Does ownership structure affect firm's payout policy? Evidence from Korean chaebol

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ABSTRACT

Using a set of data on Korean firms' ownership information and the 2014 tax reform, this study finds that the type of ownership structure affects firms' dividend payout tendencies. Specifically, firms under the circular ownership structure of larger Chaebol tend to make lower dividend payouts compared to firms under a pyramidal structure. To address endogeneity concerns, the current study examines a set of Korean firms operating under distinct regulations and investigates the effect using a regulatory change in dividend tax that reduced the dividend gains tax. By utilizing this regulatory change as a shock in a difference-in-difference methodology, the results confirm that ownership structure influences dividend payments. To address concerns that ownership structure may reflect different management styles, the study tests for differences in management styles across ownership structures. The findings confirm that there are no significant differences in management styles, including value-expropriating behavior and governance slack, between firms with different ownership structures.

Keywords: Corporate Payout Policy, Corporate Governance, Corporate Ownership Structure

INTRODUCTION

Does the ownership structure of a firm affect its payout policy? The standard classical corporate finance theory would disagree, as it is well known that a firm's payout policy is irrelevant to its value (Miller & Modigliani, 1961), and so should be the ownership structure. Such a perspective had its relevance in the real corporate environment until another strand of literature on corporate ownership structure began documenting that firms around the world may not be widely held (La Porta et al., 1999). With this notion in mind, subsequent studies provided evidence that concerns regarding the expropriation of resources by controlling owners of firms within large business groups may affect the level of payout, as dividends could be a tool to limit insider expropriation from outside shareholders (La Porta et al., 2000a; Faccio, Lang, & Young, 2001). Therefore, while it is reasonable to examine corporate payout policy in tandem with a firm's ownership structure, relatively little attention has been paid to which type of business group structure has more impact on the level of expropriation.

In the current study, the effect of business group ownership structure on the level of controlling owners' expropriation is addressed by examining the dividend payout of firms relative to different types of business group ownership. However, since the ownership structure of a firm is endogenous to management decisions, it is difficult to gauge the effect of group-level ownership structure alongside corporate decisions. To overcome this difficulty, this study turns to a set of Korean firms that operate under distinct regulations and investigates the effect using a regulatory shock in dividend tax reduction, which may help alleviate the endogeneity concern. Within this setting, it is found that firms belonging to circular ownership structures tend to pay fewer dividends than those firms belonging to pyramidal business group structures when the motivation to pay higher dividends is clear due to the tax cut on dividends. This finding suggests that a higher level of expropriation of corporate wealth from non-controlling outside shareholders to the controlling shareholder is more likely for firms within circular ownership structures. To further examine whether other types of corporate activities are affected by the type of ownership structure, this study additionally tests whether investment, wages, and leverage are influenced by the type of ownership structure. It is found that although firms in circular ownership structures do not seem to be wasting their corporate resources in a blatant manner, it is also not the case that they are engaging in either pro-shareholder or pro-stakeholder behavior.

The rest of the paper is organized as follows. In Section 3, this study discusses in detail the institutional specifics that large business groups in Korea face and develops hypotheses in conjunction with the tax reform. Section 4 describes the dataset used for the analysis, and Section 5 discusses the empirical results. Section 6 concludes.

HYPOTHESIS DEVELOPMENT

Since the study by Miller and Modigliani (1961), academics have paid attention to why dividend payment is so persistent and prevalent among firms, as the given theory suggests that the payout decision is an irrelevant concern. However, with the rise of agency problems and free cash flow issues, Jensen (1986) puts forth a set of ideas that dividends could serve as a disciplining device for managers, as the payment of dividends limits the free cash flow problem and the expropriation of corporate resources by managers while compensating investors. Meanwhile, studies documenting that firms may be held by a controlling party or owner who could yield effective control instead of being widely held introduce the conflict between inside

versus outside shareholders into the discussion, along with the idea of expropriation of wealth from outside shareholders to controlling insider shareholders (La Porta et al., 1999). As variations in ownership structure introduce a wrinkle to the expropriation of wealth from and to different types of shareholders, dividends come into the picture not only as a puzzle but possibly as a tool for expropriation from different shareholders for firms with varying levels of ownership complexity (Faccio et al., 2001). In this regard, this study also examines dividends in relation to ownership structure, but from a slightly different angle. Instead of focusing on an individual firm's ownership structure, usually measured by the separation between ownership and cash-flow rights, this study aims to consider the type of ownership structure of large groups and investigate whether the degree of expropriation can be explained by different types of ownership structures within the group, using dividend payout as a measure for the degree of corporate wealth expropriation.

Two types of business group ownership structures this study would like to investigate are circular ownership structures and pyramidal ownership structures (Figure 1a). Circular ownership structures arise when firms within the same group hold shares in other firms in a chaining manner (e.g., A holding B, B holding C, and C holding A in Figure 1a), forming a type of circle. In contrast, for pyramidal structures (Figure 1b), it is clear which company is the ultimate controlling company or owner, as that one company holds a portion of every other company in the same business group. This study believes examining these two distinct types is interesting because they vastly differ from one another. For example, while in a pyramidal structure one can easily identify the controlling entity, it is more challenging to do so with circular ownership. Moreover, while the direction of expropriation of corporate wealth under a pyramidal structure may be clear, it is harder to identify the direction of accumulation, if there is any.

Therefore, this study aims to test 1) whether different types of ownership structures affect the dividend payout practices of the firms belonging to each type, and 2) whether any evidence of expropriation behavior associated with a certain ownership type can be detected if one type exhibits a distinct affinity for paying out dividends.

The biggest challenge that studies on ownership structure face is that corporate ownership is endogenous to the manager's decision on how to shape the ownership structure. This issue complicates analyses regarding ownership structure, rendering them impossible or forcing the study to suggest only possible associations. As this study also seeks to investigate and examine a potential relationship between the type of ownership structure and dividends, it acknowledges that its analysis suffers from the same set of concerns. While it is impossible to completely eliminate these concerns, an exogenous tax reform is used in the analysis to address them. As Chetty and Saez (2005) clearly indicate, with the dividend tax cut, there is a unanimous tendency for all firms to pay higher dividends, regardless of other firm characteristics. Therefore, if this study can document the interaction between tax reform and the variable of interest—specifically if it observes any negative association between dividends and the ownership variable conditioned on the tax cut—it could indicate that specific ownership variables may have differing effects on the dependent variable.

The rationale for the exogeneity of the event is that since the ownership structure arose earlier, even before being designated as a Large Business Group (to be discussed in Section 3), managers could not have possibly chosen to select their company into a certain type to enjoy the benefits arising from dividends to be paid in ten years. Another identifying assumption required for using tax reform as an identification strategy is that firms in either of the ownership structures

described above should not be liable for different amounts of tax. That is, either structure should not systematically result in differing tax amounts. This study believes this assumption is reasonable, as dividend tax is incurred by the recipient of the dividend, not the payer. For simple illustration, consider firm D paying dividends in the ownership cases depicted in Figures 1a and 1b. While it may seem that because E and F own firm B in a circular structure whereas only A owns it in the pyramidal structure, the circular structure might be liable for more tax due to the dividend payment. However, since tax liabilities arise based on the amount of dividend paid, regardless of the number of recipients, as long as the total amount of dividends paid out is the same, the tax amount that the group as a whole may be liable for should also remain the same.

Additionally, according to Allen, Bernardo, and Welch (2005), dividend payments and differences among different firms may arise from discrepancies in institutional tax versus retail investors. However, since this set of reforms was applied to every entity, both individual and legal, in the economy, this study believes its identifying assumption is a reasonable one to make.

INSTITUTIONAL DETAIL

The unique institutional feature of the Korean company's conglomerate ownership structure, also well known as "Chaebol," arose due to the socioeconomic conditions faced post-Korean War. To resolve trade imbalances arising from importing many goods from developed countries with advanced industrialization, the Korean government actively engaged in planned economic development by granting each firm specific business rights to grow quickly and replace imported products with domestic ones (Kim, 1999). As wealth accumulated from the sales of primary-level industrial products, this primitive form of Chaebol quickly diversified into secondary and tertiary industrial businesses. With this diversification, what started as one or two firms began to grow rapidly in size, holding shares in many subsidiaries and eventually forming a complicated business group that effectively controlled numerous firms beneath it, leading to the rise of Chaebol. Because these subsidiaries had access to ample capital and human resources compared to other standalone firms in the industry, they quickly rose to become market leaders, yielding monopolistic power. While this form of crony capitalism proved successful during the rapid industrialization of the Korean economy, such indiscriminate empire-building practices condoned by regulators came at a significant cost when the economy was hit by the Asian Financial Crisis in 1997. Many overleveraged Chaebols went bankrupt as their subsidiaries engaged in inefficient investments with proceeds from profitable businesses, relying on overleveraging by using other firms in the same group as guarantors of the debt.

Recognizing the need to monitor these large business groups to manage the health of the economy, the Fair Trade Commission (FTC)—a governmental body established to promote fair economic activities and detect and prohibit malicious corporate practices that deter fair market competition—began requiring firms with complex ownership structures in 2001 to disclose their holdings information within the group. This disclosure aimed to clearly identify and manage the pyramidal and cross-holdings of the Chaebol. Specifically, every year, the FTC designates a family group as a Large Business Group if the group's consolidated total asset size exceeds 8.9 billion USD. Once a business group is designated as an LBG, it must report all holdings information of both public and private firms annually. A firm is said to be under the group's control if the controlling owner or the closely related family owner group can 1) change more than 50% of executive members or the CEO at any time, 2) influence corporate decisions significantly to alter management decisions, 3) have the owner appointed as CEO or another

executive, or 4) hold at least 30% of outstanding shares, regardless of actual control imposed. Once a family group, or Chaebol, is designated as an LBG, the controlling firm in the group is prohibited from engaging in most financing activities related to strengthening control or altering the structure of the firms within the Chaebol group. Major restrictions include 1) a complete prohibition on the purchase of shares by one subsidiary from another within the same business group, which would create cross-holdings, 2) restrictions on obtaining or purchasing stocks of firms within the same group to create a circular ownership structure, 3) prohibition on any debt financing activity of any firm in the group by assigning one of its subsidiaries, and 4) reporting requirements for any internal transactions involving two or more firms within the same group. These restrictions make it difficult for the controlling owner to modify the ownership structure of the group once designated as an LBG by the FTC. This regulatory framework provides an appropriate setting for testing the hypothesis, as it implies that while the ownership structure may be endogenous to the controlling owner's decisions, after designation as an LBG, it becomes exogenous to the rest of the corporate decisions that the group can make. However, to clarify the relationship between ownership structure and dividend payout further, this study uses the dividend tax reform in 2014 to evaluate the relationship. In 2014, as part of government initiatives to address the cash-hoarding tendency of large corporations, the Minister of Economy proposed a tax reform that reduced the dividend gains tax from 15.4% to 9.9%. This reform was subsequently passed and applied to all dividends paid by firms in Korea. The decision aimed to increase the payouts of firms hoarding significant amounts of cash, and this study argues that this is exogenous to the ownership structure decision, as ownership structure decisions were made years earlier without anticipating this legal change. These two institutional settings allow this study to test its hypothesis while addressing possible concerns that may confound the results.

DATA

　　　　To test the hypothesis regarding payout tendencies in relation to the ownership structure of business groups, this study examines a set of Korean firms known for their reliability and clarity. For the accounting data of public firms, this study uses the Total Solution 2000 (TS-2000) dataset, a Korean equivalent of Compustat, which maintains accounting data for all public firms that were active or delisted from 1981 to 2016. Relevant accounting information for the analysis is downloaded from this dataset. For the ownership structure data, this study utilizes a website called OPNI, a database maintained by the Korean Fair Trade Commission (FTC). As mentioned in Section 2, once a business group is designated as a Large Business Group (LBG), it is required to report all holdings information for both public and private firms annually. Since the LBG designation changes each year, there is some variation in the selected business groups, as some may become eligible or drop out of the designation due to the market capitalization cutoff of 2 billion USD equivalent. Throughout the remainder of the analysis and discussion in this paper, the terms "Chaebol" and "LBG" are used interchangeably. A company may leave the dataset if the group no longer holds any shares, sells the company to another group, or goes bankrupt. To identify which public companies with accessible data belong to one of these LBGs, this study first downloads all data from the website and compiles a list of groups along with the firms within each specific group. Using this dataset, the accounting data downloaded from TS-2000 is matched, labeling a public firm as a "Chaebol" if it was ever part of an LBG monitored by the Fair Trade Commission. Once the firms that are part of specific LBGs are identified, the holdings data from the FTC is analyzed to determine which groups possess pyramidal structures versus

circular structures among the LBGs in the sample. The pyramidal structure is defined as one in which a central or parent firm controls the other firms within the business group with a smaller portion of ownership. Circular ownership structure is defined as an LBG that includes any firm that closes the ownership circle. In the subsequent analysis, the variable "Chaebol" is coded as 1 if the firm belongs to any LBG designated by the FTC, and 0 otherwise. For the set of LBGs, the variable "Circular" is defined as 1 if the business group has a circular ownership structure among its firms, and 0 if the structure appears to be pyramidal. It is worth noting that since the regulations regarding the designation of LBGs severely limit the financing activities of any firms within the LBG (as discussed in Section 2), it is unlikely and almost impossible for a business group to switch endogenously from one structure to another.

Table 1 provides summary statistics of the firms in the sample. Panel A reports the statistics for all firms in the sample, Panel B compares Chaebol versus non-Chaebol firms in Korea, and Panel C presents a summary for firms belonging to circular versus pyramidal ownership structures. From Panel B, it can be seen that Chaebol observations account for about 10% of all firm-year samples, with approximately 236 firms belonging to Chaebol in a universe of close to 3,000 firms. It is interesting to note that Chaebol firms are held more by foreign investors and pay higher dividends. From Panel C, it appears that firms belonging to circular ownership structures do not show substantial differences from those belonging to pyramidal structures, except regarding dividends. While this is suggestive, it cannot be concluded that higher dividend payments are associated with circular ownership structures. Although not reported, there are 91 firms that belong to circular ownership structures, while 118 firms are classified under pyramidal ownership structures. At least within this sample, it appears that neither structure type is more preferred than the other among the Chaebols, even before their designation as LBGs.

EMPIRICAL RESULTS

To empirically test the relationship between the type of group ownership structure and payout policy, we employ panel regression analysis. Table 2 presents a straightforward panel regression using OLS estimation. While this only illustrates a simple association, the results indicate a strong negative correlation between ownership structure and payout policy. Specifically, columns (1) to (3) examine the impact of being in a circular ownership structure on a firm's dividend payout compared to firms with a pyramidal structure, while columns (4) to (6) explore the impact of being part of a Chaebol. In columns (1) and (4), we use a simple specification without any controls, except for year fixed effects, to measure any straightforward relationship. From these two regressions, we find a meaningful negative and statistically significant effect for firms in circular ownership groups. Conversely, belonging to a Chaebol suggests a positive relationship with corporate payout behavior, indicating that higher payouts are associated with being part of an LBG. To further validate that these differences are not due to varying characteristics among firms with different ownership structures, columns (2) and (5) include various corporate characteristics that might affect firm payouts. The same set of results is observed, with the statistical significance level for the Chaebol variable in column (5) slightly improving. To control for industry effects, columns (3) and (6) include industry-year fixed effects, and we observe that the same results hold. From the results in Table 2, we find tenuous evidence that the type of ownership structure may be associated with tendencies in the level of dividend payout.

We turn to the 2014 tax reform to find stronger supporting evidence that could potentially be cleaner. Table 3 presents the results of interacting the Chaebol and circular ownership variables with the tax reform variable. The "Reform" variable is a dummy variable equal to 1 if the firm's fiscal year is 2014 or later, and 0 otherwise. First, by examining the coefficient of the Reform variable, we infer that the tax cut reform has resulted in an unequivocal increase in the payout policy of firms in the economy. For both columns (1) and (4), it is evident that the tax reform has a strong positive effect on dividend payouts. The coefficients on Circular in specification (1) and on Chaebol in (4) reconfirm the results from Table 2, showing that a circular structure is associated with lower payouts, while Chaebol status is linked to higher payouts. However, more positive and significant results can be inferred for the payouts of LBG firms after the tax reform in column (5). The interaction of Circular with Reform strongly suggests a more negative tendency for firms with circular ownership structures in paying out dividends, even after the tax reform, which serves as a clear motivation for higher dividend payments. This provides strong evidence that firms under circular structures pay out less, indicating a higher likelihood of severe expropriation. This result is indeed surprising, as the level of tax payments remains the same for firms regardless of their ownership structure.

It is worth noting that although the overall specification and construction of the analysis in Table 3 resemble a Difference-in-Difference method, the nature of ownership as a variable necessitates caution in interpreting the results as causal. However, there is substantial reason to believe inferences can be drawn from this set of results. As discussed earlier, while ownership may have been endogenous to many decisions during firm development, once designated as an LBG, it becomes practically impossible for any group to switch from one ownership structure to another. Moreover, with a time difference of ten or more years between the designation as an LBG and the tax reform, it is highly unlikely that these controlling owners changed their ownership structures in anticipation of the 2014 tax cut reform. Since it can be reasonably argued that the ownership decision was exogenous to the 2014 tax reform, the impact of being part of a circular ownership structure does suggest a reduction in dividend payouts compared to being part of a pyramidal structure. To further check for any confounding heterogeneous observable variables, we used propensity score matching to identify the most closely resembling samples within the Pyramidal group against firms in the Circular group to run the same set of analyses.

We conducted one-to-one matching with replacement, using variables such as size, cash, leverage, profit, and industry at the two-digit SIC level. Table 4 reports the results of the regression with matching. It can be observed that while the overall level of dividend payments for both circular and pyramidal firms increased after the reform, those firms within the circular structure still exhibit a negative tendency regarding dividend payouts even after the tax reform. While statistical significance weakens, we believe this is due to the greatly reduced sample size used in the regression. Overall, the matched sample analysis provides further evidence supporting the notion that the type of ownership structure matters.

In the next set of analyses, we attempt to address whether firms are using corporate resources for the benefit of other stakeholders or keeping them for themselves, particularly if certain ownership structures are associated with different degrees of payout and potential expropriation. To assess whether unnecessary levels of investment in capital expenditure are made, we evaluate whether excessive investment in intangible capital is occurring, which relates to the so-called free cash flow problem (Jensen, 1986). Table 5 presents the results of regressions with various indicators for investments. For reference, since TS-2000 maintains separate variables for tangible and intangible capital, we can compare which input factors firms are more inclined to invest in.

From columns (1) and (3), it appears that circular firms engage in less R&D activity and thus have a lower level of intangible capital. This suggests that among Chaebol firms, those under circular ownership structures engage less in R&D and invest less in creating intangible capital. However, when comparing Chaebol and non-Chaebol firms on a larger scale, it can be inferred that Chaebol firms, overall, have higher levels of intangible investment activity than the rest of the firms in the economy. We believe this is due to the availability of resources that can be deployed with lower transaction costs for firms that belong to the same controlling family compared to those that do not belong to a family tree. While this finding is not entirely consistent with the prediction that circular ownership structures may promote overinvestment, it aligns with previous studies documenting lower levels of R&D investment in family firms (Chen & Tsu, 2009).

Next, we examine whether any gains that may be withheld from investors are shared with non-financial stakeholders within the firm, primarily employees. If it is the case that the firm is benefiting its non-financial stakeholders at the expense of its investors, we could argue that another dimension of the agency problem exists in circular ownership structures. Table 6 presents the results of regressing the ownership structure variable against the average wage per employee within the firm. Because larger firms tend to pay their employees more, we scale the wage variable according to firm size to control for this specific effect. From columns (1) to (3), we can conclude that while there appears to be a negative effect of firms belonging to circular ownership structures on wages, with detailed controls, the statistical significance seems to diminish. We believe this suggests that although there may be some degree of wage expropriation from employees to the firm in circular firms compared to pyramidal firms, the difference largely stems from industry practices, making it difficult to discern with strong statistical significance. From columns (4) to (6), it is interesting to note that, on average, Chaebol firms pay higher wages overall than firms that are primarily widely held. This may provide evidence suggesting that some of the retained earnings that could be visible to collective bargaining parties may weaken the bargaining power of employees who can demand higher wages, resulting in expropriation from financial stakeholders to non-financial stakeholders. A similar notion is documented in Matsa (2018), where firms may strategically choose to pay higher wages to prevent employees from exerting greater bargaining power in wage agreements. Finally, to examine whether corporate resources are simply being accumulated as cash or in liquid assets, we evaluate cash and leverage scaled by the total value of book assets. Table 7 reports the results of the regression. From the results, we cannot readily argue that there are systematic differences in cash holdings as a proportion of assets between firms under circular versus pyramidal structures, or between Chaebol versus non-Chaebol firms. Examining the leverage of these firms, it appears that while Chaebol firms operate with lower levels of leverage, there is not much difference between circular and pyramidal ownership. Although the results regarding Chaebol firms suggest that these connected firms may find ways to channel internal funds among themselves to operate with lower leverage—potentially indicating evidence of expropriation—we cannot hastily conclude this. It could simply be the case that these firms have more profitable businesses and do not require much leverage. Overall, the analyses presented indicate that while firms in circular ownership structures do not seem to waste their corporate resources in a blatant manner, they also do not appear to engage in either pro-shareholder or pro-non-financial stakeholder behavior.

CONCLUSION

Using data on Korean Large Business Groups (Chaebols) and the dividend tax reform, we examine the impact of different types of ownership structures on corporate payout policies. Through various tests, we find that LBG firms under circular ownership structures tend to pay out less than those belonging to pyramidal structure groups. We believe this is due to the more intricate nature of circular ownership, which makes it harder for the controlling owner to determine whether the payout will be beneficial for the entire group, leading to a tendency to retain more earnings. Consistent with this idea, firms with circular ownership invest less in R&D and provide lower compensation to employees. Since ownership structures pose challenges in correctly identifying causal relationships, we aim to further investigate the holdings structure and institutional details to provide better context for our analysis. Additionally, while it would be interesting to pinpoint the underlying factors that may influence the level of corporate payouts, this topic could easily extend beyond the scope of this paper. Therefore, we intend to explore it further in future research.

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Table 1. Summary Statistics

This table presents the summary statistics of various characteristics of the firms based on their sub-group. All panels report the number of sample (N), mean (Mean), standard deviation (Std. Dev.), 25th percentile (p25), median (Median), and 75th percentile (p75). Panel A presents the summary of all firms in the entire sample used. There are total of 2,981 firms with 31 Large Business Group (LBG) in the sample. Panel B compares the subsample of firms that belong to Chaebol versus those firms that are non-Chaebol. Panel C compares the subsample of firms that belong to circular business group structure versus those firms that belong to pyramidal structure business group. Except for Dividend/sales and foreign ownership, all variables are scaled by the book value of asset. Size is log value of sales. All variables are winsorized at 1% level.

Panel A: Entire Sample

	N	Mean	Std. Dev	p25	Median	p75
Dividend/Sales	44,313	0.009	0.016	0.000	0.002	0.011
Cash	44,354	0.075	0.080	0.019	0.049	0.102
Size	44,314	18.1	1.564	17.04	17.95	19
Q	42,933	0.428	0.244	0.251	0.4	0.56
Capex (Tangible)	44,350	0.296	0.190	0.149	0.281	0.423
Capex (Intangible)	44,350	0.023	0.048	0.000	0.004	0.021
Book Leverage	42,933	0.278	0.185	0.127	0.262	0.404
Market Leverage	42,981	0.633	0.259	0.481	0.707	0.834
R&D	44,354	0.008	0.018	0.000	0.000	0.007
ROA	44,354	0.047	0.103	0.014	0.053	0.097
Profitability	44,354	0.000	0.174	0.002	0.028	0.068
Foreign Ownership (%)	39,409	5.520	10.800	0.000	0.610	5.240

Panel B	Chaebol						Non-Chaebol					
	N	Mean	Std. Dev	p25	Median	p75	N	Mean	Std. Dev	p25	Median	p75
Dividend/Sales	4,708	0.009	0.017	0.000	0.004	0.011	39,605	0.008	0.016	0.000	0.002	0.011
Cash	4,715	0.059	0.065	0.017	0.039	0.077	39,639	0.077	0.082	0.019	0.050	0.105
Size	4,708	20.000	1.764	18.760	20.010	21.340	39,606	17.880	1.375	16.950	17.800	18.730
Q	4,543	0.413	0.211	0.255	0.405	0.549	38,390	0.429	0.248	0.251	0.399	0.561
Capital Exp. (Tangible)	4,715	0.334	0.202	0.167	0.337	0.477	39,635	0.292	0.188	0.147	0.276	0.416
Capital Exp. (Intangible)	4,715	0.018	0.039	0.001	0.004	0.018	39,635	0.024	0.049	0.000	0.004	0.022
Book Leverage	4,543	0.299	0.182	0.158	0.287	0.429	38,390	0.275	0.185	0.124	0.259	0.401
Market Leverage	4,545	0.702	0.245	0.603	0.781	0.879	38,436	0.624	0.260	0.470	0.697	0.827
R&D	4,715	0.004	0.013	0.000	0.000	0.003	39,639	0.009	0.019	0.000	0.000	0.008
ROA	4,715	0.062	0.066	0.032	0.060	0.092	39,639	0.046	0.106	0.011	0.052	0.098
Profitability	4,715	0.028	0.082	0.007	0.026	0.060	39,639	-0.003	0.182	0.001	0.028	0.069
Foreign Own (%)	4,250	10.970	13.720	0.380	5.000	16.930	35,159	4.862	10.190	0.000	0.480	4.160

Panel C	Circular						Pyramidal					
	N	Mean	S.Dev	p25	Median	p75	N	Mean	S.Dev	p25	Median	p75
Dividend/Sales	2,000	0.008	0.012	0.000	0.004	0.010	2,201	0.011	0.021	0.000	0.004	0.012
Cash	2,002	0.053	0.053	0.017	0.039	0.070	2,205	0.061	0.070	0.015	0.037	0.077
Size	2,000	20.140	1.730	18.890	20.110	21.490	2,201	19.890	1.775	18.610	20.000	21.290
Q	1,896	0.389	0.204	0.233	0.382	0.531	2,188	0.445	0.208	0.296	0.439	0.570
Capital Exp. (Tangible)	2,002	0.345	0.197	0.185	0.346	0.473	2,205	0.326	0.207	0.144	0.336	0.485
Capital Exp. (Intangible)	2,002	0.014	0.032	0.000	0.003	0.014	2,205	0.023	0.045	0.001	0.005	0.022
Book Leverage	1,896	0.296	0.181	0.155	0.278	0.424	2,188	0.315	0.179	0.182	0.314	0.438
Market Leverage	1,896	0.745	0.207	0.659	0.802	0.895	2,190	0.685	0.248	0.575	0.772	0.868
R&D	2,002	0.003	0.009	0.000	0.000	0.001	2,205	0.005	0.015	0.000	0.000	0.004
ROA	2,002	0.062	0.061	0.031	0.058	0.088	2,205	0.061	0.068	0.032	0.061	0.092
Profitability	2,002	0.031	0.073	0.008	0.026	0.060	2,205	0.021	0.089	0.005	0.022	0.053
Foreign Own (%)	1,774	12.460	14.640	0.510	6.590	19.860	2,022	9.470	12.210	0.240	4.000	14.790

Table 2. OLS regression on ownership structure and dividend payout

This table presents the results of OLS regression of dividend to sales ratio on ownership structure variables. Column 1 to 3 present the results of regression with Circular as the main variable, and column 4 to 6 present the result with Chaebol being the main variable of interest. Chaebol is a dummy variable coded as 1 if the firm belongs any LBG designated by FTC, and 0 otherwise. For the set of LBG's, a dummy variable Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Size is defined as log value of sales. Q is defined as the market value of common shares outstanding plus short-term debt and long-term debt, plus value of preferred shared minus deferred tax divided by the book value of the asset. Profitability is defined as the net income adjusted by the book value of asset. Foreign ownership is the percentage of ownership held by entity other than Korean investor. Cash is defined as cash and cash equivalent divided by the book value of asset. Leverage is defined as the book value of long term debt and short-term debt divided by the book value of asset. Ind*Year FE is an indication that industry-year fixed effect is included in the regression specification. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

| | Dependent Variable: Dividend / Sales | | | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Circular	-0.003**	-0.005***	-0.004***			
	(-2.16)	(-3.08)	(-2.78)			
Chaebol				0.001	0.002*	0.001*
				(1.48)	(1.92)	(1.70)
Size		-0.004***	-0.003***		-0.002***	-0.001***
		(-4.31)	(-4.16)		(-4.87)	(-5.29)
Q		-0.011*	-0.005		-0.009***	-0.008***
		(-2.02)	(-0.84)		(-5.12)	(-5.68)
Profitability		0.031***	0.036***		0.014***	0.012***
		(4.32)	(4.39)		(9.69)	(9.68)
Foreign ownership		0.044***	0.031***		0.029***	0.023***
		(5.01)	(4.54)		(6.78)	(7.02)
Cash		-0.038***	-0.019**		-0.004	0.002
		(-2.90)	(-2.11)		(-1.04)	(0.83)
Leverage		-0.009	-0.013*		-0.013***	-0.012***
		(-1.34)	(-1.74)		(-7.94)	(-7.85)
Observations	4,200	3,396	3,041	44,313	35,363	35,156
R-squared	0.053	0.292	0.643	0.013	0.171	0.320
Year FE	YES	YES	NO	YES	YES	NO
Ind*Year FE	NO	NO	YES	NO	NO	YES

## Table 3. Interaction effect with 2014 tax reform

This table presents the results of regression regressing dividend to sales ratio on ownership structure variables interacted with tax reform variable. Column 1 to 3 present the results of regression with Circular as the main variable, and column 4 to 6 present the result with Chaebol being the main variable of interest. Reform is a dummy variable that is equal to 1 if the firm fiscal year is 2014 or greater, and zero otherwise. Chaebol is a dummy variable coded as 1 if the firm belongs any LBG designated by FTC, and 0 otherwise. For the set of LBG's, a dummy variable Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Size is defined as log value of sales. Q is defined as the market value of common shares outstanding plus short-term debt and long-term debt, plus value of preferred shared minus deferred tax divided by the book value of the asset. Profitability is defined as the net income adjusted by the book value of asset. Foreign ownership is the percentage of ownership held by entity other than Korean investor. Cash is defined as cash and cash equivalent divided by the book value of asset. Leverage is defined as the book value of long term debt and short-term debt divided by the book value of asset. Ind*Year FE is an indication that industry-year fixed effect is included in the regression specification. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

| | Dependent Variable: Dividend / Sales | | | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Circular	-0.003	-0.005***	-0.003**			
	(-1.48)	(-2.86)	(-2.49)			
Circular*Reform	-0.008***	-0.006***	-0.004**			
	(-5.46)	(-2.83)	(-2.25)			
Reform	0.009***			0.003***		
	(9.67)			(15.41)		
Chaebol				0.002**	0.002*	0.001
				(2.32)	(1.79)	(1.66)
Chaebol*Reform				0.002***	0.003***	.001
				(3.30)	(3.17)	(0.67)
Size		-0.004***	-0.003***		-0.002***	-0.001***
		(-4.31)	(-4.16)		(-4.87)	(-5.29)
Q		-0.011*	-0.005		-0.009***	-0.008***
		(-2.03)	(-0.83)		(-5.12)	(-5.67)
Profitability		0.030***	0.035***		0.014***	0.012***
		(4.30)	(4.44)		(9.66)	(9.67)
Foreign ownership		0.043***	0.030***		0.029***	0.023***
		(5.02)	(4.51)		(6.79)	(7.02)
Cash		-0.038***	-0.018**		-0.004	0.002
		(-2.90)	(-2.06)		(-1.03)	(0.83)
Leverage		-0.009	-0.013*		-0.013***	-0.012***
		(-1.35)	(-1.76)		(-7.96)	(-7.86)
Observations	4,201	3,396	3,041	44,313	35,363	35,156
R-squared	0.1028	0.295	0.644	0.0162	0.171	0.320
Year FE	YES	YES	NO	YES	YES	NO
Ind*Year FE	NO	NO	YES	NO	NO	YES

Table 4. Propensity Score Matched Sample Analysis

This table presents the results of regression using matched sample based on Propensity Score Matching of observable characteristics. Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Reform is a dummy variable that is equal to 1 if the firm fiscal year is 2014 or greater, and zero otherwise. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

Dependent Variable: Dividend / Sales	
Circular	-0.002
	(-0.52)
Reform	0.009***
	(3.53)
Circular*Reform	-0.006*
	(-1.72)
Observations	792
R-squared	0.015
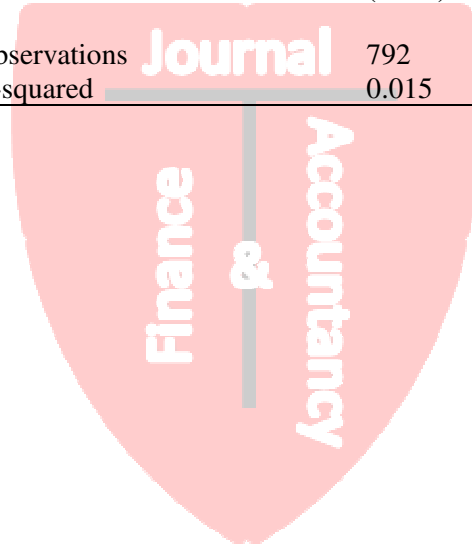
Table 5. Ownership Structure and Expropriation: Intangible Capital Investment

This table presents the results of OLS regression of various measures of investment on intangible capital on ownership structure variables. Column 1 to 3 present the results of regression with Circular as the main variable, and column 4 to 6 present the result with Chaebol being the main variable of interest. Intangible Capital (R&D) is defined as intangible capital (R&D) divided by the book value of total asset. IK Growth is defined as the yearly growth rate of intangible capital from previous fiscal year to current year. Chaebol is a dummy variable coded as 1 if the firm belongs any LBG designated by FTC, and 0 otherwise. For the set of LBG's, a dummy variable Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Size is defined as log value of sales. Q is defined as the market value of common shares outstanding plus short-term debt and long-term debt, plus value of preferred shared minus deferred tax divided by the book value of the asset. Profitability is defined as the net income adjusted by the book value of asset. Foreign ownership is the percentage of ownership held by entity other than Korean investor. Cash is defined as cash and cash equivalent divided by the book value of asset. Leverage is defined as the book value of long term debt and short-term debt divided by the book value of asset. Ind*Year FE is an indication that industry-year fixed effect is included in the regression specification. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

	Intangible Capital		R&D			IK Growth		Capex	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Circular	-0.009**		-0.003*		1.500*		-0.015	
	(-2.45)		(-1.75)		(1.83)		(-0.84)	
Chaebol		0.008***		0.000		0.397**		-0.001
		(3.54)		(0.28)		(2.27)		(-0.09)
Size	0.003**	-0.003***	0.001**	-0.000*	-0.115	-0.479***	0.018***	0.014***
	(2.15)	(-4.39)	(2.07)	(-1.81)	(-0.46)	(-4.29)	(3.06)	(5.17)
Q	-0.034	0.011**	0.001	-0.005***	0.077	0.046	0.138*	-0.051***
	(-1.58)	(2.14)	(0.07)	(-3.54)	(0.04)	(0.06)	(1.91)	(-2.85)
Profitability	-0.036**	-0.016***	-0.007	-0.005***	4.695	0.496	-0.114	-0.050***
	(-2.06)	(-4.33)	(-0.58)	(-2.97)	(1.09)	(0.72)	(-1.36)	(-4.02)
Foreign ownership	-0.016	-0.008	0.031*	0.018***	0.097	-1.773	-0.563***	-0.484***
	(-0.50)	(-1.30)	(1.95)	(5.54)	(0.03)	(-1.15)	(-5.33)	(-20.59)
Cash	0.021	-0.001	-0.007	0.001	1.876	0.883	-0.265***	-0.030
	(0.91)	(-0.17)	(-0.92)	(0.42)	(0.58)	(0.86)	(-3.76)	(-1.06)
Leverage	-0.000	-0.000	0.000*	0.000	-0.011	0.006	-0.162***	-0.051**
	(-1.07)	(-0.81)	(1.86)	(0.33)	(-0.41)	(0.68)	(-3.15)	(-2.10)
Observations	3,041	35,156	3,041	35,156	2,830	30,126		
R-squared	0.404	0.226	0.482	0.216	0.263	0.077		
Year FE	YES	YES	YES	YES	YES	YES		
Ind*Year FE	YES	YES	YES	YES	YES	YES		

Table 6. Ownership Structure and Expropriation: Wage compensation

This table presents the results of OLS regression of average wage compensation on ownership structure variables. Column 1 to 3 present the results of regression with Circular as the main variable, and column 4 to 6 present the result with Chaebol being the main variable of interest. Per employee wage scaled by firm size is calculated as the

average total wage of the firm divided by the number of employee in a given fiscal year, and scaled by the book value of asset. Chaebol is a dummy variable coded as 1 if the firm belongs any LBG designated by FTC, and 0 otherwise. For the set of LBG's, a dummy variable Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Size is defined as log value of sales. Q is defined as the market value of common shares outstanding plus short-term debt and long-term debt, plus value of preferred shared minus deferred tax divided by the book value of the asset. Profitability is defined as the net income adjusted by the book value of asset. Foreign ownership is the percentage of ownership held by entity other than Korean investor. Cash is defined as cash and cash equivalent divided by the book value of asset. Leverage is defined as the book value of long term debt and short-term debt divided by the book value of asset. Ind*Year FE is an indication that industry-year fixed effect is included in the regression specification. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

| | Per employee wage scaled by firm size | | | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Circular	-0.046**	-0.021*	-0.013			
	(-2.29)	(-1.81)	(-0.99)			
Chaebol				-0.315***	0.095***	0.088***
				(-9.94)	(4.50)	(4.71)
Size		-0.059***	-0.064***		-0.164***	-0.164***
		(-6.73)	(-7.28)		(-11.92)	(-12.31)
Q		0.251*	0.184*		0.570***	0.540***
		(1.99)	(1.71)		(10.84)	(11.23)
Profitability		-0.114	-0.040		-0.342***	-0.302***
		(-1.30)	(-0.60)		(-3.99)	(-4.08)
Cash		0.436***	0.312*		0.799***	0.633***
		(2.99)	(1.70)		(9.46)	(8.15)
Book Leverage		-0.185	-0.094		-0.476***	-0.458***
		(-1.32)	(-0.83)		(-8.46)	(-8.42)
Observations	3,612	3,517	3,144	37,016	35,847	35,606
R-squared	0.088	0.427	0.604	0.176	0.523	0.575
Year FE	YES	YES	NO	YES	YES	NO
Ind*Year FE	NO	NO	YES	NO	NO	YES

## Table 7. Ownership Structure and Expropriation: Cash hoarding

This table presents the results of OLS regression of cash and leverage ratio on ownership structure variables. Column 1 to 3 present the results of regression with Circular as the main variable, and column 4 to 6 present the result with Chaebol being the main variable of interest. Chaebol is a dummy variable coded as 1 if the firm belongs any LBG designated by FTC, and 0 otherwise. For the set of LBG's, a dummy variable Circular is defined to be 1 if the business group has circular ownership structure with its firms, and 0 if the structure is pyramidal. Size is defined as log value of sales. Q is defined as the market value of common shares outstanding plus short-term debt and long-term debt, plus value of preferred shared minus deferred tax divided by the book value of the asset. Profitability is defined as the net income adjusted by the book value of asset. Foreign ownership is the percentage of ownership held by entity other than Korean investor. Cash is defined as cash and cash equivalent divided by the book value of asset. Leverage is defined as the book value of long term debt and short-term debt divided by the book value of asset. Ind*Year FE is an indication that industry-year fixed effect is included in the regression specification. Numbers in parenthesis are t-statistics using firm and year level clustered standard errors. *, **, *** denote statistical significance level at 10%, 5%, and 1%, respectively.

| | Book Leverage | | Cash | |
	(1)	(2)	(3)	(4)
Circular	0.002		-0.006	
	(0.18)		(-0.91)	
Chaebol		-0.032***		-0.004
		(-5.95)		(-1.33)
Size	0.017***	0.031***	-0.008***	-0.008***
	(4.42)	(22.34)	(-3.67)	(-8.70)
Q	0.659***	0.548***	-0.006	0.008
	(12.80)	(27.59)	(-0.27)	(1.32)
Profitability	0.004	0.088***	0.120***	0.053***
	(0.09)	(7.73)	(3.72)	(8.61)
Cash	0.008	-0.142***		
	(0.14)	(-9.83)		
Book Leverage			0.004	-0.076***
			(0.14)	(-10.07)
Foreign Ownership	-0.000	-0.001***	0.000	0.000***
	(-0.80)	(-6.12)	(1.55)	(3.34)
Observations	3,041	35,156	3,041	35,156
R-squared	0.819	0.703	0.295	0.162
Ind*Year FE	YES	YES	YES	YES

Figure 1. Example of Circular and Pyramidal ownership structure

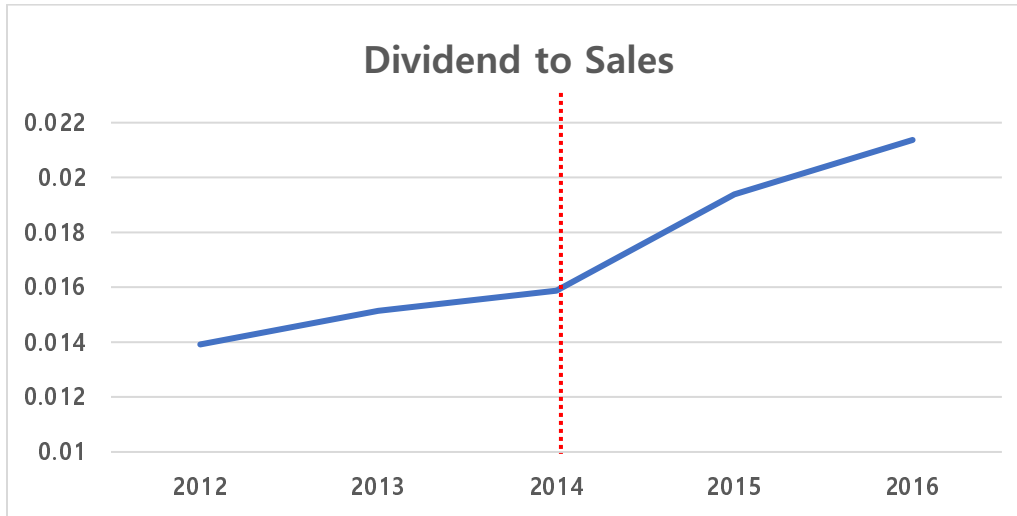**a.   Circular ownership structure (e.g. A, B, and C)**
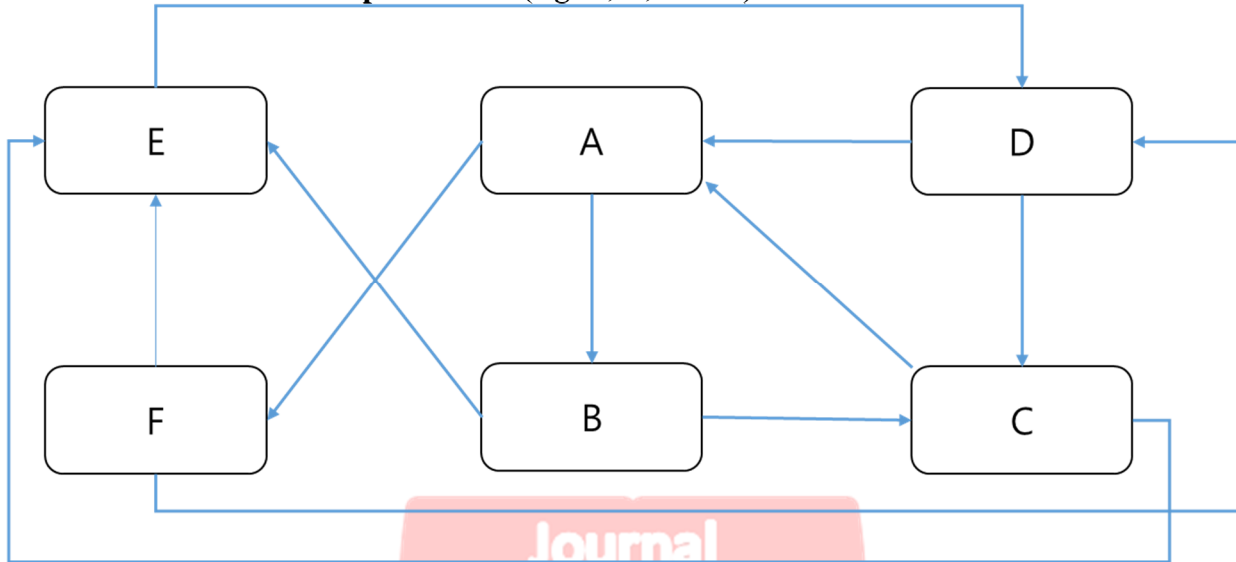
b.   Pyramidal structure
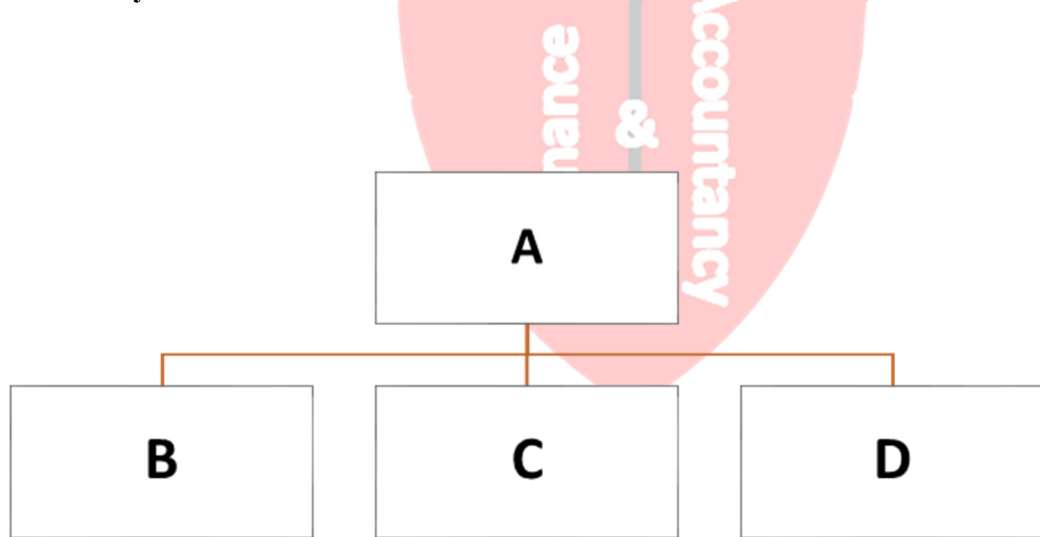
Figure 2. Dividend to Sales ratio of all firms from 2012 to 2016
a. All Firms

Dividend to Sales

b. Comparison between Circular ownership and Pyramidal Ownership firms

Dividend to Sales : Circular vs. Pyramidal