The Influence of a Firm's Ownership Structure and Chaebol Affiliates on Its Debt Level

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ABSTRACT

In this paper, we investigate the influence of corporate ownership structure and chaebol group affiliation on firms' debt levels. As different regression models often bring different results, it is too early to have a final and confident conclusion about the relationship between a firm's debt level and corporate ownership structure and between debt level and chaebol affiliations. Particularly, there are only few researchers study about the influence of chaebol group affiliates.

However, in this paper, we confirm that firms' debt ratios show statistically significant differences in line with firms' different ownership structure and chaebol group affiliation. Furthermore, corporate ownership structure and debt ratio presents an inverted U-sharp (∩) relationship between them; and a negative association between them if firms are chaebol group affiliations, and a positive association otherwise. Finally, firms with high level of ownership ratio or with chaebol group affiliations show high capital structure adjustment speed compared with other firms, ceteris paribus.

This implies that a strong ownership or an financial stability of chaebol affiliation give firms an opportunity to have more debt or to change their debt level more quickly. Our results also indicate that firms' debt ratios are more seriously influenced by firms' size, profits and tangible asset level than their corporate ownership structure. This alludes that survival-related factors take a more important role when a firm adjust its debt level than ownership structure or chaebol affiliates. In addition, we also consider the endogeneity problem that might occur when using panel data. We therefore use estimators that use instrumental variables instead of using normal OLS estimator.

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〈논문 투고일〉 2017. 10. 10 〈논문 수정일〉 2017. 11. 12 〈게재 확정일〉 2017. 11. 19

Key Words : debt ratio, corporate ownership structure, chaebol affiliation, endogeneity, and capital structure adjustment speed

Ⅰ. Introduction

As a dominant shareholder's individual opinion can greatly influence on firm's decision, 'corporate ownership structure'(hereinafter, COS: particularly when a small number of people holds a majority of shares) would affect firms' capital structures greatly. In this paper, we investigate how a firm's ownership structure affects its capital structure.

As COS and capital structure would influence on both firms' and stockholders' values, the dominant shareholders try to increase their wealth and the firms' values; or try to increase their wealth and while not to hurt the firms' values. This presumption implies the existence of optimal capital structure and agent costs between external shareholders and the dominant shareholders. Usually, capital structure theory is related to tax shield, asymmetric information, bankruptcy costs. That is, the research of capital structure so far mainly tests Modigliani and Miller(1963, hereinafter, MM) and Myers(1984). However, as capital structure is related to equity level for a firm, capital structure and COS are like two sides of the same coin. We cannot take capital structure into account without regarding COS.

In other words, capital structure is deeply influenced by COS. The matter of COS begins to investigate whether the different percentage of share-holding for the dominant shareholders, managements, and external shareholders influences on firms' values, capital structures and investing policies or not. Blarle and Means(1932) start the research of firms' ownership structure and Jensen and Meckling(1976) more specifically develop it. Particularly, Jensen and Meckling(1976) argue that firms increase their debt ratios to reduce managers' perquisite consumption. Black and Sholes(1973) likewise argue that a stock has a characteristic of an option; and therefore, shareholders can have an opportunity to impute their risk which occurs by holding stocks to bondholders. Particularly, as debt ratio increases, the value of option characteristics on the stock increases; and managements would choose risker new investing projects than they hold

100% of shares. These arguments from previous research imply that debt ratio and COS are related to a firm's optimal capital structure, value altering and the agency problems between principals agents. Johnson et al.(2000) also argue that COS is one reason of the radical decrease of stock price during financial crisis in 1997; Lin et al.(2013) likewise argue that COS influences on firms' debt financing source when borrowing.[1] In this paper, we investigate the relationship between the shareholding percentage of a dominant(or largest) shareholders and firms debt levels. We also use a variable of 'chaebol group affiliation'(hereinafter, CGA). This indicates whether a firm belongs or does not belongs to chaebol groups. As the firms of chaebol groups, controlled by a small number of dominant shareholders, take a big portion for Korean economy and their influence on the economy is accelerating, the function of chaebol affiliation is an important matter in Korean firms' capital structure. However, according to our literature review of previous studies, only few research investigates the influence of COS and CGA on firms' capital structure. Previous research mostly conducts to reveal the relationship between COS and credit rating (Shin and An(신용준 · 안상봉) 2012), between COS and firms' value (Byun and Cho(변희섭 · 조영현) 2010), between COS and dividend policy (Ko and Cho(고영경 · 조성욱) 2009), between COS and cash-holding level (Park and Yon (박순홍 · 연강흠) 2009), and between COS and social responsibility (Kim and Kim(김은 · 김태석) 2012). Particularly, to our best knowledge, we find only Jung et al.(정인구 등 2013) regard and use a variable of 'chaebol' as a capital structure determinant.

Al-Fayoumi and Bana(2009) find that debt level has a negative association with internal managements' ownership structure, and a positive association with external large-portion stockholders respectively, using Jordan firms. However, external institutional investors do not have a relationship to firms' debt levels. While most previous papers focus on the size of debt, Lin et al.(2012) study whether COS influences on the structure of syndicate loan using data from 22 countries. They argue that when a firm's dominant shareholder's control right is greater than cash-flow right, the firm borrows from few lending special institutions with a great portion of debt when it needs external capital, and this potion

1) Lin et al.(2013) find that a wider divergence between the control right and cash-flow right for shareholders leads firms to borrow from public market than banks.

has a tendency to be continued. In Korea, Shin and Kim(신민식 · 김수은 2010), Cho and Kim(조지호 · 김천호 2005) study on the relationship between COS and debt level. In this paper, we consider both firms' COS and CGA to investigate the influence on their debt levels. We observe whether there is an difference in debt levels based on COS and CGA, using statistic descriptive, one(or two)-way ANOVA test, GMM, and System-GMM(hereinafter, S-GMM). We find that COS and debt ratio show a non-linear sharp, an inverted U-sharp curve (∩); and the firms of chaebol affiliation have a negative association with debt levels, whereas firms with no chaebol group have a positive association. We likewise find that firms with high level of dominant shareholder's potion or with chaebol affiliation have a faster speed of capital structure adjustment. This implies that a strong leadership and the fact of chaebol group affiliation impact firms' debt level. This evidence suggests that COS would affect firms' debt levels but our results also show that control variables used our analyses have stronger influence on firms' debt level shifts. Therefore, altogether we would presume that firms' debt levels are decided by both COS and market situation in which firms operate. Furthermore, our results are consistent across methods and models. In this paper, we try to improve some problems that previous studies have often passed over. First we use GMM and S-GMM to consider an endogeneity problem that might occur when using panel data. Second, we implement ANOVA test to show the existence of debt level differences in line with different COS and CGA before conducting GMM model, in order to double check the reasons why we need to investigate this research. Most of previous studies do not confirm the differences of debt levels based upon COS and CGA, before estimating their model using regression methods. Third, our results indicate, there are differences in capital structure adjustment speed in line with COS and CGA.

This paper is organised as follows. After introduction in the first chapter, we describe literature reviews and previous research in Chapter 2. Chapter 3 presents methods that we use in this paper. Chapter 4 conducts analyses introduced in Chapter 3. Finally, Chapter 5 presents conclusions and problems that this paper contains.

II. Literature review

1. Literature review

COS was considered in Korea first time, after passing through the Asian financial crisis in 1997 (Shin and Kim(신민식 · 김수은) 2010), Seo and Nam(서정일 · 남윤성) 2012: Son (손평식) 2014); and Korean government suggests policies of 200% debt levels and of prohibiting 'cross-ownership or reciprocal ownership' at the same time. According to Tricker(1984), corporate governance theory includes the matters that the boards of directors face in firms while operation firms. For example, the boards of directors should consider the relationship among firm's top managements, owners[including internal, external, and dominant owners], and other interested affairs. In other words, corporate governance theory includes the stewardship, agency, and market theories(Calder 2008). Stewardship theory suggests 'the combination of the roles of chair and CEO(Calder 2008, p.10)' and weak audit committees. Agency theory presents the relationship between principal(shareholders) and agents(managements); and finally, in market theory, it is not an important matter whether managements consider themselves as stewards or agents, as shareholders will sell the stocks in market if firms cannot make profits(Calder, ibid); firms' capital structure and ownership structure cannot be considered separately. For example, if a firm wants to reduce its debt level, while other things are being equal, the firm must issue new stocks; and if old shareholders cannot put more money for this new stock issuing, their percentage of holding-shares will reduce; and this leads to the separation of ownership and the right of management of the firm and to agency problems. An agency problem occurs when principals and agents have different sources of benefits and have conflicts of interest between them(Seo and Nam(서정일 · 남윤성) 2012). Increasing dividend, debt and managements' share-holding could reduce agency costs. This implies that COS and debt level have an endogenous relationship between them. Furthermore, Shin and Kim(신민식 · 김수은 2010) argue that the relationship between COS and debt levels can be explained by using agency, portfolio, and signal theories combined together. According to the agency theory, there is a negative association between COS and debt levels, because if managements hold less shares, their

wealth would be less affected by increasing firms' bankruptcy costs and agency costs. Therefore, according to the agency theory, firms with low share-holding by managers would have more debt. In terms of the portfolio theory, managements have an disadvantage to external investors(Jensen and Meckling 1976). External investors can sell off their shares and reduce their risk if firms do not perform well. However, managements cannot easily sell-off their shares unlike external investors, as selling-off shares alludes their lack of ability of firm managing and abandonment of management control. This implies that managements are exposed by greater risk than external investors. Thus, managements reduce their risk by lessening firms' bankruptcy probability and debt levels. Furthermore, signal theory suggests that under the asymmetric information condition between internal managers and external investors, firms' debt holding behaviours itself can be a signal to the market. That is, the external investors consider a firm's debt holding behaviours as a good signal that the managements have a confidence of its future performance. This argument suggests a positive relationship between debt level and COS.

2. Previous research

Kim and Song(김병곤 · 송재호 2003) study whether Asian financial crisis has influenced on the relationship between COS and capital structure using 2SLS estimator. They find that there was a relationship between them only during the Asian financial crisis (1997~1998). After financial crisis, when Korean economy is in the period of recovery (1999~2000), the relationship has disappeared. Brailsford et al.(2002) and Shin and Kim (신민식 · 김수은 2010) argued that COS and capital structure have a nonlinear relationship. Brailsford et al.(2002) separate COS into two different groups, internal managers and external large shareholders, and try to find the relationship between COS and debt level based on these two groups. They argue that internal managements' portion of share has a ∩ sharp association with debt levels and the external larger shareholders' portion has different relation between them in line with debt level and the portion of share-holding. Shin and Kim(신민식 · 김수은 2010) show an ∪ sharp relationship between managements' portion of stock and debt level. They also argue that firms managed by a dominant

owner hold less debt than firms managed by professional managements. Using 3SLS, Cho and Kim(조지호 · 김천호 2005) argue that there is an indirect relationship between COS and capital structure but cannot find a direct relation. These previous study fail to find one consistent result between COS and debt level; this shows the difficulty of finding a strong relationship between them.

3. Research hypotheses

Kim and Song(김병곤 · 송재호 2003) and Cho and Kim(조지호 · 김천호 2005) using OLS estimators conclude that there is no clear association between COS and debt level. This can be explained with two reasons. First, their results can occur, if there is no debt ratio differences based on COS. Therefore, in the first hypothesis, we test whether there are statistical debt ratio differences in line with different COS and CGA, using ANOVA test. The second reason is that if the relationship between independent variables(COS and CGA) and dependent variable is not linear, as Brailsford et al.(2002) and Shin and Kim(신민식 · 김수은 2010) argue. Therefore, we test the first hypothesis again, using regression models, after classifying our sample firms in line with the level of COS and CGA. If there are different associations(whatever positive or negative association) in the relationships between debt level and COS or between debt level and CGA in line with these separated sub-groups, we can explain why Kim and Song(김병곤 · 송재호 2003), and Cho and Kim(조지호 · 김천호 2005) cannot show a clear relationship between debt level and COS when using whole data. Finally, if we cannot deny the first hypothesis, we would presume that firms have optimal capital structures even if we cannot find a clear relationship between debt ratio and COS and between debt ratio and CGA from the first hypothesis. Therefore, the fact cannot deny the hypothesis 1 indicates that firms try to adjust their debt levels to close their optimal ones. Thus, we test the second hypothesis to observe whether firms have different gearing level adjusting speeds in line with different firms' COS and CGA. Therefore, we decide the following 2 hypotheses to test in this paper.

1. There are debt ratio differences in line with firms' COS and CGA.
2. COS and CGA affect firms' capital structure adjustment speed.

Ⅲ. Data and Methods

1. Data

We use the data source of TS2000 for financial statement, between 1998 and 2013 and exclude data before 1998 as the Asian financial crisis affects Korean firms' debt level greatly. We also use a 'large-company group classification' announced by 'Fair Trade Commission' for deciding whether firms belong to chaebol group or not. In this paper, from 17 industries, we use 473 listed firms on Korean Stock Exchange. (retail trade, except motor vehicles and motorcycles(16), information service activities(8), textiles, except apparel(12), wearing apparel, clothing accessories and fur articles(14), rubber and plastic products(19), electrical equipment(16), other transport equipment(9), food products(30), pulp, paper and paper products(20), chemicals and chemicals products except pharmaceuticals, medicinal chemicals(69), pharmaceuticals, medicinal chemicals and botanical products(40), non-metallic mineral products(21), basic metal products(44), electronic components, computer, radio, television and communication equipment and apparatuses(41), motor vehicles, trailers and semitrailers(41) construction(30), wholesale and retail trade(44) industries).

In this paper, we exclude financial institutions, utility firms and country owned firms as they have very different operation methods, purposes and capital structures compared with other manufacturing firms; therefor, we do not often use them for capital structure research(Lew and Lim 2013: Ohlson 1980); and using these criteria, our sample consists of 29 chaebol groups based on the year 2014.

We also remove outliers to prevent to have distorted outcomes. When removing the outliers, we first calculate descriptive statistics using raw data; and remove if their values are greater than 2 and smaller than 0 in the case of debt levels. These outliers in debt level are greater then 99 percentile of data and smaller than 1 percentile. For the rest of data, we remove data if their values are unreasonably smaller than 1 percentile or greater than 99 percentile.

2. Descriptive statistics and a correlation matrix

〈Table 1〉 presents descriptive statistics(Panel A) and a correlation matrix between variables (Panel B). First, we can observe that K1, SR and Profit show a negatively skewed distribution. In addition, kurtoses of some variables except COS and SR, are greater than 3. This implies that they are leptokurtically distributed. Particularly, there are big differences in profits between firms. These likewise allude that the residual of OLS estimator would not be normally distributed and the OLS cannot be the best estimator for our data. Panel A presents that dominant shareholders have strong managerial power over firms and firms have a low level of bankruptcy probability. In addition, as 75% of firms create positive net income, most firms have a sound financial condition. Panel B presents that K1 and DR, K1 and profit have high level of correlation. Considering a multi-correlation problem, we conduct VIF test, and confirms no multi-correlation existence. However, we use GMM estimators instead of using OLS to regard if OLS would bring distorted results caused by the characteristics of our raw data.

〈Table 1〉 Descriptive statistics and a correlation matrix

Panel A

	DR	COS	K1	TA	SR	Tang	Profit
Mean	0.487	39.905	13.9804	18.173	-0.001	0.348	0.024
Min	0.032	0.490	-9.3970	9.101	-4.059	0.000	-2.313
p25	0.324	28.160	10.5936	17.127	-0.275	0.217	0.005
p50	0.481	39.915	13.9405	18.029	0.024	0.340	0.033
p75	0.624	50.980	17.5911	19.140	0.342	0.473	0.071
p99	1.166	75.870	28.2863	22.855	1.353	0.786	0.217
Max	1.974	79.990	30.0891	24.485	1.682	0.935	0.271
SD	0.225	16.274	5.9252	1.741	0.614	0.183	0.106
Skew	1.029	0.095	-0.2871	0.104	-0.991	0.264	-4.526
Kurtosis	6.696	2.453	4.0142	4.294	6.589	2.607	57.639
Obs	6751	6382	6582	6762	6153	6765	6536

Panel B

	DR	COS	K1	TA	SR	Tang	Profit
DR	1						
COS	-0.2021	1					
K1	-0.6705	0.2278	1				
TA	0.1091	-0.0081	0.3289	1			
SR	-0.0812	0.0384	0.1229	0.073	1		
Tang	0.1088	0.0928	-0.0126	0.4715	0.0013	1	
Profit	-0.3932	0.1834	0.5388	0.1365	0.2601	-.0447	1

3. Methods

(1) The definitions of variables

Debt ratio(DR)

A firm's debt level can be computed by using book value or market value of firms. In this paper, we use book value based debt ratio with two reasons. First, both book and market value of firms are mainly affected by their net incomes. Therefore, market based firm values are highly correlated to book based firm values(Frank and Goyal 2009). Second, as market value changes every second and has great volatility, it cannot give a stable debt level. We therefor define DR as follows.

DR=(Total debt/ Total asset)

Corporate ownership structure(COS)

In this paper, we use the sum of portion of shares held by 'one dominant shareholder and specially related people to him' as a proxy of COS provided by 'Korea Listed Companies Association'(Kim and Song(김병곤 · 송재호) 2003).

COS = the sum of portion of shares held by 'one dominant shareholder and his specially related people'

Chaebol(chaebol group affiliation, CGA)

Recalling previous research, papers about COS use many different types of proxies such as the percentage of share-holding for larger shareholders, a dominant shareholders and his family, internal professional managements, foreign investors, and domestic institutional investors, and the ratio of external executives over total number of executives, control-ownership disparity(the differences between the number of holding-shares and the number of voting rights) and the size of executive board. In this paper, following Lee and Lee(이해영 · 이재춘 2003) and Park and Baek(박경서 · 백재승 2001), we use CGA as an additional variables for COS. If firms belong to chaebol group, we put a dummy value of 1, and 0 otherwise. Our criterion of a firm's CGA decision is based on the announcement of 'Fair Trade Commission' that announces 63 groups in 2014. As mentioned earlier, we exclude firms with financial institutions, utility companies, and country owned firms among 63 groups; and some chaebol groups among 63 do not have firms in the industries chosen for our research. Therefore, we have 98 firms left from 29 chaebol groups in our sample. Firms belonging to chaebol groups have better reputation and are believed to have low bankruptcy probability. This implies that chaebol affiliations probably have lower asymmetric information costs than non-chaebol firms, when they issue new securities either equity or bond. This likewise suggests that it is easier for chaebol affiliations to adjust their debt levels then non-chaebol firms.

Chaebol = dummy values of 1 or 0. 1 if firms belong to chaebol group, 0 if non-chaebol firms

Bankruptcy probability(K1)

In 1996, the Bank of Korean and Altmam develop two bankruptcy probability estimating models for Korean firms. The first model is called the K1-score model for listed firms and the second model called the K2-scored model for both the listed and non-listed firms. In this paper, we use K1-score model as we use only listed firms.

$$K1-score = -17.862 + 1.472 \cdot \log(TA) + 3.041 \cdot \log\frac{Sale}{TA} + 14.893 \cdot \frac{Earning\,surplus}{TA} + 1.516 \cdot \frac{Book\,value\,equity}{Debt}$$

where, If a firm's K1-score is greater than 0.75(K1-score 〉 0.75), the firms is in a safe place of bankruptcy. If K1-score is between -2.0 and 0.75(0.75 ≥ K1-score ≥ -2.0), the firm is in an unclear area of bankruptcy. If K1-score is smaller than -2.0(K1-score 〈 -2.0), the firm faces a high level of bankruptcy probability. TA: total asset

Total asset(TA)

Kurshev and Strevulac(2006) argue that a firm's size is the most important capital structure determinant. Crutchley and Hansen's(1989) research presents that a dominant shareholder's stockholding portion has a negative association with firms size. They argue that as firms' size growth, a dominant shareholder's shareholding portion reduces, as the dominant shareholder has limited ability of financing. In terms of trade-off theory, a firm's size has a positive association with debt level as a firm's size in general shows a negative association with firm's bankruptcy probability. In this paper, we use total asset as a proxy of firms' size(Lew and Lim 2013: Kurshev and Strevulac 2006), and define it as follows.

TA=ln(total asset)

Stock return(SR)

Stock return reflects a firm's future earning expectation in the financial market. High stock return implies that market expects the firm will perform well in the future. Thus, the firm has low transaction costs, can issue new securities with low costs, and of course, can issue more debt. This implies that stock return would have a positive association with debt ratio. On the contrary, high stock return can bring low debt levels as firms with high stock prices would have high profits that reduce debt levels. We define stock return as follows.

SR=ln(stock price at T_0/stock price at T_{-1})

Tangibility(Tang)

Debt ratio and tangibility in general have a positive relationship, explaining by both capital structure and agency theories. In terms of capital structure theory, particularly

trade-off theory, tangible assets have a collateral value but intangible assets do not. This fact of course helps firms to borrow more. In addition, in terms of agency theory, tangible assets have lower asymmetric problem as it is clear where the tangible assets can be used. Following Antoniou et al.'s(2008) example, we define firms' tangibility as follows.

Tang=Tangible asset/ total asset

Profitability(Profit)

Profit is the most normal and biggest source of cash inflow for firms. The pecking order theory suggests an order for firms to finance. Firms first use internal cash, and if they still need more cash they issue debt and equity in order. This implies that if there is no a new investment plan in the foreseeable future, they accumulate the profits inside the firms for their future needs. Therefore, firms' profits and retained earnings will reduce their debt levels. Applying Cheng and Shiu(2007), we define firms' profitability as follows.

profit= net income at T_0/ total asset at T_{-1}

4. Research methods

As described, we use two different proxies for COS, COS and CGA. Park and Yon(박순홍 · 연강흠 2009) use COS와 CGA to study Korean firms' ownership structure. Furthermore, Lee and Lee(이해영 · 이재춘 2003) and Park and Baek(박경서 · 백재승 2001) presume that firms within 30 largest chaebol groups would have different type of corporate governing pattern compared with non-chaebol firms.

A part from COS and CGA, all other 6 variables are control variables in Equation (1), as firms' capital structures are likewise influenced by these 6 variables. These control variables could provide to close real environment for our models. In addition, control variables are also used as capital structure determinants to compute firms' capital structure adjustment speed in Equations (2) and (4). Comparing firms' capital structure adjustment speeds in line with COS and CGA, we investigate whether firms' debt level

adjustment speeds would be affected by firms' COS(Lew and Lim 2013a; 2013b). If firms do not adjust their capital structures toward their optimal ones, we presume that there are no optimal capital structures for firms and, in Equation (2), the coefficient of DR_{t-1} will be 1. Furthermore, if firms immediately adjust their debt levels toward their optimal ones, the coefficient of DR_{t-1} will be 0.

$$DR_t=\alpha_t+COS_t+CGA_t+K1_t+TA_t+SR_t+Tang_t+Profit_t+\varepsilon_t \quad (1)$$

$$DR_t=\alpha_t+DR_{t-1}+COS_t+CGA_t+K1_t+TA_t+SR_t+Tang_t+Profit_t+\varepsilon_t \quad (2)$$

where, COS: corporate ownership structure, CGA: chaebol group affiliation, K1: K1-score, the bankruptcy probability for listed firms, TA: Total asset, firms' size, SR: annual stock return, Tang: Tangibility, Profit: Profitability, DR_{t-1}: Firms' debt ratio at T_{-1}.

In addition, we separate firms into two groups in line with the median value of COS from 〈Table 1〉, firms with high and low COS, and conduct Equation (1) again to size up the COS's influence on firms' debt levels in more detail. Of course, we also investigate the capital structure adjustment speed based on COS using Equation (2). Conducting Equations (3) and (4), we also test whether or not chaebol group affiliates may have different association between COS and DR, and debt level adjustment speed in comparison to non-chaebol firms. Equations (3) and (4) exclude CGA, as CGA is dummy variable of 1 or 0. We instead conduct Equations (3) and (4) twice, one with chaebol affiliations, the other one with non-chaebol firms.

$$DR_t=\alpha_t+COS_t+K1_t+TA_t+SR_t+Tang_t+Profit_t+\varepsilon_t \quad (3)$$

$$DR_t=\alpha_t+DR_{t-1}+COS_t+K1_t+TA_t+SR_t+Tang_t+Profit_t+\varepsilon_t \quad (4)$$

5. The endogeneity of data

As described earlier, as COS and debt ratio have close relationship between them, there is high level of probability of occurring an endogeneity problem. For example, if firms try to reduce their debt levels by increasing shares, with other things being equal, present shareholders' stockholding portion will be reduce. In other words, stock issuing

and COS alternation occur simultaneously and there will be an endogeneity problem. This means that the residual of regression model will not be 0, and OLS cannot be a BLUE(best linear unbiased estimator).

Furthermore in Equations (2) and (4), we can observe that regressand DR_t is influenced by regressor DR_{t-1}, this likewise implies that the endogeneity can also occur by having an inter-correlation between DR_t and DR_{t-1}. Therefor, auto-regression like estimators as seen Equations (2) and (4) will bring the endogeneity problem in models. In addition, we continuously collect a firm's debt level and other variables annually. In other words, when using panel data, endogeneity problem often occurs, as one or two period previous situations(t_{-1} or t_{-2}...) could affect the firm's next situations(t_0, or t_{+1}); we therefor cannot assume a normal distribution from collected sample that is generally presumed to apply OLS. This phenomenon could occur all variables when using panel data(Lew and Lim 2013a: 2013b). Some previous research therefore uses 2SLS(Kim and Song(김병곤 · 송재호) 2003) or 3SLS(Shin and Kim(신민식 · 김수은) 2010: Cho and Kim(조지호 · 김천호) 2005) to control this endogenous problem, instead of using OLS. A part from these estimators, GLS, GMM, ML can likewise be used. In this paper, we use GMM, GMM fixed effect, and S-GMM.[2] Therefore, we try to consider these problems that our data might contain and to improve the validity of our results.

VI. Empirical analyses

1. ANOVA test

In this section, we investigate whether there are differences in firms debt ratios based on COS levels or CGA. Panel A in 〈Table 2〉, we separate our firms into two sub-groups, high COS and low COS, based on the median value of COS in 〈Table 1〉, the descriptive statistics; and we test whether there is a difference in debt levels between two groups using ANOVA test. In Panel B, we conduct the ANOVA test again with CGA criterion to

2) See, Lew and Lim(2013a)

investigate the difference of debt level between two groups where one group belongs to chaebol groups and the other group does not. Panel A indicates a significant debt level difference between high and low COS groups[3]; and Pane B also presents a difference between chaebol and non-chaebol group firms. In other words, 〈Table 2〉 indicates that COS and CGA influence on firms' debt levels.

〈Table 2〉 Debt level differences in line with COS and CGA using ANOVA test

Panel A					Panel B				
	ss	df	ms	F value		ss	df	ms	F value
COS	7.4508	1	7.4508	149.23***	Chaebol	8.0035	1	8.003	161.16***
residual	317.85	6366	.0499		residual	335.177	6749	.0496	
total	325.30	6367	.0510		total	343.177	6850	.0508	

1) ss : sum of square, df : degree of freedom, ms : mean square, *** : 0.01in significant level

2. Regression models

In this section we test Equations from (1) to (4) that we have considered in previous chapter. In 〈Table 3〉, using Equations (1) and (2), we test the relationships between COS and debt level, and between CGA and debt ratio, and capital structure adjustment speed, using whole data, before classifying data into sub-groups in line with COS level and CGA. In this table, we use five different regression estimators. As explained in 〈Table 1〉, there is a great possibility that our sample cannot fulfill the normal distribution assumption, and OLS would not be a best estimator. We therefore, use OLS and other estimators such as, OLS fixed effect, GMM, and GMM fixed effect etc together to increase the validity of our results.

〈Table 3〉 indicates that the influences of COS and CGA on firms' debt ratios are not clearly visible. The association between COS and debt level is not consistent across different regression methods. For example, a negative association presents when using fixed effect, and a positive relationship when using other models. Furthermore, although

3) Although we do not report in this paper, our unreported ANOVA test result using quarternal level of COS also present a significant difference in debt level in line with different COS.

there are statistic significances when using OLS fixed, GMM fixed and S-GMM, there is no unified direction between them across the estimators. Therefore, it is not easy to conclude the relationship between COS and debt ratio, using only 〈Table 3〉. In terms of the second variable, CGA, there is a positive association between CGA and regressand but not statistically significant in the first column, we can observe a negative association with statistically significant level when using only S-GMM. This also implies there is not consistent relationship between estimators.

K1 present a negative association with gearing level across all methods. Namely, low K1 firms, a high level of bankruptcy probability, hold high debt. TA has a positive association, as this lessens asymmetric information between market and internal managers as mentioned in the section of variable definition. SR has a negative association with debt level. This can be interpreted into two ways. Increased stock price leads firms to issue stock with high price, and the second reason is that high stock price would be caused by increasing firms' profits. The first reason is the market timing theory and the second reason is the pecking order theory. Tang shows a negative association, this is inconsistent some previous papers(Lemmon et al. 2008: Brav 2009). With two reasons, we can view a negative association with Profit. The first reason is that increasing profits trigger stock price increasing as well as new stock issuing with high price. The second reason is that profit itself increases the amount of equity and therefore reducing debt level. It seems that profit and SR have a close relationship between them and might be that there is an endogeneity; however as seen from correlation matrix in 〈Table 1〉, there is not a great correlation; and our VIF test also proves that.

The associations between control variables and dependent variable are very consistent across different estimators, and this consistency too presents in forthcoming Tables 5 and 7. This means that these control variables have stronger relationships to debt levels than COS and CGA. This likewise means that when firms adjust their debt levels, these control variables take a more important role than COS or CGA. In other words, firms' survival related factors such as profit, growth, and K1 are more important factors than COS. When we interpret this table, we need to remind that two important financial events occur, the Asian financial crisis in 1997 and global financial crisis in 2007, in Korea during our sample period. During financial crises, most firms in Asia increase their

cash holding levels(Lew and Lim 2013a), and reduce their debt level(Lew and Lim 2013b) at the same time. In other words, there is a tendency of that while firms increase their cash holding levels, their debt level decreases; unless firms with extremely low debt level at t_{-1}, most firms attend this inclination. Thus, if the same inclination is presented in this table, it is possible that the importances of COS and CGA could be less compared with the control variables; and we may not find a strong statistical significance between COS(or CGA) and debt ratio.

Column 5 using S-GMM presents that firms' debt level adjusting speed is 0.3256 (=1-0.6744). This shows that firms in Korea have optimal capital structure and try to move toward it. As 〈Table 3〉 cannot present an importance and consistency in the relationships between COS(or CGA) and debt level, we conduct additional analyses using Equations from (1) to (4) in the next sections. In the coming sections, we separate our sample into 4 different sub-samples, high and low COS, and chaebol and non-chaebol group affiliations.

〈Table 3〉 Important debt ratio determinants

	OLS	OLS fixed	GMM	GMM fixed	S-GMM
con	-.2065 (-8.33)***	-.3963 (-8.77)***	-.2733 (-7.56)***	-.0435 (-21.82)***	-.295 (-23.87)***
DR_{t-1}					.6744 (131.75)***
COS	.0002 (1.42)	-.0009 (-6.04)***	.0003 (2.54)**	-.0003 (-1.55)	.0001 (2.18)**
CGA	.0038 (.75)		-.0063 (-.97)		-.0226 (-10.88)***
K1	-.0295 (-76.94)***	-.0277 (-64.49)***	-.032 (-26.79)***	-.0312 (-34.93)***	-.0095 (-41.35)***
TA	.0634 (40.91)***	.0744 (27.34)***	.0693 (27.44)***	.0909 (15.45)***	.0344 (35.93)***
SR	-.0026 (-.91)	-.0019 (-.93)	-.0146 (-2.83)***	-.0024 (-.79)	-.0232 (-34.95)***
Tang	-.1592 (-13.90)***	-.1308 (-8.38)***	-.2058 (-14.88)***	-.2107 (-9.36)***	-.1088 (-19.29)***

	OLS	OLS fixed	GMM	GMM fixed	S-GMM
Profit	-.0893 (-3.63)***	-.2132 (-11.26)***	.2221 (1.60)	-.1268 (-3.35)***	-.2306 (-29.05)***
Adj-R^2	.6311	.6155	.621	.5701	
AR(1)					-9.23***
AR(2)					-.03
Inst			L1, L2	L1, L2	L1, L2
H's J (chi2-p-value)			7.399 (.1162)	.131 (.7171)	399.76 (.102)
Obs	5849	5849	5523	5778	5848

1) AR(1) and AR(2) : Arellano-Bond test for autocorrelation in the 1st order and the 2nd order differences respectively, H's J : Hansen J statistic, L1 and L2 : one and two periods lagged data as instruments. chaebol : dummy 1 value 1, if firms belong to chaebol group, 0 otherwise, * : significance at 0.1% level, ** : significance at 0.05% level, *** : significance at 0.01% level.

(1) Different COS and different capital structure

As COS and CGA cannot indicate clear effect on debt ratio decision in 〈Table 3〉, we analysis our data again based on COS levels, high and low COS. 〈Table 4〉 presents two descriptive statistic tables based on COS level. We use median value(50 percentile in Table 1) of COS as mean value can be affected by some extraordinarily great values. If a firm's COS value is greater than median value(Panel A), we consider it as a high level of COS firm, otherwise low COS firms(Panel B). 〈Table 4〉 indicates that there is of 6% differences between two groups in terms of mean and median values of debt levels. Furthermore, although the differences of magnitude in debt level may not be great, there are differences in the values of K1, SR, Tang and Profit between two groups. The table presents that firms with high COS level have low K1, high SR, profit, and tangible assets in general. This implies that firms with greater COS level are financially more stable than the smaller COS firms. In addition, from Panels A and B, some values of kurtoses and skewnesses indicate that they would not be randomly distributed, and this of course implies that we should be careful to use an OLS estimator.

〈Table 4〉 Descriptive statistics based on COS level

Panel A(firms with low COS level)							
	DR	COS	K1	TA	SR	Tang	Profit
Mean	0.5178	26.5550	13.0748	18.2592	-0.0145	0.3346	0.0083
Min	0.0316	0.4900	-9.3970	9.1006	-4.0585	0.0000	-2.3134
p25	0.3442	19.9500	9.5175	17.0556	-0.3118	0.1959	-0.0036
p50	0.5162	28.1600	12.9827	18.0381	0.0125	0.3234	0.0260
p75	0.6511	33.8600	16.9044	19.4671	0.3542	0.4564	0.0637
p99	1.3766	39.6900	28.3666	23.1119	1.3637	0.7844	0.2099
Max	1.9743	39.9100	30.0891	24.4852	1.6816	0.8917	0.2710
SD	0.2422	8.9388	6.3288	1.9668	0.6451	0.1877	0.1260
Skew	1.0999	-0.5442	-0.2541	0.1019	-0.9042	0.3361	-4.6739
Kurtosis	6.6668	2.4281	3.8598	4.0066	6.0506	2.5664	53.6034
Obs	3179	3191	3071	3188	3060	3191	3106
Panel B(firms with high COS level)							
	DR	COS	K1	TA	SR	Tang	Profit
Mean	0.4494	53.2551	14.9939	18.1550	0.0170	0.3613	0.0360
Min	0.0449	39.9200	-8.8108	12.2078	-3.2347	0.0013	-0.9568
p25	0.3048	45.5600	11.6843	17.2568	-0.2312	0.2351	0.0101
p50	0.4409	50.9800	14.7920	18.0437	0.0372	0.3535	0.0377
p75	0.5827	59.2300	18.4293	18.9834	0.3328	0.4842	0.0730
p99	0.9373	78.3600	28.3769	21.6818	1.3406	0.7954	0.2062
Max	1.8894	79.9900	30.0599	23.6860	1.6803	0.9346	0.2672
SD	0.2030	9.6589	5.4479	1.4350	0.5764	0.1752	0.0763
Skew	0.8748	0.7463	-0.1715	0.1186	-1.0828	0.2377	-2.0519
Kurtosis	6.4637	2.6646	3.9466	3.9250	7.3495	2.7285	19.0611
Obs	3189	3191	3134	3190	3013	3190	3116

In 〈Table 5〉, we test whether there are differences in the relationships between important capital structure determinants and debt ratio based on COS levels. In these analyses, we can observe that COS has a negative association with debt level when firms'

COS level is low but a positive association when COS level is high. In other words, it has a ∩ sharp association as COS increases. This result is inconsistent with Shin and Kim(신민식 · 김수은 2010) but consistent with Brailsford et al.(2002). Furthermore, 〈Table 5〉 presents a negative association in general between CGA and debt ratio. This was not clear in 〈Table 3〉. Moreover, in both panels with different COS levels, all other control variables and DR have coherent relationships across analyses as seen in 〈Table 3〉. This implies the importance of those control variables as firms' debt ratio decision determinants. Their importance is constant, regardless of COS levels. The third columns in each panel indicate faster debt ratio adjustment speed (.4407=1-.5593) for high COS level firms than low COS level firms(.2725=1-.7275), using a S-GMM estimator. This would suggest that a strong readership with stable financial condition(see 〈Table 4〉) leads a faster decision for firms to alter their debt levels.

〈Table 5〉 Regression based on COS level

	Panel A(firms with low COS level)			Panel B(firms with high COS level)		
	GMM	GMMfixed	S-GMM	GMM	GMMfixed	S-GMM
Con	-.2396 (-5.06)***	-.0424 (-15.77)***	-.2079 (-68.12)***	-.1932 (-4.48)***	-.0386 (-14.24)***	-.2722 (-56.62)***
DR_{t-1}			.7275 (491.37)***			.5593 (248.07)***
COS	.0008 (2.48)**	-.0002 (-.59)	.0002 (8.13)***	-.0003 (-1.51)	-.0004 (-1.87)*	-.0004 (-23.85)***
CGA	.0091 (.95)		-.0101 (-15.02)***	-.0035 (-.52)		-.0183 (-30.46)***
K1	-.0292 (-36.15)***	-.0308 (-23.76)***	-.0066 (-84.95)***	-.0297 (-28.19)***	-.0295 (-19.50)***	-.0124 (-140.7)***
TA	.0638 (21.94)***	.0804 (10.22)***	.0240 (88.38)***	.0657 (24.36)***	.0694 (12.49)***	.0420 (108.86)***
SR	-.0005 (-.11)	.0017 (.42)	-.0238 (-113.46)***	-.0082 (-1.51)	-.0054 (-1.00)	-.0196 (-67.78)***
Tang	-.1535 (-7.07)***	-.1577 (-3.01)***	-.0202 (-14.16)***	-.2262 (-12.92)***	-.1798 (-7.73)***	-.1987 (-123.2)***
Profit	-.1065 (-1.51)	-.1800 (-3.66)***	-.2777 (-96.90)***	-.0045 (-.03)	-.1742 (-1.01)	-.2480 (-62.23)***

	Panel A(firms with low COS level)			Panel B(firms with high COS level)		
	GMM	GMMfixed	S-GMM	GMM	GMMfixed	S-GMM
R^2	.5906	.5781		.6743	.5712	
AR(1)			-7.72***			-6.60***
AR(2)			1.00			-.44
Inst	L1, L2	L1, L2	L1, L2	L1, L2	L1, L2	L1, L2
H's J	2.090 (.1483)	.943 (.3314)	314.67 (.479)	3.590 (.1661)	1.195 (.2743)	314.10 (.488)
Obs	2883	2883	2915	2798	2798	2933

(2) CGA and different capital structure

In 〈Table 6〉, Panels A and B show descriptive statistics for firms that belong to and do not belong to chaebol groups, respectively. Firms that belong to chaebol group have a higher debt ratio, K1, SR, profit, greater firms' size, and more tangible assets than firms that are not chaebol group affiliates. Park and Baek(박경서 · 백재승 2001) likewise argue higher debt levels for chaebol affiliations. 〈Table 6〉 supports their argument by presenting financial stability for chaebol affiliations. It also shows that firms in chaebol groups hold less COS although the difference is not great. Kurtosis and skewness likewise present in 〈Table 6〉.

〈Table 6〉 Descriptive statistics based on CGA

Panel A(firms in chaebol groups)							
	DR	COS	K1	TA	SR	Tang	Profit
Mean	0.551	38.056	15.033	19.859	0.081	0.362	0.038
Min	0.045	2.850	-18.999	13.396	-2.896	0.001	-0.538
p25	0.424	24.360	12.135	18.722	-0.220	0.209	0.010
p50	0.567	36.075	15.230	20.009	0.080	0.360	0.038
p75	0.664	49.600	18.393	21.029	0.419	0.510	0.078
p99	1.106	74.910	28.630	23.568	1.350	0.812	0.221
Max	1.702	79.380	30.070	24.485	1.682	0.935	0.266

Panel A(firms in chaebol groups)							
	DR	COS	K1	TA	SR	Tang	Profit
SD	0.200	17.131	5.722	1.822	0.570	0.203	0.078
Skew	0.555	0.284	-0.722	-0.484	-0.521	0.135	-1.514
Kurtosis	5.749	2.422	5.904	3.515	4.906	2.349	10.876
Obs	1510	1412	1480	1511	1366	1511	1460
Panel B(firms in non-chaebol groups)							
	DR	COS	K1	TA	SR	Tang	Profit
Mean	0.469	40.430	13.074	17.688	-0.024	0.345	0.020
Min	0.032	0.490	-75.387	9.101	-4.059	0.000	-2.313
p25	0.306	29.050	10.072	16.923	-0.290	0.218	0.004
p50	0.456	40.625	13.394	17.721	0.011	0.335	0.031
p75	0.599	51.280	17.203	18.528	0.319	0.463	0.069
p99	1.180	75.880	28.214	20.836	1.353	0.780	0.217
Max	1.974	79.990	30.089	21.976	1.680	0.923	0.271
SD	0.229	15.985	7.817	1.378	0.625	0.176	0.112
Skew	1.210	0.045	-2.727	-0.682	-1.082	0.298	-4.679
Kurtosis	7.268	2.485	22.089	5.723	6.824	2.680	57.237
Obs	5241	4970	5184	5251	4787	5254	5076

〈Table 7〉 presents whether or not CGA affects firms' debt ratio using regression models. Although it is not statistically significant, firms in chaebol groups generally have a negative association between COS and DR but a positive association for non-chaebol firms. Our results are inconsistent with Park and Baek(박경서 · 백재승 2001). They show a significant positive relationship between COS and DR for chaebol group affiliations but not significant negative relationship for non-chaebol group firms.

This table also presents different capital structure adjustment speeds between chaebol and non-chaebol firms. Chaebol firms' adjustment speed is 0.3805(=1-.6195) and non-chaebol firms' adjustment speed is 0.25(=1-.75). We have already explained the reason why chaebol firms could change their debt levels more quickly, using descriptive statistics in

〈Table 6〉 Although chaebol affiliations hold more debt, they have low K1, high SR, profits, greater total and tangible assets. This implies that chaebol group affiliations have better financial stability and profitability. In addition, firms within chaebol groups can easily get help from their mother and sister companies, would have the scale of economics, and might have better ability to managing their financial conditions; thus they spend lower transaction costs when they issue new securities. Combing together all these factors, chaebol group firms would have faster capital structure adjustment speed. From Tables 3, 5, and 7, we confirm that COS and CGA can affect firms' debt ratios. However, at least, judging by the magnitude of estimated coefficient values, the influences of COS and CGA on firms' debt ratio change are not greater than what we first consider at the beginning of this paper; in other words, our results in this paper suggest that firms bankruptcy probability, operating profits, tangible asset, and firms' size are more important capital structure determinants.

〈Table 7〉 Regression results based on CGA

	Panel A(chaebol group firms)			Panel B(non-chaebol group firms)		
	GMM	GMMfixed	S-GMM	GMM	GMMfixed	S-GMM
Con	.2023 (3.58)***	-.0385 (-9.70)***	.1509 (13.54)***	-.3798 (-11.17)***	-.0411 (-20.18)***	-.3144 (-34.62)***
DR_{t-1}			.6195 (184.68)***			.75 (249.48)***
COS	-.0003 (-1.31)	-.0007 (-1.41)	-.0002 (-7.26)***	.0002 (1.34)	-.0002 (-.95)	.0001 (7.94)***
K1	-.0283 (-21.67)***	-.0351 (-13.92)***	-.0076 (-22.45)***	-.0289 (-64.75)***	-.0289 (-36.44)***	-.0062 (-37.83)***
TA	.0442 (13.81)***	.0801 (8.76)***	.0123 (14.49)***	.0734 (36.41)***	.0740 (15.44)***	.0302 (43.64)***
SR	.0061 (.80)	.002 (.27)	-.0208 (-65.05)***	-.0048 (-1.28)	-.0046 (-1.45)	-.0193 (-39.98)***
Tang	-.1992 (-10.10)***	-.1814 (-4.24)***	-.1339 (-20.25)***	-.1876 (-12.51)***	-.1723 (-7.45)***	-.0737 (-17.85)***
Profit	-.4164 (-4.88)***	-.2115 (-2.25)***	-.4929 (-34.66)***	-.1292 (-2.92)***	-.1365 (-3.24)***	-.2573 (-60.21)***

	Panel A(chaebol group firms)			Panel B(non-chaebol group firms)		
	GMM	GMMfixed	S-GMM	GMM	GMMfixed	S-GMM
R^2	.593	.6073			.5722	
AR(1)			-4.18***			-9.04***
AR(2)			1.10			-.54
Int	L1, L2	L1, L2	L1, L2	L1, L2	L1, L2	L1, L2
H's J	5.053 (.2819)	6.755 (.1494)	101.27 (1.00)	4.339 (.362)	1.902 (.7537)	324.54 (.343)
Obs	1233	1248	1301	4305	4361	4547

V. Conclusion

In this paper, we study whether COS and CGA affect firms' debt levels decision making process and find that these two factors have a limited influence on debt level. The relationships between COS(or CGA) and regressand, and statistic significant levels do not show a coherent result across different regression estimators and different regression models with different sample classifications. This implies that it is still too early to conclude the relationship between COS and debt ratio, and between CGA and debt ratio. This result suggests us to use more accurate models or estimators than what we have used in this paper: or we may need more data that cover longer period and represent more general economic condition. Particularly, our results would be influenced by Asian financial crisis in 1988 and sub-prime mortgage crisis from the U.S in 2007. They increase the uncertainty of future economic situation in Korea. Therefore, Korean firms continuously reduce their debt levels; and this unusual behaviours would affect firms' debt level decision policies. In other words, our sample firms are influenced by this unusual economic condition; and therefor most firms show the similar behaviours, reducing debt levels, unless their debt levels are extremely low, during our sample period.

In this paper, we have confirmed whether firms have different debt levels based on

COS and CGA using one way ANOVA test; and then, we find that COS and CGA affect firms' debt level using regression estimators; in addition, there is a non-linear(∩sharp) association between COS and debt levels. Furthermore, while firms' debt levels have a negative association with COS among chaebol group affiliations, there is a positive association among non-chaebol group firms. In addition, our results suggest that firms with high COS or chaebol affiliations have higher capital structure adjustment speed. Our results likewise suggest that the influences of COS and CGA on debt levels are smaller than the influence of firms' size, profits, tangible asset; we discover that the factors that are related to firms operation and survival are more important elements for debt level decision. This also indirectly suggests why our results cannot show a clear interaction between COS and debt level and statistically significant coefficients. Our results also imply that there are many determinants waiting to be discovered their roles for firms' debt level decision process.

In this paper, we have some contributions that we enlarged our research period in comparison with pervious research. As they use data shortly after two financial crises, their results are more strongly influenced by these crises than our results. Secondly, we have confirmed there are capital structure adjustment speed differences based on COS and CGA. Finally but not least, we consider an endogeneity problem and use GMM and System-GMM estimators instead of OLS to improve previous research and increase the validity of our results.

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기업소유구조와 재벌변수가 기업의 부채비율변화에 미치는 영향

류 성 희

요 약

본 논문에서, 우리는 기업 소유구조와 재벌 기업 소속여부가 기업의 자본구조결정에 미치는 영향을 파악하기 위해서 노력하였다. 우리는 분석에서, 각기 다른 회귀모형이 상이한 결과를 도출하는 경우가 발생하는 것으로 보아, 확정적인 결론을 내리기에는 아직 이른 것으로 보여지나, 기업의 부채비율이 기업의 소유구조와 재벌그룹의 소속여부에 따라서 통계적으로 유의하게 다르다는 것은 확인하였다. 또한, 기업의 소유구조와 부채비율은 ∩의 모양을 가지는 비선형적인 관계에 있고, 재벌기업들은 부채비율과 음의 관계를, 비재벌 기업과는 양의 관계를 가지는 것을 관찰하였다.

또한, 대주주의 소유비율이 높은 기업과 재벌기업들이 더 높은 자본구조 조정속도를 가지고 있는 것으로 나타났다. 즉, 오너의 리더쉽과 재벌기업에 속함으로 인해서 발생하는 재무적 안정성의 이미지가 이들 기업으로 하여금 보다 빨리 부채비율을 조정할 수 있는 기회를 주는 것으로 보여 진다. 그러나 기업의 부채 비율이 소유구조보다는 기업의 크기, 수익성, 고정자산비율 등으로부터 받는 영향이 더 크다는 것을 보여줌으로서, 부채비율 결정을 단지 소유구조라는 변수만을 가지고 결론을 내리기에는 아직도 연구되어야 할 부분이 많다는 것을 보여 주었다.

마지막으로 방법론적인 측면에서, 본 논문은 자료가 가지고 있는 내생성 발생가능성에 대한 고려를 하여, 도구변수를 사용하는 방법론을 사용하여 OLS가 가지고 있는 제약점을 극복하기 위해서 노력하였다.

핵심 주제어 : 소유구조, 재벌기업, 부채비율, 자본구조 조정속도, 그리고 내생성

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