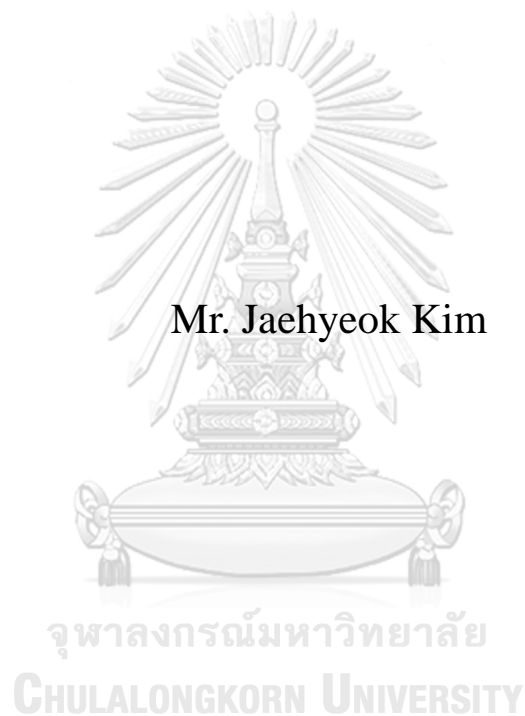The Effect of Control-Ownership Disparity on Earnings
Management: Evidence from Korean Large Business Groups

Mr. Jaehyeok Kim

ผลกระทบของการแบ่งแยกความเป็นเจ้าของออกจากการมีอำ นาจควบคุมกิจการต่อการจัดการ
กำไร ข้อมูลจากกลุ่มบริษัทขนาดใหญ่ในประเทศเกาหลี

นายแจฮยอก คิม

จุฬาลงกรณ์มหาวิทยาลัย

CHULALONGKORN UNIVERSITY

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาการเงิน ภาควิชาการธนาคารและการเงิน
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แจฮยอก คิม : ผลกระทบของการแบ่งแยกความเป็นเจ้าของออกจากการมีอำ นาจควบคุมกิจการต่อการจัดการ กำไร ข้อมูลจากกลุ่มบริษัทขนาดใหญ่ในประเทศเกาหลี. (The Effect of Control-Ownership Disparity on Earnings Management: Evidence from Korean Large Business Groups) อ.ที่ปรึกษาหลัก : ผศ. ดร.จอห์น โทมัส คอนเนลลี่

วิทยานิพนธ์เล่มนี้เป็นส่วนหนึ่งของการศึกษาเพื่อเปรียบเทียบความแตกต่างวิธีการจัดการรายได้ของ บริษัทที่ ควบคุมโดยครอบครัวที่อยู่ในกลุ่มธุรกิจขนาดใหญ่ของเกาหลี (หรือ แชบอล) กับ บริษัทที่ไม่ได้บริหารและควบคุมโดย ครอบครัวของกลุ่มธุรกิจขนาดใหญ่ของเกาหลี ในระหว่างปี 2002-2016 นอกจากนั้นวิทยานิพนธ์ฉบับนี้ ยังศึกษา ทดสอบ เปรียบเทียบความแตกต่างระหว่างสิทธิในการออกเสียงของผู้ถือหุ้น และกระแสเงินสดนั้น มีผลต่อการจัดการกำไรหรือไม่ โดยการศึกษานี้จะตรวจสอบทั้งการตกแต่งกำไรผ่านรายการคงค้าง (AEM) และการตกแต่งกำไรผ่านการสร้างรายการทาง ธุรกิจ (REM) โดยใช้เครื่องมี ๒ ประเภทในการชี้วัดคือ การจัดการกำไรผ่านรายการคงค้าง และการจัดการกำไรสามประการ จริง

การศึกษานี้พบว่า บริษัทประเภทแชบอล มีกำไรมากกว่าเมื่อเทียบกับ บริษัทที่ไม่ได้บริหารและควบคุมโดยครอบครัวของกลุ่ม ธุรกิจขนาดใหญ่ หากแต่เมื่อใช้การวัดคุณภาพรายได้เป็นพร็อกซี AEMเป็นเครื่องวัดแล้ว พบว่าไม่มีข้อแตกต่างอย่างมี นัยสำคัญระหว่าง บริษัทประเภทแชบอล และ บริษัทที่ไม่ได้บริหารและควบคุมโดยแชบอล และเมื่อมีการใช้พร็อกซี AEM ตัวที่สองซึ่งเป็นการวัดค่าคงค้างตามดุลยพินิจ ผลการทดลองบ่งชี้ว่าไม่มีพบแตกต่างระหว่าง บริษัทประเภทแชบอล และ บริษัท ที่ไม่ได้บริหารและควบคุมโดยแชบอลเช่นกัน ในการใช้การจัดการรายรับแบบคงค้าง

ประการที่สองบทความนี้แสดงให้เห็นว่าไม่มีความแตกต่างอย่างมีนัยสำคัญระหว่าง บริษัทประเภทแชบอล และ บริษัทที่ไม่ได้ บริหารและควบคุมโดยแชบอลเกี่ยวกับมาตรการทั้งสามประการของการจัดการกำไรจากกิจกรรมจริง การศึกษาครั้งนี้พบ หลักฐานที่เด่นชัดว่าการผลิตเกินกำลัง เป็นวิธีการจัดการกำไรของกิจกรรมจริงที่ตัวอย่างของ บริษัท ในอุตสาหกรรมการผลิตเมื่อ เทียบกับตัวอย่างที่มี บริษัท ในอุตสาหกรรมการผลิตและไม่ใช้การผลิต

การศึกษาครั้งนี้แสดงให้เห็นว่าการควบคุม และความไม่เท่าเทียมกันในการเป็นเจ้าของโดยการควบคุมบุคคลภายในของกลุ่ม ธุรกิจขนาดใหญ่ไม่มีผลกระทบต่อการจัดการรายได้ตามเกณฑ์คงค้างหรือการจัดการรายได้ตามกิจกรรมจริง เนื่องจากกฎระเบียบ ต่างๆที่บังคับใช้ในกลุ่มธุรกิจขนาดใหญ่ทำให้การใช้การจัดการรายได้มีค่าใช้จ่ายสูงโดยไม่คำนึงถึงการควบคุมความเป็นเจ้าของ ลิ่ม

โดยสรุปแล้วพบว่าบริษัทประเภทแชบอลที่บริหาร และควบคุมโดยครอบครัวนั้น มีความไม่เท่าเทียมกันในการเป็นเจ้าของ และ การควบคุมอำนาจ ซึ่งส่งผลกับรายได้ที่ไม่ดี สุดท้ายการศึกษานี้พบว่า บริษัทประเภทแชบอลมีการมุ่งเน้นในการผลิตมากเกินไป ซึ่งผกผันกับวิธีการจัดการรายได้จริงนั้น เกิดจากกิจการ ที่ควบคุมโดยกลุ่มครอบครัวแชบอล มีความแตกต่างระหว่างสิทธิการ ควบคุมและสิทธิความเป็นเจ้าของนั่นเอง

สาขาวิชา	การเงิน	ลายมือชื่อนิสิต ....
ปีการศึกษา	2562	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

Jaehyeok Kim : The Effect of Control-Ownership Disparity on Earnings Management: Evidence from Korean Large Business Groups. Advisor: Asst. Prof. John Thomas Connelly, Ph.D.

This study examines the difference in the use of earnings management at family-controlled firms belonging to Korean large business groups (*chaebol*) versus non-*chaebol* firms belonging to Korean large business groups from 2002 to 2016. Firms belonging to large business groups are subject to similar regulations by authorities. This study also tests whether a divergence between voting rights and cash flow rights affects earnings management by controlling shareholders.

This study examines both accrual-based earnings management (AEM) and real-activities earnings management (REM), using two measures of accrual-based earnings management and three measures of real-activities earnings management.

This study finds that *chaebol* firms have better earnings quality compared to non-*chaebol* when an earnings quality measure is used as an AEM proxy. However, there is no significant difference between *chaebol* and non-*chaebol* firms when a second AEM proxy, measuring discretionary accruals, is employed. These mixed results indicate that there is no difference between family-controlled firms (*chaebol*) and non-family firms (non-*chaebol*) in the use of accrual-based earnings management.

Second, this paper provides evidence that there is no significant difference between *chaebol* firms and non-*chaebol* firms with respect to all three measures of real-activities earnings management. This study finds stronger evidence of overproduction as a means of real-activities earnings management at a subsample of firms in manufacturing industries, compared with the full sample containing firms in both manufacturing and non-manufacturing industries.

This study shows that a control-ownership disparity by controlling insiders of large business groups does not have an impact on accrual-based earnings management or real-activities earnings management. This is because a variety of

Field of Study:	Finance	Student's	
		Signature	
Academic	2019	Advisor's	
Year:		Signature	

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Chapter 1. Introduction

1.1.Introduction

In the late 1990s, the Korean economy suffered from a severe financial crisis. Even though there are many reasons for the crisis, weak corporate governance mechanisms were one reason cited that exacerbated the crisis (Campbell and Keys, 2002). In particular, an incentive to expropriate minority shareholders by controlling insiders of large business groups is one reason that may have worsened the crisis (Johnson et al. 2000). After the crisis, since 1998, the Korea government has been trying to reform large business groups, especially family-controlled large business groups, in order to protect minority shareholders and in order to restrict the concentration of economic power currently held by a small number of business groups. Nevertheless, controlling insiders in a large business group may still abuse their position to gain private benefits at the expense of minority shareholders' interests (Korea Fair Trade Commission, 2017).

In Korea, a small number of family-controlled large business groups, called *chaebol*, dominate the Korean economy. Even though these large business groups played a crucial role in economic growth over the last five decades, numerous side effects derived from concentrated economic power and the seeking of private benefits of control by the controlling insiders became pervasive. Many *chaebol* families, through the monopoly power of their business groups and concentrated voting rights, abused their economic power to consume private benefits at the expense of disadvantaged groups.[1] For example, family members' wealth increased through related party transactions made under significantly favorable conditions (Almeida et al. 2011; Kang et al. 2014; and Black et al. 2015) or capital reallocation among affiliated firms (Almeida et al. 2015). If these actions, which seek to obtain private benefits and expropriate minority shareholders, are uncovered, outsiders such as regulatory authorities, auditors, analysts or minority shareholders may impose disciplinary pressures. Consequently, controlling insiders have a motivation to manipulate earnings

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[1] Korea Fair Trade Commission Annual Report, 2017.

and make accounting information less informative in order to conceal the true performance of firms and to hide self-serving behaviors (Leuz et al. 2003; Haw et al. 2004; Kim and Yi 2006; Gopalan and Jayaraman 2012).

Kim and Yi (2006) investigates all Korean companies to compare *chaebol* firms with non-*chaebol* firms across a sample period from 1992 to 2000.[2] According to Kim and Yi (2006), controlling owners in *chaebol*s easily transfer firms' resources through utilizing intra-group resources to increase value (i.e. tunneling or propping) and take private wealth at the expense of minority shareholders. As *chaebol*s have complicated ownership structures, minority shareholders have trouble in monitoring these internal transactions. As a result, *chaebol* firms appear to be more motivated to engage in accrual-based earnings management (hereafter, AEM) than independent firms are.

On the other hand, Hong et al. (2015) argue that *chaebol* firms use less AEM than stand-alone firms do. Instead, *chaebol* firms implement real-activities earnings management (hereafter, REM) as a means to manipulate earnings. As AEM is constrained by the likelihood of scrutiny and regulations, firms opt for REM as a substitute (Zang 2012). In addition, Hong et al. (2015) suggest that *chaebol*'s large economic scale and bargaining power with stakeholders, owing to their market leader status make REM less costly because the likelihood of a decline in competitive advantage is relatively small. *Chaebol*s have many channels to offset the negative effects of REM such as related-party transactions and sharing resources among affiliated groups.[3]

Based on prior literature, which provides evidence of earnings management by *chaebol* firms, this paper examines earnings management by comparing *chaebol* firms and non-*chaebol* firms. Unlike studies by Kim and Yi (2006) and Hong et al. (2015) which compare *chaebol*-affiliated firms with all other firms, this paper exclude independent firms and small and medium-sized group affiliated firms from the sample.

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[2] Kim and Yi (2006) test all firms including privately held firms, and public firms.
[3] Park (2016) compares *chaebol* firms with non-*chaebol* firms. She shows REM is more prevalent in *chaebol* firms than non-*chaebol* firms. However, she does not explain the theoretical relation between *chaebol* and REM. See the Appendix 2 for more detail comparison among prior literature.

Instead, this paper compares *chaebol* firms with non-*chaebol* firms both of which are classified as large business groups by the Korea Fair Trade Commission (KFTC). Despite efforts of economic democracy by the Korean government, large business groups are forming an ever-greater part of the Korean economy.[4] Given the importance of large business groups in Korea, this paper focuses on firms belonging to a large business group.

Next, this paper investigates whether the divergence between voting rights and cash flow rights held by controlling shareholders is associated with earnings management. One unique characteristic of *chaebol* is excessive control rights compared to ownership, derived from pyramidal ownership structures.[5] A small number of *chaebol* families have a tremendous influence on management even though they have a small fraction of equity ownership.

Controlling shareholders have greater incentives to pursue private control benefits and to expropriate firms' resources at the expense of minority shareholders' rights since controlling insiders have more voting rights in excess of cash flow rights (Claessens et al. 2000; Faccio and Lang 2002). In addition, the absence of a strong corporate governance system worsens expropriation by controlling shareholders because the controlling shareholders perceive the benefits from pursuing their private interests as being greater than the costs of doing so (Shleifer and Vishny 1997; La Porta et al. 1999&2002; Bebchuk et al. 2000; Johnson et al. 2000; Bae et al. 2002; Joh 2003; Lemmon and Lins 2003).[6] Moreover, controlling insiders do not have to bear the entire consequences from the financial and operating activities and have the rights to make managerial decisions. As a result, they are likely to run the company as they please with little consideration of the minority shareholders to obtain wealth for themselves. For instance, they shift the resources of a firm in which they have little ownership to other

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[4] For example, the number of listed firms belonging to a large business group account for 12.4 percent of the firms listed on the Korean stock exchange. However, these firms comprise 64.9 percent of the market capitalization of the Korean stock market in 2016

[5] A divergence between control-rights (voting rights) and ownership (cash flow rights), which is derived from a pyramidal structure, cross-holding ownership or dual-class stocks, is pervasive in European and East Asian countries. (Claessens et al. 2000; Faccio and Lang 2002).
[6] These costs include not only the loss of ownership, but also the costs of external factors such as legal costs due to litigation and loss of reputation (Haw et al. 2004).

firms in which they hold substantial cash flow rights.[7] In particular, as *chaebol*-affiliated firms show greater control-ownership disparity, *chaebol* owners tend to conduct certain actions to gather wealth such as tunneling through related-party transactions (Kang et al. 2014). If these actions are uncovered, stakeholders including minority shareholders, analysts, or regulators may require firms to be scrutinized and shake firms up. As a result, firms are likely to encounter an increase in legal costs and suffer a loss of reputation. Accordingly, controlling shareholders are motivated to mask expropriations by managing reported earnings opportunistically through both AEM and REM to avoid disciplinary actions by outsiders (Leuz et al . 2003; Haw et al. 2004; Kim and Yi 2006; Gopalan and Jarayaman 2012; Enomoto et al. 2015).

A number of studies show evidence of managing earnings via adjusting accounting accruals. However, extant academic studies with respect to earnings management show that managers achieve target earnings not only by using accounting accruals, but by also controlling real operating activities. Changes to real operating activities, undertaken to achieve earnings targets, mean that the activities of the firm are less than optimal. The consequences can be harmful to future performance (Graham et al. 2005; Roychowdhury 2006). This paper extends the previous literature by comparing *chaebol* with non-*chaebol* and examining the effect of control-ownership disparity on REM as well as AEM.

This paper estimates AEM using the modified Jones model (1991) proposed by Dechow et al. (1995) and the modified Dechow and Dechiv model (2002) developed by McNichols (2002). Following Roychowdhury (2006), abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses are used as REM measures.

This study uses data from 2002 to 2016 for listed firms in the Korea Stock Exchange which belong to large business group. When a discretionary accruals measure, the Modified Jones model (1995), is used as an AEM proxy, there is no difference

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[7] Controlling owners are also able to obtain private gains through other types of "tunneling" such as issuing dilutive shares, inordinate executive compensations or merger and acquisition among affiliated-firms to transfer resources. (Johnson et al. 2000; Bae et al. 2002; Baek et al. 2006; Black et al. 2015)

between *chaebol* and non-*chaebol* in the use of AEM. However, when the earnings quality measure proposed by McNichols (2002) is used, regression results show that *chaebol* firms have better earnings quality compared to non-*chaebol* firms. *Chaebol*s encounter stricter regulations by the regulatory authorities and are required by law to announce group status, such as ownership structure. Moreover, *chaebol* firms are at the center of attention by outsiders due to their economic and political significance. As a result, *chaebol* insiders are not likely to implement certain actions which could be easily uncovered by outsiders.

However, regression results do not show a significant relation between *chaebol* and REM. Instead, regression results show some strong yet mixed evidence of REM through abnormal production costs by *chaebol* firms. When firms in non-manufacturing industries are excluded from the sample, regression results show that *chaebol* firms are more associated with REM through abnormal production. There is no significant difference between *chaebol* and non-*chaebol* when the full sample is used. These results suggest that REM through overproduction measures is attributed to firms in real manufacturing industries

This paper also finds that the control-ownership disparity of large business groups has no impact on earnings management, either the AEM or the REM measures. As firms belonging to large business groups face various restrictions on the use of earnings management, the ownership disparity does not affect earnings management for firms belonging to large business groups.

In an additional analysis, the earnings quality of *chaebol* is exacerbated by a disparity in control and ownership as *chaebol* insiders have excessive control rights over ownership rights. On the other hand, *chaebol* firms with greater control-ownership disparity exhibit more REM through abnormal production costs.

1.2. Hypothesis

Once a business group is designated as a large business group by the KFTC, those affiliated firms are subject to prohibitions on certain activities which may infringe on the rights of other people. Such regulations imposed by the authorities may make

insiders perceive the use of AEM as costly because AEM is likely to be easily detected by outsiders. In addition, if a chairman of a business group is a natural person and the group is controlled by his family members (*chaebol*), the large business group is prohibited from pursuing private interests under the law[8]. Therefore, compared to non-*chaebol* firms, family-controlled large business groups face stricter regulations which make the use of AEM costly and thus make *chaebol* engage less in AEM.

Hypothesis 1.a. Chaebol affiliated firms engage less in AEM than non-chaebol affiliated firms

According to Zang (2012), managers opportunistically employ two types of earnings management as substitutes. They control the use of earnings managements based on the situations and constraints they face. For example, firms in the country where investor protection is strong show less AEM while they exhibit more REM instead (Enomoto et al. 2015). Assuming that a variety of administrative regulations and laws enacted after the crisis in 1997 strengthened investor protection, it is expected that *chaebol* owners who encounter more restrictions prefer REM to AEM. Moreover, as *chaebol*'s large business scale and market-leader status make *chaebol* perceive REM as less costly, it is expected that *chaebol* chooses REM rather than AEM (Hong et al. 2015).

Hypothesis 1.b. Chaebol affiliated firms engage more in REM than non-chaebol affiliated firms

Consistent with previous research on expropriation by controlling shareholders and earnings management, this paper predicts that controlling shareholders tend to strive for lining their pocket at the expense of minority shareholders' interests when

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[8] Monopoly Regulation and Fair Trade Act Article 23. Prohibition of Unfair Trade Practices

they have control rights in excess of ownership. As a result, controlling shareholders tend to manage earnings through accounting accruals (Leuz et al. 2003; Haw et al. 2004; Kim and Yi 2006; Gopalan and Jayaraman 2012).

Hypothesis 2.a. Control-ownership disparity is positively associated with AEM

A lower control-ownership disparity means that external investors are properly protected and there exist less agency problems between controlling insiders and outsiders. In that case, managers encounter difficulty with the use of AEM because it is easily discovered. Therefore, managers are likely to engage in REM instead of AEM (Zang 2012; Enomoto et al. 2015). In other words, managers in firms with a large gap between ownership and control-rights engage less in REM than AEM.

Hypothesis 2.b. Control-ownership disparity is negatively associated with REM

1.3.Contribution

This paper makes a contribution to the study on *chaebol*. Recently, the role of *chaebol* in the Korean economy has been becoming influential. Despite *chaebol*s' economic clout, they receive fierce criticism for expropriations and monopolistic or oligopolistic positions because family members who own *chaebol*s abuse their power for their own interests with a small percentage of equity ownership and expropriate minority shareholders through *chaebol*s' economic power. Problems derived from *chaebol*s justify efforts by the Korean government to reform *chaebol*s forcing them to move towards more transparent ownership structures. Therefore, the need arises to investigate *chaebols* and their ownership structures. By investigating *chaebol*'s earnings management behavior and ownership structure disparity, it is expected to find a solution to enhance the corporate governance mechanism in Korea.

This paper also sheds light on the study of Korean large business groups. Previous studies compare *chaebol* firms with non-*chaebol* firms which include all types of business group-affiliated firms or individual firms. However, as Korean large business groups account for a huge part of the Korean economy and their influences continue to grow, the importance of a large business group is growing considerably greater. This paper is the first attempt to focus on large business groups. By focusing on firms in large business groups, which face stricter constraints compared to independent firms and firms in small and medium-sized groups, it is possible to eliminate a potential endogeneity.

Lastly, this study contributes to the literature examining control-ownership disparity and earnings management, both AEM and REM. Prior literature to date shows evidence of expropriation through AEM by controlling shareholders in firms with a high level of control-ownership disparity. However, only a few studies identify the effect of ownership structure on REM as the control-ownership disparity changes. This paper is the first attempt to examine the effect of a control-ownership wedge on both AEM and REM together to identify whether, and how firms with a greater control-ownership disparity are associated with both forms of earnings management.

Chapter 2. Literature review

2.1.Chaebol

Every April, the Korea Fair Trade Commission (KFTC) designates and announces large business groups based on the total assets of the business group. KFTC regulates certain activities to restrict the concentration of economic power by a small number of controlling shareholders[9]. More specifically, the main purpose of the KFTC is to form a strong corporate governance mechanism through monitoring family-controlled large business groups. Even though there is no doubt that *chaebol*s contributed to Korean economic development, *chaebol* families have been fiercely criticized for unfair trading, moral hazard, and greed for worldly money and power. For example, *chaebol* families reckless expand new business into the local business and eliminate their competitors by using enormous market power of *chaebol*. They also overuse their power to have a strong bargaining position against contractor for their accumulation of wealth (Kim et al. 2006; Kang et al. 2014). As a result, the Korean government prohibits *chaebol*s from mutual investments and circular investment, and encourages *chaebol*s to establish a holding company in order to protect disadvantaged groups. Nevertheless, *chaebol* families still exert a huge influence on the group with a small percentage of ownership by using indirect ownership such as affiliated firms and related parties.

Many prior studies demonstrate *chaebol* have a negative effect on firms and violet the interests of minority shareholders. For example, Bae et al. (2002) argue that controlling shareholders in *chaebol* tend to inefficiently transfer resources among affiliated firms in order to gain private wealth and expropriate minority shareholders. Because of weak corporate governance mechanisms and agency problems between controlling shareholders and minorities, *chaebol* affiliated firms show low profitability (Joh 2003). Kim (2011) shows that *chaebol* affiliated firms increased investments through external financing during the Asian crisis. However, those firms show low profitability because investment decision making by *chaebol* owners is less efficient.

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[9] See appendix 1 for more details regarding to designation of a large business group.

Several researchers examine the relation between *chaebol* status and earnings management. Kim and Yi (2006) investigate the Korean market and show that firms belonging to large business groups are likely to engage in AEM to a greater extent than non-affiliated firms because group affiliated firms exert their resources to "tunnel" readily.[10] On the other hand, Hong et al. (2015) argue that a *chaebol* tends to engage less in AEM because it is likely to be easily detected by outsiders. Instead, *chaebol* firms manage earnings through real operating activities because *chaebol*'s large business scale and group status make REM less costly.

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2.2.Control-ownership disparity

Inconsistent with classical ownership structure theory which is described as a separation of ownership and control and dispersed ownership, ownership is typically concentrated in a small number of controlling shareholders in European and Asian countries in which legal protection for minority shareholders is weak (La Porta et al. 1999; Claessens et al. 2000; Faccio and Lang 2002). The concentrated ownership results in a discrepancy between voting rights and cash flow rights accomplished through various ways such as dual-class stock, pyramids, and cross-ownership structure (Bebchuk et al. 2000).[11]

Figure 1 describes a simple example of a pyramidal structure which leads to the control-ownership disparity. In the above example, the controlling shareholder has $(b+c)$% of   the voting rights of Firm B while holding $(b+a \times c)$% of cash flow rights of Firm B. Therefore, if control-ownership disparity is defined as a difference between voting rights and cash flow rights, the controlling shareholder owns *c(1-a)%* of the excess voting rights of Firm B. Under the pyramidal structure as the example, controlling shareholders are able to possess more voting rights compared to cash flow rights as more affiliated firms are included in the pyramidal structure vertically. If

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[10] Kim and Yi (2006) also find that listed firms reveal more earnings management than private firms as managers in public firms have an incentive to meet market's expectations.

[11] Korean firms cannot issue dual-class shares. A control-ownership disparity in Korea firms is originates primarily from the use of a pyramidal structure, and mutual and circular equity investments.

mutual and circular investment are allowed, controlling owners are able to have considerable power over affiliated firms.

Figure 1   An example of pyramidal structure
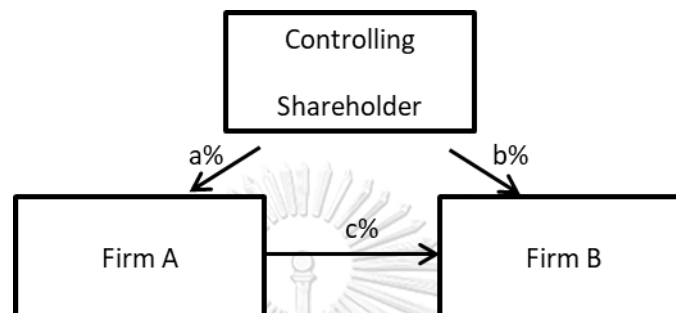
The control-ownership disparity allows controlling owners to control firms with a small fraction of equity ownership and gives them to abilities (through their voting rights) and the incentives (through their cash flow rights) to extract private benefits from firms and minority shareholders. The controlling shareholders do not have to tolerate the entire negative financial consequences of their decision making, causing agency problem between controlling shareholders and minority shareholders (Bebchuck et al. 2000; Fan and Wong 2002; Classenes and Fan 2002).

Existing literature demonstrates that costs derived from agency problems between controlling shareholders and minority shareholders for firms with a great extent of control-ownership disparity have a negative impact on firms. For example, firms with large control-ownership disparity exhibit lower firm value (Claessens et al. 2002; La Porta et al. 2002; Gompers et al. 2010), profitability (Joh 2003), stock returns (Mitton 2002; Lemmon and Lins 2003), bond ratings (Boubakri and Ghouma 2010), and market liquidity (Chu et al. 2015). Hong et al. (2017) suggest that when voting rights are not proportionate to cash flow rights, controlling insiders have the incentives and the ability to manage earnings. Consequently, firms are likely to be exposed to great danger, such as stock price crash risk due to accumulated negative information. Kang et al. (2014) show that firms with large control-ownership disparity in Korea suffer

from value loss caused by tunneling through related-party transactions. This result suggests that controlling shareholders exploit related-party transactions among affiliated-firms for the sake of private wealth as control-ownership disparity increases, destroying firm value.

In addition to the effects of control-ownership disparity on financial performance, some academic studies document that control-ownership disparity has relevance to accounting earnings. Fan and Wong (2002) and Francis et al. (2005) show that separation of voting rights and cash flow rights is linked to less informative reported earnings, indicating that control-ownership disparity has an impact on reliable accounting earnings because controlling insiders are motivated to increase the opacity of accounting information from outsiders.

Previous literature provides evidence that controlling owners for firms with greater control-ownership disparity engage in earnings management by adjusting accounting accruals as a means of hiding their expropriations (Haw et al. 2004; Kim and Yi 2006; Gopalan and Jayaraman 2012). Gopalan and Jayaraman (2012) investigate nations where investor protection is weak, including South Korea and find that the extent of earnings management for firms with greater control-ownership disparity increases when investor protection is weak. These are consistent with arguments by Leuz et al. (2003), which explains that legal protection for minority shareholders is one key factor in earnings management.

2.3. Earnings management

Many researchers give a definition of earnings management. For example, Schipper (1989) defines earnings management as "a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain". According to Healy and Wahlen (1999), "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". From the diverse definitions of earnings management

suggested by scholars, in summary, earnings management is defined as an action to manipulate earnings for certain purposes, resulting in misleading judgements by outsiders.

Managers are motivated to manage reported earnings for numerous reasons. For example, they tend to engage in earnings management when accounting performance is linked to lending contracts, CEO compensation and reputation by outsiders, and stock prices (Healy and Wahlen 1999; Graham et al 2005).

In addition to a capital market and contractual motivations, managers also have incentives to manage earnings due to external factors. Previous literature shows that legal protection for investors also plays a significant role in AEM by insiders such as controlling owners and managers. Leuz et al. (2003) suggest that the prevalence of AEM is increasing in undeveloped stock markets, concentrated ownership, weak outsider rights, weak legal implementation, and low disclosure level. This is because the lack of legal protection for minority shareholders permits controlling owners to obtain private control benefits at the expense of stakeholders with less risks and costs. Consequently, they have strong incentives and abilities to manage earnings in order to hide their serf-serving behaviors (Leuz et al. 2003; Haw et al. 2004; Kim and Yi 2006).

Most earnings management studies have focused on AEM. However Graham et al. (2005) survey financial executives and find evidences of earnings management through deviated from normal operating activities. According to survey, managers are willing to reduce discretionary expenses or to postpone positive NPV projects to meet target earnings. Roychowdhury (2006) documents that managers engage in real-activities earnings manipulation through: (1) escalating sales by providing price discount or generous credit terms, (2) reductions in discretionary expenses, and (3) overproduction, resulting in a lower cost of goods sold and higher profit margin. He suggests an empirical model to estimate the extent of REM via abnormal cash flow from operations, production costs, and discretionary expenses.

Enomoto et al. (2015) show that such legal environments have a relation to REM as well as AEM. Enomoto et al. (2015) find that implementation of AEM is constrained by strong legal protection. As contrasted with AEM, investor rights is

positively associated with REM. In other words, managers choose REM instead of AEM as legal protection becomes strong because AEM is easily detected by stakeholders. This is consistent with Zang (2012) who finds that managers use AEM and REM as substitutes.

Chapter 3. Methodology

3.1. Data

The sample in this study consists of listed firms which are affiliated with large business groups, as designated by KFTC, from 2002 to 2016. The criterion for the classification of a large business group changed in 2002. Before 2002, only the top 30 business groups based on total assets were designated as large business groups by law. Since 2002, however, any business group with total assets meeting a certain level is categorized as a large business group.[12] One distinctive difference from prior literature is that this paper excludes all independent firms and affiliated firms in small and medium-sized business group. As mentioned above, prior papers compare *chaebol* with all other firms, which include small and medium-sized group affiliated firms, and independent firms. As large business groups face relatively stricter regulations, a simple comparison between firms belonging to large business groups versus other firms is inappropriate. Moreover, as the major characteristic of group affiliated firm is a divergence between voting rights and cash flow rights derived from pyramidal structure (Almeida et al. 2011), including group affiliated firms allows researchers to test the effect of control-ownership disparity explicitly.

Investigating Korean firms, particularly firms in a large business group, has several advantages. *Chaebol*s, which play economically and politically significant roles in Korea, are characterized by concentrated ownership structures and are family-controlled which may lead to severe agency problems between controlling insiders and outsiders. There is much evidence that controlling shareholders expropriate minority shareholders through means such as tunneling, propping, related party transactions, intra-group asset diversion, and management inheritance. In Korea, a small number of corporate moguls who exercise far-reaching influence on the Korean economy have ultimate power over group-affiliated firms. These moguls have a small fraction of ownership stakes yet impinge on the interests of the minority shareholders.[13] Due to

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[12] See Appendix 1 for more detail explanations in terms of a large business group designation.
[13] Korea Fair Trade Commission Annual Report 2017

the prevalence of control-ownership deviations (or wedge) and numerous examples of the expropriation of minority shareholders by *chaebol* owners, *chaebol* firms provide an appropriate setting to study the effect of control-ownership disparity on earnings management as a means of a concealment of expropriations. Second, once a business group is designated as a large business group by law, the business group has the obligation to announce transparent group status such as ownership structure, shareholders, board of directors, or related party transactions. This publicly available information makes researchers utilize detailed, well-organized and credible data.

Figure 2 shows the sample composition this paper uses. For example, the number of listed firms belonging to a large business group is 247; 220 *chaebol* firms and 27 non-*chaebol* firms while the number of the listed firm in Korea Stock Exchange is 1,987 in 2016.[14]

Figure 2   The example of sample description
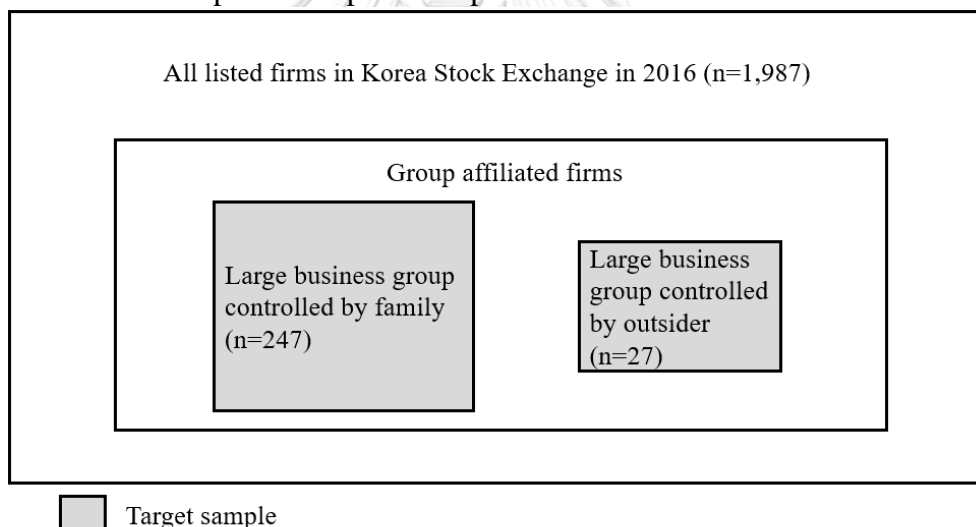
Panel A in Table 1 describes the procedure of sample selection. Firms in the financial industry are excluded in the sample because large business groups are subject to a restriction on exercising voting rights on financial and insurance companies and financial companies have different characteristics in terms of accounting information. Following Roychowdhury (2006) and Zang (2012) which exclude firms in regulated

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[14] The number of listed firms belonging to large business groups account for 12.4 percent of the firms listed on the Korean stock exchange. However, these firms comprise 64.9 percent of the market capitalization of the Korean stock market in 2016

industries (SIC 4400-5000), firms in regulated industries such as energy and utility companies are also excluded from the sample. Such firms in regulated industries are likely to have difficulty engaging in earnings management.

Unlike Kim and Yi (2006) and Hong et al. (2015), this paper includes delisted firms in the sample in order to avoid survivorship bias. The 1st or 99th percentile values are winsorized in order to reduce errors by extreme value.

Panel A of Table 1 shows the sample ranges from 2,183 to 2,564 firm-year observations, covering 269 to 306 distinct firms, and 62 to 71 business group. On average, a business group has 4.3 affiliated firms. More specifically, *chaebol* has 4.6 group-affiliated firms, while non-*chaebol* has 2.5 group affiliated firms.

Table   1   Sample description

Panel A   Sample selection

Sample selection process	The number of firm-year observations				
	DA	EQ	abCFO	abPROD	abDE
Listed firms belonging to Korean Large Business Group designated by KFTC from 2002 to 2016	3,283	3,283	3,283	3,283	3,283
Less: firms in regulated industries by the Korean government	65	65	65	65	65
Less: firms in financial industry	229	229	229	229	229
Less: firms with missing data	426	454	425	806	778
Final data (firm-year observations)	2,563	2,535	2,564	2,183	2,211
Distinct firms	306	301	306	269	272
Distinct business group	71	71	71	62	64

Panel B   Sample composition

	DA	EQ	abCFO	abPROD	abDE
Full sample	2,563	2,535	2,564	2,183	2,211
(Firm-year observations)	(100%)	(100%)	(100%)	(100%)	(100%)
Chaebol	2,333	2,308	2,334	1,993	2,016
	(91.03%)	(91.04%)	(91.03%)	(91.30%)	(91.18%)
Non-*chaebol*	230	227	230	189	195
	(8.97%)	(8.96%)	(8.97%)	(8.70%)	(8.82%)
Distinct firms	306	301	306	269	272
	(100%)	(100%)	(100%)	(100%)	(100%)
Chaebol	281	279	281	246	250
	(91.83%)	(92.69%)	(91.83%)	(91.45%)	(91.91%)
Non-*chaebol*	25	22	25	23	22
	(8.17%)	(7.31%)	(8.17%)	(8.55%)	(8.09%)
The number of large business group	71	71	71	62	64
	(100%)	(100%)	(100%)	(100%)	(100%)
Chaebol group	61	61	61	53	54
	(85.92%)	(85.92%)	(85.92%)	(85.48%)	(84.38%)
Non-*chaebol* group	10	10	10	9	10
	(14.08%)	(14.08%)	(14.08%)	(14.52%)	(15.62%)

Where; DA=Discretionary accruals measured by modified Jones model (Dechow et al. 1995); EQ=Earnings quality measured by McNichols model (2002); abCFO=abnormal cash flow from operations measured by Roychowdhury model (2006); abPROD=abnormal production costs measured by Roychowdhury model (2006) and, abDE=abnormal discretionary expenses measured by Roychowdhury model (2006).[15]

Panel B in Table 1 presents sample composition; *chaebol* versus non-*chaebol*. *Chaebol*s form 91 percent of sample and 85 percent of large business group are family-controlled group.

For computing the level of control-ownership disparity, ownership data is obtained from KFTC.[16] It is mandatory for all large business groups designated by KFTC to disclose ownership information for the purpose of curbing controlling owners

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[15] Detailed explanations with respect to variables are available at Appendix 4

[16] The dataset is publicly available at https://groupopni.ftc.go.kr

from expropriation behaviors. To measure both AEM and REM, financial and accounting data are from Thomson Reuters Datastream

3.2. Control-ownership disparity measurement

In this paper, cash flow rights and voting rights are measured following Kim et al. (2007) and Almeida et al. (2011). The Appendix 3 provides a detailed explanation of computing control-ownership disparity by using theoretical ownership structure.

Ownership dataset obtained from KFTC is used to compute cash flow rights and voting rights. It is possible to estimate exact cash flow rights and voting rights by using these ownership datasets which provide detailed direct ownership held by controlling owner, spouse, relatives, and other related parties.

3.2.1. Cash flow rights

A cash flow rights are estimated as a sum of equity ownership possessed by controlling owner, family members, and indirect ownership from affiliated-firms. Family members take in   the immediate family and close relatives with eight-degree of consanguinity (four-degree of consanguinity for relatives by marriage).

$$cfr_i = d_i + f_i + \sum_{j=1}^{n} s_{ij}(d_j + f_j) + \sum_{j=1}^{n} s_{ij} \sum_{k=1}^{n} s_{jk}(d_k + f_k) + \cdots \quad (1)$$

Where for firm i, j, $k \cdots$; cfr = the percentage of cash flow rights; d = the percentage of cash flow rights held by controlling shareholder; f = the percentage of cash flow rights held by family members, s = the percentage of ownership held by affiliated firm which controlling shareholder and his(her) family hold.

The first and second term, $d_i + f_i$, are direct ownership held by controlling owner and family members. Succeeding terms are defined as indirect ownership held by controlling owner and family members by means of affiliated-firms. More specifically, assuming that firm j holds s percent of ownership on firm i, firm j

pays $d_j + f_j$ as a dividend to controlling owner and family members, resulting in increasing $s_{ij}(d_j + f_j)$ of equity ownership of controlling owners and family members. Likewise, the fourth term represents indirect ownership based on firm j and firm k. These terms are extended to the number of affiliated-firms that the business group has.

Equation (1) can be expressed in a matrix as follow:

$$cfr = (d + f) + S(d + f) + S^2(d + f) + S^3(d + f) + \cdots \tag{2}$$

Where; $cfr = (n \times 1)$ vector of cash flow rights held by controlling owners; $(d + f) = (n \times 1)$ vectors of direct ownership held by controlling owner and family members and $S = (n \times n)$ matrix of equity ownership chain of affiliated-firms.

Computing Equation (2) by using an infinite series, it can be simplified to:

$$cfr = (I - S)^{-1}(d + f) \tag{3}$$

Where; $I = (n \times n)$ of unit matrix.

3.2.2. Voting rights

Voting rights are measured as a sum of direct equity ownership held by controlling shareholder, and related parties.[17] KFTC classifies related parties who have *de facto* control over firms as follows [18]: (1) family members; (2) non-profit corporations; (3) companies controlled by controlling shareholders and related parties and (4) executives. According to The Monopoly Regulation and Fair Trade Act, related parties have *de facto* control over firms along with controlling owner's interests. Using ownership structure data obtained from KFTC, voting rights, vr, are computed as:

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[17] Some studies measure voting rights by using the weakest link concept, which is defined as the minimum ownership along the control chain of the group (La Porta et al. 1999; Claessens et al. 2000&2002; Faccio et al. 2001; Faccio and Lang, 2002). However, this measurement is inappropriate for firms belonging to a group with complex pyramidal structure and circular investment (Almeida et al. 2011). Therefore, in this paper, voting rights is defined as a sum of internal equity ownership (Lemmon and Lins 2003; Lins 2003; Joh 2003; Kim et al. 2007; Almeida et al. 2011; Kang et al. 2014).

[18] The Monopoly Regulation and Fair Trade Act; Presidential Decree No. 27034, Mar. 8. 2016.

$$vr_i = d_i + m_i + \sum_{j=1}^{n} s_{ij} \tag{4}$$

Where for firm i and j; d = direct ownership held by controlling shareholder; m = direct ownership held by related parties; and s_{ij} = direct ownership of firm i owned by firm j.

3.2.3. Control-ownership disparity

In this study, a control-ownership disparity is defined as a difference between voting rights and cash flow rights (La Porta et al. 1999; Joh 2003; Kim et al 2007).

$$WEDGE_i = vr_i - cfr_i \tag{5}$$

Where for firm i, WEDGE = control-ownership disparity.

Alternatively, a control-ownership ratio can be used as a degree of control-ownership disparity (Claessens et al. 2000; Mitton 2002; Lins 2003) or one minus the ratio of voting rights to cash flow rights (Hong et al. 2017). However, the difference is used in this study because the ratio value is likely to drastically fluctuate as the denominator becomes smaller and it is impossible to estimate control-ownership wedge if the denominator is zero.

3.3. Earnings management measurement

3.3.1. Accrual-based earnings management

In this paper, the modified cross-sectional Jones model (1991) developed by Dechow et al. (1995) is used to measure AEM following many prior studies.[19] Cross-sectional regressions for each year and industry are employed as in following equation[20]:

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[19] Alternatively, the performance-matched modified Jones model developed by Kothari et al. (2005), which adds return on assets (ROA) to Equation (6), is used to estimate discretionary accruals. In this paper, however, the modified Jones model proposed by Dechow et al. (1995) is used in order to avoid multicollinearity problems when a full regression, which includes ROA, is performed.
[20] Industrial classifications in this paper are based on the Korea Standard Industrial Classification (KSIC). Following Jones (1991), if observations of each year and industry are

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{it-1}}\right) + \alpha_3 \left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_{it} \tag{6}$$

Where, for firm i and in year t: TA = total accruals, which equal to net income after taxes minus cash flow from operations; A_{it-1} = lagged total assets; ΔREV = changes in total revenue; and ΔREC = changes in accounting receivable and, PPE = gross property, plant, and equipment

The absolute value of residual from Equation (6) is defined as discretionary accruals (DA), which are proxy for accrual earnings management.

In addition to discretionary accruals measures, earnings quality is used as a proxy for AEM. Dechow and Dichev (2002) suggest a method for measuring earnings quality by identifying the relation between cash flow from operations and accruals. However, McNichols (2002) argues that changes in revenue and tangible assets used in Jones model (1991) also need to be considered because those are explainable fundamental factors as well as cash flow from operations. Therefore, this paper uses earnings quality proxy estimated by the McNichols model (2002) as follows:

$$\frac{\Delta WC_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{CFO_{it-1}}{A_{it-1}} + \alpha_2 \frac{CFO_{it}}{A_{it-1}} + \alpha_3 \frac{CFO_{it+1}}{A_{it-1}} + \alpha_4 \frac{\Delta REV_{it}}{A_{it-1}} + \alpha_5 \frac{PPE_t}{A_{it-1}} + \varepsilon_{it} \tag{7}$$

Where: ΔWC = changes in working capital

The higher absolute value of ε_{it} indicates that a large portion of accruals has not been realized through cash. In contrast, a lower absolute value of ε_{it} implies that much of accruals have been realized through cash. That is, the lower absolute value of residuals represents higher earnings quality and vice versa. This earning quality measure increases as managers manipulate earnings through AEM because earnings adjusted by accruals is not likely to impact cash flow from operations.

3.3.2. Real-activities earnings management

Following Roychowdhury (2006), three types of earnings manipulation through real activities are used as a proxy for REM: (1) abnormal cash flow from operations,

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less than 8, they are categorized by "others" in regression.

(2) abnormal production costs, and (3) abnormal discretionary expenses. Firms are able to boost sales temporarily through price discounts and lenient credit terms. However, such price discounts and favorable credit terms may result in lower cash flow in the current period. Firms also can manage earnings by increasing production costs. Increased production leads to lower fixed costs per unit. As a result, the lower cost of goods sold will lead a higher operating margin. Lastly, managers accelerate earnings by reducing discretionary expenses such as advertising, research and development, and selling, general and administrative expenses.

In order to measure abnormal CFO, production costs, and discretionary expenses, the normal component is estimated by cross-sectional regression for each year and industry, which is classified by the Korea Standard Industry Classification (KSIC) to decompose CFO; production costs, and discretionary expenses into normal elements and abnormal elements as follow:

$$\frac{CFO_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{Sales_{it}}{A_{it-1}} + \alpha_3 \frac{\Delta Sales_{it}}{A_{it-1}} + \varepsilon_{it} \tag{8}$$

Where for firm i and in year t: CFO = cash flow from operations; $\Delta Sales$ = change in sales and A_{t-1} = lagged total asset

The residuals from Equation (8) multiplied by negative one are defined as abnormal cash flow from operations (abCFO) because manipulating earnings through boosting sales leads to lower cash flow from operating activities (Zang 2012).

Production costs are defined as the sum of COGS, which is estimated as linear function by Equation (9), and change in inventory, which is estimated as a linear function by Equation (10).

$$\frac{COGS_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{Sales_{it}}{A_{it-1}} + \varepsilon_{it} \tag{9}$$

$$\frac{\Delta INV_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{\Delta Sales_{it}}{A_{it-1}} + \alpha_3 \frac{\Delta Sales_{it-1}}{A_{it-1}} + \varepsilon_{it} \tag{10}$$

Where for firm i and in year t: $COGS$ = cost of goods sold; ΔINV = change in

inventory; $PROD$ = production cost; and DE = discretionary expenses

Using Equation (9) and (10), normal production costs is estimated in each year and industry as follow:

$$\frac{PROD_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{Sales_{it}}{A_{it-1}} + \alpha_3 \frac{\Delta Sales_{it}}{A_{it-1}} + \alpha_4 \frac{\Delta Sales_{it-1}}{A_{it-1}} + \varepsilon_{it} \quad (11)$$

Where for firm i and in year t: $PROD$ = production cost

Regression residuals are used as abnormal production costs (abPROD). By boosting production, it is possible to allocate fixed costs to overproduction units in inventory. As a result, the cost of goods sold per unit is decreased and reported earnings become higher.

Firms in certain industries, such as the construction industry and distribution industries are likely to have trouble engaging in earnings management through abnormal production costs because those firms have different characteristic in terms of the cost of goods sold and changes in inventory. For example, firms in the construction industry realize their revenues, costs, and inventories based on contracts in progress. Therefore, this paper uses two abnormal production costs proxies: the full sample (abPROD1) and a subsample which excludes non-manufacturing firms (abPROD2), in order to capture differences in earnings management through over-production by the real manufacturers.

Discretionary expense (DE) is a sum of advertising expenses, research and development expenditures, and selling, general and administrative expenses. The normal level of discretionary expense is estimated as follows:

$$\frac{DE_{it}}{A_{it-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{Sales_{it-1}}{A_{it-1}} + \varepsilon_{it} \quad (12)$$

Along with abCFO, residuals from Equation (12) multiplied by negative one are used as abnormal discretionary expenses (abDE) because a higher amount of REM leads to lower discretionary expenditures.

3.3. Empirical specification

To test the effect of *chaebol* on earnings management, Hypothesis 1.a. and Hypothesis 1.b., an ordinary least squares (OLS) regression by year and industry is performed with Equation (13) and (14).

$$AEM_{it} = \alpha_0 + \alpha_1 Chaebol_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROA_{it} + \alpha_4 LEV_{it} +$$
$$\alpha_5 MTB_{it} + \alpha_6 BIG4_{it} + \varepsilon_{it} \tag{13}$$

$$REM_{it} = \alpha_0 + \alpha_1 Chaebol_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROA_{it} + \alpha_4 LEV_{it} +$$
$$\alpha_5 MTB_{it} + \alpha_6 BIG4_{it} + \varepsilon_{it} \tag{14}$$

Where for firm *i* and year *t*; AEM = absolute value of discretionary accruals estimated from the Dechow et al. (1995) model (DA) and an absolute value of earnings quality estimated from the McNichols (2002) model (EQ); $REM = abCFO$, $abPROD$ and abDE; $Chaebol$ = a dummy variable equal to one if the firm belongs to *chaebol*, and otherwise, zero, $WEDGE$ = difference between the percentage of total voting rights held by controlling owners and related parties and percentage of both direct and indirect cash flow rights held by controlling owner and family members; $SIZE$ = natural logarithm of total assets; ROA = return on assets; MTB= =market to book ratio; LEV = ratio of total interest-bearing liabilities to total assets at fiscal-year end; and $BIG4$ = a dummy variable equal to one if the firm is audited by one of the top-four audit companies, and otherwise, zero[21].

To test Hypothesis 2.a. and 2.b., which test the relation between control-ownership wedge and earnings management, an OLS regression by year and industry is used with Equation (15) and (16).

$$AEM_{it} = \alpha_0 + \alpha_1 WEDGE_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROA_{it} + \alpha_4 LEV_{it} +$$
$$\alpha_5 MTB_{it} + \alpha_6 BIG4_{it} + \varepsilon_{it} \tag{15}$$

$$REM_{it} = \alpha_0 + \alpha_1 WEDGE_{it} + \alpha_2 SIZE_{it} + \alpha_3 ROA_{it} + \alpha_4 LEV_{it} +$$
$$\alpha_5 MTB_{it} + \alpha_6 BIG4_{it} + \varepsilon_{it} \tag{16}$$

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[21] Samil PWC, Anjin Deloitte, Samjong KPMG, and Hanyoung EY (Source: The Korea Institute of Certified Public Accountants, KICPA)

Following Cohen and Zarowin (2010) and Zang (2012), firm size (SIZE), profitability (ROA), and growth (MTB) are included in order to control variables which affect earnings management. SIZE is likely to be negatively associated with earnings management as large firms are effectively monitored by outsiders while smaller firms are able to withhold inside information with fewer constraints (Watts and Zimmerman 1986; Becker et al. 1998; Ashbaugh et al. 2003). Firms engage in earnings management in order to avoid losses or in order to meet expected future earnings. Therefore, ROA is used to control firm-level profitability (Defond and Park 1997; McNicols 2000; Kim and Yi 2006; Kothari et al. 2005; Roychowdhury 2006). Growing firms are likely to react greater sensitively to earnings surprises and earnings shocks. Therefore, growing firms have more incentive to engage in earnings management. (Skinner and Sloan 2002; Matsumoto 2002). Market to book value is used as a proxy for growth. Lastly, solvency is included as a control variable because firms with high debt ratio tend to manage earnings in order to evade debt-covenant violations (Dichev and Skinner 2002; Kim et al. 2010; Dyreng et al. 2011). A dummy variable $BIG4$ is included to control the effect of audit firms because earnings management is more likely to be detected by big audit firms. Therefore, it is expected that big audit firm has negative relation with earnings management.

The empirical tests begins with an OLS regression without dummy variables, shown as model (1) in regression result tables. Next, in model (2), the OLS regression includes year dummy variables. In model (3), industry dummy variables are added, in addition to year dummy variables, because firms are likely to manage earnings differently based on the type of business firm has Lastly, as all firms in the sample belongs to a business group, group dummy variables are included in model (4) in order to capture a different use of earnings management by group level. For example, Samsung Electronics, which is one of Korea's most well-known companies, belongs to Samsung Group. Samsung Group consists of 59 companies and 10 companies of the 59 are included in sample in 2016, a typical sample year.[22]

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[22] Top five *chaebol*s, Samsung, SK, Hyundai Motors, and Lotte, account for 25 percent of the full sample. SK Group makes up the largest number of sample at 159 firm-year observations, followed by 156 firm-year observations from Samsung Group, 146 firm-year observations from

For a robustness check, a firm fixed effects model, including time fixed effect is conducted in model (5). The sample includes 306 of distinct firms with a long period of time (t=15). Therefore, it is appropriate to control firm and year fixed effects by using panel data.

The empirical specifications through model (1) to model (5) apply to every regression model in Equation (13), (14), (15), and (16). As observations are collected over time, clustered standard errors are likely to be inherent in the sample. Therefore, standard errors are clustered at the firm level.

LG Group, 98 firm-year observations from Hyundai Motors Group, and 96 firm-year observations from Lotte Group.

Chapter 4. Results

4.1. Descriptive statistics and correlation

Panel A in Table 2 shows the summary statistics for earnings management measures and control-ownership disparity variables in the full sample between 2002 and 2016. Other control variables used for the empirical tests are also included in the table.

Controlling insiders of listed firms belonging to large business groups hold on average 43.29 percent of voting rights, while they hold 22.64 percent of cash flow rights. This indicates that, on average, a 20.65 percent gap between control rights and ownership exists in listed firms belonging to large business groups. The mean value of CHAEBOL is 0.9103, indicating that 91.03 percent of the sample are *chaebol* firms; non-*chaebol* firms account for merely 8.97 percent. The table also shows that most firms affiliated to large business groups, 92.24 percent, are audited by a big four audit firm.

Panel B in Table 2 compares each variable for *chaebol* firms with non-*chaebol* firms. It shows that non-*chaebol* firms have greater mean value of absolute DA and significantly different at 5 percent level, implying that non-*chaebol* firms have more discretionary accruals. In other words, AEM is more prevalent in non-*chaebol* firms than *chaebol* firms. Consistently, Panel B in Table 2 also presents that non-*chaebol* firms show greater mean and median values of absolute EQ. The differences are significant difference at the 1 percent level, suggesting worse earnings quality of non-*chaebol* firms. As with absDA, these differences suggest that *chaebol* is less associated with AEM. In other words, *chaebol* firms engage less in AEM than non-*chaebol* firms, which is consistent with Hypothesis 1.a.

Panel B in Table 2 shows that *chaebol* exhibit greater mean and median values of REM through abnormal CFO, abnormal production costs, and abnormal discretionary expenses, suggesting greater REM by *chaebol* firms. Hypothesis 1.b. predicts that *chaebol* firms implement more REM. The univariate comparisons in Panel B in Table 2 support Hypothesis 1.b.

Notably, Panel B in Table 2 shows controlling shareholders in *chaebol* firms have greater voting rights with the mean value of 0.4417 and smaller cash flow rights with a mean value of 0.2176, resulting in a 22.41 percent of control-ownership wedge. On the other hand, non-*chaebol* have a lower voting rights on average with the mean value of 0.3439 and more cash flow rights with the mean value of 0.3157, resulting in a 2.81 percent of control-ownership wedge. Median value of ownership measures, voting rights, cash flow rights, and control-ownership wedge are also statistically different, which suggest *chaebol* are characterized by a   high control-ownership disparity.

Table   2   Descriptive statistics
Panel A   Descriptive statistics of full sample

VARIABLES	mean	sd	med	min	max	N (firm-year)
DA	-0.0061	0.0488	-0.0021	-0.1821	0.1445	2,563
absDA	0.0345	0.0351	0.0238	0.0000	0.1821	2,563
EQ	-0.0002	0.0446	-0.0009	-0.1526	0.1283	2,535
absEQ	0.0326	0.0304	0.0234	0.0000	0.1526	2,535
abCFO	-0.0001	0.0464	0.0020	-0.1574	0.1161	2,564
abPROD1	-0.0032	0.0471	0.0001	-0.2852	0.1805	2,182
abPROD2	-0.0013	0.0324	0.0001	-0.2852	0.1805	1,611
abDE	0.0042	0.1008	0.0070	-0.4170	0.2684	2,211
CHAEBOL	0.9103	0.2858	1.0000	0.0000	1.0000	2,564
VR	0.4329	0.1836	0.4271	0.0000	1.0000	2,564
CFR	0.2264	0.1915	0.1714	0.0000	0.9870	2,564
WEDGE	0.2065	0.1649	0.2074	0.0000	0.8991	2,564
Total Assets	5,854	11,798	1,587	39	78,488	2,564
ROA	3.8354	6.3487	3.9950	-24.0900	18.3245	2,564
LEV	0.5349	0.1958	0.5532	0.1153	0.9771	2,564
MTB	1.3072	1.1786	0.9700	-0.8200	7.3675	2,564
BIG4	0.9224	0.2676	1.0000	0.0000	1.0000	2,564

Panel B   Descriptive Statistics of *chaebol* firms versus non-*chaebol* firms

Variables	*Chaebol*			Non-*chaebol*			Test of difference	
	Mean	Median	N	Mean	Median	N	Mean	Median
DA	-0.0045	-0.0013	2,333	-0.0224	-0.0148	230	-5.3348***	-4.873***
absDA	0.0340	0.0236	2,333	0.0393	0.0264	230	2.1730**	1.493
EQ	-0.0014	-0.0019	2,308	0.0119	0.0124	227	4.6997***	4.770***
absEQ	0.0317	0.0227	2,308	0.0416	0.0355	227	4.3238***	5.742***
abCFO	0.0010	0.0025	2,334	-0.0113	-0.0049	230	-3.8714***	-3.186***
abPROD1	-0.0025	0.0002	1,993	-0.0115	-0.0009	189	-2.5268**	-3.667***
abPROD2	0.0001	0.0004	1,445	-0.0132	-0.0014	166	-5.0451***	-4.374***
abDE	0.0065	0.0084	2,016	-0.0195	-0.0022	195	-3.4464***	-3.550***
VR	0.4417	0.4271	2,334	0.3439	0.4315	230	-7.7996***	-3.082***
CFR	0.2176	0.1655	2,334	0.3157	0.3934	230	7.4889***	2.455**
WEDGE	0.2241	0.2202	2,334	0.0281	0.0002	230	-18.2747***	-19.922***
Total Assets	5,641	1,658	2,334	8,019	582	230	2.9197***	-2.161**
ROA	3.8284	4.0000	2,334	3.9058	3.9000	230	0.1762	0.027
LEV	0.5428	0.5639	2,334	0.4541	0.4582	230	-6.6080***	-6.742***
MTB	1.2654	0.9300	2,334	1.7316	1.3750	230	5.7582***	7.605***
BIG4	0.9199	1.0000	2,334	0.9478	1.0000	230	1.5114	1.511

Note:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

Panel B in Table 2 shows *chaebol* firms have values of Total Assets and MTB lower than non-*chaebol* firms but, greater value of LEV. These values imply that, compared to non-*chaebol* firms, on average, *chaebol* firms are smaller, are growing less rapidly, and have greater leverage. There is no difference in the mean or median values for the profitability measure (return on assets) when comparing *chaebol* and non-*chaebol* firms.

Panel C in Table 2 reports the descriptive statistics comparing firms with greater control-ownership disparity with firms with lower control-ownership disparity. The group is divided based on the median value of the control-ownership disparity. As all firms in the sample belong to business group and have pyramidal structures, most firms have positive wedge. Figure 3 shows that only a few firms exhibit a zero control-ownership disparity.[23] Therefore, it is inappropriate to compare zero control-ownership

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[23] In the full sample, the number of zero wedge firm is 90 out of 2,564 firm-year observations.

wedge firms with positive control-ownership wedge firms.

Figure   3   The distribution of wedge
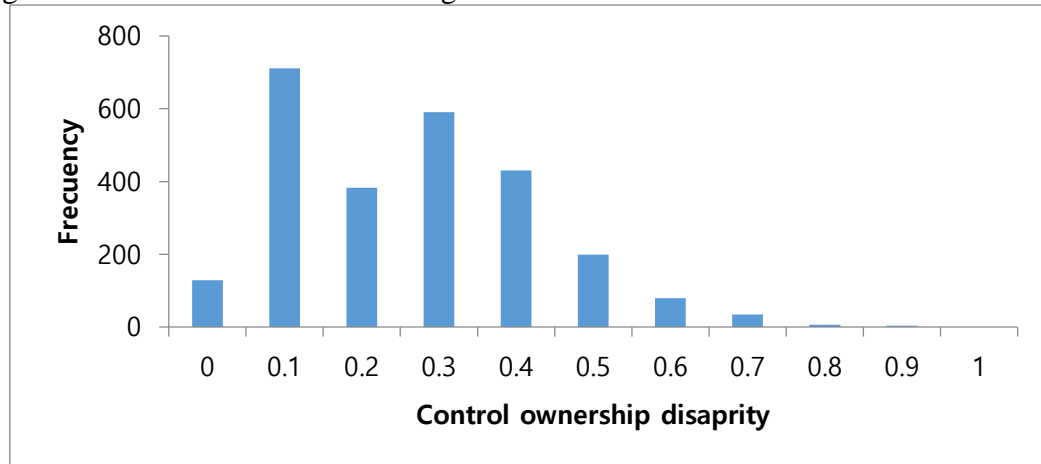
Panel C in Table 2 shows that mean values of AEM measures (both absDA and absEQ) do not show clear differences between firms with high wedge and low wedge. Instead, median value of AEM measures between high wedge firms and low wedge firms are statistically different at five percent level. Hypothesis 2.a. predicts that a control-ownership wedge is positively related to AEM as controlling shareholders have more incentives to take private benefits and thus, make accounting information less informative to hide expropriations (Haw et al. 2004; Kim and Yi 2006; Gopalan and Jayaraman 2012). However, Panel C in Table 2 shows that the use of AEM, with respect to the control-ownership disparity, is ambiguous.

Panel C in Table 2 also presents that there are no significant difference between high wedge firms and low wedge firms in the use of REM through abnormal CFO and abnormal production. When the subsample is used in comparison (abPROD2), high wedge firms show greater mean value of REM through overproduction, with 10 percent statistical significance and lower mean and median value of abDE with 10 percent and 1 percent of significance.

In short, Panel C in Table 2 implies that excessive voting rights held by controlling shareholders of Korean large business group have no impact on AEM and REM through abnormal CFO. High wedge firms use abnormal production costs as a means of REM (abPROD2), while REM through abnormal discretionary expenses is more prevalent for firms with low wedge, suggesting that a control-ownership wedge is positively related to REM through abnormal production costs, and negatively associated with REM through abnormal discretionary expenses.

Panel C in Table 2 presents that high wedge firms have 34.22 percent of control ownership wedge, while low wedge firms have 7.07 percent of control-ownership disparity on average. *Chaebol* firms account for 99.22 percent of high wedge firms, which is consistent with finding in Panel B in Table 2 that *chaebol* is characterized greater control-ownership disparity.

Panel C   Descriptive Statistics of firms with high wedge versus firms with low wedge

Variables	Firms with high wedge			Firms with low wedge			Test of difference	
	Mean	Median	N	Mean	Median	N	Mean	Median
DA	-0.0057	-0.0011	1,281	-0.0065	-0.0034	1,282	-0.403	-1.104
absDA	0.0353	0.0254	1,281	0.0336	0.0225	1,282	-1.198	-2.088**
EQ	0.0020	0.0011	1,257	-0.0024	-0.0023	1,278	-2.445**	-2.738***
absEQ	0.0334	0.0244	1,257	0.0318	0.0222	1,278	-1.344	-2.167**
abCFO	-0.0007	0.0014	1,282	0.0005	0.0023	1,282	0.662	0.644
abPROD1	-0.0019	0.0000	1,085	-0.0046	0.0001	1,097	-1.320	0.682
abPROD2	0.0003	0.0003	798	-0.0028	0.0000	813	-1.912*	-0.388
abDE	0.0003	0.0041	1,096	0.0082	0.0104	1,115	1.844*	2.844***
CHAEBOL	0.9922	1.0000	1,282	0.8284	1.0000	1,282	-15.143***	-14.510***
VR	0.4834	0.4653	1,282	0.3824	0.3662	1,282	-14.476***	-13.884***
CFR	0.1412	0.1085	1,282	0.3117	0.3042	1,282	25.168***	20.494***
WEDGE	0.3422	0.3195	1,282	0.0707	0.0453	1,282	-73.433***	-43.846***
Total Assets	4,213	1,010	1,282	7,497	2,409	1,282	7.113***	7.784***
ROA	3.7874	4.0650	1,282	3.8834	3.9050	1,282	0.383	-1.181
LEV	0.5292	0.5450	1,282	0.5405	0.5626	1,282	1.460	1.324
MTB	1.3378	0.9900	1,282	1.2766	0.9400	1,282	-1.315	-2.588***
BIG4	0.9423	1.0000	1,282	0.9025	1.0000	1,282	-3.773***	-3.764***

Note:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

Table 3 Spearman Correlation Matrix

	absDA	absEQ	abCFO	abPROD	abDE	CHAEBOL	WEDGE	SIZE	ROA	MTB	LEV	BIG4
absDA	1											
absEQ	0.1351***	1										
abCFO	-0.0485**	-0.0930***	1									
abPROD	-0.0387*	-0.0348	0.2986***	1								
abDE	0.0057	0.0152	0.1260***	0.3963***	1							
CHAEBOL	-0.0331	-0.1186***	0.0647***	0.0781***	0.0675***	1						
WEDGE	0.0205	0.0149	-0.0192	-0.0485**	-0.0810***	0.3821***	1					
SIZE	-0.0552**	-0.0932***	-0.0588***	0.0485**	0.0106	0.0441**	-0.2059***	1				
ROA	-0.0234	0.0002	-0.3939***	-0.1802***	-0.1288***	0.0035	0.0360*	-0.0300	1			
MTB	0.0567***	0.0784***	-0.1804***	-0.0834***	-0.1293***	-0.1510***	0.0229	0.0396*	0.1562***	1		
LEV	-0.0144	-0.0111	0.2346***	0.0985***	-0.0039	0.1297***	-0.0341	0.3343***	-0.3804***	0.0219	1	
BIG4	-0.0313	-0.0929***	-0.0665***	-0.0053	-0.0341	-0.0426**	0.0774***	0.1986***	0.0686***	0.1219***	-0.0024	1

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

There are no differences of profitability (ROA), growth opportunities (MTB), or leverage (LEV) between high wedge firms and low wedge firms. High wedge firms are smaller, on average, and more high wedge firms are audited by big audit firms.

Table 3 shows the Spearman correlation matrix among all variables used in the test. The correlation between CHAEBOL and EQ is negative and significant, which implies that AEM is less prevalent for *chaebol* firms. The correlations between CHAEBOL and all REM measures (abCFO, abPROD and abDE) are positive and statistically significant. These suggest that *chaebol* firms are more associated with REM. The relation among all REM variables (abCFO, abPROD, and abDE) are positive and statistically significant at 1 percent level, suggesting that firms use three types of REM at the same time.

4.2. Empirical Results

4.2.1. *Chaebol*-status and accrual-based earnings management

Table 4 The effect of *chaebol* on discretionary accruals

Variable	Dependent variable: absDA				
	(1)	(2)	(3)	(4)	(5)
Chaebol	-0.0031	-0.0031	-0.0022	0.0181[***]	0.0069
	(0.0057)	(0.0057)	(0.0054)	(0.0015)	(0.0093)
SIZE	-0.0009	-0.0007	-0.0002	0.0002	-0.0024
	(0.0009)	(0.0008)	(0.0009)	(0.0008)	(0.0026)
ROA	-0.0937[***]	-0.1010[***]	-0.0931[***]	-0.0712[***]	-0.0466[*]
	(0.0238)	(0.0250)	(0.0252)	(0.0266)	(0.0266)
LEV	-0.0052	-0.0067	0.0007	-0.0066	0.0175[*]
	(0.0058)	(0.0059)	(0.0059)	(0.0068)	(0.0096)
MTB	0.0034[***]	0.0033[***]	0.0021[*]	0.0022[**]	0.0012
	(0.0011)	(0.0012)	(0.0011)	(0.0011)	(0.0011)
BIG4	0.00006	0.0004	-0.0006	-0.0015	-0.0021
	(0.0035)	(0.0037)	(0.0038)	(0.0038)	(0.0041)
Constant	0.0580[***]	0.0495[***]	0.0338[**]	-0.0200	0.0656
	(0.0168)	(0.0167)	(0.0170)	(0.0158)	(0.0521)
Observations	2,563	2,563	2,563	2,563	2,563
No. of firms	306	306	306	306	306
Adjusted R^2	0.0420	0.0506	0.0981	0.1638	0.0251
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
[*], [**] and [***] denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Table 4 shows the results of the regression of discretionary accruals measured by Dechow et al. (1995) model on *chaebol* from Equation (13), which is to test Hypothesis 1.a. Panel B in Table 2 describes significant difference between *chaebol*, non-*chaebol* with respect to DA. Hypothesis 1.a. and Panel B in Table 2 predict that the coefficient of *chaebol* would be negative.

As described at Chapter 3, column (1) in Table 4 shows the OLS regression without any dummy control variables. Column (1) does not present significant relation between *chaebol* and discretionary accruals. However, it shows the coefficient of ROA is negative (-0.0937) and significant at the 1 percent level and the coefficient of MTB is positive (0.0034) and statistically significant at the 1 percent level. When time specific fixed-effect is controlled, in column (2), the result is similar to result in column (1). When industry dummy is included in column (3) in Table 4, the coefficient of MTB is positive but has less statistical significance (10 percent level). In column (4) in Table 4, which controls for group effect, the coefficient of *chaebol* is positive and significant at the 1 percent level. However, this result demonstrates weak evidence due to flipped sign of coefficients. One possible explanation is that flipped sign after including group dummy implies that the regression model does not have statistical power or the group dummy is highly correlated to other variables, resulting in multicollinearity.

As mentioned at Chapter 3, Column (5) in Table 4 shows the regression result which controls firm and time fixed effects. Because 306 distinct firms in the sample spread for a long period of time (t=15), it is useful setting for testing panel data. In common with pool OLS regressions, column (5) does not show statistical result of the relation between *chaebol* and discretionary accruals. Contrary to Panel in Table 2 that *chaebol* shows less absDA compared to non-*chaebol*, results from Table 4 do not support to Hypothesis 1.a.

Even though there is no clear evidence of the relation between *chaebol* and AEM, Table 4 provide several implications. First, ROA is negatively, and statistically associated with absDA in all models. As predicted in Chapter 3, low profitability firms are motivated to manage earnings by adjusting accounting accruals. Second, Table 4

shows MTB is positively significant through column (1) to (4).Growing firms tend to try to maintain their growth opportunities. If those firms face earnings surprise or earnings shock unexpectedly, they might lose growth opportunities. Therefore, firms with greater MTB firms are likely to sensitively react to earnings chagnes.

Table 5 The effect of *chaebol* on earnings quality

VARIABLES	Dependent variable: absEQ				
	(1)	(2)	(3)	(4)	(5)
Chaebol	-0.0091***	-0.0092***	-0.0069**	-0.0074***	-0.0194***
	(0.0034)	(0.0034)	(0.0032)	(0.0016)	(0.0058)
SIZE	-0.0021***	-0.0020***	-0.0014*	-0.0013*	-0.0057***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)	(0.0019)
ROA	0.0020	-0.0040	0.0019	0.0054	0.0240
	(0.0122)	(0.0131)	(0.0129)	(0.0135)	(0.0148)
LEV	0.0090*	0.0073	0.0120**	0.0032	0.0204**
	(0.0051)	(0.0052)	(0.0051)	(0.0065)	(0.0089)
MTB	0.0027***	0.0030***	0.0019**	0.0024***	0.0012
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)
BIG4	-0.0105***	-0.0101***	-0.0115***	-0.0103***	-0.0049
	(0.0029)	(0.0029)	(0.0028)	(0.0030)	(0.0035)
Constant	0.0868***	0.0897***	0.0719***	0.0510***	0.1630***
	(0.0129)	(0.0133)	(0.0147)	(0.0131)	(0.0369)
Observations	2,535	2,535	2,535	2,535	2,535
No. of firms	304	304	304	304	304
Adjusted R^2	0.0438	0.0471	0.0797	0.1117	0.0190
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Table 5 presents the regression results which test the effect of *chaebol* on earnings quality, which is another AEM measures. Column (1) presents that the coefficient of *chaebol* is negative (-0.0091) and statistically significant at the 1 percent level. As year dummy variable is included in column (2), the coefficient of *chaebol* is negative (-0.0092) and significant at the 1 percent level. In column (3), industry dummy variable is added. Likewise, the coefficient of *chaebol* is negative, and significant at 5 percent level. Furthermore, the result in column (4) also presents the coefficient of

chaebol is negatively significant. When time and firm-fixed effects are controlled, column (5), the coefficient of *chaebol* is negative (-0.0194) and statistically significant at the 1 percent level, consistent with OLS regression results. Consistent with Panel B in Table 2 and Hypothesis 1.a., Table 5 provides evidence that *chaebol* firms have better earnings quality, as measured by earnings quality or EQ.

As predicted at Chapter 3, the coefficients of SIZE are negative because large firms are likely to be effectively monitored by outsiders. Consistent with the result from Table 4, the coefficients of MTB are positive and statistically significant, which imply that growing firms react sensitively to earnings. The results also show that the coefficients of BIG4 are negative and statistically significant at 1 percent level, indicating that big audit firms are able to suppress the use of AEM.

4.2.2. *Chaebol*-status and real-activities earnings management

Table 6 presents the regression results from Equation (14) that includes abCFO as the dependent variable. Column (1) shows the coefficient of *chaebol* does not have statistical significance. When year dummy variables are included in column (2), result is not different from column (1). Likewise, adding industry dummy variables does not have impact on the regression result in column (3). Column (4) shows that the coefficient of *chaebol* is positive and statistically significant at 1 percent level when group effect is controlled.

In the firm-fixed effect model, column (5) does not show any statistical results. Only variable ROA is negatively significant at the 1 percent level.

Table 6 demonstrates firm SIZE, ROA, and MTB are negatively, and significantly associated with abCFO, suggesting that small sized-firms, firms suffering from low profitable, and less growing firms are likely to be limited and restricted in boosting sales by providing merciful credit conditions or price discounts. The positive coefficients of LEV suggest that firms greater leverage is positively related to REM through abnormal CFO. As highly leveraged firms are likely to face strict scrutiny by creditors, those firms are may choose the use of REM through abnormal CFO because AEM is easily detected by outsiders. Moreover, firms with greater leverage are likely

to manage earnings in order to avoid violating debt covenants.

In conclusion, some weak evidence show the positive relation between *chaebol* and REM through abCFO, suggesting that there is no significant difference between *chaebol* and non-*chaebol* in the use of REM through boosting sales.

Table   6   The effect of *chaebol* on REM through abnormal CFO

VARIABLES	Dependent variable: abCFO				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0062	0.0064	0.0064	0.0387***	0.0039
	(0.0065)	(0.0065)	(0.0067)	(0.0022)	(0.0120)
SIZE	-0.0028**	-0.0027**	-0.0034***	-0.0035***	0.0006
	(0.0011)	(0.0011)	(0.0013)	(0.0012)	(0.0033)
ROA	-0.2220***	-0.2290***	-0.2330***	-0.2370***	-0.2140***
	(0.0267)	(0.0275)	(0.0272)	(0.0273)	(0.0257)
LEV	0.0448***	0.0451***	0.0529***	0.0579***	0.0301**
	(0.0098)	(0.0100)	(0.0099)	(0.0115)	(0.0128)
MTB	-0.0057***	-0.0059***	-0.0064***	-0.0057***	-0.0021*
	(0.0015)	(0.0016)	(0.0015)	(0.0014)	(0.0011)
BIG4	0.0009	0.0004	-0.0004	-0.0032	-0.0040
	(0.0044)	(0.0045)	(0.0045)	(0.0044)	(0.0040)
Constant	0.0436**	0.0354	0.0495*	0.0949***	-0.0242
	(0.0219)	(0.0225)	(0.0263)	(0.0241)	(0.0690)
Observations	2,564	2,564	2,564	2,564	2,564
No. of firms	306	306	306	306	306
Adjusted R^2	0.1880	0.1887	0.2005	0.2644	0.1192
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Table 7 presents the result from Equation (14) to test the effect of *chaebol* on REM through abnormal productions. As described at the Chapter 3, Table 7 includes two variables: the full sample (abPROD1) in Panel A and subsample in Panel B in Table 7. As described at Chapter 3, non-manufacturing firms have different characteristics in terms of costs of goods sold and inventories. Therefore, firms in non-manufacturing

industries are excluded in the variable abPROD2, resulting in less firm-year observations.

In Panel A, Table 7, full sample regressions do not present significant results. Only column (3) shows the coefficient of *chaebol* is positively significant at 5 percent level. Meanwhile, Panel B in Table 7 shows that the coefficient of *chaebol* in column (1), (2), and (3) are positive and significant at 5 percent level when subsample is used as a dependent variable, suggesting that *chaebol* is more associated with REM through overproduction, consistent with the result in Panel B in Table 2 and Hypothesis 1.b.

Table   7   The effect of *chaebol* on REM through abnormal production costs

Panel A

VARIABLES	Dependent variable: abPROD1				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0079	0.0081	0.0121^{**}	0.0026	-0.0036
	(0.0057)	(0.0057)	(0.0057)	(0.0036)	(0.0048)
SIZE	0.0021^{*}	0.0021^{*}	0.0029^{**}	0.0028^{*}	0.0066^{**}
	(0.0012)	(0.0012)	(0.0013)	(0.0014)	(0.0031)
ROA	-0.0452^{*}	-0.0451^{*}	-0.0384^{*}	-0.0252	-0.0232
	(0.0261)	(0.0250)	(0.0230)	(0.0217)	(0.0197)
LEV	0.0139	0.0132	0.0159^{*}	0.0363^{***}	-0.0093
	(0.0085)	(0.0088)	(0.0094)	(0.0122)	(0.0143)
MTB	0.0010	0.0012	0.0009	0.0006	0.0017^{*}
	(0.0012)	(0.0012)	(0.0014)	(0.0013)	(0.0010)
BIG4	-0.0001	0.0009	0.0002	-0.0001	0.0002
	(0.0052)	(0.0053)	(0.0051)	(0.0055)	(0.0037)
Constant	-0.0628^{**}	-0.0519^{**}	-0.0745^{**}	-0.0334	-0.1059^{*}
	(0.0264)	(0.0242)	(0.0305)	(0.0575)	(0.606)
Observations	2,182	2,182	2,182	2,182	2,182
No. of firms	271	271	271	271	271
Adjusted R^2	0.0189	0.0177	0.0350	0.0745	0.0111
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Panel B

VARIABLES	Dependent variable: abPROD2				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0144**	0.0144**	0.0163**	0.0149	0.00008
	(0.0061)	(0.0061)	(0.0063)	(0.0507)	(0.0062)
SIZE	0.0010	0.0012	0.0018*	0.0019*	0.0031
	(0.0007)	(0.0008)	(0.0009)	(0.0010)	(0.0024)
ROA	-0.0489**	-0.0554***	-0.0530**	-0.0502**	-0.0391**
	(0.0191)	(0.0211)	(0.0214)	(0.0217)	(0.0196)
LEV	-0.0012	-0.0040	-0.0035	-0.0006	-0.0107
	(0.0069)	(0.0072)	(0.0076)	(0.0078)	(0.0096)
MTB	0.0012	0.0013	0.0012	0.0012	0.0005
	(0.0014)	(0.0014)	(0.0016)	(0.0016)	(0.0011)
BIG4	0.0059	0.0063	0.0044	0.0018	0.0033
	(0.0062)	(0.0064)	(0.0063)	(0.0073)	(0.0051)
Constant	-0.0402**	-0.0418**	-0.0593**	-0.0341	-0.0369
	(0.0186)	(0.0183)	(0.0237)	(0.0239)	(0.0461)
Observations	1,611	1,611	1,611	1,611	1,611
No. of firms	214	214	214	214	214
Adjusted R^2	0.0263	0.0246	0.0284	0.0876	0.0057
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

As expected in Chapter 3, Panel B in Table 7 demonstrates that ROA is negatively, and significantly related to REM through overproduction as low profitable firms have trouble in boosting earnings through overproduction which directly impact firms' net profit and future performance.

Table 7 present that regression results in Panel B have more explanatory power than Panel A. Only column (3) in Panel A shows a significant result, while the coefficient of *chaebol* is significant in Column (1), (2), and (3) in Panel B. This implies that REM through overproduction is attributable to firms in real manufacturing industries and that the sample selection must be considered on the study of REM through overproduction.

Table 8 shows the regression result from Equation (14), which tests the relation between *chaebol* and REM through abnormal discretionary expenses. Panel B in Table

2 demonstrates that *chaebol* has more mean and median value of abDE. However, the regression results in Table 8 do not show statistical relation between *chaebol* and REM through abnormal discretionary expenses.

From column (1) to column (4), pooled OLS regression results show that the variable ROA and MTB are negative and statistically significant, indicating that low profitable firms are not likely to engage in REM through abnormal discretionary expenses because the REM actions destroy firm future value. Firms growing less rapidly are also reluctant to use REM through abnormal discretionary expenses.

Table 8 The effect of *chaebol* on REM through discretionary expenses

VARIABLES	Dependent variable: abDE				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0204	0.0205	0.0203	0.0050	0.0064
	(0.0204)	(0.0205)	(0.0227)	(0.0053)	(0.0068)
SIZE	0.0014	0.0012	0.0021	0.0051	-0.0050
	(0.0028)	(0.0029)	(0.0032)	(0.0032)	(0.0068)
ROA	-0.1940***	-0.1810***	-0.1770***	-0.1370**	-0.0147
	(0.0569)	(0.0612)	(0.0572)	(0.0554)	(0.0322)
LEV	-0.0096	-0.0064	0.0026	-0.0375	-0.0651**
	(0.0253)	(0.0250)	(0.0267)	(0.0281)	(0.0291)
MTB	-0.0117***	-0.0123***	-0.0141***	-0.0081**	0.0023
	(0.0040)	(0.0041)	(0.0043)	(0.0039)	(0.0024)
BIG4	-0.0153	-0.017	-0.0191	-0.0353*	0.0053
	(0.0191)	(0.0197)	(0.0197)	(0.0201)	(0.0087)
Constant	-0.0027	0.0251	-0.0005	-0.3630***	0.153
	(0.0638)	(0.066)	(0.0749)	(0.0714)	(0.141)
Observations	2,211	2,211	2,211	2,211	2,211
No. of firms	275	275	275	275	275
Adjusted R^2	0.0361	0.0319	0.0408	0.1765	0.0202
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

In summary, the results show very weak evidence that *chaebol* firms engage in REM through abnormal CFO, and stronger yet mixed evidence of REM through overproduction. As firms in real-manufacturing industries are more linked to earnings

manipulation through overproduction, subsample abPROD2 provides more significant results compared to regressions with the full sample, abPROD1.

There is no evidence that *chaebol* employ REM through discretionary expenses to a greater extent than non-*chaebol* firms. In that, REM by firms belonging to large business group are much the same no matter what firms are controlled by family or outsiders.

Regression results show that ROA is a key variable which has negative effect on all REM measures, suggesting low profitable firms are not likely to do certain action influencing firms' performance. Firm's growth opportunities, MTB, is also important measure which negatively affect REM through abnormal CFO and abnormal discretionary expenses, implying that firms with greater growth opportunities do not choose REM as a method of managing earnings. Instead, Table 4 and Table 5 show that firms with higher MTB firms engage in AEM because AEM does not have impact on firms' future performance and firm value. Lastly, Table 5 provides evidence that strong earnings quality is associated with big audit firms. However, big audit firms do not affect REM.

4.2.3. The control-ownership disparity and accrual-based earnings management

Table 9 presents the regression results from Equation (15) to test the effect of control-ownership disparity on discretionary accruals. Hypothesis 2.a. expects that the control-ownership disparity is positively related to AEM. Therefore, the coefficient of wedge would be positive. Panel C in Table 2 shows that mean value of DA is not significantly different between high wedge firms and low wedge firms and median value is different at 5 percent level. Column (1) in Table 9 shows that the coefficient of wedge has no statistical significance. Likewise, the additions of dummy variables for year, industry, group affiliation, and firm fixed effects do not affect the regression results.

Table   9   The effect of control-ownership disparity on discretionary accruals

VARIABLES	Dependent variable: absDA				
	(1)	(2)	(3)	(4)	(5)
Wedge	-0.0008	-0.0002	0.0058	0.0086	0.0028
	(0.0082)	(0.0082)	(0.0074)	(0.0089)	(0.0125)
SIZE	-0.0009	-0.0007	0.0004	0.0005	-0.0024
	(0.0009)	(0.0009)	(0.0009)	(0.0010)	(0.0026)
ROA	-0.0945***	-0.1020***	-0.0940***	-0.0715***	-0.0457*
	(0.0238)	(0.0249)	(0.0250)	(0.0266)	(0.0268)
LEV	-0.0060	-0.0074	-0.0003	-0.00671	0.0176*
	(0.0059	(0.0059)	(0.0059)	(0.0068)	(0.0097)
MTB	0.0035**	0.0034***	0.0022*	0.0023**	0.0012
	(0.0012)	(0.0012)	(0.0012)	(0.0011)	(0.0011)
BIG4	0.0002	0.0004	-0.0010	-0.0017	-0.0021
	(0.0036)	(0.0038)	(0.0039)	(0.0038)	(0.0041)
Constant	0.0557***	0.0466**	0.0271	-0.0089	0.0716
	(0.0189)	(0.0188)	(0.0192)	(0.0191)	(0.0521)
Observations	2,563	2,563	2,563	2,563	2,563
No. of firms	306	306	306	306	306
Adjusted R^2	0.0414	0.0500	0.0984	0.1644	0.0249
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Similarly, when earnings quality is used as another AEM measure, results are not changed regardless of the model. Prior literature shows that a control-ownership wedge is positively associated with AEM (Haw et al. 2004; Kim and Yi 2006; Goplan and Jarayaman 2012). However, when the sample is limited to firms belonging to a Korean large business group, Table 9 and Table 10 do not show significant results. As a variety of regulations for the rights of minority shareholders appear to increase earnings quality, controlling insiders do not engage in AEM regardless of a control-ownership disparity.

Table 10 The effect of control-ownership disparity on earnings quality

VARIABLES	Dependent variable: absEQ				
	(1)	(2)	(3)	(4)	(5)
Wedge	-0.0003	-0.0006	0.0022	0.0096	0.0007
	(0.0054)	(0.0055)	(0.0055)	(0.0067)	(0.0115)
SIZE	-0.0021***	-0.0020***	-0.0012	-0.0009	-0.0057***
	(0.0007)	(0.0008)	(0.0008)	(0.0008)	(0.0019)
ROA	-0.0004	-0.0064	0.0004	0.0051	0.0220
	(0.0123)	(0.0132)	(0.0129)	(0.0134)	(0.0149)
LEV	0.0068	0.0051	0.0104**	0.0032	0.0203**
	(0.0052)	(0.0053)	(0.0052)	(0.0064)	(0.0089)
MTB	0.0030***	0.0032***	0.0022***	0.0025***	0.0012
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)
BIG4	-0.0103***	-0.0098***	-0.0116***	-0.0106***	-0.0048
	(0.0028)	(0.0028)	(0.0027)	(0.0030)	(0.0035)
Constant	0.0789***	0.0817***	0.0630***	0.0358**	0.146***
	(0.0144)	(0.0149)	(0.0163)	(0.0154)	(0.0369)
Observations	2,535	2,535	2,535	2,535	2,535
No. of firms	304	304	304	304	304
Adjusted R^2	0.0367	0.0398	0.0760	0.1131	0.0168
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

4.2.4. *Control-ownership disparity* and real-activities earnings management

Hypothesis 2.b. expects excessive voting right are negatively associated with REM. However, Table 11 does not show significant results. Column (4) in Table 11, which include dummies for year, industry and business group, shows that the coefficient of wedge is negative and significant at 10 percent level. Whereas, when firm-fixed effect and year fixed effect are controlled, column (5) in Table 11 shows that the coefficient of wedge is positive and significant at 10 percent level.

In conclusion, consistent with the results in Panel C of Table 3 which shows that there is no clear difference between high wedge firms and low wedge firms in the use of REM through abCFO, a divergence between control rights and ownership does

not have impact on REM through abnormal CFO

Table   11   Control-ownership disparity and REM through abnormal CFO

VARIABLES	Dependent variable: abCFO				
	(1)	(2)	(3)	(4)	(5)
Wedge	-0.0103	-0.0094	-0.0092	-0.0240*	0.0241*
	(0.0102)	(0.0102)	(0.0102)	(0.0130)	(0.0143)
SIZE	-0.0031***	-0.0030**	-0.0038***	-0.0045***	0.0005
	(0.0012)	(0.0012)	(0.0014)	(0.0014)	(0.0033)
ROA	-0.2200***	-0.2270***	-0.2310***	-0.2360***	-0.2130***
	(0.0264)	(0.0271)	(0.0268)	(0.0271)	(0.0257)
LEV	0.0468***	0.0471***	0.0546***	0.0580***	0.0305**
	(0.0099)	(0.0101)	(0.0100)	(0.0114)	(0.0127)
MTB	-0.0059***	-0.0061***	-0.0067***	-0.0058***	-0.0021*
	(0.0015)	(0.0016)	(0.0016)	(0.0014)	(0.0011)
BIG4	0.0015	0.0010	0.0006	-0.0025	-0.0038
	(0.0043)	(0.0044)	(0.0044)	(0.0043)	(0.0039)
Constant	0.0563**	0.0480**	0.0634**	0.153***	-0.0250
	(0.0230)	(0.0238)	(0.0285)	(0.0281)	(0.0680)
Observations	2,564	2,564	2,564	2,564	2,564
No. of firms	306	306	306	306	306
Adjusted R^2	0.1878	0.1882	0.2001	0.2676	0.1213
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Panel A in Table 12 presents the regression results from Equation (14) by including abPROD1 as dependent variables. When the full sample is included (Panel A), the coefficients of wedge do not have statistical significance in all models from column (1) to column (5).

When the regressions are run with a subsample (abPROD2), the coefficient of wedge is positive when industry and year dummies are added in Equation (14) and has statistical power (10 percent level). However, models except column (3) lack explanatory power. As Panel C in Table 2 suggest, regression results in Table 12 show

that the level of wedge does not have an impact on REM through overproduction.

Results from Table 11 to Table 13 show that REM by firms belonging to large business groups is not affected by control-ownership disparity. As large business groups are likely to maximize operating efficiency, they do not take certain actions which may have negative impact on firm's value. Moreover, firms belonging to large business groups are well monitored by outsiders and required to strengthen corporate governance mechanism, the use of REM is costly.

In summary, once a business group is designated as a large business group by the Korea government, those group affiliated firms face numerous constraints. As a result, controlling insiders do not engage in either AEM or REM irrespective of control-ownership disparity.

Table 12 Control-ownership disparity and REM through abnormal production costs
Panel A

VARIABLES	Dependent variable: abPROD1				
	(1)	(2)	(3)	(4)	(5)
Wedge	-0.0026	-0.0032	0.0007	0.0027	0.0093
	(0.0166)	(0.0168)	(0.0157)	(0.0150)	(0.0156)
SIZE	0.0020*	0.0020*	0.0028**	0.0029**	0.0065**
	(0.0011)	(0.0011)	(0.0013)	(0.0014)	(0.0031)
ROA	-0.0428	-0.0427*	-0.0355	-0.0252	-0.0230
	(0.0261)	(0.0249)	(0.0227)	(0.0218)	(0.0198)
LEV	0.0159*	0.0152*	0.0186**	0.0363***	-0.0089
	(0.0083)	(0.0085)	(0.0093)	(0.0122)	(0.0144)
MTB	0.0007	0.0010	0.0005	0.0006	0.0017*
	(0.0012)	(0.0012)	(0.0013)	(0.0013)	(0.0010)
BIG4	-0.0002	0.0008	-0.0001	-0.0002	0.0003
	(0.0050)	(0.0051)	(0.0051)	(0.0055)	(0.0037)
Constant	-0.0536**	-0.0430*	-0.0633**	-0.0334	-0.1098*
	(0.0251)	(0.0234)	(0.0297)	(0.0573)	(0.0613)
Observations	2,182	2,182	2,182	2,182	2,182
No. of firms	271	271	271	271	271
Adjusted R^2	0.0168	0.0150	0.0303	0.0746	0.0113
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Panel B

VARIABLES	Dependent variable: abPROD2				
	(1)	(2)	(3)	(4)	(5)
Wedge	0.0134	0.0133	0.0149*	0.0121	0.0124
	(0.0083)	(0.0084)	(0.0088)	(0.0118)	(0.0118)
SIZE	0.0012	0.0014*	0.0020**	0.0023**	0.0030
	(0.0008)	(0.0008)	(0.0010)	(0.0011)	(0.0024)
ROA	-0.0451**	-0.0512**	-0.0489**	-0.0505**	-0.0378*
	(0.0189)	(0.0209)	(0.0212)	(0.0218)	(0.0195)
LEV	0.0023	-0.0004	0.0004	-0.0008	-0.0106
	(0.0072)	(0.0073)	(0.0077)	(0.0079)	(0.0095)
MTB	0.0005	0.0006	0.0005	0.0011	0.0005
	(0.0013)	(0.0014)	(0.0015)	(0.0016)	(0.0011)
BIG4	0.0040	0.0044	0.0028	0.0014	0.0034
	(0.0065)	(0.0066)	(0.0066)	(0.0074)	(0.0051)
Constant	-0.0339*	-0.0380**	-0.0529**	-0.0290	-0.0038
	(0.0182)	(0.0179)	(0.0230)	(0.0548)	(0.00462
Observations	1,611	1,611	1,611	1,611	1,611
No. of firms	214	214	214	214	214
Adjusted R^2	0.0128	0.0110	0.0119	0.0886	0.0065
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.

Clustered standard errors are clustered by firm level.

Table   13   Control-ownership disparity and abnormal discretionary expenses

VARIABLES	Dependent variable: abDE				
	(1)	(2)	(3)	(4)	(5)
Wedge	-0.0257	-0.0254	-0.0203	-0.0390	-0.0214
	(0.0256)	(0.0259)	(0.0256)	(0.0252)	(0.0260)
SIZE	0.0007	0.0005	0.0013	0.0034	-0.0049
	(0.0029)	(0.0030)	(0.0033)	(0.0035)	(0.0067)
ROA	-0.1860***	-0.1730***	-0.1710***	-0.1360**	-0.0150
	(0.0567)	(0.0608)	(0.0567)	(0.0554)	(0.0322)
LEV	-0.0035	-0.0003	0.0079	-0.0375	-0.0653**
	(0.0246)	(0.0241)	(0.0259)	(0.0280)	(0.0291)
MTB	-0.0124***	-0.0130***	-0.0149***	-0.0082**	0.0023
	(0.0037)	(0.0039)	(0.0041)	(0.0039)	(0.0025)
BIG4	-0.0141	-0.0158	-0.0180	-0.0338*	0.0051
	(0.0189)	(0.0195)	(0.0194)	(0.0200)	(0.0087)
Constant	0.0336	0.0605	0.0358	-0.3190***	0.1610
	(0.0629)	(0.0665)	(0.0713)	(0.0780)	(0.1420)
Observations	2,211	2,211	2,211	2,211	2,211
No. of firms	275	275	275	275	275
Adjusted R^2	0.0346	0.0303	0.0389	0.1787	0.0206
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.

Clustered standard errors are clustered by firm level.

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Chapter 5. Additional analysis

One unique characteristic of *chaebol* is that controlling shareholders have voting rights to a great extent in excess of cash-flow rights. Whereas, non-*chaebol* firms have a relatively lower control-ownership wedge. However, as Figure 4 describes, there still exist a number of *chaebol* firms with low control-ownership wedge and non-*chaebol* firms with a high control-ownership wedge.[24] In light of these facts, this paper examines the relation between two independent variables which are used in this paper: *chaebol*, control-ownership disparity (wedge), and earnings management measures. Kim and Yi (2006) provide evidence that *chaebol* and control-ownership disparity has an impact on AEM. However, they separately test those key variables. To test the effect of *chaebol* with wedge on earnings management, an interaction term, CHAEBOL times WEDGE(*Chaebolwedge*), is included in the regression as shown in Equations (17) and (18).

Figure 4 Separation of the sample group

	Chaebol	Non-*chaebol*
High wedge	*Chaebol* with greater control-ownership disparity	Non-*chaebol* with greater control-ownership disparity
Low wedge	*Chaebol* with less control-ownership disparity	Non-*chaebol* firms with less control-ownership disparity

In the same methods with prior chapter, the empirical specifications through model (1) to model (5) apply to every regression model testing Equations (17) and (18).

$$AEM_{it} = \alpha_0 + \alpha_1 Chaebol_{it} + \alpha_2 WEDGE_{it} + \alpha_3 ChaebolWedge_{it} +$$
$$\alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 LEV_{it} + \alpha_7 MTB_{it} + \alpha_8 BIG4_{it} + \varepsilon_{it} \qquad (17)$$

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[24] Practically, non-*chaebol* firms with high control-ownership disparity are remarkably rare. The sample used in this study has only 10 observations.

$$REM_{it} = \alpha_0 + \alpha_1 Chaebol_{it} + \alpha_2 WEDGE_{it} + \alpha_3 ChaebolWedge_{it} +$$
$$\alpha_4 SIZE_{it} + \alpha_5 ROA_{it} + \alpha_6 LEV_{it} + \alpha_7 MTB_{it} + \alpha_8 BIG4_{it} + \varepsilon_{it} \qquad (18)$$

The relation is tested using an interaction term. If the coefficient of the interaction term, multiplying *chaebol* times wedge ($Chaebolwedge$), is positive, *chaebol* with greater control-ownership wedge is more associated with earnings management, and vice versa.

5.1. *Chaebol*-status, control-ownership disparity and accrual-based earnings management

Table 14 reports the regression result from Equation (17), which includes *chaebol*, wedge, and interaction term *chaebol* multiplied by wedge (Chaebolwedge). There are no statistically significant result in column (1) and (2). Whereas, when year and industry dummies are added, in column (3), the coefficient of interaction term is positive and significant at 10 percent level. Likewise, column (4) shows that the coefficient of interaction term is positive and significant at 10 percent level. A positive interaction term indicates that *chaebol*s with greater control ownership wedge are more associated with discretionary accruals. However, the robustness check in column (5), the firm and year fixed effect model does not show significant results.

Table   14   Empirical results of full regression on absolute discretionary accruals

VARIABLES	Dependent variable: absDA				
	(1)	(2)	(3)	(4)	(5)
Chaebol	-0.0048	-0.0051	-0.0057	0.0155***	0.0064
	(0.0066)	(0.0066)	(0.0061)	(0.0030)	(0.0102)
Wedge	-0.0421	-0.0426	-0.0485	-0.0577	-0.0069
	(0.0333)	(0.0359)	(0.0313)	(0.0384)	(0.0184)
Chaebolwedge	0.0443	0.0458	0.0580*	0.0677*	0.0082
	(0.0339)	(0.0364)	(0.0321)	(0.0390)	(0.0230)
SIZE	-0.0009	-0.0007	0.0005	0.0005	-0.0024
	(0.0009)	(0.0009)	(0.0009)	(0.0010)	(0.0026)
ROA	-0.0934***	-0.1010***	-0.0924***	-0.0705***	-0.0466*
	(0.0238)	(0.0249)	(0.0252)	(0.0265)	(0.0266)
LEV	-0.0051	-0.0064	0.0013	-0.0061	0.0175*
	(0.0058)	(0.0059)	(0.0059)	(0.0068)	(0.0097)
MTB	0.0033***	0.0033***	0.0021*	0.0022**	0.0012
	(0.0011)	(0.0012)	(0.0011)	(0.0011)	(0.0011)
BIG4	-0.0006	0.0001	-0.0013	-0.0019	-0.0021
	(0.0036)	(0.0038)	(0.0039)	(0.0038)	(0.0041)
Constant	0.0592***	0.0503***	0.0314*	-0.0243	0.0659
	(0.0186)	(0.0185)	(0.0184)	(0.0177)	(0.0520)
Observations	2,563	2,563	2,563	2,563	2,563
No. of firms	306	306	306	306	306
Adjusted R^2	0.0421	0.0508	0.0998	0.1656	0.0244
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

Table 15 presents the regression result from Equation (17) that use earnings quality as an AEM proxy. Column (1) in Table 15 shows that the coefficient of interaction term is positive and statistically significant at 10 percent level. When year dummy is included, in column (2), the result is consistent. The model that includes dummies for year and industry, column (3), also shows that the coefficient of interaction

term is positive and have more significance (5 percent level).[25] These results are similar with results from Table 14, implying that controlling shareholders in *chaebol* engage more in AEM as they have more voting rights in excess of cash flow rights.

Table   15   Empirical results of full regression on earnings quality

VARIABLES	Dependent variable: absEQ				
	(1)	(2)	(3)	(4)	(5)
Chaebol	-0.0119***	-0.0119***	-0.0101***	-0.0102***	-0.0223***
	(0.0041)	(0.0041)	(0.0037)	(0.0025)	(0.0074)
Wedge	-0.0373	-0.0376	-0.0414*	-0.0290	-0.0145
	(0.0251)	(0.0252)	(0.0247)	(0.0324)	(0.0530)
Chaebolwedge	0.0444*	0.0445*	0.0501**	0.0399	0.0230
	(0.0257)	(0.0258)	(0.0254)	(0.0328)	(0.0544)
SIZE	-0.0020***	-0.0019**	-0.0012	-0.0009	-0.0057***
	(0.0007)	(0.0008)	(0.0008)	(0.0008)	(0.0019)
ROA	0.0023	-0.0035	0.0025	0.0057	0.0245
	(0.0122)	(0.0130)	(0.0128)	(0.0134)	(0.0150)
LEV	0.0092*	0.0075	0.0126**	0.0035	0.0206**
	(0.0051)	(0.0052)	(0.0051)	(0.0064)	(0.0090)
MTB	0.0026***	0.0029***	0.0019**	0.0025***	0.0012
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)
BIG4	-0.0110***	-0.0106***	-0.0121***	-0.0107***	-0.0048
	(0.0029)	(0.0028)	(0.0028)	(0.0030)	(0.0035)
Constant	0.0857***	0.0885***	0.0697***	0.0457***	0.1650***
	(0.0138)	(0.0144)	(0.0158)	(0.014)	(0.0374)
Observations	2,535	2,535	2,535	2,535	2,535
No. of firms	304	304	304	304	304
Adjusted R^2	0.0451	0.0483	0.0816	0.1133	0.0187
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

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[25] Based on Column (3) in Table (15), regression model is expressed as:
$$absEQ_{it} = -0.0101 Chaebol_{it} - 0.0414 WEDGE_{it} + 0.0501 ChaebolWedge_{it}$$
$$- 0.0012 SIZE_{it} + 0.0025 ROA_{it} + 0.0126 LEV_{it} + 0.0026 LEV_{it}$$
$$- 0.0121 BIG4_{it} + \varepsilon_{it}$$
   To see the effect of *chaebol* with wedge on earnings quality, substitute 1 for the value of *chaebol* into original equation, resulting in the coefficient of wedge is 0.0087, which indicates that the effect of wedge for *chaebol* is positively associated with absEQ.

5.2. *Chaebol*-status, control-ownership disparity and real-activities earnings management

      Table 16 shows the full regression result from Equation (18). In pooled OLS regression, from column (1) to column (4), the coefficients of interaction term are negative. However, those results are not statistically significant. In column (5), using fixed effect model, the coefficient of the interaction term is negative and statistically significant at the 1 percent level, implying that as *chaebol* firms have greater control-ownership disparity, those firms use abnormal cash flow from operations as a method of REM.

Table   16   Empirical results of full regression on abnormal CFO

VARIABLES	Dependent variable: abCFO				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0107	0.0108	0.0108	0.0452***	-0.0013
	(0.0073)	(0.0073)	(0.0074)	(0.0043)	(0.0136)
Wedge	0.0187	0.0227	0.0226	0.0071	0.1070***
	(0.0677)	(0.0669)	(0.0678)	(0.0613)	(0.0140)
Chaebolwedge	-0.0357	-0.0390	-0.0387	-0.0328	-0.0872***
	(0.0682)	(0.0674)	(0.0685)	(0.0620)	(0.0214)
SIZE	-0.0032***	-0.0031***	-0.0038***	-0.0045***	0.0006
	(0.0012)	(0.0012)	(0.0014)	(0.0014)	(0.0033)
ROA	-0.2230***	-0.2300***	-0.2340***	-0.2360***	-0.2120***
	(0.0266)	(0.0274)	(0.0271)	(0.0271)	(0.0256)
LEV	0.0446***	0.0448***	0.0523***	0.0578***	0.0306**
	(0.0097)	(0.0099)	(0.0098)	(0.0114)	(0.0127)
MTB	-0.0056***	-0.0058***	-0.0064***	-0.0058***	-0.0020*
	(0.0015)	(0.0016)	(0.0016)	(0.0014)	(0.0011)
BIG4	0.0022	0.0017	0.0011	-0.0024	-0.0038
	(0.0043)	(0.0044)	(0.0044)	(0.0043)	(0.0039)
Constant	0.0502**	0.0418*	0.0564**	0.1090***	-0.0246
	(0.0232)	(0.0239)	(0.0281)	(0.026)	(0.0692)
Observations	2,564	2,564	2,564	2,564	2,564
No. of firms	306	306	306	306	306
Adjusted R^2	0.1904	0.1908	0.2025	0.2683	0.1223
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.

Clustered standard errors are clustered by firm level.

In column (1), (2), and (3) in Panel A in Table 17, the coefficients of the interaction term are negative and statistically significant. These results suggest that *chaebol* with greater control-ownership disparity is negatively associated with REM due to abnormal production. Table 12 shows that there are no significant relation between WEDGE and abPROD1. However, Table 17 presents that the coefficient of wedge is positively significant in column (1), (2), (3), and (5). These results support Hypothesis 2.b., which expects the positive relation between control ownership disparity and REM through abnormal production costs.

Panel B in Table 17, which include firms in real manufacturing industries as a dependent variable (abPROD2), presents similar results as Panel A in Table 18. In Panel B in Table 17, column (1), (2), and (3) show that the coefficients of interaction term are negative and all statistically significant at 5 percent level. Column (1), (2), and (3) also report positive coefficients of wedge at 5 percent level of statistical significance. These results are consistent with results from Panel A in Table 17.

In short, controlling insiders in firms with greater control-ownership disparity are motivated to manage earnings through overproduction. However, as *chaebol* firms have greater control-ownership disparity, *chaebol* firms use less in REM through abnormal production costs.

Table 17 Empirical results of full regression on abnormal production costs

VARIABLES	Dependent variable: abPROD1				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0117	0.0123*	0.0156**	0.0021	-0.0042
	(0.0072)	(0.0073)	(0.0076)	(0.0057)	(0.0067)
Wedge	0.0545**	0.0598**	0.0508**	0.0301	0.0669**
	(0.0242)	(0.0253)	(0.0239)	(0.0210)	(0.0337)
Chaebolwedge	-0.0643**	-0.0706**	-0.0599**	-0.0282	-0.0600
	(0.0301)	(0.0314)	(0.0299)	(0.0249)	(0.0371)
SIZE	0.0019*	0.0019*	0.0027**	0.0029**	0.0065**
	(0.0011)	(0.0011)	(0.00130	(0.0014)	(0.0031)
ROA	-0.0459*	-0.0461*	-0.0393*	-0.0257	-0.0219
	(0.0263)	(0.0252)	(0.0231)	(0.0218)	(0.0198)
LEV	0.0136	0.0127	0.0153	0.0361***	-0.0089
	(0.0085)	(0.0088)	(0.0094)	(0.0122)	(0.0144)
MTB	0.0010	0.0013	0.0010	0.0006	0.00174*
	(0.0013)	(0.0013)	(0.0014)	(0.0013)	(0.0010)
BIG4	0.0007	0.0018	0.0009	-0.0002	0.0002
	(0.0050)	(0.0051)	(0.0050)	(0.0055)	(0.0036)
Constant	-0.0610**	-0.0491**	-0.0716**	-0.0353	-0.1062*
	(0.0256)	(0.0237)	(0.0304)	(0.0574)	(0.0608)
Observations	2,182	2,182	2,182	2,182	2,182
No. of firms	271	271	271	271	271
Adjusted R^2	0.0196	0.0182	0.0355	0.0739	0.0109
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.

Clustered standard errors are clustered by firm level.

Panel B

VARIABLES	Dependent variable: abPROD2				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0161**	0.0163**	0.0181**	0.0217	-0.0008
	(0.0072)	(0.0072)	(0.0075)	(0.0509)	(0.0080)
Wedge	0.0595**	0.0633**	0.0614**	0.0448*	0.0552
	(0.0272)	(0.0285)	(0.0271)	(0.0246)	(0.0344)
Chaebolwedge	-0.0586**	-0.0627**	-0.0610**	-0.0343	-0.0465
	(0.0279)	(0.0293)	(0.0286)	(0.0273)	(0.0363)
SIZE	0.0011	0.0013	0.0018*	0.0023**	0.0030
	(0.0008)	(0.0008)	(0.0010)	(0.0011)	(0.0024)
ROA	-0.0498**	-0.0568***	-0.0546**	-0.0513**	-0.0372*
	(0.0192)	(0.0213)	(0.0217)	(0.0219)	(0.0198)
LEV	-0.0015	-0.0045	-0.0040	-0.0011	-0.0105
	(0.0069)	(0.0072)	(0.0076)	(0.0079)	(0.0096)
MTB	0.0012	0.0014	0.0013	0.0012	0.0005
	(0.0014)	(0.0015)	(0.0016)	(0.0016)	(0.0011)
BIG4	0.0057	0.0062	0.0042	0.0014	0.0033
	(0.0063)	(0.0065)	(0.0063)	(0.0074)	(0.0050)
Constant	-0.0439**	-0.0453**	-0.0623**	-0.0504*	-0.0371
	(0.0196)	(0.0193)	(0.0244)	(0.0265)	(0.0463)
Observations	1,611	1,611	1,611	1,611	1,611
No. of firms	214	214	214	214	214
Adjusted R^2	.027273771	.02589036	.0294567	.08863776	0.0062
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:

*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.

The values in parenthesis are standard errors.

Clustered standard errors are clustered by firm level.

In the regression result from Equation (18) which uses abDE as a dependent variable, Table 18 shows there is no significant relation between interaction term and REM through discretionary expenses. Only column (4) in Table 18 presents that the coefficient of *chaebol* is positive and statistically significant at 5 percent level, indicating weak evidence of positive relation between *chaebol* and REM through abnormal discretionary expenses, and supporting Hypothesis 1.b.

Table 18 Empirical results of full regression on abnormal discretionary expenses

VARIABLES	Dependent variable: abDE				
	(1)	(2)	(3)	(4)	(5)
Chaebol	0.0303	0.0302	0.0285	0.0153**	0.0178
	(0.0232)	(0.0234)	(0.0257)	(0.0078)	(0.0132)
Wedge	-0.0213	-0.0247	-0.0323	-0.0083	0.0639
	(0.0878)	(0.0893)	(0.0902)	(0.1040)	(0.0593)
Chaebolwedge	-0.0235	-0.0199	-0.0060	-0.0319	-0.0967
	(0.0914)	(0.0926)	(0.0952)	(0.1070)	(0.0661)
SIZE	0.0003	0.0007	0.0010	0.0034	-0.0049
	(0.0029)	(0.0029)	(0.0032)	(0.0035)	(0.0067)
ROA	-0.1950***	-0.1810***	-0.1770***	-0.1370**	-0.0171
	(0.0570)	(0.0614)	(0.0573)	(0.0554)	(0.0327)
LEV	-0.0102	-0.0070	0.0017	-0.0376	-0.0654**
	(0.0252)	(0.0249)	(0.0268)	(0.0281)	(0.0291)
MTB	-0.0115***	-0.0121***	-0.0140***	-0.0082**	0.0023
	(0.0040)	(0.0041)	(0.0044)	(0.0039)	(0.0025)
BIG4	-0.0113	-0.0130	-0.0160	-0.0338*	0.0049
	(0.0185)	(0.0191)	(0.0191)	(0.0200)	(0.0087)
Constant	0.0178	0.0482	0.0203	-0.333***	0.1470
	(0.0651)	(0.0679)	(0.0753)	(0.0761)	(0.140)
Observations	2,211	2,211	2,211	2,211	2,211
No. of firms	275	275	275	275	275
Adjusted R^2	0.0395	0.0353	0.0430	0.1780	0.0204
Year dummy	No	Yes	Yes	Yes	Yes
Industry dummy	No	No	Yes	Yes	No
Group dummy	No	No	No	Yes	No
Firm fixed effect	No	No	No	No	Yes

Notes:
*, ** and *** denote significance at the 10%, 5%, and 1% level respectively.
The values in parenthesis are standard errors.
Clustered standard errors are clustered by firm level.

In conclusion, the effect of control-ownership disparity is influenced by *chaebol* status. Table (14) and Table (15) show the relation between control-ownership

disparity and AEM is more associated with *chaebol* firms. Even though *chaebol* has better earnings quality than non-*chaebol* firms, a divergence between control rights and ownership by *chaebol* increases opacity of accounting information. On the other hand, *chaebol* firms with greater control-ownership disparity is negatively related to REM through abnormal CFO and overproduction, indicating that *chaebol* firms tend to engage less in REM through abnormal CFO and abnormal production costs as *chaebol* insiders have more voting rights compared to cash-flow rights, which is opposite to result of AEM.

Chapter 6. Conclusion

This study examines two types of earnings management, accrual-based earnings management (AEM) and real-activities earnings management (REM) by comparing *chaebol* firms with non-*chaebol* firms of which firms classified as large business group by the Korea Fair Trade Commission. This paper also tests whether the divergence between control and ownership has an impact on both AEM and REM.

To test AEM, this study uses two measures: discretionary accruals estimated by the Modified Jones model (1995), and earnings quality estimated by the McNichols model (2002). To estimate REM, the Roychowdhury model (2006) is used, which tests three REM measures: abnormal cash flow from operations, abnormal production costs, and abnormal discretionary expenses.

First, this paper finds that *chaebol* firms have better earnings quality than non-*chaebol* firms based on the McNichols (2002) model, indicating that corporate governance mechanisms of *chaebol* function well enough to increase investor protection. As a result, *chaebol* firms are not likely to engage in AEM which is easily discovered by outsiders and has negative impact on firms' reputation. However, when the Modified Jones model (1995) is used as an AEM proxy, there is no significant difference between *chaebol* and non-*chaebol*. These mixed results imply there is no significant difference between *chaebol* and non-*chaebol* when the sample in limited to firms belonging to large business group. Even though *chaebol* firms are subject to stricter regulations and are well monitored by outsiders, regulations of large business group enforced the Korean Government makes no great difference between family controlled large business groups and non-family owned large business groups.

Second, this paper provides evidence that there is no significant difference between *chaebol* firms and non-*chaebol* firms with respect to REM. Previous study shows that *chaebol* firms engage more in REM than non-*chaebol* firms because *chaebol*s have many channels to offset negative effects of REM such as efficient internal market, related party transactions, and bargaining power. Moreover, as firms face numerous regulations which make the use of AEM costly, firms tend to choose the

use of REM as substitutes (Enomoto et al. 2015; Hong et al. 2016). However, when a sample is restricted to firms belonging to large business groups, ther is no difference in REM for *chaebol* firms or non-*chaebol* firms. Nevertheless, this study finds significant implication with respect to sample selection on the test of REM through abnormal production costs. As non-manufacturing firms have different characteristics in terms of cost of goods sold and inventory, this study uses another overproduction variable which excludes firms in non-manufacturing industries. With the smaller subsample, the results show a positive relation between *chaebol* and REM through abnormal production costs. This finding implies the sample selection on the test of REM through overproduction must be considered for researchers.

This study also shows that that excessive voting rights by controlling insiders of large business groups do not have an impact on AEM. These results are inconsistent with prior research that provide evidence of expropriation of outsiders when insiders have more control in excess of ownership (Shleifer and Vishny 1997; La Porta et al. 1999&2002; Bebchuk et al. 2000; Johnson et al. 2000; Bae et al. 2002; Joh 2003; Lemmon and Lins 2003). This is because a variety of regulations imposed on large business group makes the use of earnings management costly regardless of the presence of a control-ownership wedge.

In additional analyses, this paper finds that *chaebol* firms with greater control-ownership disparity is more associated with bad earnings quality. In other words, when controlling shareholders in *chaebol* have excessive voting rights, they have more incentive to make accounting information less informative.

Lastly, this study finds that *chaebol* is negatively associated with REM through overproduction as *chaebol* owners have more voting rights in excess of cash flow rights. Even though *chaebol* firms may employ REM through overproduction, *chaebol* firms use overproduction less as a means of REM as *chaebol* insiders have a greater excess of voting rights over cash flow rights.

This paper has several significant contributions. First, this paper is first to test earnings management behavior focusing on firms in a large business group. Most studies test all firms when compare *chaebol* with other types of firms. By examining firms with similar scale and firms bearing analogous regulations, it is possible to

capture the characteristics of *chaebol*. Second, this paper is the first paper which tests the effect of control-ownership disparity on both AEM and REM. Previous papers focus on only one type of earnings management; accrual-based earnings management

Despite the contributions, this paper has several limitations. This study examines each earnings management variable separately. Since firms are likely to employ both types of earnings management methods strategically (Roychowdhury 2006; Zang 2012), further study is needed to investigate both AEM and REM in an integrated manner. Second, this study investigates each firm's earnings management implementation for an empirical test. As a small number of family members exercise their influence to the whole group, group-level research regarding earnings management is required. Lastly, this study tests only firms in large business groups. Because of a small number of distinct firms and a long sample period, regression results may not have sufficient explanatory power.

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Appendix

Appendix 1. Designation and regulations on Korean large business groups

The Korean Fair Trade Commission (KFTC) was established in 1981 in order to promote fair competition, to strengthen consumers' rights, to secure competitive environment for SMEs, and to restrain concentration of economic power by a small number of large business groups. Since 1987, KFTC has designated and announced large business groups each year. If controlling shareholders and related parties hold 30 percent of ownership on certain firm, the firm is defined as a firm affiliated with business group. From 1987 to 2001, top 30 groups based on total assets are categorized as large business groups. Since 2002, KFTC has been designating large business groups based on total assets threshold.

Table a.1   Change in criteria for classification of large business group

Period	Criteria	Description
1987-1992	Total assets criteria	Groups whose total assets are above 40 million KRW are designated as large business groups
1993-2001	Total assets ranks	KFTC designated top 30 large business groups based on their total assets
2002-2008	Total assets criteria	Groups whose total assets are above 2 trillion KRW are designated as large business groups. For groups above 5 trillion KRW, upper ceiling on equity investment is applied
2009-2016		Groups whose total assets are above 5 trillion KRW are designated as large business groups. Restriction on upper ceiling on equity investment is abolished
2017-present		Groups above 5 trillion KRW of total assets are obliged to disclose group status. Groups above 10 trillion KRW of total assets are subject to prohibition on mutual investment

All firms belonging to large business groups are prohibited from transactions of mutual or circular investment among affiliated-firms, and the exercise of voting rights on financial and insurance companies. Large business groups affiliated firms are also obliged to disclose status of business group. Moreover, if affiliated firms are controlled by family members(*chaebol*), the family controlled firms are subject to regulation on prohibition of owner's family members from seeking private control benefits which include (1) transactions under considerably favorable terms and conditions; (2) provision of opportunities for business activities; (3) transactions of money or other financial products under considerably favorable terms and conditions; and (4) transactions in a considerably large scale without reasonable consideration or comparison (also known as intra-group deals for supporting affiliates)

Appendix 2. Comparison with prior literature

Several studies examine the use of earnings management by comparing *chaebol* firms with non-*chaebol* firms. However this paper is clearly different from other papers in terms of sample selection. Kim and Yi (2006) test all Korean firms to test the use of AEM by *chaebol.* Hong et al. (2015) and Park (2015) include all listed firms in the Korean Stock Exchange. Those studies compare *chaebol* with non-*chaebol* which comprise independent firms, and firms belonging to non-large business groups. On the other hand, this paper include only firms belonging to the large business group in the sample.

Table a.2 Comparison with prior literature

Literature	Topic	Findings	Sample
Kim and Yi (2006)	The use of AEM of *chaebol* comparing with non-*chaebol* The relation between control-ownership disparity and AEM	AEM is more prevalent in *chaebol* firms than non-*chaebol* firms Control-ownership disparity is positively associated with AEM Listing status have impact on AEM	All Korean firms 1992-2000 (n=15,159)
Hong et al. (2015)	The use of AEM and REM of *chaebol* comparing with non-*chaebol*	Insiders in *chaebol* prefer choosing REM through over-production to AEM	All listed firms in Korean Stock Exchange 2001-2010 (n=5,239)
Park (2015)	The use of AEM and REM of *chaebol* comparing with non-*chaebol*	REM based on abnormal production and discretionary expenditure is more prevalent in *chaebol* firms than non-*chaebol* firms	All listed firms in Korean Stock Exchange 2006-2010 (n=2184)
This paper	The use of AEM and REM of *chaebol* comparing with non-*chaebol* The relation between control-ownership disparity and both AEM and REM	The use of AEM by *chaebol* is smaller than non-*chaebol*. On the contrary, the use of REM by *chaebol* is greater than non-*chaebol* firms. A control-ownership disparity is positively associated with AEM but negatively associated with REM	Listed firms in Korean Stock Exchange belonging to large business group between 2002 and 2016 (n=2,329)

Appendix 3. Example of computing cash flow rights

This paper measures control-ownership disparity following Kim et al. (2007), Almeida et al. (2011) and Kang et al. (2014). Assume the hypothetical ownership structure of a business group as in Figure a.1. For simplicity, controlling owners in this example include his family members.

Figure a.1   An example of ownership structure
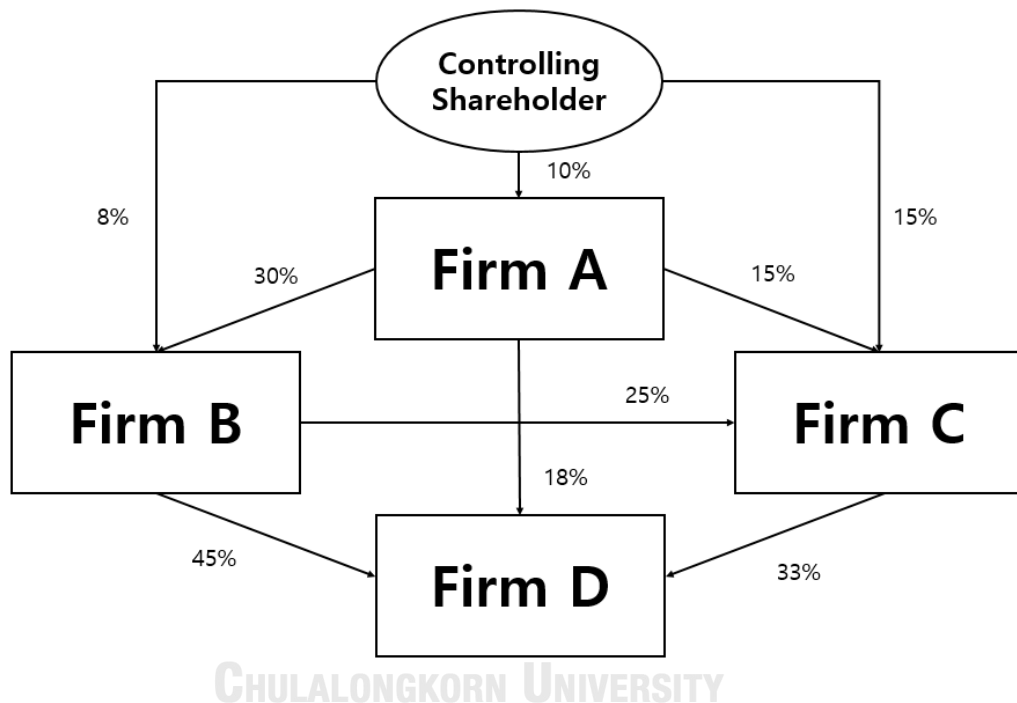
This example can be described as an ownership matrix as below;

$$d + f = \begin{pmatrix} 10\% \\ 8\% \\ 15\% \\ 0\% \end{pmatrix}$$

$$vr = \begin{pmatrix} 10\% \\ 38\% \\ 55\% \\ 99\% \end{pmatrix}$$

$$S = \begin{pmatrix} 0\% & 0\% & 0\% & 0\% \\ 30\% & 0\% & 0\% & 15\% \\ 15\% & 25\% & 0\% & 0\% \\ 18\% & 45\% & 33\% & 0\% \end{pmatrix}$$

Where: $d + f = (4 \times 1)$ vectors of direct ownership held by controlling owners; vr $= (4 \times 1)$ vectors voting rights; and $S = (4 \times 4)$ matrix of share ownership chain of each firms;

Following Equation (3), $cfr = (I - S)^{-1}(d + f)$, cash flow rights and voting rights can be computed as vector matrix as below;

$$cfr = \begin{pmatrix} 10.00\% \\ 13.14\% \\ 19.78\% \\ 14.24\% \end{pmatrix}$$

Therefore,

$$vr - cfr = \begin{pmatrix} 0.00\% \\ 24.86\% \\ 35.22\% \\ 84.76\% \end{pmatrix}$$

Cash flow of controlling shareholder on firm A,B,C, and D is 10.00%, 13.14%, 19.78%, and 14.24% respectively. Therefore, control-ownership disparity for firm A,B,C, and D is 0.00%, 24.86%, 35.22%, and 84.76% respectively.

In summary, voting rights, cash flow rights and control-ownership disparity are described as Table a.3

Table a.3   Summary of computing control-ownership disparity using hypothetical structure

Firm	Voting rights	Cash flow rights	Control-ownership disparity
A	10.00%	10.00%	0.00%
B	38.00%	13.14%	24.86%
C	55.00%	19.78%	35.22%
D	99.00%	14.24%	84.76%

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