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# CEO-Employee Pay Ratio and Earnings Management

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**Abstract:** This study empirically tested the relationship between managerial and employee wage gap and earnings management for Korean firms listed on KOSPI and KOSDAQ market from 2009-2014. As a result both the accrued earnings management and the actual earnings management showed a significant negative correlation with the manager-employee pay ratio. In addition as a result of comparing the corporate governance with the existing results, it is found that the wage gap when the corporate governance is superior is less influential on earnings management than it is not. Furthermore, the effect of the pay ratio on the actual earnings management was analyzed by dividing the sample used in the study into the group with the relatively higher wage gap and the group with the lower wage gap and the results showed that the effect of the pay ratio on the earnings management is larger for the group with relatively low wage gap compared with relatively large wage gap. This empirical result suggests that the wage gap has information usefulness as accounting information and it is expected that the disclosure of pay ratio between manager and employee will be used as a measure of earnings management.

**Key words:** Wage gap between manager and employee, corporate governance, earnings management, retention ratio disclosure, analyzed, influential

## INTRODUCTION

In 2015, the annual salary of Samsung CEO was about 14.9 billion won (Korea Financial Supervisory Service Electronic Disclosure System DART) and the salary of Google CEO was about 116 billion won (US Securities and Exchange Commission (SEC) Electronic Disclosure System EDGAR). The salaries of CEOs of large corporations around the world have been released each year and have become the focus of many people. Rather than being limited to academic issues, the issue of salary is easily accessible to everyone in everyday life. Since, the global financial crisis in 2008, countries around the world are showing a trend to limit CEO wages.

In Switzerland in 2013, the "Minder Initiative", the CEO's high salary limit was passed but the 1:12 Initiative Act which limits the wage gap to twelve times was rejected in the referendum. Peter Drucker who is also called the father of modern business, presented the wage gap cap of 20 times.

On this wage gap which is a global task and consensus in 2013, laws were introduced in the United States to allow managers to disclose individual compensation, furthermore in 2015, the Securities and Exchange Commission (SEC) finalized a final ruling on the disclosure of compensation ratios between management and employees. In the US, despite the fact that it has newly established a bill of compensation disclosure, there is still a heated debate on the pros and cons of disclosure of the pay ratio. In opposition to disclosure of the pay ratio, first, the compensation announcement of the registered director does not provide useful information to the shareholders. In this regard, the Securities and Exchange Commission (SEC) noted that the compensation factor is useful because it includes newly applied remuneration information such as remunerations of existing registered directors as well as the median of employee remuneration. In addition, some analysts speculated that the information about the total compensation and distribution provided by the company would be more effective because it is more detailed than the publicly disclosed remuneration (Ciesielski, 2011). The second argument for the disclosure of conservative magnification is that the method of calculating the conservative magnification seems simple on the surface but actually results in compliance costs. Moreover, the method of calculating the pay ratio weakens the information usefulness of the pay ratio in that it permits the company to use the pay ratio according to their preference in various viewpoints. As a solution to this in order to help users of the financial statements interpret the pay ratio, each company must disclose relevant information such as the assumptions, methodologies and estimates they used. Besides, the additional information (for example, there is information applied separately to domestic and foreign employees at the payout ratio) used

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to calculate the pay ratio should also be disclosed. In regards to the pay ratio disclosure of the US which is still controversial, the purpose of this study is to examine the necessity of the case of Korea and explore the implication of the pay ratio in Korean companies. Among the studies on the usability of accounting information in the capital market, the main topics are earnings management, conservatism, value relevance and corporate performance. In this study, the relationship between earnings management and pay ratio will be analyzed, since, numerous research on the pay ratio related to the corporate performance has been done so far. This study will provide a positive basis for the necessity of disclosure of the pay ratio because it will act on various stakeholders if the managerial-employee pay ratio has usefulness as accounting information.

This study used discretionary accruals and actual earnings management measures as a proxy for earnings management. Empirical results show that the wage differentials and earnings managements are negative and actual earnings managements are more relevant to the wage gap than accruals managements. In addition, it was confirmed that the effect of wage gap on earnings management is reduced when corporate governance is added as a control variable. Furthermore, two groups were divided by the wage gap and analyzed how they relate to real profit management and the results show that the effect of the pay ratio on the earnings management is greater for the group with lower wage gap than the group with higher wage gap. These results indicate that the wage gap is useful information for the investor's decision making because it means that the wage gap can be an indicator of earnings management behavior. Therefore, it is expected that disclosure of the pay ratio between managers and the employees will be needed in the future.

## Research background and prior research

**Pay ratio disclosure status:** Corporate disclosure may have country-specific characteristics but in general, countries have a similar framework and so are new and revised parts. First, let's look at the current pay ratio status of the US.

**The united states:** The issue of executive remuneration has always appeared in the laws that are newly enacted every time an economic event occurs. The announcement of executive remuneration started from the Securities Act of 1933 and the Securities Transactions Act of 1934 and legal provisions were laid down. In 1938, proxies were announced in the Proxy Statements (Chang byung-seop, "A legal study on disclosure of officer's Remuneration", Dongguk University Graduate School of Law (2014)) . The Sarbanes-Oxley Act which was enacted as a measure against accounting fraud cases of US large corporations such as Enron, Worldcom and Tyco that occurred after that, introduces regulations on the remuneration of new officers (Article 409) (return of compensation at the time of profit modification, prohibition of credit granting, remuneration of the executive officers of the top 5 executives, etc.). In addition as the Dodd-Frank Wall Street Reform and Consumer Protection Act was enacted in July 2010, focusing on preventing the recurrence of the financial crisis triggered by the subprime mortgage insolvency that occurred in 2008, the financial reform act that contains more intense regulations has emerged. As a result, the SEC which was significantly revised in 2006 is now expanding its disclosure in relation to disclosure of compensation for executives (SEC, "Executive Compensation and Related Person Disclosure", release No. 33-8732A, (2006. 8. 29), 17 CER 229.402-(Item 402) executive compensation). It can be observed that the announcement of the remuneration has been strengthened by the law on the pay scale in 2015.

**Dodd-Frank Wall Street Reform and Consumer Protection ACT, Section 953(b), 2010:** In the case of listed companies, it is required to disclose the total amount and amount of individual compensation for the past three business years for the total of five executives (only if the salary and total amount of the latest business year exceeds $ 100,000) along with the top three PEOs, PFOs (The name was changed to Principal Executive Officer (PEO) and Principal Financial Officer (PFO), respectively as officers corresponding to the previous Chief Executive Officer and Chief Financial Officer) and remuneration.

**Item 402(u) of Regulation S-K, 2015; Disclosure of compensation between manager and employee:** §229.402 (Item 402) executive compensation:

- (Pay ratio) disclosure
- disclosure
- The median of the annual total pay for all employees except PEO
- CEO's annual total remuneration
- The ratio of (u) (1) (I)-(u) (1) (ii) indicates whether the median of employee compensation is 1 or the CEO compensation is several times higher than the median of employee compensation)

The Securities and Exchange Commission (SEC) has finalized a mandate for publicly listed companies to disclose the median total annual salary of all employees except PEO and the annual total salaries of officers as well as mandate disclosure of the multiple of both.

**Korea:** In Korea, although, there has been no disclosure has been made on the pay ratio between management and employees, it can be seen that it is established similar to the US in Articles 159 and 160 (Capital market and financial investment business Act Article 159 (Submission of business report, etc.). The corporation to which the business report is submitted shall attach the following matters to the Business Report of Paragraph 1 and attach documents prescribed by the Presidential Decree. Purpose of the company, business name, business contents. Executive remuneration (including the option to purchase shares under the Commercial Act, other laws but limited to those prescribed by the Presidential Decree, the same shall apply, hereinafter). Executive's individual compensation and its specific criteria and methods (In the case that the amount paid to executive individual is more than the amount prescribed by Presidential Decree within the range of <500 million won). Individual's compensation for the total amount of remuneration and their specific calculation standards and methods (limited to cases where the remuneration paid to an individual is more than the amount prescribed by the Presidential Decree within a range of <500 million won). Financial matters, other matters prescribed by Presidential Decree.

Article 160 (Submission of semiannual and quarterly reports) the corporation subject to submission of business reports shall submit a business report (hereinafter, referred to as "Semiannual Report") for 6 months from the commencement date of the business year and a business report for three months and nine months (hereinafter, referred to as the "quarterly report") to the financial services commission and the exchange within 45 days after the expiration of such period, if a corporation subject to submission of a business report submits a semi-annual report and a quarterly report prepared on the basis of consolidated financial statements based on financial matters, its subsidiary specifications and other matters prescribed and announced by the financial services commission to the financial services commission and the exchange, it may be submitted within 60 days after the expiration of the first business year and the next business year. In this case, Article 159 (2) (4) (6) and (7) shall be applied) of the capital market and financial investment business act (hereinafter, referred to as the "Capital Market Act") in relation to disclosure of executive's remuneration. That is in the contents of the capital markets act amended in March 2016, Article 159, Paragraph 2, Section 3 of Article 159 related to the announcement of remuneration of executives shows that the existing "total compensation amount of over 500 million won" was revised to 'the top 5 executives regardless of whether they were executives or not. This is to prevent some companies from registering management as unregistered executives and avoiding disclosures. In addition, the Article 160 of the capital market act relaxed the regulations twice, claiming that the existing report was submitted four times a year.

Until now, Korea has made mandatory disclosure of executive compensation. However in the United States, since, the disclosure of pay ratios between managers and employees has been confirmed and the fact that the contents of the remuneration announcements of executives in Korea have been revised in a similar manner to that of the US, there is a possibility of enactment of the conservative rate disclosure in Korea.

**Earnings management:** Kwon Soo-young, Kim Moon-Chul, Son Seong-Kyu, Choi Gwan and Han Bong-Hee, The usefulness of accounting information in capital markets (Bomin *et al*., 2011).

Earnings management is defined differently depending on the researcher. Schipper defined "intentionally intervening in the process of making external financial reporting with the intention of obtaining any private benefit". Schipper looked at earnings management in two ways, one of which was to adjust investment and financial decisions and actually adjust the profits while influencing the flow of resources. Another method is to adjust the net income by changing the accounting method regardless of the actual resource flow. He also noted that whichever of the two methods is used earnings management is made to the extent permitted by Generally Accepted Accounting Principles (GAAP). Similarly, Healy (1985) pointed out that "earnings management" can be defined as "financial management in which an executive intervenes in the financial reporting or accounting process and changes the disclosed financial information in order to influence the contractual relationships determined by the accounting figures or misleading investors or creditors against the company's economic performance". Types of earnings managements include big bath, income minimization, income maximization and income smoothing.

**Accrual earnings managements:** Healy (1985) studied significant motivations for contractual earnings management and found that under the company's compensation plan, managers acted to maximize their profits. Beyond the cap on the bonus system, the bonus is no longer available to management unless the bonus is increased, meaning there is no bonus until a certain performance occurs below the bottom line. On the other hand, the bonus increases linearly between the lower limit and the upper limit. Therefore, if profits are below the

lower limit, one will be tempted to take the big bath strategy to report lower profits (losses) and if profits are higher than the cap, one can also reduce profits to report future profits. While, between the two, Healy argued that they would report manipulated increasing profits. In this study, Healy assumed that managers adjusted their earnings using accruals. Earnings management using accruals is made through depreciation, increase in accounts receivable and decrease in inventories, purchases and debts and it is difficult for external investors or researchers to know the reasons for the change in accruals. Therefore, total accruals are used as a proxy for discretionary accruals. Thus, Jones (1991) developed a sophisticated estimation equation for measuring discretionary accruals. Holthausen, Larcker and Sloan used a kind of Jones Model to re-examine Healy's research. As a result, those who do not receive the bonus do not make downward earnings management, while those who exceed the upper income limit do the downward earnings management as well. In conclusion, many studies on discretionary accruals have been conducted, beginning with Healy's research. On average when earnings are high, executives have adjusted their earnings using accruals in connection with their bonuses.

**Actual earnings management:** Actual earnings management refers to the act of deferring a substantial economic activity or reducing related investment which is highly relevant to the enterprise value with an intention to adjust the reported profit by the manager in an attempt to overcome the limitation of the accruals earnings management research. In a previous study, managerial R&D investment cuts (Dechow *et al*., 1995) and fixed asset disposition activities were reported to increase short-term accounting profits. Actual earnings management is presented in the Roychowdhury (2006) study and studies using this model have been actively conducted so far.

**The relationship between accrued earnings management and actual earnings management:** In a previous study, comparing accruals earnings management and actual earnings management, it appears that managers are using both of these earnings management. This suggests that managers use earnings management and actual earnings management complementarily to adjust earnings or as an alternative means (Cohen and Zarowin, 2008). In particular, Young-Kyu (2012) examined the influence of the type of auditor and continuous audit period on actual earnings management as well as accrued earnings management. As a result, management confirmed that these two earnings managements are complementary rather than interchangeable.

**Corporate governance:** Corporate governance can be defined from a variety of perspectives such as earnings managements. In a broad sense, it is a mechanism to coordinate interests among stakeholders including shareholders, managers, creditors, workers, consumers and local residents. In other words, it is an operating system and institutional device that regulates the authority and responsibility of each group. In a narrow sense, corporate governance can be reduced to a conflict of interests between shareholders and management which is caused by the separation of ownership and management. In any sense, corporate governance is the most important factor that determines the efficiency and competitiveness of an enterprise as an institutional device and its management system that exercises management control based on ownership structure and monitors and supervises it Choi Wan-Jin, Corporate Governance Act, (Rev. Seoul, Korea: Huine, 2010).

If the main role of corporate governance is management control to mitigate agency costs and enhance corporate value then corporate governance can be defined with a complex governance structure that embodies the post-apportionment of quasi-rents created by the enterprise. Or when a full contract cannot be expected with regard to transaction costs, corporate governance has a meaning as a set of mechanisms that can have a direct impact on managerial decision making or it may be a norm or institutional device. Corporate governance can be understood as an overall monitoring function such as supervision of the CEO of the company, supervision of the board of directors or audit committee and is directly linked to the transparency and credibility of accounting and can be a key factor in curbing accounting missteps and earnings management.

If the interests of the shareholders and the management are in agreement, the agent cost does not occur and the first-best outcome can be brought about through efficient promotion by the division of labor. However, if the shareholder delegates management to the manager and the understanding of the manager and the shareholder is not in agreement, information asymmetry exists and in this case agent problem arises. Corporate governance is divided into internal governance and external governance which are mechanisms that effectively control the agency costs arising from the separation of ownership and management, setting the management goals of the enterprise and regulating the management objectives to be implemented.

The internal governance structure of a corporation is a control device that is used to effectively monitor and control the management of the company, it includes the board of directors including the outside directors, the insider ownership held by the management and the salary

system. The external governance structure consists of the capital market and the regulatory body as controls by external stakeholders not insiders of the enterprise. External stakeholder institutional investors, foreign investors, credit rating agencies and creditors, discipline by capital markets and corporate governance markets. These external governance structures play a role in establishing external corporate governance and forcing transparency in management.

**Precedent research**

**A study on the wage gap between managers and employees:** Previous research on manager-employee wage differentials has mainly focused on organizational and corporate performance. The relationship between managerial-employee wage gap and firm performance is divided into three aspects, positive impact, negative impact or no positive or negative impact. Studies that the wage gap has a positive effect on firm performance are asserted based on the ranking tournament theory. Lee *et al.* studied the effect of corporate governance on the relationship between compensation gap and firm performance and found that the larger the compensation gap, the more positive impacts are on firm performance, positive impacts and firm independence.

On the other hand, studies that the wage gap negatively affects firm performance are mostly based on the theory of relative deprivation (Hederson and Fredrickson, 2001) cohesion theory Levine and fair wage theory (Akerlof and Yellen, 1988).

Firth, Leung, Rui and Na studied Chinese listed companies and found that manager-employee compensation gap negatively affects corporate productivity.

Byung-Tae (2014) analyzed the factors affecting compensation gap between positions and argued that wage gap could increase as organizational complexity and volatility of business environment increased.

Jung-Woo *et al.* (2013) reported that there is an inverse U relationship between the level of salary gap and the performance of team using Korean professional baseball salary.

Hyen *et al.* showed that if the actual compensation gap is larger than the expected compensation gap, the negative impact on firm performance is shown. Shin *et al.* studied the determinants of wage disparity and its impact on performance in Korea and the wage gap was found to have a negative (-) relationship with future stock returns. There have been studies that claim that the wage gap has a complex impact on the performance of the firm or has no effect. Henderson and Fredrickson (2001) studied whether the compensation gap could have a negative (-) or positive (+) effect on firm performance.

Eom Dong-Wook showed that the difference in bonus pay had a positive effect on the distribution of residual wages but it had no negative effect on the company performance and did not lead to a consistent result. Jae-Dae (2015) studied the effects of the ratios of compensation between managerial-employee compensation and external (reference group) compensation to corporate performance in Korean listed companies. The results of this study show that the theory of relative deprivation is established for listed companies in Korea because managerial-employee compensation multiple negatively affects firm performance.

In addition, as a result of quantile regression, it is shown that the compensation gap at low compensation gap positively affects firm performance for the whole sample, non-manufacturing and large enterprise sub-sample. He found that the effects of managerial-employee compensation gap in Korean listed firms on corporate performance were different.

Recently, the study on the newly revised disclosure of the payout ratio has been made mainly on the relation of SOP say on pay, A bill that allows shareholders to exercise their voting rights on CEO compensation caps. A study on the disclosure of the pay ratio is as follows.

Ertimur *et al.* (2013) studied the advisory role of SOP voting rights to S and P 1500 companies in 2011 in accordance with the newly amended first voting rights advisory law. He found that shareholders would not follow their advice on voting rights but were the main determinant of the outcome of the SOP vote. Similarly, management advisory has shown that it has a significant impact on the SOP voting results (Ferri and Oesch, 2013). Initial studies related to SOP were not available at the time mandatory disclosure of mandatory pay offs was available, so no fundamentals were available to calculate the pay ratio. Despite these limitations (Faleye *et al.*, 2013; Hyun *et al.*, 2014a, b) studied the relationship between pay ratio and future financial performance. Crawford *et al.* (2016) found that the newly established SEC method of disclosure of pay ratios is relevant and relevant to shareholder SOP voting decisions.

In addition to this, Lacmanoviae (2013) stated that the disclosure of the pay ratio should improve the performance of the company and the individual, so, it should also be mandatory in the annual salary report and Chen *et al.* found that S&P 1500 companies in the US Bureau of Labor Statistics which measured employee

wages had a negative relationship between the maintenance magnification and the quality of financial reporting.

**A study on the relationship between manager compensation and earnings management:** The study of manager compensation and earnings management is mainly concerned with stock options and stock options is a research result that alleviates agent problems between shareholders and managers. Dechow *et al.* (1995) argued that stock options reduce the agent problem in manager compensation, thereby increasing the market value of the firm. Furthermore, Brickley *et al.* (1985) reported that stock option grant disclosures or introductions have a positive effect on excess returns.

Bergstresser and Philippon find that manager compensation for stock options is related to discretionary accruals. Moreover, during the period of high accruals, managerial performance was found to have many options and managers and other insiders sold large amounts of stock.

UiSur studied the financial industry in the United States and found that manager's stock options and earnings management is significantly positive.

Jin-Hwan (2010) examined the effect of stock option compensation on earnings management and the effect of using stock options. The results show that the higher the proportion of stock option compensation of managers, the more the relationship between earnings management and negative (-) indicates that the effect on corporate value can be significant.

Sun and Yong-Sik (2014) studied the relationship between manager compensation and earnings management for listed companies in Korea and found that the earnings management act decreased significantly as manager compensation increased. In addition to the traditional approach whether manager's overpayment has the role of reducing the upward and downward earnings management behavior in the typical agent relationship has been verified.

Kyung-Su *et al.* (2015) analyzed the effect of stock options compensation on actual earnings management of executives and verified whether the granting of stock options serves as an effective incentive mechanism. As a result, there was a significant negative (-) relationship between the share of stock option compensation and the actual earnings management.

**A study on the relation between corporate governance and earnings management:** Corporate governance is a widely used concept and precedent research is also vast. Therefore, some representative research on the field directly related to this study will be examined.

First, it is a study on accruals earnings management. Xie *et al.* argued that as the independence, expertise and activity of the board increased, earnings managements decreased and Liu and Peng examined the effect of institutional investor's earnings management on US firms and found that institutional investors were not able to effectively control earnings managements.

Bae Han-Su and Kim Kyung-Hwa showed that, corporate governance significantly reduces both accrued earnings management and actual earnings management. This implies that corporate governance is an effective control mechanism for manager's incentives to adjust earnings regardless of earnings control measures and in particular, verifies that actual earnings managements are reduced more than accruals earnings managements.

In this study, the corporate governance score of Korean corporate governance structure was used as a proxy for corporate governance. The previous research on corporate governance and earnings management using such substitute is as follows. Yu-Chan and Yoon-Sik (2011) used the corporate governance rating of Korean corporate governance structure as a substitute for corporate governance and showed that the better the corporate governance structure, the smaller the actual earnings management in the enterprise. In addition, the analysis results based on corporate governance rating by division level proved that shareholder rights protection, disclosure, board and audit organization are related to actual earnings management negatively (-). This result implies that the actual earnings management has a direct effect on the cash flow which is different from the accrual earnings management.

Ae-Young (2013) also verified by sing corporate governance rating as a proxy for corporate governance excellence that good corporate governance functions to control manager's actual earnings management using real earnings management measures measured by Cohen and Zarowin (2010). Also, it is shown that the effect of managerial ownership ratio on actual earnings management can be changed according to the excellence of corporate governance of individual corporation. This suggests that superior corporate governance has the effect of controlling agency problem such as earnings management acts.

In the study of Jung-Woo *et al.* (2013), empirical analysis of the relationship between the corporate governance evaluation score of the Korean corporate

governance structure and the profit softening by using these five scores was conducted. As a result, it was found that firms with higher corporate governance scores performed more flexible reporting profits. In addition, it was found that firms with higher corporate governance scores in managerial error distribution were more likely to use the profit flexibility strategy regardless of the profit flexibility measurement method. These results show that the more firm the desirable and the better the corporate governance is the more flexible the profit of the reporting profit is unlike the earnings management using the accrual earnings management or the actual earnings management. Jin-Bae *et al.* (2015) empirically analyzed the effect of actual earnings management on manager compensation, together with the role of corporate governance. In the case of relatively good corporate governance, managerial compensation decreases significantly as the profit upward and downward adjustment using actual sales activities increases. On the other hand, if corporate governance level is relatively low, managerial compensation does not decrease even if both actual upward revision and downward revision increase. This suggests that corporate governance plays an important role in giving the manager compensation system an appropriate disadvantage to manager's actual profit earnings management behavior.

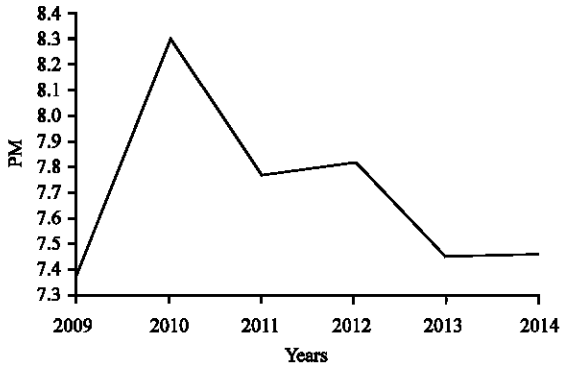


Fig. 1: Average pay ratio (PM) graph by year

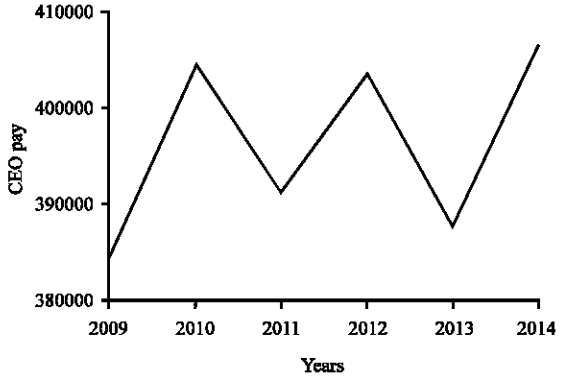


Fig. 2: Average manager's salary graph by year

## MATERIALS AND METHODS

### Research design

### Hypothesis setting and research model

**Relationship between earnings management and wage gap:** Hypothesis 1 is to examine the effect of wage disparity on manager's earnings management. In this study, the replacement ratio of the wage gap is calculated as (average salary per registered director)/(average salary per employee). In addition, the pearson correlation coefficient of the annual pay ratio and managerial salary used in this study is 0.823 which is significantly positive at the 1% level. The following is a graph of annual pay ratio and manager compensation, it confirms that the pay ratio is proportional to the manager's compensation (Fig. 1 and 2).

Generally, since, a company has a higher compensation level than an employee compensation level, there is a difference in management between the manager and the employee. The reasons for the increase in the incentive for managers to make earnings management are in the case where the manager receives more compensation and the manager does not want his or her compensation to decrease. In this study, the pay ratio that is the low wage gap means that managers compensation is low and there is not sufficient compensation from the manager's point of view, therefore, increase in the incentive for earnings managements is expected:

- $H_1$: there will be a significant relationship between earnings management and wage gap
- $H_{1.1}$: the Pay Ratio (PM) will have a negative (-) relationship with accrued earnings management
- $H_{1.2}$: the Pay Ratio (PM) will have a negative (-) relationship with the actual earnings management

Therefore, hypothesis 1 tests whether the wage gap between manager and employee has a negative relation with the discretionary accruals which is a substitute for earnings management and the actual earnings management measure. The research model is modified by the model used by Kyung-Su *et al.* (2015) which proves the relationship between manager compensation and earnings management.

**$H_{1.1}$:**

$$DA_{it} = a_0 + a_1\ Pmit + a_2\ LEV_{it} + a_3\ ROA_{it} + a_4\ MTB_{it} + a_5\ I\text{-}Dum + a_6\ Y\text{-}Dum + e_{it}$$

**$H_{12}$:**

$$REM_{it} = a_0+a_1\ Pm_{it}+a_2\ LEV_{it}+a_3\ ROA_{it}+ a_4\ MTB_{it}+a_5\ I\text{-}Dum+a_6 Y\text{-}Dum+e_{it}$$

Where:

$DA_{it}$ = Discretionary Accruals
$REM_{it}$ = Measurement of actual earnings management
PM = Average salary per registered director/average salary per employee
LEV = Leverage
MTB = Total capital/market capitalization
ROA = Net income/total assets
I-dum = Industry dummy
Y-dum = Year dummy

**The relationship between earnings management and wage gap according to the pattern of corporate governance:** In hypothesis 2, whether the relationship between earnings management and wage gap changes according to the pattern of corporate governance will be examined. If management's remuneration is determined by the full authority of the manager, it will become difficult to objectively evaluate and it will be difficult to control manager's remuneration. Brown and Lee (2010) found that sustainability of managerial power is large when corporate governance is weak.

The manager uses the accrued earnings management and the real earnings management complementarily (Young-Kyu, 2012) or alternatively (Cohen *et al*., 2008; Cohen and Zarowin, 2010). When the actual earnings management is more actively used than the accruals earnings management if corporate governance serves as an effective control mechanism for both earnings managements, corporate governance should reduce both the accrued earnings management and the actual earnings management that occur simultaneously in the firm (Han-Su and Kyung-Hwa, 2012). Corporate governance was added as a control variable based on this and the effect of wage gap on earnings management is expected to decrease as firm governance structure is better.

The substitution of corporate governance to be used in hypothesis 2 is based on the corporate governance rating of Korean corporate governance structure. The Korean corporate governance body evaluates the governance structure of each company by year using the corporate governance evaluation model which consists of five divisions, shareholder rights protection, board of directors, disclosure, audit organization and management fault distribution. Thus, each year's average corporate governance rating is divided into those with higher average ratings and those with lower average ratings.

- $H_2$: if corporate governance is excellent, the effect of wage gap on earnings management will decrease

$$DA_{it} = a_0+a_1PM_{it}+a_2CG_{it}+a_3LEV_{it}+a_4ROA_{it}+ a_5MTB_{it}+a_6I\text{-}Dum+a_7Y\text{-}Dum+e_{it}$$

Where:

$DA_{it}$ = Discretionary Accruals
$REM_{it}$ = Measurement of actual earnings management
PM = Average salary per registered director/average salary per employee
CG = If the Corporate Governance rating is higher than the average rating 1 or 0
LEV = Leverage
MTB = Total capital/market capitalization
ROA = Net income/total assets
I-dum = Industry dummy
Y-dum = Year dummy

**Measuring variables**

**Independent variable measurement:** Many previous studies did not use the same Pay Ratio (PM) measurements because they were done before the law on revenues disclosure was enacted. In the study, Ji Sung Kwon *et al*. and Hyun *et al*. (2014), compensation was calculated as (compensation per employee per t-1 year)/(t-1) per employee. Faleye *et al*. (2013) used the natural logarithm of (compensation per manager/compensation per employee) and Crawford *et al*. (2014) used a rank transformation of (compensation per manager/compensation per employee). Jung-Dae (2015) said that because of the difference in the method of measuring the pay ratio, domestic pay ratio is at least 2 to maximum 220 whereas the overseas pay ratio is at least 5-850. In this study, the independent variable pay ratio (PM) was used as one of the methods used in the previous research (average salary per registered director)/(average salary per employee) as the wage disparity substitute between manager and employee. As a result of using all of the measurement methods presented in the previous research, the directionality is consistent and the result is the result of the measurement method with the highest level of significance.

**Dependent variable measurement**

**Discretionary Accruals (DA):** Discretionary accruals are derived from the revised Jones (1991) Model of Dechow *et al*. (1995) which is most commonly used in earnings managements. The modified Jones Model calculates the non-discretionary accruals which are measured by applying the model for each year-industry to control the structural changes of the economic

environment and the effects of each industry by subtracting the accruals from the total accruals. Discretionary Accruals (DA) are residuals of each firm estimated by applying formula by year-industry. This is expressed by Eq. 1:

$$\frac{TAC_{\delta}}{A_{t-1}} = a_0\left(\frac{1}{A_{t-1}}\right)+a_1\left(\frac{\Delta REV_t-\Delta AR_t}{A_{t-1}}\right)+a_2\left(\frac{PPE}{A_{t-1}}\right)+\varepsilon \quad (1)$$

$$DA_t = \frac{TAC_t}{A_{t-1}}\left[\hat{a}_0\frac{1}{A_{t-1}}+\hat{a}_1\frac{\Delta REV_t-\Delta AR_t}{A_{t-1}}+\hat{a}_2\frac{PPE}{A_{t-1}}+\varepsilon\right] \quad (2)$$

Where:

$DA_t$ = Discretionary Accruals of year t by modified Jones model
$TAC_t$ = Total Accruals in year t (net profit-cash flow from operating activities)
$\Delta REV_t$ = Sales change in year t
$\Delta Ar_t$ = Changes in trade receivables in year t
$A_{t-1}$ = Total assets of period t-1
$PPE_t$ = Facility assets in year t
$\varepsilon_t$ = Residual

**Real earnings management; REM:** In previous research, it was focused on the three methods of adjusting the actual activity that temporarily increases the profit of the report and measured the substitution of the actual earnings management (Roychowdhury, 2006; Cohen *et al*., 2008; Cohen and Zarowin, 2010). First in Roychowdury's study, the residuals of each estimation equation were named Abnormal Cash Flow From Operation (abCFO), Abnormal Production Cost (AbPC) and Abnormal Discretionary Expense (AbDE). These three substitution variables are measured in the model. The model used by Dechow *et al*. (1998) was applied by Roychowdhury (2006):

$$\frac{CFO_t}{A_{t-1}} = a_0+a_1\frac{1}{A_{t-1}}+B_1\frac{S_t}{A_{t-1}}+B_2\frac{\Delta S_t}{A_{t-1}}+\varepsilon \quad (3)$$

$$\frac{PC_t}{A_{t-1}} = a_0+a_1\frac{1}{A_{t-1}}+B_1\frac{S_t}{A_{t-1}}+B_2\frac{\Delta S_t}{A_{t-1}}\ B_3\frac{\Delta S_{t-1}}{A_{t-1}}+\varepsilon \quad (4)$$

$$\frac{DE_t}{A_{t-1}} = a_0+a_1\frac{1}{A_{t-1}}+B_1\frac{\Delta S_{t-1}}{A_{t-1}}+\varepsilon_{\delta} \quad (5)$$

Where:

$CFO_t$ = Cash Flows from Operating activities of period t
$PC_t$ = Manufacturing Cost of period t (= Cost of Goods Sold (COGS)+change In inventory ($\Delta$INV))
$DE_t$ = Discretionary costs (= SG and A-Taxes and lessons-Depreciation-Rental costs-Premiums)
$\varepsilon_t$ = Residuals
$A_{t-1}$ = Total assets of period t-1
$S_t$ = Sale of period t
$S_{t-1}$ = Sale of period t-1
$\Delta S_t$ = Changes in sale of period t
$\Delta S_{t-1}$ = Changes in sale of period t-1

Also in this study, we use the total measured value calculated by summing the three Real Earnings Management (REM) measures (Cohen *et al*., 2008; Cohen and Zarowin, 2010). Considering the direction of analysis, multiply AbCFO and AbDE with the negative value (-1) of the REM result negative (-) to unify the sign of the earnings management activity through the three real activities:

$$REM_t = AbCFO_t\times(-1)+AbPC_t+AbDE_t\times(-1)$$

Where:

$AbCFO_t$ = The residual of estimation Eq. 1
$AbPC_t$ = The residual of estimation Eq. 2
$AbDE_t$ = The residual of estimation Eq. 3

**Control variable measurement:** DeFond and Jiambalvo argue that, the leverage under the liability contract hypothesis is one of the major factors influencing earnings management and that the higher the leverage, the greater the possibility of violation of the debt contract. According to the debt contract hypothesis, discretionary accruals and leverage are expected to have a positive (+) relationship but some studies expect that discretionary accruals and leverage are negative. In this study, the leverage which is the total of debt divided by total assets is used as a control variable and how it correlates with real earnings management measures as well as discretionary accruals was examined. In addition, the control variables used in the multiple earnings management studies were selected by referring to the study by Jang-Gun (2016) which reviewed the literature focusing on the control variables frequently used in the study of domestic discretionary accruals. Market-To-Book value (MTB) is used as a control variable because it is expected that there will be an incentive to adjust profit for market expectations and funding (Rozeff and

Zaman, Ke *et al*., Roychowdhury, 2006) studies by Seong-Kyu and Gyeong-Min (2005), Su-Yeong *et al*. (2006), Jong-Chang and Sora (2008), Jun-Hwa (2009), Sun-Seok Hyo-Jin (2010), Seong-Hwang and Seong-Gyu (2011), Jae-Wook (2011), Jeong-Min *et al*. (2012), Jun-Hwa and Gil-Su (2013) and Tae-Beom (2013). The Return on Assets (ROA) means the performance of the firm and in many studies, it is suggested that the performance of the firm is highly related to the measurement error of the earnings management substitute. In this study, control variables were set to control the effect of profitability of company and dividing net profit by basic total assets. In addition, industry and year-by-year dummies were given to control industry and year effects.

**Selection of samples:** This study analyzes the companies listed on the Korea exchange securities market from 2009-2014 on a yearly basis. This is because the official data on managerial salaries should be available as early as 2009. The Fn-Guide and the business report of the financial supervisory service's electronic disclosure system was used to extract variables and companies that satisfy all of the following four criteria were selected.

- Listed company with financial data in data guide
- Non-financial businesses
- December closing company
- Companies with stock prices and financial statement items required for variable measurement

In order to eliminate the effect of the abnormalities on the study results, the corresponding values within the upper 1% and lower 1% of the variables included in the analysis model were winsorized to the upper and lower 1%, respectively. The final sample that satisfies the above conditions is 3.469.

## RESULTS AND DISCUSSION

**Technical statistics and correlation analysis:** The descriptive statistics and correlations for the variables used to test the hypotheses presented in this study are as follows.

Table 1 shows the descriptive statistics of the main variables. First, the average of Discretionary Accruals (DA) is 0.001 which indicates that managers increase their profits on average through accruals. On the other hand, the average of the Real Earnings Management (REM) is -0.257 which is negative (-) and this is the result of managerial downward adjustments on average through real activity. Earnings management for the two measurements derived using the same sample were directed upward and downward, respectively.

Table 1: Descriptive statistics for key variables

| Variables | N | Mean | SD | Min. | Median | Max. |
|---|---|---|---|---|---|---|
| DA | 3469 | 0.001 | 0.074 | -0.334 | 0.005 | 0.252 |
| REM | 3469 | -0.257 | 0.438 | -1.941 | -0.184 | 1.530 |
| PM | 3469 | 7.648 | 6.847 | 0.698 | 5.422 | 37.397 |
| LEV | 3469 | 0.472 | 0.202 | 0.027 | 0.480 | 1.845 |
| ROA | 3469 | 0.022 | 0.082 | -0.449 | 0.029 | 0.213 |
| MTB | 3469 | 1.288 | 1.332 | 0.174 | 0.860 | 9.146 |

The average of the Leverage (LEV) which is a control variable is 0.472, indicating that the leverage to total assets is about 47% and the Return on Assets (ROA) is 0.022 which is about 2% of total assets. The average Market-Book Value (MTB) was 1.288.

Table 2 shows Pearson's correlation coefficients showing the correlation of major variables. In the research model, DA which is a proxy for accrued earnings management for dependent variable and REM which is a measure of real earnings management has positive correlation coefficient (+) and negative coefficient respectively. This is supported by hypothesis 1 only in case of real earnings management but it is analyzed whether regression analysis shows the same result. The following is the correlation coefficient between the control variable and the dependent variable except for the main variables. First, let's look at the coefficient with DA which is accrued earnings management substitute. Leverage (LEV) and Discretionary Accruals (DA) show a significant negative correlation coefficient. Discretionary accruals (DA) are the negative correlation between the Market-Book value (MTB) which indicates the growth potential of the firm and -0.091 and it is in contrast to previous research that predicted that the growth rate of firms would have a positive (+) relationship with discretionary accruals. The Return on Assets (ROA) which is the performance of the firm was 0.451, indicating a significant positive correlation coefficient. This is in agreement with Kothari's claim that corporate performance should be controlled in estimating discretionary accruals. Next is the correlation between the Real Earnings Management (REM) and the control variable which is somewhat contradictory with the DA. Leverage (LEV) and real earnings management (REM) showed a significant positive correlation coefficient. This supports the hypothesis of the debt contract which is a result of concurrent support of two opposing arguments when compared with Discretionary Accruals (DA). The Market-Book value ratio (MTB) was -0.223, indicating a negative (-) correlation coefficient equal to Discretionary

Table 2: Pearson correlation

| N = 3.469 | DA | REM | PM | LEV | ROA | MTB |
|---|---|---|---|---|---|---|
| DA | 1 | - | - | - | - | - |
| | | - | - | - | - | - |
| REM | 0.138 | 1 | - | - | - | - |
| | <0.0001 | | - | - | - | - |
| PM | 0.040 | -0.248 | 1 | - | - | - |
| | 0.018 | <0.0001 | | - | - | - |
| LEV | -0.128 | 0.128 | 0.038 | 1 | - | - |
| | <0.0001 | <0.0001 | 0.025 | - | - | - |
| ROA | 0.451 | -0.381 | 0.161 | -0.365 | 1 | - |
| | <0.0001 | <0.0001 | <0.0001 | <0.0001 | - | - |
| MTB | -0.091 | -0.223 | 0.077 | -0.066 | 0.073 | 1 |
| | <0.0001 | <0.0001 | <0.0001 | 0.000 | <0.0001 | - |

Definitions of variable; DA: Discretionary accruals; REM: Real Earnings Management; PM: Average salary per registered director/Average salary per employee; LEV: leverage; CG = If the corporate governance rating is higher than the average rating 1 or 0; MTB: Total capital/market capitalization; ROA: Net income/total assets

Table 3: Regression analysis for hypothesis 1 verification (N = 3.469)

| | DA | | REM | |
|---|---|---|---|---|
| Dependent variable | Coefficient | t-values | Coefficient | t-values |
| Intercept | -0.032 | -1.310 | -0.854 | -5.970*** |
| PM | -0.0004 | -2.370** | -0.011 | -11.630*** |
| LEV | 0.012 | 1.930** | -0.070 | -1.990** |
| ROA | 0.442 | 29.670*** | -1.758 | -20.480*** |
| MTB | -0.006 | -7.090*** | -0.048 | -9.690*** |
| Year pile | included | - | included | - |
| Industry pile | included | - | included | - |
| $R^2$ | 0.246 | - | 0.277 | - |
| Adj $R^2$ | 0.242 | - | 0.273 | - |

***, **, * Indicate significance at the 1, 5 and 10% levels, respectively; Statistics for the year and industry pile are omitted; See (Note) in Table 2 for a description of the variables

Accruals (DA), however, Return on Assets (ROA) is -0.381 which is positive (+), unlike Discretionary Accruals (DA).

Table 3 shows the results of a regression analysis that verifies whether there is a negative relationship (-) between earnings management and wage gap between manager and employee. The pay ratio (PM) which is a substitute for the wage gap is significantly negative (-) with Discretionary Accruals (DA) of -0.0004. In addition, there is a significant negative (-) correlation, -0.011 with the Real Earnings Management measure (REM). The discretionary accruals and actual earnings management measures are both negative (-) with the pay ratio (PM). However when the correlation coefficient is compared with the significance level, it can be seen that the real earnings management is more related to the wage gap than the accrued earnings management. The correlation between the Discretionary Accruals (DA) and the Real Earnings Management measure (REM) has been found to have a different correlation with the managerial-employee pay ratio (PM), however, in regression analysis both dependent variables were negative (-). This is the result of supporting hypothesis 1.

Table 4 shows the results of the regression analysis that verifies the relationship between earnings

Table 4: Regression analysis for hypothesis 2 verification (N = 3.469)

| | DA | | REM | |
|---|---|---|---|---|
| Dependent variable | Coefficient | t-value | Coefficient | t-value |
| Intercept | -0.033 | -1.35 | -0.874 | -6.14*** |
| PM | -0.0003 | -1.73* | -0.009 | -9.33*** |
| CG | -0.005 | -1.61* | -0.104 | -5.47*** |
| LEV | 0.012 | 2.02** | -0.059 | -1.67* |
| ROA | 0.444 | 29.71*** | -1.721 | -20.06*** |
| MTB | -0.006 | -6.98*** | -0.047 | -9.41*** |
| Year dummy | included | - | included | - |
| Industry dummy | included | - | included | - |
| $R^2$ | 0.247 | - | 0.283 | - |
| Adj $R^2$ | 0.242 | - | 0.279 | - |

***, **, * Indicate significance at the 1, 5 and 10% levels, respectively; Statistics for the year and industry pile are omitted; See (Note) in Table 2 for a description of the variables

management and wage gap according to the pattern of corporate governance. In the model of hypothesis 1, regression analysis was performed by adding a control variable with 1 for companies with higher corporate governance rating than the average rating and 0 for firms without corporate governance rating. Regression analysis of hypothesis 2 revealed that the pay ratio (PM) which is a substitute for the wage gap is negative (-) like hypothesis 1. In the case of the accruals earnings management, the correlation coefficient of the pay ratio (PM) is -0.003 which is smaller than the Discretionary Accrual (DA) when compared with the correlation coefficient of the pay ratio (PM) of hypothesis 1 -0.004. In the case of real earnings management, it is also found that the effect of the pay ratio (PM) coefficient of hypothesis 2 on the Real Earnings Management (REM) is -0.009 which is lower than the negative correlation coefficient of hypothesis 1 -0.011 is. These results support hypothesis 2 that wage gap will have less effect on earnings management if corporate governance is excellent.

**Further analysis:** Empirical analysis of hypothesis 1 and 2 shows that actual earning management has more relevance to wage gap than accruals management. In this analysis, analyzation of the relationship between the wage gap and the actual earnings management will be shown in more detail. It is compared the effect of the two groups on earnings management by dividing the wage gap into two groups if the pay ratio (PM) which is a substitute for the wage gap is higher than the median, divide the wage gap into high wage groups if it is lower than the median, divide the wage gap into a lower wage gap. Based on the results of hypothesis 1 in the additional analysis, the group with lower wage gap is expected to have a larger effect on earnings management relative to the group with larger wage gap. The additional analytical model is based on the research model used in this study but adds the Discretionary Accruals (DA) estimated through the

Table 5: Regression analysis for additional analysis

| Dependent variable = REM | A group with a high wage gap | | A group with a low wage gap | |
|---|---|---|---|---|
| | Coefficient | t-values | Coefficient | t-values |
| Intercept | -1.468 | -7.3*** | -0.186 | -1.09 |
| PM | -0.004 | -3.76** | -0.047 | -6.77*** |
| CG | -0.052 | -2.49** | -0.213 | -6.44*** |
| DA | 1.770 | 13.14*** | 1.933 | 16.22*** |
| LEV | 0.053 | 1.08 | -0.167 | -3.89** |
| ROA | -2.594 | -16.99*** | -2.268 | -20.4*** |
| MTB | -0.050 | -7.35*** | -0.020 | -3.2** |
| Year pile | included | - | included | - |
| Industry pile | included | - | included | - |
| $R^2$ | 0.393 | - | 0.364 | - |
| adj $R^2$ | 0.386 | - | 0.356 | - |
| Sample | 1735 | - | 1734 | - |

***, **, * Indicate significance at the 1, 5 and 10% levels, respectively; Statistics for the year and industry pile are omitted; See (Note) in Table 2 for a description of the variables

modified Jones Model (Dechow *et al*., 1995) as a control variable. This is because the actual earnings management can be made at the same time as the accruals earnings management, it is based on a number of actual earnings management prior research models using discretionary accruals as control variables.

Table 5 shows the regression results for additional analysis. As a result of the analysis, it was found that the influence of the compensation coefficient of the low wage group (PM) on the Real Earnings Management (REM) is -0.047 when compared with the correlation coefficient of the pay ratio (PM) -0.004 which is greater than what was expected. In addition in both groups, REM and Discretionary Accruals (DA) were 1.770 and 1.933, respectively, indicating a significant positive relationship at 1% level, therefore, it can be seen that actual earnings management and accrued earnings management are performed at the same time.

## CONCLUSION

The purpose of this study is to find out the meaning of the pay ratio in the capital market by examining whether the wage gap between the manager and the employee is related to the earnings management of Korean firms listed on the securities market and KOSDAQ market from 2009-2014 . In addition, the sample used in the study was further divided into two groups, the wage gap being relatively high and the low wage gap.

As a result of hypothesis 1 which confirms the relationship between earnings management and manager-employee compensation ratio both accruals earnings management and actual earnings management show a significant negative correlation with manager-employee wage gap.

Hypothesis 2 compares the results of hypothesis 1 with the relationship between earnings management and wage gap between manager and employee according to the pattern of corporate governance. As a result, if the corporate governance structure is excellent, the effect of the wage gap on earnings management decreases.

In the further analysis, the effect of the pay ratio on the earnings management was larger for the group with relatively low wage gap than the group with relatively high wage gap. Furthermore, the results of previous research that actual earnings management can be made at the same time as earnings management were re-examined. Based on the empirical results of hypothesis 1 and 2 and further analysis, it is confirmed that the wage gap has information usefulness as accounting information and suggests that the future disclosure of compensation ratios between management and employees is needed in the future.

## SUGGESTIONS

This study suggests that the newly published disclosure of the payout ratio has relevance to decision making by stakeholders and can be used as an earnings management measure. In addition, it has significance in that it is mainly related to earnings management, unlike previous studies related to business performance or SOP. This study has the following limitations. First, the sample period is too short because laws and amendments on the maintenance ratio have recently been made. Second, the pay ratio was not accurately measured. It is because not only the method of measuring the pay ratio in previous studies is not uniform but also the value that should be used according to the pay ratio measurement method of the US was not available in Korea. This is because the measure of the pay ratio in the US related to the disclosure of the pay ratio is based on the median but in Korea, the number of employees is not measured because it is not yet legally specified. Finally, it is necessary to further theoretically and empirically investigate the results in accordance with the pay ratio. It is difficult to claim only the results obtained because the previous studies supporting the research on the subject of the pay ratio are insufficient and do not show concordant results. It is expected that further research on the subject of future pay ratio.

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