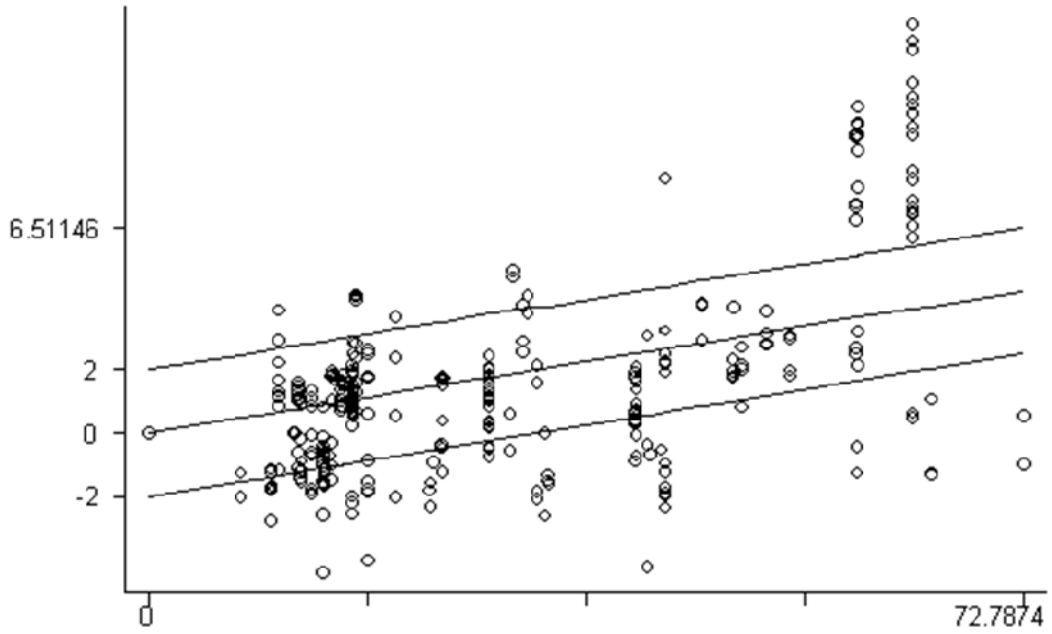

Figure 3. Galbraith plot of partial correlation coefficients (Fisher's Zr)

This figure displays the amount of heterogeneity of partial correlation coefficient estimates (Fisher's Zr) computed from empirical results of the 27 primary studies. The number of observation is 313. The position of each Zr on the horizontal axis indicates the weight allocated to it in the Q test. The position on the vertical axis gives the contribution of each Zr to the Q statistic for heterogeneity. A regression line constrained through the origin indicates the overall correlation. In the absence of heterogeneity, all the points are expected to lie within the 95% boundaries of the overall correlation (positioned 2 units over and below the regression line).

Endnotes

[1] For examples of the existence and persistence of concentrated ownership, see Lins (2003) for 18 emerging markets, Claessens et al. (2000) for East Asia emerging economies, and Rogers et al. (2008) or Brazil.

[2] We have adjusted original tow-tailed test results to one-tailed for distinguishing between significant positive and negative results.

[3] If the differences between effect sizes arise largely from sampling error (i.e., the true effect is the same in each estimate and the variation of in study estimates is wholly random), the effect estimates are considered to be homogeneous.

[4] See Standard & Poor's (2007) for criteria for identifying emerging markets. The 36 emerging markets are: Argentina, Bahrain, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Kuwait, Lebanon, Malaysia, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, Sri Lanka, Taiwan, Thailand, Tunisia, Turkey, UAE, and Zimbabwe.

[5] A range of electronic databases were searched[5], including ABI/INFORM Global (multiple databases), SSRN, ScienceDirect, EconPapers, and Google Scholar.

[6] See Glossary of Industrial Organisation Economics and Competition Law, OECD, <http://www.oecd.org/dataoecd/8/61/2376087.pdf>.

[7] For clarity and consistency with most of the literature, an individual paper will be called a "study" throughout this paper. The terms "paper" and "study" are used interchangeably in this meta-analysis.

[8] The 11 countries are Brazil, China, Czech, Hungary, Jordan, Korea, Malaysia, Poland, Russia, Thailand, and Turkey. There is no cross-country study in our sample because no cross-country study in our initial sample satisfied our selection criteria.

9 Only one study is in this case. It contributes 8 observations to the meta-analysis, and among which 6 correlation estimates are assumed zero because of non-significant findings without associated statistics.

[10] Three cases fall into this category: privatization stage in Czech, provincial GDP per capita and listing stock exchanges in China's case.

[11] r ranges from -1 to 1.

12 Since we have assumed a zero correlations for 6 observations that reported "non-significant" findings without the associated statistics, this conservative procedure may exaggerate the variance in

correlation estimates when relations actually exist (Cooper, 1989: 117). We thus conducted a Q test excluding the 6 observations. Although this yield a smaller Q statistics of 2205.434 on 304 degrees of freedom, the significance level remains the same, i.e., the homogeneity null hypothesis is still rejected. So we choose not to exclude the 6 observations in our analysis.

[13] See Wooldridge (2006) for details of omitted variable bias.

[14] This does not include those control variables that are pertained to specific country context. See footnote 10.

[15] For regressions that use fixed effects estimation method, we also code the dummy variable *Industry* equal unity since fixed effects model can control for industry fixed effects.

[16] Although *Expenditure Intensity* is not excluded by this criterion, we excluded in our meta-regression models since this variable is dominated by one particular study and result in multicollinearity problem in the meta-regression models.

[17] We take a broad meaning of "endogeneity" of an explanatory variable consistent with Wooldridge (2006), i.e., any situations in which an explanatory variable (e.g., ownership concentration variable) may be correlated with the error term, rather than a single case that arise from simultaneous equation analysis when the explanatory variable (e.g., ownership concentration variable) is jointly determined with the dependent variable (e.g., firm performance variable).

[18] For regressions using panel data, the data y*ear that we used to distinguish whether it is* from 2000 onwards is the average year, which equal the median year when the total number of data year is odd, and equal [(data start year + data ending year/2)+0.5 when the total number of data year is even .

[19] Different with Cochran and Wood (1984) who take P/E ratio as accounting return, we classify P/E ratio as market return because it is affected by investor expectation on firm's future performance and investor sentiment.

20 Concentration ratios used include the percentage of total shares held by top 1, the second largest shareholder, top 2, top 3, non-state top 3, top 5, top 10, non-state top 10, or all blockholders, as well as the natural logarithm of the percentage of total shares held by the second through to the tenth largest shareholder. Herfindahl indices used include Herfindahl top 3, Herfindahl top 5, Herfindahl top 10, and Herfindahl (no formula was given in primary studies).

[21] Investigation on country difference/similarity within regions can only be achieved for Asia and East Europe, and unachievable for Pan Arab, Latin America and non-Eastern Europe, because each of them has only one country being studied.

[22] The use of REML is to overcome the tendency to underestimate variances attributed to the original maximum likelihood (ML) approach for estimating τ^2 proposed in Hardy & Thompson (1996) and Pocock et al. (1981).

[23] There are a total of three estimation methods used in primary studies to control for endogeneity problem: 2SLS, fixed effects model, and GMM. Because there are only 4 effect sizes are estimated by GMM, and also because GMM used in the primary regressions and 2SLS are instrumental variable (IV) approach, we combined it with 2SLS. Before the combination, we have run a regression contains three of the estimation methods and use estimation methods that do not control for endogeneity as the base group, the results of which show that both studies using GMM and 2SLS estimation methods do not report a significantly different ownership concentration-performance relation with studies do not control for endoneneity, indicating that it is appropriate to combined them together. After the combination, the results for other variables remain unchanged.

24 These are rough groups of the rankings of journal papers included in our primary studies. The

journals in which the primary studies published consist of Journal of Journal of Financial Economics (JFE), Banking & Finance (JBF) , Asia Pacific Business Review, Asia Pacific Journal of Management, Corporate Governance, Economics of Planning, Empirica, International Journal of Electronic Finance, Journal of Business Finance & Accounting, Journal of Comparative Economics, Journal of Corporate Ownership & Control, and Economics of Transition. Since few studies on the relation between ownership structure and firm performance in emerging markets published in tier 1 journals, we group studies published in JBF and JFE together.