Ownership Structure and Executive Compensation in Canadian Corporations

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Abstract

Agency theory, proposed by previous studies such as Guidry, Leone, and Rock (1999) and Arya and Huey-Lian (2004), suggests that bonus and other accounting-metric-based compensation can motivate managers to perform well in the short horizon while equity-based compensation, such as restricted shares and stock options, can serve the purpose of aligning the long run interests of shareholders and managers. The empirical evidence, for example Jensen and Murphy (1990), Kaplan (1994), Hall and Liebman (1998), Murphy (1999), Zhou (2000), and Chowdhury and Wang (2009), confirms that incentive compensation is popular in many countries. However, recent studies suggest that the relation between performance and incentive compensation is weak. Shaw and Zhang (2010) find that CEO bonus compensation is less sensitive to poor earnings performance than it is to good earnings performance. Fahlenbrach and Stulz (2011) study the relation between bank performance during the 2008 bank crisis and the bonus and equity-based compensation of bank CEOs. They find that banks with CEOs whose incentives were better aligned with the interests of shareholders performed worse than other banks.

This study examines whether ownership structure can explain the differences among compensation structures of chief executive officers (CEOs). In particular, we examine the compensation structure of three distinct groups: family-controlled, institution-controlled, and widely-held firms. We distinguish these three kinds of firms to represent different levels of market imperfection. Compared with family-controlled and institution-controlled firms, widely held firms have dispersed ownership. The most significant weakness of a widely-held ownership structure is the lack of shareholder monitoring due to the unmatched benefit and cost of monitoring for small shareholders. In contrast, a holder of a large block of shares will have the same monitoring costs but the benefits to this shareholder from monitoring management and reducing agency costs would be substantial and larger than the costs of monitoring. Thus the presence of a large shareholder will reduce the agency costs. In addition, large shareholders may be willing to spend time and effort continuously to collect more information on management performance or to estimate the firm’s investment projects. This behaviour will reduce the problems that arise from information asymmetry and will decrease the waste of free cash flows by managers.

Both family-controlled firms and institution-controlled firms have large shareholders. However, whether or not the control shareholders are playing an active monitoring role is still an important issue. From the viewpoint of aligning the interests of managers and shareholders, the family-controlled group is superior to the institution-controlled group. First, institutions are more flexible in moving their ownership from one firm to another depending on performance. If the costs of monitoring are high in comparison to the costs of rebalancing portfolios, institutions will choose to rebalance instead of monitoring. In contrast, a family that controls a firm does not have this flexibility. Second, family-controlled firms generally assign influential positions to family members whose focus is in line with that of the family group. Even though a non family member may be appointed as the manager, the level of monitoring is significant given the high ownership concentration by the family. However, the level of monitoring by a family may not necessarily translate into a reduction of agency costs for minority shareholders. Indeed, previous studies suggest that significant family ownership may lead to agency costs of its own. The family may divert company resources for its own benefit despite the presence of a manager who may or may not be a family member. Essentially, the family and the manager can collude to spend on perks and personal benefits at the expense of minority shareholders. Chourou (2010) suggests that excessive compensation of chief executive officers at some family owned Canadian corporations may be viewed as expropriation of minority rights.

Overall, the main objective of this study is to examine whether block-holder monitoring is a substitute to the incentive components of compensation. We propose that as we move from widely-held to institution-controlled the level of monitoring may or may not increase. However, as we move further into higher control, as may be suggested by family ownership, the level of monitoring will increase but this monitoring may not necessarily reduce agency costs. The results show that the institution-controlled firms pay significantly less bonus compensation per dollar of assets than widely-held firms but the differences in equity based compensation are not significant. In addition, the family-controlled corporations offer the lowest performance-based compensation, bonus per dollar of assets, in comparison to the institution-controlled and the widely-held groups. These results indicate that the family-controlled Canadian corporations rely more on monitoring managers than paying them incentive payments in the form of bonus payments. In addition, our results indicate that the institutions which control corporations may be monitoring the managers of these corporations but this monitoring does not significantly reduce

the need for the long-term incentive components of compensation. This result suggests that institutions may monitor the short-term performance effectively but they may prefer rebalancing their portfolio rather than monitoring long term performance.

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CHAPTER 1
Introduction

In theory, efficient pay contracts bond executive compensation with firm performance, and offer strong incentives for executives to act in shareholders' best interests. Guidry, Leone, and Rock (1999) suggest that bonus and other accounting-metric-based compensation can motivate managers to perform well in the short run. Jenson and Murphy (1990) propose that CEO ownership of their firm's stock is the largest CEO performance incentives. Lamber, Larchker, and Verrecchia (1991) point out that the stock-based compensation can mitigate agency problems. Similarly, Arya and Huey-Lian (2004) propose that equity-based compensation, such as restricted shares and stock options, can align the long-term interests of shareholders and managers.

A number of empirical studies confirm that incentive pay, including both short-term bonus and long-term equity-based compensation, are used to reduce agency costs. Kaplan (1994) provides evidence suggesting that the fortunes of Japanese top executives are related to stock performance and to factors that are conducive to stock and earning performance. Hall and Liebman (1998) provide evidence suggesting that firm performance is correlated to CEO compensation. Murphy (1999) reports that the relation between compensation and performance in the United States is stronger than the same relation in other countries. In the context of Canada, Zhou (2000) suggests that executive compensation is positively correlated to firm performance with an overall weak relationship. Another Canadian study, Chowdhury and Wang (2009), find that contingent pay and its ratio to total pay have been increasing in Canada from 1995 to 2002.

Recently, some studies show that the relation between performance and incentive compensation is weak. Shaw and Zhang (2010) find that CEO bonus compensation is less sensitive to poor earnings performance than it is to good earnings performance. They suggest that CEOs get rewards even with poor firm performance. Similarly, Fahlenbrach and Stulz (2011) find no evidence to support the proposition that banks with CEOs whose incentives were not well aligned with the interests of their shareholders performed worse.

This study examines whether ownership structure can explain the differences among the levels and structures of chief executive officer (CEO) compensation. In particular, we examine the compensation of three distinct groups: family-controlled, institution-controlled, and widely-held firms. We distinguish these three kinds of firms to represent different levels control and

monitoring provided by widely disbursed and concentrated ownership and by institutions as opposed to families.

Previous studies suggest that the most significant weakness of a widely-held ownership structure is the lack of shareholder monitoring due to the unmatched benefit and cost of monitoring for small shareholders. Demsetz (1983) suggests that when ownership is widely dispersed across many individuals and institutions, shareholders cannot exercise real power to oversee managerial performance in modern corporations. The existence of at least one large shareholder will reduce the agency costs and asymmetric information. McConaughy et al. (1998) examine the efficiency, measured by sales growth, and value of family-controlled firms. Their family-controlled firms are defined as public corporations whose CEOs are either the founder or a member of the founder's family. Controlling for size, industry and ownership effects, they apply a matched-pairs methodology. Their key finding is that family controlled firms are more valuable and efficient than firms of the same size, in the same industry, and with similar managerial ownership. Their findings also emphasize that who owns the shares is more important than ownership concentration. Firth, Fung and Rui (2006) indicate that concentrated ownership reduces agency costs.

Both family-controlled firms and institution-controlled firms have large shareholders. David, Kochhar, and Levitas (1998) argue that institutions have the obligation to know and protect what they invest. They should take proactive actions, so that the managements of investee firms work towards maximizing shareholder value. We propose that firms with a concentrated ownership structure would behave differently depending on whether they are institution-controlled or family-controlled. Shleifer and Vishny (1986) show that institution block holders do not usually interfere with management but they perform better monitoring than small shareholders in widely-held firms. However, whether or not institutions are effective in controlling managers is still an important issue. Interviews with six investment managers that control significant pension assets in Canada reveal that institutions actively communicate with and monitor managements of the firms they invest in but these investment managers stopped short of claiming that they attempt to exercise control over managements. Institutions are more flexible in moving their ownership from one firm to another depending on performance. If the costs of monitoring are high in comparison to the costs of rebalancing portfolios, institutions will choose to rebalance instead of trying to change managerial attitudes and decisions. Therefore, we

propose that institutions are better positioned than individuals to monitor managers and provide recommendations but they are not likely to exert significant and effective control over the managers of the firms in which they have control.

In contrast, a family that holds a controlling portion of voting shares is likely to have a significant and personal interest in the firm. They family would generally assign influential positions to family members or to managers who are controlled indirectly by the family. Thus, the managers of family-controlled firms are likely to be monitored more closely than the managers of institution-controlled firms and they are more likely to be directed and influenced by the controlling family. Many studies suggest that the fortunes of the managers of family-controlled firms are very much tied with the fortunes of the families that control their firms. Fama and Jensen (1983) and Demsetz (1983) suggest that a manager who cooperates with the controlling family can guarantee employment at an attractive salary as long as the firm's performance is in line with the industry's performance and the decisions of the manager are consistent with the expectations of the family. Furthermore, Chen and Kensinger (1988) suggest that managers of family-controlled firms may avoid risky ventures which might be desirable for outside shareholders. Morck et al. (2000) suggest that the concentration of family wealth in a business and the concern over the family legacy may explain why family-controlled firms may display excessive risk-aversion and forego profitable expansion strategies and mergers. Chourou (2010) suggests that excessive compensation of chief executive officers at some family owned Canadian corporations may be a sign of cooperation between the controlling family and the CEO and can be perceived as expropriation of minority rights. These arguments suggest that the compensation packages of family-controlled managers are likely to be competitive in the market for managerial talent, encourage good performance, promote cooperation with the controlling family, and discourage managers from taking excessive risk. Therefore, we propose that the incentive compensation in concentrated ownership firms may or may not vary depending on whether the firm is family-controlled or institution-controlled. However, the relation between incentive compensation and performance should be stronger when a family is the source of ownership concentration.

Overall, we propose that incentive compensation may or may not vary across ownership structures but the relation between incentive compensation and performance is likely to be weak at the widely-held firms, stronger at institution-controlled firms, and strongest at the family-

controlled firms. Furthermore, we propose that if incentive compensation is different across the ownership structures the differences are likely to be significant with the bonus component. We suggest that the ownership structure that provides the strongest monitoring is likely to rely more on bonus compensation as contingent component may reward managers due to factors beyond their control. Overall, it is easier to see how managerial actions affect the measures upon which bonuses are based rather than to point out the managerial actions that affect contingent compensation.

We examine our theory regarding the relationship between ownership structure, compensation, and monitoring by also considering how incoming CEOs are compensated in comparison to their predecessors. Previous studies provide little information on the differences. Ocasio (1994) suggests that CEO compensation is affected by the CEO's tenure. In particular, experience in the industry and in similar position may enable the incoming CEO to negotiate a high compensation package and a structure that is in the best interests of the CEO. On the other hand, the departure of a CEO could be seen as an opportunity for a firm to re-establish its own priorities and to design the compensation package to promote the interests of shareholders and the ultimate power brokers of the firm. Accordingly, we expect that the compensation of the incoming CEOs would be structured differently than the compensation of their predecessors. Furthermore, we propose that the structure of the compensation packages of incoming CEOs will vary depending on the ownership structure.

Finally, we examine the relation between equity performance and compensation. Previous studies find this relation to be positive but weak. We propose that separating firms across ownership structures may reveal that the relation is significant for one ownership structure and not significant for another. In particular, we propose that the relation is not likely to be significant in the widely-held firms and institution-controlled firms but it is more likely to be significant for firms in the family-controlled firms. In our view, the strength of the relation between incentive compensation and equity performance should be inversely related to the level of monitoring by the owners of the firms.

The remainder of this thesis is organized into seven sections. In Chapter 2, we review the prior literature on ownership structures, CEO incentive compensation, and firm performance. Theoretical arguments and hypothesis are discussed in Chapter 3. In Chapter 4, we describe the data, define the variables, and explain the methods. In Chapter 5, we discuss our descriptive

statistics and results of univariate tests. In Chapter 6, we present and analyze the results of multivariate tests. Chapter 7 covers conclusions and recommendations for future research.

CHPATER 2

Literature Review

This study examines whether ownership structure can explain the differences among compensation structures of CEOs. In particular, we examine the compensation structure of three distinct groups: family-controlled firms, institution-controlled firms and widely-held firms. Thus, this chapter divides the literature into four sections: Section 2.1 discusses the components of incentive pay. Section 2.2 reviews the literature that examines agency theory and incentive pay. Section 2.3 provides a review of the empirical evidence regarding the relation between pay and performance. Section 2.4 discusses the literature related to ownership structure and incentive pay, and Section 2.5 presents some additional factors that may impact incentive pay.

2.1 The Components of CEO Compensation

Although structures of CEO compensation vary across firms and over time, previous studies, for example Gray and Cannella (1997), find that CEO compensation contracts are usually structured as a combination of cash compensation (salary and annual bonus) and long-term compensation (stock-based and option-based compensation). Both the annual bonus and long-term incentive pay are usually set based on some measures of firm performance. Yet, there is a major difference between the two. The annual bonus is mostly based on accounting earnings such as return on equity or return on assets while the long-term incentive pay is based on stock returns.

Healy (1985) examines the nature of bonus payments. He notes that when actual firm performance is below some minimum threshold, no funds are allocated to the bonus pool. As firms perform better than the minimum, funds are linearly related to firm performance. When firm performance is up to a ceiling, the bonus pool will be capped. He argues that since a large part of CEO compensation is short-term bonuses based on accounting earnings, managers are likely to choose to maximize their short-term bonuses.

Murphy (1999) reports that every profit-oriented company provides performance-based bonus payments paid annually in cash. His findings suggest that if the CEO meets the performance target, the CEO will receive the bonus which is usually determined as a given percentage of his/her salary. Murphy (1999) finds that bonus contracts are usually written based on accounting earnings and not explicitly on stock returns. Yet, he argues that annual bonus

payments have the potential of strengthening the alignment of interests between managers and shareholders as they link the annual incentive awards to the future value of common shares. Guidry, Leone, and Rock (1999) and Arya and Huey-Lian (2004), suggests that bonus and other accounting-metric-based compensation can motivate the managers to perform well in the short horizon while equity-based compensation, such as restricted shares and stock options, can serve the purpose of aligning the long run interests of shareholders and managers.

2.2 Agency Theory and Incentive Compensation

Jensen and Meckling (1976) argue that an agency relationship arises when principals appoint agents to make and execute decisions on behalf of the principals. Both the principal and the agent want to maximize their respective utilities. Therefore, the agent will focus on maximizing his/her own utility, not that of the principal. Unless the interests of the principal and the agent are the same, the decisions of the agent will lead to suboptimal results from the perspective of the agent. Hence, the principal would like to provide the agent enough incentives to ensure that the agent acts in the best interests of the principal. The problem of the principal is to determine the optimal incentive package that does not offer excessive incentives to the agent.

Furthermore, alignment of the interest between the agent and the principal cannot be achieved at zero cost. Jensen and Meckling (1976) define agency costs to be consisting of three components: the monitoring expenditures by the principal, the bonding expenditures by the agent, and the residual loss from the suboptimal decisions. They argue that managerial ownership in the firm would reduce the conflicts between management and shareholders because managers would pay a share of the agency costs proportional to their ownership. Thus, Jensen and Meckling (1976) suggest that management ownership is a good way to align the interests of managers and shareholders and to reduce agency costs.

These arguments suggest that a mechanism for reducing agency problems between managers and owners is the employment contract which specifies compensation and its components. Shavell (1979) proposes that different forms of compensation have different incentive effects on CEOs. Lambert, Larcker, and Verrecchia (1991) suggest that if a manager's compensation is tied to the stock price, the agency problem which includes overly short-sighted behaviours can be mitigated. Gray and Cannella (1997) argue that incentive pay is related more with long-term performance and value appreciation of firms and non-incentive compensation

aims at providing the CEOs with a stable stream of cash flows. Daily, Johnson, Ellstrand, and Dalton (1998) propose that incentive pay and non-incentive pay induce different levels of risk and incentive objectives. Arya and Huey-Lian (2004) suggest that equity-based compensation, such as restricted shares and stock options, can serve the purpose of aligning the long run interests of shareholders and managers. Chowdhury and Wang (2009) argue that companies are structuring CEOs compensation as a combination of incentive pay and non-incentive pay to align the interests of owners and CEOs.

Another mechanism for reducing agency problems between managers and owners is the ownership structure. Fama and Jensen (1983) argue that concentrated ownership by outsiders has the same effects as managerial ownership in reducing agency costs. Thus, the presence of a shareholder that owns a significant portion of voting rights can be a substitute to significant managerial ownership in large corporations, large professional partnerships, and mutual companies. They indicate that concentrated shareholdings by outsiders create more effective monitoring of managers, which can improve firm performance. Ang, Cole, and Lin (2002) empirically examine how agency costs vary with a firm's ownership structure using a sample of 1,708 small US corporations. Their results support the theories of Jensen and Meckling (1976) and Fama and Jensen (1983) about ownership structure and the alignment of interests between managers and shareholders. In particular, they find that when an outsider manages the firm, agency costs are higher. Also, agency costs vary inversely with the manager's ownership level. Moreover, agency costs are positively related to the number of non-manager shareholders.

2.3 Empirical evidence regarding the relation between pay and performance

Section 2.2 suggests that incentive compensation is the tool to align the interests of managers and owners. The empirical evidence confirms that incentive compensation is popular in many countries and is widely accepted by companies. For example, Barenbaum and Schubert (1993) find that in 1988 more than 90% of the 400 largest industrial and service companies in the United States (US) used stock options as part of their compensation packages. However, recent studies suggest that the relation between performance and incentive compensation is weak.

Jensen and Murphy (1990) empirically examine the relationship between executive incentives and performance by using over 2000 CEOs data. Their results show that a 10% change in firm value leads to 0.33% change in total CEO compensation. These results

demonstrate that CEO wealth is not significantly related to shareholder wealth. They argue that CEO ownership of their firm's stock is the largest CEO performance incentive. However, the holdings of CEOs are small and decreasing. Leonard (1990) finds results different from Jensen and Murphy (1990). The author indicates that corporate success does not have an impact on the level of executive pay using 439 large US corporations over a period of 1981-1985. Kaplan (1994) indicates that incentive pay which is tied to stock performance and to factors that are conducive to earnings performance affects the fortunes of Japanese top executives. He also finds that the stock performance is less related to the fortunes of Japanese managers than those of US managers. A related study of Hall and Liebman (1998) document that firm performance is strongly correlated to CEO compensation using data over the period 1980-1994. In particular, they show that salary and bonus are weakly related to firm performance. However, in comparison to salary and bonus, the equity-based pay works better to align the interests of CEOs and shareholders. Similarly, Murphy (1999) uses a number of control variables to clarify the pay-performance relationship. By using US data covering 1970 to 1996, and international data in 1997, he offers the following important insights. First, in larger firms, if the levels of pay are high, the pay-performance sensitivities are low. Second, the relationship between the level of pay and pay-performance sensitivity are more significant in industrial firms than in utilities. Third, in the US the level of pay for performance is much higher than the pay for performance in other countries. Fourth, although the incentive pay-performance relations are significant, managers should not be left alone to design performance-based compensation.

More recent, many studies have shown significant positive relation between pay and performance, but with rather weak pay-performance sensitivity (Jeppson, Smith, and Stone 2009; Shaw and Zhang 2010; Fahlenbrach and Stulz 2011). Jeppson, Smith, and Stone (2009) examine the relationship between CEO compensation and several measures of firm performance using 200 large public companies in 2007 which filed proxy statements with the SEC. They do not find a strong relationship between CEO compensation and firm performance. The exception is total revenue, but with a low R^2. They also find that CEO compensation is positively related to firm size. Similarly, Shaw and Zhang (2010) find that CEO bonus compensation is less sensitive to poor earnings performance than it is to good earnings performance using data over the period 1992-2005. They find no evidence supporting that CEOs are punished for poor firm performance. Indeed, CEOs are even rewarded with poor performance. Similarly, Fahlenbrach and Stulz (2011)

study the relation between bank performance during the 2008 bank crisis and the bonus and equity-based compensation of bank CEOs. They find that banks with CEOs whose incentives were better aligned with the interests of their shareholders performed worse. Their results show that both cash bonus and stock options do not have an adverse impact on bank performance during the crisis.

There are two studies that consider that relation between incentive pay and performance in Canadian companies. Zhou (2000) considers executive compensation over the period 1991-1995 inclusive and provides several insights. The results show that executive compensation is positively correlated to firm performance but the overall relationship is weak. The author finds that firm size has a positive impact on CEO compensation. Moreover, smaller firms exhibit a strong negative correlation between the probability of CEO turnover and stock performance. We extend their study by examining contingent compensation using more recent observations that cover 5 years instead of 3 and we classify companies on the basis of their ownership structure.

Another Canadian study that may have objectives similar to those of this study is Chowdhury and Wang (2009). Using data related to the TSE 300 firms from 1995 to 2002, they find that contingent pay in Canada, both in monetary terms and as percentage of total pay, has been increasing during the study period. They argue that this finding is consistent with an implication of agency theory. Namely, boards of directors seem to be trying to raise CEO contingent pay to ensure better performance. Their results show that firm size and investment opportunities positively affect contingent pay. However, the key limitation in Chowdhury and Wang (2009) is that they investigate CEO contingent compensation only in institution-controlled firms. We extend their work by examining family-controlled as well as institution-controlled firms.

2.4 Ownership Structure

This study examines whether ownership structure can explain the differences among the compensation structures of chief executive officers (CEOs). Therefore, in this section we review the findings of previous studies regarding the impact of ownership structure on corporations.

During the era of Berle and Means (1932), the theory of the firm was developed under the assumption that organizations have widely-held ownership. La Porta et al (1999) suggest that the widely-held ownership structure continues to be a very common form of organization in the richest common law countries including the United States. However, Shleifer and Vishny (1986)

and Morck et al. (1988) show that the largest American firms have some concentration of ownership. Shleifer and Vishny (1986) show that such concentration of shareholding can make sense in terms of solving the agency problem. They argue that if there are many small shareholders, each will try to take a free-ride on the issue of monitoring the managers. In that case no monitoring would occur. Hence, if there are large shareholders they would solve the free-rider problem. In addition, Morck et al. (1988) find that large firms, outside the United States and the United Kingdom, normally have controlling owners, such as families. These controlling families maintain their significant influence through various mechanisms such as pyramidal control structures, cross-shareholdings, and super voting rights. Such mechanisms allow the families to remain in control even without making commensurate capital investment. Therefore, given the enormity of these corporations, such families have considerable power in controlling significant proportions of their countries' economies.

In a later study, La Porta et al. (1998, 1999) indicate that firms in other developed and developing countries have a higher level of ownership concentration. The study shows that, managerial ownership aligns managers' and outside shareholders' interests at low levels of managerial ownership. Up to a certain level of managerial ownership, managers would like to maximize the firm's value. However, if the managerial ownership achieves and passes an optimal level, managers focus on maximizing their own benefits, such as undertaking high-risk projects, resisting a takeover, and building empires at the expense of other shareholders in the firm.

The first study to examine the issue of ultimate control is that of La Porta et al. (1999). Studying ownership structures of large firms in 27 wealthy economies, they find that if we trace the ultimate owners, we will find relatively fewer firms with widely-held ownership. Even the largest firms have controlling shareholders, such as families or states. This study underscores the importance of ownership pyramids through which an ultimate owner could control other companies by means of indirect ownership. An ultimate owner, who has the most voting rights (instead of cash flow rights), can be found by tracing the chain of ownership. In addition, the study shows that different kinds of ownership and control have different impacts on the wealth of large shareholders.

The idea of ultimate ownership, which was initially propagated by La Porta et al (1999), instigated a number of related empirical works. First, Claessens, Djankov, and Lang (2000)

analyze the separation of ownership and control by using data from nine East Asian countries. They find that pyramid structures and cross-holdings improve corporate control in all studied countries. Second, Claessens, Djankov, and Lang (2000) use 1,301 publicly traded corporations in eight East Asian economies to disentangle the incentive and entrenchment effects of large ownership. They find that a positive relationship exists between the cash-flow ownership of the largest shareholder and firm value. However, when the control rights of the largest shareholder exceed its cash-flow ownership, firm value falls. They also find that managers at family-controlled firms have more ways to divert benefits to themselves than managers at firms with widely-held ownership. Third, Faccio and Lang (2002) study the ultimate ownership and control of corporations. They use data of 5,232 firms in 13 Western European countries. They find that there are more family-controlled firms than widely-held firms. Also, most financial and large firms are widely-held firms, while most non-financial and small firms are family-controlled firms. Furthermore, studies show that in the US and the UK, firms are mostly characterized by dispersed ownership. However, most of continental Europe and Asia are commonly characterized by ownership controlled by individuals, families, governments or industrial groups (La Porta et al 1999, Faccio and Lang 2002). Last, unlike other countries, in China, the government controls the majority of listed firms (Kato and Long, 2006).

In terms of the nature of governance structures in Canada, Roe and Lee-Sing (1996) observe that ownership concentration in Canada is high because individuals, families or private holding companies are the ultimate controlling owners of many large firms. La Porta et al. (1999) suggest that the ownership structures at Canadian firms are closely similar to those observed in most countries. Amoako-Adu and Smith (2001) note that the existence of dual-class shares, which is a relatively common phenomenon in Canada, facilitates concentrated ownership and family control. Klein, Shapiro, and Young (2005) examine the Canadian evidence on the relationships between corporate governance, family ownership, and firm value. They suggest determining the ultimate control by using voting rights instead of equity ownership. They do not study CEO compensation directly but they test the relationship between firm value and the newly released indices of effective corporate governance.

2.4.1 Widely-held group versus the concentrated group

In our study, we examine the compensation structure of three distinct groups: family-controlled firms, institution-controlled firms and widely-held firms. We distinguish these three kinds of firms to represent different levels of market imperfection. Compared with family-controlled and institution-controlled firms, widely held firms have dispersed ownership. Demsetz (1983) mentions that since ownership is widely dispersed across many shareholders, no shareholders can exercise real power to oversee managerial performance in modern corporations. Shareholders, owning a low amount of shares, have little or no incentives to exert monitoring behavior (Grossman and Hart, 1988). Thus, managers in widely-held firms have more freedom in using firm's capital than managers in non-widely-held firms. Shleifer and Vishny (1997) suggest that in absence of monitoring, managers would like to maximize their own utilities instead of shareholders. Another empirical work of Healy and Cole (2002) shows that absence of a stockholder with a large proportion of stock increases the agency costs, leading to the use of compensation contracts based on performance.

The most significant weakness of a widely-held ownership structure is the lack of shareholder monitoring due to the unmatched benefit and cost of monitoring for small shareholders. The existence of at least one large shareholder will reduce the costs of monitoring and agency costs and asymmetric information. Major shareholders mitigate the conflict between managers and shareholders (Shleifer and Vishny, 1986). Shleifer and Vishny (1997) empirically examine the consequences of corporate ownership for corporate valuation using data on companies from 27 wealthy countries around the world. They find that compared to small shareholders, large shareholders have greater resources and incentives to monitor managers reducing some agency costs.

In particular, large shareholders may be willing to spend time and effort to collect more information on management performance or to estimate the firm's investment projects and thus reduce the information asymmetry. Theoretically, shareholders with significant shares have more incentives to monitor management. As a result, they (large shareholders) are able to monitor more efficiently (La Porta et al, 1999). Bebchuk and Stole (1993) suggest if an investor holds a larger block of shares, this investor will have stronger incentives to protect the investment by monitoring management. Firth, Fung and Rui (2006) investigate the relationship among agency costs, ownership structure, and governance mechanisms by using data from China listed firms. They find that the level of agency cost is not significantly related to individual shareholding,

institutional shareholding, and government ownership. Their results indicate that agency costs are lower because of concentrated ownership, but they are not lower for the boards with a majority of outside directors. Hence, they argue that though Chinese public firms are undergoing ownership and governance reforms, such reforms have not yet led to lower agency costs. Their results support some prior empirical results for the US firms (Singh and Davidson, 2003). A related study of of Florackis and Ozkan (2008) shows that managerial ownership plays a significant role for corporate governance mechanism for the UK firms over period from 1999 to 2003. Their results indicate that both compensation and ownership concentration are important factors in mitigating agency problems. Besides, they find that executive ownership has a positive relationship with growth opportunities, which means, more growth opportunities firms offer more incentive mechanisms. Similarly, Ozkan (2007) empirically examines the impact using a sample of 414 large UK companies for the fiscal year 2003/2004. They also find that institutional, block-holder ownership, and directors' are negatively related to CEO compensation

In addition, enhanced monitoring will decrease the waste of free cash flow by managers. In the USA, publicly traded family-controlled firms (which constitute about one third of the total listed firms) have higher Tobin's q values and higher return on assets than nonfamily-controlled firms (Anderson and Reeb, 2003). Ben-Amar and Andre (2006) state that family ownership has a positive impact on value creation.

2.4.2 **Family-controlled Group Versus Institution-controlled Group**

Both family-controlled firms and institution-controlled firms have large shareholders. However, whether or not the control shareholders are playing an active monitoring role is still an important issue. Empirical research suggests that institutional investors play an important role on firm strategies, for example, executive/CEO compensation (Smith 1996; David, Kochhar, and Levitas, 1998). Smith (1996) concludes that when shareholder activism is successful in changing governance structure, shareholder wealth will increase. We can argue from Smith's study that institutional activism does have impact on share price, which again could affect stock-based CEO compensation. Similarly, David et al (1998) examine whether institutional investors have an impact on CEO compensation policy or not. Their results show that institutional owners with only an investment relationship with a firm influence compensation in accordance with shareholders preferences to "(1) lower its level and (2) increase the proportion of long-term

incentives in total compensation." Moreover, some other studies have examined the effect of institution ownership on CEO/executive compensation (Hartzell and Starks, 2003). Hartzell and Starks (2003) use a sample of 1,914 firms from S&P's ExecuComp between 1992 and1997. They find that the concentration of institutional investor ownership is positively tied to the performance sensitivity of managerial compensation and is negatively tied to the level of that compensation. They also find a positive relationship between institutional investors and executive compensation. Besides, their results imply that institution-controlled firms tend to use incentive compensation to mitigate the agency problem between shareholders and managers.

From the point of aligning the interests of managers and shareholders, the family-controlled group is superior to the institution-controlled group. According to Jensen and Meckling (1976), family-controlled firms should be characterized by reduced problems of agency and agency costs. This hypothesis has been tested and confirmed by Chrisman, Chua, and Litz (2004). They suggest that the overall agency problems in family-controlled firms is less than that in non-family-controlled firms using 1,141 small privately held US firms. Demsetz and Lehn (1985) show that family-controlled firms face less agency problems because they (family-controlled firms) are able to monitor their managers directly. Similarly, Mehran (1995) examines the relationship between executive compensation structure and ownership using 153 randomly-selected manufacturing firms. Results show that firms with a larger percentage of their shares controlled by outside block-holders offer less long term incentive pay, implying that block-holder monitoring is a substitute to the incentive components of compensation. Another empirical work of Kole (1997) indicates that the likelihood of any form of explicit compensation arrangement is reduced by the presence of an agent of founding family on the board.

First, institutions are more flexible in switching their ownership from one firm to another depending on performance. If the costs of monitoring are high in comparison to the costs of rebalancing portfolios, institutions will choose to rebalance instead of monitoring. Unlike individuals or families, institutions invest money of other people. Institutions have the obligation to know and protect what they invest. They should take proactive actions, so that the management of investee firms works towards maximizing shareholder value. (David, Kochhar, and Levitas 1998). Consistent with internal monitoring of management, substantial top management changes is negatively related to a firm's stock returns (Warner, Watt, and Wruch, 1988). They examine this relationship using the sample consists of 269 firms listed on the New

York and American Stock Exchanges in the period 1963-1978. Results show that the ratio of the number of top management changes to the number of firms is relatively stable at 0.183 for all changes. They indicate that this relationship is consequence from monitoring by the board, other top managers, or shareholders. Huson, Parrino, and Starks (2002) examine CEO turnover at large public firms listed in the Forbes over a period of 1971-1994. Results show that the frequency of forced CEO turnover and the frequency of outside succession are increased. They also indicate that from the beginning to the end of the period, the relationship between the firm performance and the likelihood of forced CEO turnover remain the same, even though the internal mechanisms is significantly changed. Thus, the characteristics of internal monitoring mechanisms and the nature of CEO turnover do not influence the sensitivity of forced turnover to firm performance. Kaplan and Minton (2006) studies CEO turnover using data from large US companies spanning a period of 13 years from 1992 to 2005. The authors find that CEO's tenure on average is less than 7 years. Compared to previous studies, the results show that the annual CEO turnover rate has been increasing. Furthermore, the average tenure of CEOs drops to six years by using data from 1998 to 2005. They analyze the impact of three components of firm performance (performance relative to industry, industry performance relative to the overall market, and the performance of the overall stock market) on internal turnover. Results show that these three factors have stronger impact on internal turnover after 1998. In contrast, a family that controls a firm does not have this flexibility.

Second, family-controlled firms generally assign influential positions to family members whose focus is in line with that of the family group. Even though a non family member may be appointed as the manager, the level of monitoring is significant given the high ownership concentration by the family. Anderson and Reeb (2003a) state that family firms are managed or controlled by founding families. About one-third of the S&P 500 firms across a broad range of industries are characterized by such ownership. They also suggest that family owners have better knowledge of the firm's business activities. Such knowledge helps the owners in detecting manipulations of stock or firm performance, if any. Bennedsen et al. (2007), using data from Denmark, show that a professional CEO provides much better performance in a family firm than a CEO who is a member of the family. Similarly, Villalonga and Amit (2004), upon their study on all Fortune 500 firms over period 1994-2000, argue that family ownership creates value only when a founder of the firm or non-family members serve as CEOs. Ben-Amar and Andre (2006)

conclude from Canadian data that separation of ownership and control does not negatively affect value creation. They indicate that family ownership in Canada is a positive factor in value creation. However, the level of monitoring by a family may not necessarily translate into a reduction of agency costs for the minority shareholders. Indeed, previous studies suggest that significant family ownership may lead to agency costs of its own. The family may divert company resources for its own benefit despite the presence of a manager who may or may not be a family member. Essentially, the family and the manager can collude to spend on perks and personal benefits at the expense of minority shareholders. Schulze, Lubatkin, and Dino (2003) suggest that agency benefits gained by family-controlled firms are offset by free-riding and other agency problems. Chourou (2010) use a panel of Canadian companies ultimately controlled by families over a period 2001-2004 to examine hypothesis of owner managers expropriating minority shareholders by receiving excessive compensation. He suggests that excessive compensation of chief executive officers at some family owned Canadian corporations may cause expropriation of minority rights.

2.5 Other Factors

Early studies, for example Baumol (1959) and Lewellen and Huntsman (1970), examined that factors that determine CEO compensation. They find that firm size and firm performance have an impact on CEO compensation. Ciscel and Carroll (1980) argue that the findings of these studies are limited by multicollinearity problems. They find that the market for managerial talent, the external performance of the firm, and the internal technical efficiency of production affect the level of executive compensation, after correcting for multicollinearity.

Some studies examine the relationship between CEO compensation and market or industry performance. Hart (1983) indicates that when a manager owns a small stake the product market may still force managers to follow the principle of shareholder value maximization. Hart's argument is based on the assumption that a given product has a cost component that is common among all producers. If agency costs make the costs of a product higher than the costs of its peers, consumers will avoid buying it. This result affects negatively the manager's personal benefits.

Jensen and Ruback (1983) focus on the role of the market for corporate control. They investigate the relationship between managers and shareholders and corporate takeovers. Their

results show that corporate takeovers benefit the target firm's shareholders. In addition, the shareholders in the bidding firm do not lose. More recently, Tannous and Cheng (2007), propose that the market for corporate control provides another incentive for managers to perform. They provide evidence suggesting that corporate takeovers are often motivated by the poor performance of the target and turn around plans that include dismissal of existing managers.

Gibbons and Murphy (1990) argue that corporate performance depends on non-controllable factors such as industry and market conditions, which also have an impact on CEO compensation. They examine the relationship between relative performance and CEO compensation. Their empirical evidence strongly supports the existence of a positive relation between CEO pay and firm performance but they find that CEO pay is negatively related to industry and market performance. They also find that CEO performance is more tied to aggregate market movements than industry movements.

Jacobs (1991) shows that CEO compensation is correlated to market effects. He argues that managerial short-sightedness is a key reason for the decline in American business competitiveness. Such short-sighted behaviour of managers raises questions regarding whether better designed compensation contracts could induce managers to behave in a way that is consistent with the long-run interests of shareholders.

CHAPTER 3

Theoretical Arguments and Hypotheses

Past studies indicate that the ownership structure affects the degree of agency costs. It is argued that the higher the ownership of a particular entity the lower will be this entity's monitoring costs in proportion to its benefits of monitoring the managers. We propose that the ownership structure is a spectrum that ranges from full ownership by one individual to widely dispersed ownership by a large number of shareholders each owning a very small portion of the firm. Furthermore, we propose that the costs of monitoring management effectively are significant but these costs are fixed while the benefits of monitoring management are proportional to the percentage of ownership in the firm. Thus, shareholders who have significant ownership in a firm should be willing to monitor managers closely, which suggests that concentrated ownership in a firm should increase the level of monitoring and reduce agency costs.

Similarly, previous studies suggest that the compensation contract can be designed to tie a portion of the pay to performance. It is argued that performance-based compensation will align the interests of managers and shareholders. Therefore, it should reduce the need for shareholders to monitor the performance of managers. Therefore, if we assume that shareholders are indeed in a position to structure compensation packages as they please regardless of the ownership structure then we can suggest the existence of a negative relation between the degree of monitoring and the proportion of performance-based CEO compensation. Under this scenario the performance-based compensation may vary depending on the ownership structure of firms. The widely-held firms, in which ownership is widely dispersed across many shareholders, should rely heavily on performance-based compensation to align the interests of managers and shareholders and reduce agency costs. In contrast, firms which have concentrated ownership should have less need for performance-based compensation. In these firms, the existence of at least one shareholder with a significant ownership stake will improve monitoring and reduce the level of agency costs.

However, there is no evidence that suggests shareholders are in control of compensation packages. In the contrary, the evidence suggests that executive compensation is mainly determined by competitive pressures in the market for CEOs and by benchmarking. We propose that in this environment concentrated control by an institution or a family may or may not lead to

significant differences in incentive compensation across ownership structures. However, in the presence of high monitoring by families or by institutions we should find a significant relation between incentive compensation and performance.

Previous studies suggest that performance based compensation can take many shapes and forms. The annual compensation of a CEO in a typical firm has three components that account for approximately 90% or more of the CEO's total compensation.[1] The three most significant components are fixed annual salary, bonus, and contingent compensation (contingent compensation consists of stock options, performance plans, restricted options, and other long-term incentives). The bonus is usually based on some accounting metric such as return on assets, return on equity, or cash flow per share. Theoretically, these metrics are positively related to the value of the firm and good performance along these metrics will improve shareholder's value. Furthermore, it is easy to link performance in accounting measures to managerial actions. Therefore, it is preferable in environments of active monitoring. However, the bonus as an incentive pay may be criticized on the basis that it focuses the attention of managers on short-term performance and distracts from capitalizing on the long-term interests of shareholders. Stock-based compensation is introduced to align the long-term interests of shareholders with the interests of managers. It is argued that managerial equity ownership in a firm leads CEOs to manage in the best interests of shareholders because these interests are their own interests. However, there are wide differences of opinion among academics, practitioners, and policy makers regarding the effectiveness of stock-based compensation in promoting the long-term interests of shareholders. First, stock-based compensation may reward managers for success resulting from factors beyond the control of managers. Second, managers may not hold enough cash flow interest to align their interests with those of the owners. Third, there is no universally accepted model or method that can help owners to set the optimal stock-based compensation component to prevent excessive compensation. Therefore, we propose that shareholders who are in control of compensation packages are likely to prefer bonus compensation as a way to control the actions of managers and they are likely to offer equity based compensation based on market practices benchmarking methods.

[1] The remaining portion consists of annual pension, annual vocation, lump-sum pension, and retirement allowances.

In summary, our hypotheses are as follows:

H1a: The proportion of CEO annual bonuses in concentrated firms is lower than the proportion of CEO annual bonuses in widely-held firms.

H1b: The proportion of CEO contingent compensation in concentrated firms is lower than the proportion of CEO contingent compensation in widely-held firms.

Concentrated ownership may be the result of high percentage ownership by a family or by an institution. We propose that either form of control should improve monitoring and reduce agency costs but if all else are equal control by a family provides better monitoring than control by an institution. Therefore, our hypotheses can be expanded to include:

H2a: The proportion of CEO annual bonuses in family-controlled firms is the largest among the three types of ownerships: family-controlled, institution-controlled, and widely-held.

H2b: The proportion of CEO annual bonuses in institution-controlled firms is lower than that in family-controlled firms and is higher than that in widely-held firms.

H2c: The proportion of CEO annual bonuses in widely-held firms is the lowest among the three types of ownerships: family-controlled, institution-controlled, and widely-held.

H3a: The proportion of CEO contingent compensation in family-controlled firms is the lowest among the three types of ownerships: family-controlled, institution-controlled, and widely-held.

H3b: The proportion of CEO contingent compensation in institution-controlled firms is higher than that in family-controlled firms and is lower than that in widely-held firms.

H3c: The proportion of CEO contingent compensation in widely-held firms is the highest among the three types of ownerships: family-controlled, institution-controlled, and widely-held.

Previous empirical studies on CEO compensation concentrate mainly on the pay to performance relationship. Earlier studies, for example Jensen and Murphy (1990), Kaplan (1994), and Hall and Liebman (1998), argue that incentive pay is related to firm performance. However,

recent studies suggest that the relation between performance and incentive pay is weak. Shaw and Zhang (2010) find that CEO bonus compensation is less sensitive to poor earnings performance than it is to good earnings performance. Similarly, Fahlenbrach and Stulz (2011) find no evidence to support the proposition that the performance of banks during the 2008 financial market crisis is positively related to the alignment of incentives of bank managers and their shareholders. We examine the relation between incentive pay and firm performance to see whether controlling for ownership structure can clarify this relation.

H4a: Annual bonus of CEOs is positively related to firm performance and this relation varies across ownership structures

H4b: Contingent compensation of CEOs is positively related to firm performance and this relation varies across ownership structures

We examine how incoming CEOs are compensated in comparison to their predecessors. We propose that experience in the industry and in similar position may enable the incoming CEO to negotiate a high compensation package and a structure that is in the best interests of the CEO. On the other hand, the departure of a CEO could be seen as an opportunity for a firm to re-establish its own priorities and to design the compensation package to promote the interests of shareholders and the ultimate power brokers of the firm. Accordingly, we expect that the compensation of the incoming CEOs would be structured differently than the compensation of their predecessors. Furthermore, we propose that the structure of the compensation packages of incoming CEOs will vary depending on the ownership structure.

H5a: The bonus compensation of incoming CEOs is lower than the bonus compensation of their predecessors.

H5b: The contingent compensation of incoming CEOs is higher than the contingent compensation of their predecessors.

CHAPTER 4

Data

4.1 Ownership Structure

The sample selection starts by considering the 269 firms that made up the S&P/TSX Composite Index (formerly known as the TSX 300) at the end of 2007. These firms comprise approximately 71% of the market capitalization of all Canadian-based companies listed on the TSX. Our data spans the years 2003 to 2007 inclusive. Because the components of the S&P/TSX index vary from year to year, we choose the components of the 2007 index as the initial sample and then we track back through the sample period to select only the firms that have continuous presence on the S&P/TSX index throughout the sample period. By doing this, we get 143 firms which have full records.[2]

Data on ownership structure are manually collected from the Inter-Corporate Ownership (ICO) database which is released quarterly by Statistics Canada.[3] We choose the last quarter of each year to represent the firms' ownership for the entire year. We rely on the annual reports instead of the quarterly reports because the quarterly reports contain missing data. The accounting data is collected from the Compustat database.

From the ICO, we find that there are three overwhelming kinds of ownership structures: family-controlled, institution-controlled, and widely-held. The widely-held group consists of all companies that do not have a controlling interest of 10% or more. We define a firm as family-controlled if its controlling shareholders who own 10% or more are from a family-controlled group. Institution-controlled are firms with controlling shareholders from institutions such as pension plans, mutual funds, trusts, banks, and insurance companies. The categorization between widely-held, institution-controlled, or family-controlled is done each year from 2003 to 2007 inclusive which allows ownership to change over time. We observe that compared to the other two groups, the family-controlled firms have the most stable ownership structure over time.

In our study, a firm is categorized as having controlling shareholders if 10% of the voting shares of the firm are owned by a single individual, a group of individuals acting together, a

[2] Our data sample may be criticized on the basis that the method by which we selected the firms will subject the results to survivorship bias. However, our main objective is to compare the incentive compensation among the three ownership groups. We expect that the survivorship bias, if any, will have the same impact on each of the three groups. Thus, the survivorship bias will not affect the comparison results.

[3] Statistics Canada requires publicly held companies to identify any controlling interest of 10% or more. Failure to comply with this requirement violates Canadian laws and subjects the violators to penalties.

family, an institution, or another corporation. Previous studies, for example La Porta et al. (1999), show that this threshold is sufficient to control a firm's decision making system. Furthermore, other Canadian databases, such as the Financial Post (FP) Informat, use this threshold to classify firms between concentrated ownership and dispersed ownership.

While the 10% cut off is sufficient, it may not be necessary. Critics may argue that the 10% cut off is too high as ownership interests less than 10% may be effective in controlling a company. We agree with this argument but we cannot lower the cut off ownership level. The ICO database from which we obtain the control information does not report on ownership interests less than 10%. We decided to rely on the ICO despite its limitations for two reasons. First, we feel that it is the most reliable source given that the information is collected to comply with government regulations. Second, we considered the possible effects of using a high cut off level and concluded that it is not affecting the qualitative results. In our view, using a 10% cut off level instead of a lower one, for example 5%, would improperly classify some firms as widely-held when they should be classified as family-controlled or institution-controlled. The impact of this misclassification would be to weaken the differences between the widely-held firms and each of the other two groups. Our results suggest that the differences are significant despite the possible misclassifications.

According to La Porta et al (1999), an ultimate owner is the entity that has the most voting rights instead of cash flow rights. For example, a family-controlled firm is controlled by an individual or family owning 10% or more of the firm's voting stock. For this purpose, we track the ownership structures of the direct controllers and categorize firms accordingly. For example, Ensign Resource Service Group Inc. is controlled by the Mackenzie Financial Corporation through 12.33% of the voting rights. Meanwhile, Mackenzie Financial Corporation is 100% controlled by a family-controlled group. Under this case, Ensign Resource Service Group Inc. is categorized as family-controlled firm. In our sample, there are several companies for which the direct controllers are institutions while the ultimate controllers are families.

4.2 CEO compensation

CEO's compensation data are hand-collected from the proxy circulars of each company as listed in the System of Electronic Document Analysis and Retrieval (SEDAR)[4]. During our

[4] SEDAR is a comprehensive, online archive of securities documents filed by publicly traded companies in Canada.

study period, the majority of sample firms (87) had the same Chief Executive Officer over the entire 5-year period. We call this subsample the Permanent CEO Group. The remaining 39 firms experienced one or more changes in CEOs during the study period. We call this subsample the Transient CEO Group. Since 8 firms changed ownership structures in the transient CEO group, we use 31 (39 minus 8) firms to compare the compensation of the new CEOs with the compensation of their predecessors.[5] Eight firms changed CEOs more than once during the 5-year period of our study.

We combine the Permanent CEO Group and the Transient CEO Group to conduct multivariate analysis. For the 87 firms that make up the Permanent CEO Group, we obtain the market-to-book (M/B) ratio, the return on assets (ROA), and the debt-to-equity (D/E) ratio of each company from the Compustat database. For 8 firms, ratios are not reported. Thus, for the subsample of permanent CEO firms, we have 79 firms. In the Transient CEO Group, ratios of 6 firms are not available. Therefore, for the subsample of transient CEO firms, we have 33 firms. As the study covers the period 2003-2007 inclusive, for this group we have a total of 560 observations. The composition of the observations is as follows: 96 from family-controlled firms, 228 from institution-controlled firms, and 236 from widely-held firms.

The components of CEO compensation vary among various companies. In this study, the analysis of CEO compensation is based on five different measures of compensation: total compensation, salary, annual bonus, contingent compensation, and all other compensation. Salary measures the component of compensation that is fixed at the beginning of the year. The annual bonus is the short-term incentive which is often based on accounting measures of performance. Contingent compensation consists of stock options, performance plans, restricted options, and other long-term incentives[6]. The term 'contingent' indicates that such compensation depends on the performance of the underlying asset. All other compensation consists of annual

[5] The compensation of departing and the incoming CEOs are reported separately in the compensation information we found in the proxy circulars. If firms report compensation for a portion of the year for the departing and the incoming CEOs, we annualize the compensation.

[6] Some firms specify the maximum, target, and threshold of future payouts A firm grants a number of shares to its CEO, and it sets performance goals for the CEO. If firm performance is superior, the CEO can get a contain percentage (e.g.120%) of grant shares, which is the Maximum. If firm performance is average, the CEO gets the same number of shares as they are granted, which is the target. If firm performance is below the required level, the CEO will only get a percentage less than the target (e.g. 80%), which is threshold. We use the target to estimate the compensation.

pension, annual vocation, lump-sum pension, and retirement allowances. Total compensation is the sum of salary, annual bonus, contingent compensation, and all other compensation.

As salary, annual bonus and all other compensation are typically paid in cash or cash equivalent, the valuation of these three components is straightforward. However, the valuation of the contingent component is complex. We use the Black-Scholes Option Pricing model to calculate the dollar value of total contingent compensation.[7] This process involves several steps. First, we need to know the number of options granted the exercise price, and the time to expiry. These data are collected from the proxy statements. Second, we use the 3-month Treasury bill rate as the risk-free rate. We obtain this data from the Bank of Canada. Third, we assume the time period is monthly. Then, if companies provide the grant date only for the grant year, but do not provide a grant date in later years, we assume that the grant date in later years is the same date as the grant year. Fourth, if companies do not give the grant exercise price, we assume that the closing share price on the grant date is the grant exercise price.

Furthermore, to be consistent with prior studies (Jensen and Murphy 1990a and Zhou 2000), we use the standard deviation of the continuously compounded monthly return as our volatility. We use the monthly total return index over a three-year period ending with the grant date. We obtain this data from DataStream. This approach may be criticized on the basis that weekly and annual return may be more appropriate. First, weekly returns have higher autocorrelations than monthly and annual returns. Second, using annual returns to calculate volatility requires data from prior years and that may reduce the number of companies in our sample due to missing data. Third, the volatility as determined from prior years, many of which may be far from the grant date, may not reflect the true volatility of the underlying security.

Moreover, a number of firms report CEO compensation annually in US dollars. Some of these firms also report the average exchange rate for the year. For these firms, we convert the CEO compensation from US dollars to Canadian dollars using the reported exchange rate. If firms reported CEO compensation annually in US dollars, but do not report the exchange rate, we use the average exchange rate for the year as reported by the Bank of Canada. In addition,

[7] Canadian firms under the TSX do not need to report the values of option grants. We estimate the monetary values of options by the Black-Scholes formula (Fischer Black and Myron Scholes 1973). Option value $C_0 = S_0 \times N(d_1) - E/(1+R_f)^t \times N(d_2)$, where $d_1 = \left[\ln(S_0/E) + \left(R_f + 1/2 \times \sigma^2\right) \times t\right] / \left[\sigma \times \sqrt{t}\right]$, and $d_2 = d_1 - \sigma \times \sqrt{t}$. In the formula, S_0 is the value of the stock at the date, E is exercise price, t is expiration term (in months), R_f is the risk-free interest rate on 3-month Canadian Treasury Bills, σ is volatility, and N(•) is the cumulative standard normal distribution function.

with the intention of comparing compensation of departing and incoming CEOs, we record salary, bonus, and contingent pay in the year of the grant for both departing and incoming CEOs in the Transient group.

4.3 Variables

4.3.1. Dependent variables

We analyze three measures of CEO compensation: annual bonus, contingent pay, and total pay. Contingent pay includes securities under options (SUO), stock appreciation rights (SAR), value of restricted share units (LTIP), and contingent incentive pay. Total pay includes salary, annual bonus, contingent pay, and other pay. In addition, we use the percentage of each category of compensation (out of total compensation) as our dependent variable. In addition, we use the compensation per dollar of total assets as our dependent variable.

4.3.2. Control variables

Our review of prior research suggests the inclusion of four control variables in our analysis. Total assets represent one measure of size. This measure was used by Daily et al. (1998) and Chowdhury and Wang (2009). Chowdhury and Wang (2009) found a positive relationship between total assets and executive compensation in Canadian corporations. Therefore, in our original model, we control for firm size by using the natural logarithm of assets.

We use Tobin's q ratio to control for the growth opportunities of the firm. Tobin's q measures the market value of a firm's assets in relation to their replacement cost. Many studies, for example Hartzell and Starks (2003) and Harvey and Shrieves (2001), document a strong relationship between growth opportunities and the presence of incentive compensation. In addition, Chowdhury and Wang (2009) show that growth opportunities are positively related to incentive compensation of institution-controlled firms in Canada. We use Tobin's q to account for the variation in firm performance and to control for the presence of growth opportunities. We use the market-to-book (M/B) ratio as a proxy for Tobin's q. We download the appropriate data from the Compustat database.

Consistent with David et al (1998) and Chowdhury and Wang (2009), we use the return on assets (ROA) to measure firm performance. Chowdhury and Wang (2009) did not find a relationship between financial performance and executive compensation of Canadian firms while

Zhou (2000) suggests that an overall weak relationship exists between executive pay and performance in Canadian firms.

We use the debt to equity ratio as one of the explanatory variables. Previous studies, for example Healy and Cole (2000), argue that CEOs of firms with a high level of indebtedness would prefer less contingent pay to avoid the increased risk, because the amount of cash available for either dividends or cash compensation is influenced by debt. However, owners would like to offer CEO more stock-based compensation to prevent the CEO from choosing a debt to total equity ratio that is suboptimal to the stockholders. Hence, we expect a positive relation between the debt to equity ratio and incentive pay.

4.3.3. Dummy variables

Our main concern objective is to examine the relation between the ownership structure and CEO compensation. We start by comparing CEO compensation at the concentrated group with CEO compensation at the widely-held group. Dcon is the dummy variable that takes the value of 1 if a firm belongs to the concentrated ownership group and 0 otherwise. Then, the sample is divided between widely-held, institution-controlled, and family-controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. After that, we switch the base group from widely-held group to institution-controlled group, while DW is a dummy variable that takes the value of 1 if a firm is widely-held group and 0 otherwise.

In addition, we examine the industry effects. Given the limited sample size, we divide our sample into four industries based on the list of companies in the TSX Sector Indices: S&P/TSE Canadian Energy Sector Index, S&P/TSE Canadian Financials Sector Index, S&P/TSE Canadian Materials Sector Index, and other Indices.[8] We use other indices as the base index and add three dummies to represent the financial industry (DFin), the energy industry (DEgy), and the material industry (DMat). DFin is a dummy variable that takes the value of 1 if a firm is a member of the financial industry and 0 otherwise. DEgy and DMat are defined in the same manner.

[8] The other S&P/TSX sector indices are: Canadian Consumer Discretionary Canadian Consumer Staples, Canadian Diversified Metals & Mining, Canadian Gold Index, Canadian Health Care, Canadian Industrials, Canadian Information Technology, Canadian Real Estate, Canadian Telecommunication Services Sector, and Canadian Utilities

We use another dummy variable, D1YC, to control for newly appointed CEOs. D1YC takes the value of 1 if the CEO is in her/his first year on the job and 0 otherwise.

Finally, we control for the year effects. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007.

CHAPTER 5
Descriptive Statistics and Univariate Tests

In this chapter, we examine the trends of CEO monetary compensation over the period 2003-2007. For this analysis, the focus is on the compensation of CEOs who remained in the same position throughout the study period. Each component of CEO compensation is calculated as a percentage of total pay. In addition, for transient CEO firms we compare CEO compensation before and after the turnover. The analysis is conducted for the three different ownership structures: family-controlled, institution-controlled, and widely-held. Finally, for both permanent CEO firms and transient CEO firms we present descriptive statistics and univariate tests to compare the family-controlled, institution-controlled, and widely-held firms.

5.1. Permanent CEO firms

The following tables and figures analyze CEO compensation across different years. Table 1.1 presents the salary, annual bonus, contingent pay, and total compensation paid by permanent CEO firms. The table shows that all components of compensation have been increasing in Canada over the five-year period of 2003-07. We find that the family-controlled group has the highest pay in terms of salary, annual bonus, contingent pay, and total compensation. In addition, the growth rate of the CEO compensation is higher in the family-controlled group than in the other two groups. In 2003, the institution-controlled group has the lowest pay among the three groups. All components of CEO compensation have been increasing steadily from 2003 to 2006. This finding is consistent with the conclusions of previous studies which show that the contingent component of CEO compensation has increased in Canada (Zhou 2000; Chowdhury and Wang 2009). From 2006 and onwards, the components of compensation in the institution-controlled group were higher than the components of compensation in the widely-held group. In widely-held group, we see that the salary and annual bonus have increased sharply, but there is no change in the contingent pay. Thus, in 2007, the widely-held group has the lowest pay among the three groups.

[Insert Table 1.1 Here]

These findings can be observed in Figures 1.1, 1.2, and 1.3. Figure 1.1 shows that salary[9], adjusted for inflation, has been continually increasing from 2003 to 2007 for every ownership

[9] We obtain the annual rate of inflation from the Bank of Canada website.

group. Compared to the institution group and the widely-held group, the family-controlled group offers the highest salary for the CEO. Figure 1.2 shows that the annual bonuses of the widely-held and institution-controlled firms have moved higher slowly and are almost equal in 2007. In contrast, the annual bonuses of the family-controlled group have increased at a faster rate steadily over the years. Figure 1.3 shows that contingent compensation of the widely-held firms is almost stable during our study period. In contrast, the contingent pay of the family firms has increased sharply between 2003 and 2005 and stabilized in 2006 and 2007. Similarly, contingent pay of the institution-controlled group increased steadily between 2003 and 2006 but declined in 2007. Figure 1.4 illustrates that the total pay of both the family-controlled and the institution-controlled groups has an upward trend, whereas total pay of the widely-held firms is almost constant.

[Insert Figures 1.1, 1.2, 1.3, and 1.4 about Here]

Table 1.2 presents each of the components of CEO compensation as a proportion of total pay. The table shows that salary makes up a small proportion of total compensation. In 2003, the proportion of salary to total pay was 16.53%, 18.83%, and 16.45% respectively for the family-controlled, institution-controlled, and widely-held firms. Between 2004 and 2007 inclusive the ratio declines for the first two groups and remains almost stable for the widely-held firms.

[Insert Table 1.2 Here]

The table also shows that the ratio of CEO annual bonus to total pay in 2003 was almost equal to the ratio of salary to total pay. In 2003, bonus compensation was 19.37%, 17.13%, and 18.01% of total pay respectively for the family-controlled, institution-controlled, and widely-held firms. However, contrary to salary the proportion of bonus pay increased on average after 2003. In 2007, bonus payments account for 31.60%, 20.07%, and 24.46% of total compensation in the family-controlled, institution-controlled, and widely-held firms. In particular, the proportion of bonus payments in the family-controlled group experiences a sharp rise from 19.37% in 2003 to 31.60% in 2007. In the institution-controlled group the ratio in 2003 was 18.01% and it increased by only 2.8% over the five-year period. In the widely-held group, bonus compensation moves up to 24.46% over the five-year period. Hence, we can conclude that the annual bonus payments as proportion of total compensation have increased from 2003 to 2007 regardless of the ownership structure to which a firm belongs.

Furthermore, Table 1.2 shows that contingent pay makes up a significant proportion of total CEO compensation. In 2003, contingent compensation accounted for 58.55%, 57.81%, and 63.95% of total pay respectively for the family-controlled, institution-controlled, and widely-held firms. These proportions fluctuate slightly between 2003 and 2007 but contingent compensation remained well above 50% of total pay throughout the 5-year period. For example, the proportion of CEO contingent compensation in the family-controlled group increases from 58.55% in 2003 to 60.19% in 2005, but thereafter decreases to around 53%. Similarly, the ratio for the institution-controlled group rises to 68.15% in 2006, but it decreases to 60.94% in 2007. In the widely-held group, the proportion of contingent compensation in total pay decreases steadily from 63.95% in 2003 to 52.38% in 2006 but rises to 55.11% in 2007.

Figures 2.1, 2.2, and 2.3 present each of the components of CEO compensation as a proportion of total pay. Figure 2.1 illustrates that although S-to-TP in the institution-controlled group is the highest in 2003, it decreased continually from 2003 to 2006. The S-to-TP has become lower than the ratio in the widely-held group since 2006. S-to-TP in the widely-held group is relatively stable. In the family-controlled group, the S-to-TP deceases sharply in 2003. However, the ratio remains unchanged from 2004 and onwards.

Figure 2.2 shows the annual bonus as a proportion of total compensation. We see that the family-controlled group offers the highest proportion for the CEO across the three groups. Also, we see an upward trend of AB-to-TP over the five-year period. In widely-held group, AB-to-TP moves downward from 2006. In the institution-controlled group, we observe that AB-to-TP rises sharply from 2003 to 2004, decreases the next two years and finally recovers back in 2006.

Figure 2.3 shows that CP-to-TP follows a similar trend in the family-controlled group and the widely-held group over the study period. In particular, CP-to-TP follows a constant pattern from 2003 to 2005, a sharp decline for some time period and remains unchanged afterwards. In the institution-controlled group, CP-to-TP has increased dramatically from 2005 to 2006, and then starts to fall in 2006.

[Insert Figures 2.1, 2.2, and 2.3 about Here]

5.2 Transient CEO Group

A total of 39 firms (31% of all consistent ownership structure firms) replace their CEOs within the 5-year period. This result implies a replacement rate of 6% of CEOs per year. This

turnover is consistent with other studies that look at CEO turnover around this time frame by using US data (for example, Kaplan and Minton, 2006; Chhaochharia and Grinstein, 2009). Since 8 firms change both ownership structures and CEOs, 31 transient CEO firms are used to compare the compensation packages of new CEOs with the packages of their predecessors. In the multivariate tests, we include these 8 firms in the Transient CEO Group.

Regarding the corporations that change CEOs, we treat the change event for every CEO as a way to divide the data into two sub-samples. In the case of two changes, we have three periods. One period before the first change, another period after the second change, and the third period is in the middle. We give each company a maximum of one change. In the case of two or more CEO changes, the compensation of the first departing CEO is added to the data before the change and the compensation of the last incoming CEO is added to the data after the change. That is, we compare the last period with the first and ignore the periods in the middle.

We find that in the family-controlled group, firms offer the new CEO contingent incentive plans at the beginning of the term. As a result, contingent compensation and total compensation of the first year are much higher than other years.

Figure 3.1 presents the annual salary, annual bonus, contingent pay, other compensation, and total compensation of new and departing CEOs of the family-controlled firms. Total compensation of the departing CEOs includes payments related to retirement. The figure shows that the new CEOs in the family-controlled group get, on average, higher compensation in terms of contingent compensation and total compensation. This observation is consistent with prior studies. Chowdhury and Wang (2009) suggest that the fortunes of many Canadian companies have climbed during the past few years because of the increasing price of oil. This could be one of the reasons why compensation of the new CEOs is higher than the compensation of the old CEOs.

[Insert Figure 3.1 about Here]

Figure 3.2 illustrates the annual salary, annual bonus, contingent pay, other compensation, and total compensation of new and departing CEOs of the institution-controlled firms. It shows that in the institution-controlled firms, the new CEOs receive almost the same salary but higher bonus and higher contingent compensation than their outgoing peers. As a result, total compensation is higher as well.

[Insert Figure 3.2 about Here]

Figure 3.3 depicts the annual salary, annual bonus, contingent pay, other compensation, and total compensation of new and departing CEOs of the widely-held firms. It shows that in these firms, the new CEOs receive almost the same salary but lower bonus and lower contingent compensation than their outgoing peers. As a result, total compensation is lower as well.

[Insert Figure 3.3 about Here]

Our sample contains five firms whose CEOs retired during our study period. Specifically, four of these CEOs retire while employed at institution-controlled firms and one CEO retires while employed at a family-controlled firm. Figure 4.1 reports the same information as in Figure 3.1 after deleting the family-controlled firm whose CEO was replaced due to retirement. The table shows that the result shown in 3.1 remains unchanged. One exception is that the new CEOs get more other pay than old CEOs. Figure 4.2 reports the same information as in Figure 3.2 after deleting the four institution-controlled firms who's CEOs were replaced due to retirement. The figure shows that, on average, incoming CEOs receive higher annual bonus, contingent pay, and total compensation than their predecessors. At the same time, incoming CEOs are paid similar salary as the outgoing CEOs while other compensation of the incoming CEOs is less than other compensation of the outgoing CEOs.

[Insert Figures 4.1 and 4.2 Here]

Table 2.1 presents descriptive statistics for all components of compensation (annual salaries, annual bonuses, contingent compensation, and total pay) reported for the departing CEOs and for the incoming CEOs. On average, the salary of departing CEOs is higher than the salary of incoming CEOs. However, all other components of compensation are higher for the incoming CEOs than those for the departing CEOs. Total compensation of the incoming CEOs is also higher than the total compensation of the departing CEOs.

[Insert Table 2.1 Here]

Panel A of Table 2.2 shows the t-test results of annual bonus and contingent compensation in the Transient CEO Group. The evidence shows that the compensation, in terms of bonus, contingent pay, and total pay, of incoming CEOs is not significantly different from the compensation of outgoing CEOs.

[Insert Table 2.2 Here]

The table also presents the results of comparing the salary, bonus, and contingent pay as percentages of total pay of incoming and departing CEOs. We find that the contingent pay as a

percentage of total compensation of incoming CEOs is significantly higher than contingent pay as a percentage of total compensation of outgoing CEOs.

In conclusion, we find that the contingent pay of incoming CEOs is higher than the contingent pay of their predecessors particularly in the family-controlled and the institution-controlled firms. In contrast, in the widely-held firms contingent pay of new CEOs is lower than the contingent pay of their predecessors. This finding is consistent with Hypothesis H5b.

5.3 Aggregate Sample

5.3.1 Descriptive Statistics

Table 3 presents the summary statistics of the aggregate sample. We examine both the dependent and control variables. Our results show that contingent pay has a higher proportion of total pay than that of annual bonus. Also, some firms do not offer their CEO contingent pay in some specific years. The mean of the natural logarithm of firm size is 21.77 indicating that firm size is on average 2.848 billion dollars in assets. We use the variable return on assets (ROA) to measure the firm's performance. Some firms report negative ROA which means they do not perform well during our study period. The mean ROA is 4.17%. Market-to-book ratio (M/B) is used as a proxy for the firm's investment opportunities. The average of M/B is 2.73. Firms with above average M/B indicate more investment opportunities. We expect that the proportion of CEO contingent pay in such firms would be higher than firms with less investment opportunities. The debt-to-equity (D/E) ratio can have an impact on the availability of cash. We find that the mean of the D/E ratio is 85.77%.[10]

[Insert Table 3 Here]

Table 4 shows the summary statistics of both the dependent and control variables for each of the three ownership structure groups. Several observations can be made. We find that the role of different components of CEO pay tends to be different across firm size. As firms become larger, all components of compensation become higher. First, the family-controlled group has the largest average firm size and the highest compensation pay. Second, the family-controlled group has the highest average D/E ratio. Third, the family-controlled group has the lowest ROA and lowest M/B ratio. Fourth, the institution-controlled and widely-held firms have similar average firm size, average D/E ratio, average ROA, and average M/B. Fifth, the widely-held firms and

[10] Quebecor World Inc has an unusual D/E ratio of 1383.31%. We ran regressions after excluding this observation from the data. The results remain unchanged. Our reported results are based on the sample that includes Quebecor.

the institution-controlled firms pay similar compensation in the form of annual bonus, contingent pay, and total pay.

[Insert Table 4 Here]

We separate our sample into four different industries and Table 5 presents the summary statistics of both dependent and control variables for each industry. There are 90 observations that belong to the energy industry, 90 observations that belong to the financial industry, 110 observations that belong to the materials industry, and 270 observations in other industries. Energy, material, and financial industries are important industries in Canada, constituting 16%, 16% and 20%, respectively, of the total sample. Several observations can be made from the table. First, firms in the financial industry have the largest average size while the average firm size in the energy and material industries and other industries have similar average firm sizes. Second, the executives in the financial services industry earn higher pay than all other industries. In particular, financial CEOs receive notably higher pay in terms of the annual bonus and contingent pay. Third, firms in the energy and material industries have relatively lower pay than firms in other industries. Fourth, the financial industry has the lowest average ROA (2.34) while the ROA of the energy and material industries is almost three times higher. The ROA in the other firms is approximately 3.34. Fifth, the material industry has the highest average M/B of 3.06 followed by other industries (2.7) and the energy industry (2.6) while the financial industry has the lowest M/B of 2.5. Sixth, the material industry has the lowest average D/E ratio while the financial industry has the highest average D/E ratio.

[Insert Table 5 Here]

5.3.2 Univariate Tests

We conduct t-tests to determine the significance of the differences in the compensation levels paid by the family-controlled, institution-controlled, and widely-held firms. In particular, we conduct t-tests to compare bonus, contingent, and total compensation. The results are reported in Table 6.1. The table shows that both annual bonus and contingent pay of the family-controlled firms are significantly different from their counterparts at the institution-controlled firms or the widely-held firms. The family-controlled firms and institution-controlled firms seem to be using different levels of incentive payments to motivate their CEOs although both have high degree of concentration of ownership. Furthermore, Table 6.1 shows that the differences in

the components of compensation between the institution-controlled group and the widely-held group are not statistically significant.

[Insert Table 6.1 Here]

The results reported in Table 6.1 may be biased by size. We conduct z-tests to determine the significance of the differences in the structure of compensation paid by the family-controlled, institution-controlled, and widely-held firms. In particular, we conduct z-tests to compare bonus and contingent pay as percentages of total compensation. The results are reported in Table 6.2. The table shows that the family-controlled firms pay the highest bonus per dollar of compensation (23.6%) while the institution-controlled firms pay the lowest bonus per dollar of total compensation (21.6%). The widely-held group has a slightly higher percentage (21.9%) than the institution-controlled group. However, the differences among the ratios are statistically insignificant.

[Insert Table 6.2 Here]

Table 6.2 also shows that the family-controlled and the institution-controlled firms pay higher contingent compensation as percentage of total compensation than the widely-held firms. The institution-controlled firms pay the highest proportion of compensation in the form of contingent pay (46.8%). The family-controlled firms pay a lower fraction (45.6%). However, the differences among the ratios are statistically insignificant.

Another observation that can be learned from Table 6.2 is that contingent pay accounts for the highest proportion of total compensation and it ranges between 42.9% at the widely-held firms and 46.8% at the institution-controlled firms. This observation suggests that contingent compensation have become more and more significant in executive compensation since 1990. Using TSX data over the period of 1993 to 1995, Zhou (2000) shows that the mean of stock option related compensation is as high as total cash compensation. Using a Canadian sample over the period from 1996 to 2002, Chowdhury and Wang (2009) find that the average percentage of contingent pay to total pay in institution-controlled firms is 50.30%. Therefore, our results suggest that contingent compensation as a proportion of total compensation have increased during the 1996-2002 period and then decreased after 2002. It is possible that these changes are related to the stock market performance during the period of 1996-2000.

We also investigate how the control variables including total assets, ROA, M/B, and D/E vary among the family-controlled, institution controlled, and widely-held firms. The results are

shown in Table 7 from which several observations can be obtained. First, the family-controlled firms are significantly larger in size and they have significantly higher leverage than the firms in the institution-controlled or the widely-held firms. However, the sizes of the firms in the last two groups are not significantly different while widely-held firms are significantly more leveraged than the institution-controlled firms. In contrast, we find the ROA and M/B of the family-controlled group are significantly lower than their counterparts of the other two groups. The institution-controlled firms have similar ROA and M/B as the widely-held firms.

[Insert Table 7 Here]

We analyze the correlations among the different variables in Tables 8.1, 8.2, 8.3, and 8.4. The correlations among the different variables do not seem to be a problem in our study.

[Insert Table 8.1 Here]

[Insert Table 8.2 Here]

[Insert Table 8.3 Here]

[Insert Table 8.4 Here]

In summary, using unvariate tests we find that both annual bonus and contingent pay are different among the family-controlled, institution-controlled, and widely-held firms. This means that the structure of compensation of a firm's CEO depends on the firm's ownership structure. Next, we use multivariate analysis to examine how ownership structure affects CEO compensation after controlling for other factors that may influence CEO compensation.

CHAPTER 6

Multivariate Analysis

Previous empirical studies on CEO compensation mainly concentrate on the relation between pay and performance. The focus of this thesis is slightly different. We examine the effect of corporate ownership structure on the levels and structures of the CEO compensation. Since there is no precedent research on this topic, we borrow and extend the models on pay to performance relationship to serve our purpose.

Bertrand and Mullaninathan (2001) use the following equation to analyze agency framework.

$$y_{it} = \beta \times perf_{it} + \gamma_i + \delta_t + \alpha_x \times X_{it} + \varepsilon_{it}$$

Where y_{it} stands for total CEO pay in firm i at time t, $perf_{it}$ measures firm performance, γ_i are independent variables that represent the firms fixed variables, δ_t are time fixed variables, and X_{it} are firm characteristics and CEO's characteristics. The coefficient β captures the sensitivity between performance and CEO pay.

As well, Zhou (2000) estimates the following semi-elasticity specification to examine the relationship between pay and return and between pay and firm size.

$$\ln (CEO\ pay)_t = a + b \times \ln(firm\ size)_t + c \times return_t$$

Chowdhury and Wang (2009) used incentive pay parentage and the natural log of incentive pay as their dependent variables.

We extend the above models by adding a new independent variable, namely ownership structure, and controlling for the above mentioned pay to performance relationships. Models 1-3 are intended to replicate previous research, particularly Bertrand and Mullaninathan (2001), while models 4-6 are our main extended models. In model 1, we include the natural logarithm of total assets (TA), ROA, M/B, D/E, and dummy year variables as our independent variables. Year 2003 serves as the base year and we add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We use the aggregated sample to investigate the relationship between the annual bonus and firm characteristics.

$$LN(C_i) = \alpha_i + \beta_{TA} \ln(TA) + \beta_{ROA} ROA + \frac{\beta_{QM}}{B} + \beta_{\frac{D}{E}} \frac{D}{E} + \sum \beta_y\ Dummy\ Years + \varepsilon_{i,t} \qquad (1)$$

In model 2, we include industry factors by adding three dummy industries to represent the financial industry (DFin), energy industry (DEgy), and materials industry (DMat). The resulting equation is:

$$LN(C_i) = \alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \frac{\beta_Q M}{B} + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years + \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \varepsilon_{i,t} \quad (2)$$

In model 3, in order to study the impact of changes in a firm's CEO, we use a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year (Transient CEO Group) and 0 otherwise.

$$LN(C_i) = \alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years + \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC + \varepsilon_{i,t} \quad (3)$$

In model 4, we include variables to control for the concentrated group (firms controlled either by families or by institutions) and its interaction with each of the independent variables. The introduction of concentrated ownership dummies change the results reported with model 1.

$$LN(C_i) = \alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years + \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC + \omega_{Dcon}\, Dcon + \omega_{DconROA}Dcon * ROA + \omega_{Dconmb}\, Dcon * M/B + \omega_{DconD/E}\, Dcon * \frac{D}{E} \quad (4)$$

In model 5, we separate concentrated-controlled into two groups: family-controlled and institution-controlled. Including widely-held, we have three variables to control for the ownership structures. Therefore, we set two dummy variables to compare these three groups. We compare the annual bonus in the widely-held group to that in both the family-controlled group and the institution-controlled group, while using widely-held group as the base group.

$$LN(C_i) = \begin{aligned} & \alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years \\ & + \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC \\ & + \omega_{DF}DF + \omega_{DFTA}DF * \ln(TA) + \omega_{DFROA}DF * ROA \\ & + \omega_{DFmb}DF * M/B + \omega_{DFD/E}DF * \frac{D}{E} + \omega_{DI}DI + \omega_{DITA}DI * \ln(TA) \\ & + \omega_{DIROA}DI * ROA + \omega_{DImb}DI * M/B + \omega_{DID/E}DI * \frac{D}{E} \end{aligned} \quad (5)$$

In order to investigate how annual bonus in family-controlled group is related to annual bonus in institution-controlled group, we switch our base group, the widely-held group, to the institution-controlled group, all else equal.

$$LN(C_i) = \begin{aligned} & \alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years \\ & + \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC \\ & + \omega_{DFTA}DF * \ln(TA) + \omega_{DFROA}DF * ROA + \omega_{DFmb}DF * M/B + \omega_{DFD/E}DF * \frac{D}{E} \\ & + \omega_{DWTA}DW * \ln(TA) + \omega_{DWROA}DW * ROA + \omega_{DWmb}DW * M/B + \omega_{DWD/E}DW * \frac{D}{E} \end{aligned} \quad (6)$$

6.1 Natural logarithm of compensation as dependent variable

Table 9.1 reports the results of examining the relation between the annual bonus and various variables. The table shows that in the absence of control for ownership structure (Models 1, 2, and 3) the annual bonus is positively related to the return on assets and to total assets. When we divide the sample between concentrated ownership and widely held ownership additional observations emerge. First, within the widely-held firms the bonus is positively related to total assets and negatively related to the debt to equity ratio. Also, we find that for the widely held firms the return on assets is not a significant determinant of the bonus. Second, the concentrated ownership group seems to pay a higher bonus than the widely held group. Third, within the concentrated ownership group the bonus is positively and significantly related to the return on assets, the market to book ratio, and to the debt to equity ratio. This result suggests that the concentrated ownership firms are linking the higher bonus payments to performance implying support for our hypothesis that the owners of these firms are monitoring the CEOs more closely. Fourth, within the concentrated ownership structure the relation between the bonus and asset size

is negative and significant which is opposite to the result we found for the widely-held firms. Again, this result provides support to our hypothesis that the concentrated firms tie their bonuses to more meaningful measures of performance rather than size.

[Insert Table 9.1 Here]

Table 9.2 reports the results of examining the relation between the annual bonus after splitting the concentrated ownership group between family-controlled and institution-controlled firms. The table shows that both family-controlled and institution-controlled firms pay a higher bonus than the widely held group and that the bonus is positively and significantly related to the return on assets but negatively related to the size of assets. This result provides support to our hypothesis that the family-controlled and institution-controlled firms tie their bonuses to more meaningful measures of performance rather than size. Furthermore, Table 9.2 shows that the bonus in the family-controlled firms is positively related to the debt to equity ratio but this relation is not significant for the institution-controlled firms. Finally, Table 9.2 compares the institution-controlled firms with the family-controlled firms. The results suggest that on average the two groups pay similar amounts of bonuses but for the family-controlled firms the positive relation between bonus compensation and the return on assets is stronger. This result suggests that the level of monitoring by family-controlled firms is stronger which is consistent with our hypothesis.

[Insert Table 9.2 Here]

Table 10.1 reports the results of examining the relation between the incentive pay and various variables. The table shows that in the absence of control for ownership structure (Models 1, 2, and 3) the incentive pay is either negatively related to the return on assets or the relationship is not significant. In contrast, incentive pay seems to be positively and significantly related to asset size and the market to book ratio. When we divide the sample between concentrated ownership and widely held ownership (Model 4) additional observations emerge. First, within the widely-held firms the bonus is positively related to total assets and negatively related to the return on assets and to the debt to equity ratio. Second, the concentrated ownership group seems to pay higher incentive compensation but this compensation is negatively related to size while its relation to return on assets or to the market to book ratio are insignificant.

[Insert Table 10.1 Here]

Table 10.2 reports the results of examining the impact of ownership structure on the incentive pay after splitting the concentrated ownership group between family-controlled and institution-controlled firms. The table shows that the results of Table 10.1 related to the concentrated group can be repeated for each of the family-controlled and institution-controlled firms taken separately. As Model 6 shows, the incentive pay offered by the family-controlled and the institution-controlled firms does not seem to be related to performance and the levels of incentive pay provided by the two groups seem to be similar.

[Insert Table 10.2 Here]

Tables 10.1 and 10.2 suggest a significant industry effect in determining incentive compensation. The energy and materials industries seem to pay significantly higher incentive compensation than the financial industry firms. This result is consistent regardless of the ownership structure.

6.2 Bonus and incentive compensation as percentages of total assets

When we analyze the impact of the ownership structure on the annual bonus and the contingent compensation we find that asset size is a significant determinant of both. This result is consistent with the findings of previous studies. In this section, we control the impact of asset size by examining incentive compensation as a ratio of total assets.

In preparation for this analysis, we draw a graph that shows total compensation as a function of total assets. The graph is shown in Figures 5.1-5.4. Figure 5.1 shows the graph for the entire dataset while Figures 5.2-5.4 show the relationship for different ranges of assets. The graphs show that for assets sizes less than $9 billion total compensation is increasing in asset size. However, at larger asset sizes the graphs do not show a clear pattern of compensation increasing as a function of total assets.

Figures 6.1 and 6.2 show salary plus bonus compensation as a function of total assets. Figure 6.1 shows the graph for the entire dataset. This graph shows that bonus plus salary increases with asset size. Figure 6.2 shows the relation for asset sizes of $20.48 million to $55 billion. For this group of firms, bonus plus salary show an increasing pattern but the rate of increase will slow down as the size increases.

6.2.1. Annual bonus as a percentage of total assets

We use the ratio of annual bonus to total assets (AB-to-TA) as our dependent variable to test the main hypotheses. Since this dependent variable is restricted at the range of [0, 1], we use the Tobit model to mitigate the possible problem caused by censored variable. The independent variables are similar to what included in the previous models. Table 11.1 reports the results.

[Insert Table 11.1 Here]

The table shows that in the absence of control for ownership structure (Models 1, 2, and 3) the annual bonus as percentage of total assets is positively related to the return on assets and negatively related to the debt to equity ratio. When we divide the sample between concentrated ownership and widely held ownership additional observations emerge. First, within the widely-held firms the bonus continues to be negatively related to the debt to equity ratio but the return on assets is no longer a significant determinant of the bonus. Second, firms within the concentrated ownership group seem to pay a lower bonus per dollar of assets than the widely held group. Third, within the concentrated ownership group the bonus is positively and significantly related to the debt to equity ratio. Again, this result provides support to our hypothesis that the concentrated firms tie their bonuses to more meaningful measures of performance rather than size.

Table 11.2 reports the results of examining the relation between the annual bonus as a percentage of total assets and the various independent variables after splitting the concentrated ownership group between family-controlled and institution-controlled firms. The table shows that both family-controlled and institution-controlled firms pay a lower bonus per dollar of assets than the widely held group. In addition, within the family-controlled group we find that the bonus per dollar of assets is positively and significantly related to the return on assets and to the debt to equity ratio. Furthermore, Model 6 shows that the family-controlled firms pay lower bonuses per dollar of assets than the institution-controlled firms and that the return on assets is a positive and significant factor in determining the bonus. The impact of the return on assets is stronger for the family controlled firms than for the institution controlled firms. This result provides support to our hypothesis that the family-controlled and institution-controlled firms tie their bonuses to more meaningful measures of performance rather than size. Furthermore, it shows that the family-controlled firms provide more monitoring and stronger pay-performance relation than institution-controlled firms. Finally, Table 11.2 shows that the bonus in the family-

controlled firms is positively related to the debt to equity ratio but this relation is negative and significant for the institution-controlled firms.

[Insert Table 11.2 Here]

Tables 11.1 and 11.2 suggest that new CEOs often receive lower bonus per dollar of assets than their predecessors. This result is consistent in the various models but it is stronger when we compare the relations across the various ownership structures. In addition, the tables show that failing to differentiate between family-controlled and institution-controlled firms may lead us to conclude that there is a significant industry effect suggesting that financial firms pay lower bonus per dollar of assets. Controlling for ownership structure shows that this effect is not significant.

6.2.2. Contingent compensation as a percentage of total assets

We use the ratio of contingent compensation to total assets (CP-to-TA) as our dependent variable to test the main hypotheses. Since this dependent variable is restricted at the range of [0, 1], we use the Tobit model to mitigate the possible problem caused by censored variable. The independent variables are similar to what included in the previous models. Table 12.1 reports the results.

[Insert Table 12.1 Here]

The table shows that in the absence of control for ownership structure (Models 1, 2, and 3) the contingent compensation as percentage of total assets is negatively related to the return on assets and to the debt to equity ratio but positively related to the market to book ratio. When we divide the sample between concentrated ownership and widely held ownership these observations continue to hold. More important, the table shows that the contingent compensation as percentage of assets is insignificantly different from the same ratio at the widely-held firms.

Table 12.2 reports the results of examining the relation between the contingent compensation as percentage of total assets and the various independent variables after splitting the concentrated ownership group between family-controlled and institution-controlled firms. The table shows that there is no evidence to suggest that the family-controlled and institution-controlled firms pay a different percentage of contingent compensation per dollar of assets than the widely held group.

[Insert Table 12.2 Here]

Tables 12.1 and 12.2 show that there is no evidence to suggest that new CEOs receive different contingent compensation per dollar of assets than their predecessors. This result is consistent in all the models. In addition, the tables show that there is a strong industry effect. When we do not control for ownership structure, Table 12.1 shows that contingent compensation at financial institutions is lower than other industries while the energy and materials sectors pay greater contingent compensation per dollar of assets than financial institutions or other industries. Adding control for concentrated ownership does not change the results significantly. However, when we differentiate between family-controlled and institution-controlled firms, Table 12.2 shows that the results change significantly. Within the family-controlled firms, the debt to equity ratio seems to have a positive and significant impact on contingent compensation per dollar of assets. In addition, contingent compensation at financial institutions is no longer significantly lower than other industries. In contrast, the result related to the energy and materials sectors continues even after dividing the concentrated ownership firms between family-controlled and institution-controlled.

6.3 Ownership and the structure of compensation

One objective of this study is to determine whether ownership structure affects the structure of compensation. In particular, we examine whether bonus payment and contingent compensation as percentages of total compensation vary across the widely-held, institution-controlled, and family-controlled firms.

6.3.1 Annual bonus as a percentage of total pay (AB-to-TP)

We use the ratio of bonus compensation to total pay (AB-to-TP) as our dependent variable to test the main hypotheses. Since this dependent variable is restricted at the range of [0, 1], we use the Tobit model to mitigate the possible problem caused by a censored variable. The independent variables are similar to those used in the previous models.

Table 13.1 reports the results of models 1-4. It shows that in the absence of controls for ownership, the annual bonus as proportion of total pay is positively related to the return on assets and negatively related to the debt to equity ratio. Table 13.2 shows that as we add controls for ownership, the relation to the return on assets remains unchanged. Furthermore, Model 5 shows that the ratio of bonus to total compensation in widely-held firms is not significantly different

from the same ratio for institution-controlled and family-controlled firms. However, the relation between the return on assets and the ratio is strongest for the family-controlled firms while there is no evidence to suggest that the widely-held and the institution-controlled firms display significantly different relations.

[Insert Table 13.1 Here]

[Insert Table 13.2 Here]

Tables 13.1 and 13.2 also show that new CEOs receive lower proportion of their compensation in the form of bonus payments. This result is consistent in all the models. In addition, the tables show that there is a strong industry effect. Table 12.1 shows that when we do not control for ownership structure, the bonus payments at financial institutions as a percentage of total pay are higher than other industries while the energy and materials sectors pay less bonus compensation per dollar of total compensation. As we add controls for ownership structure, the tables show that there is no evidence to suggest that financial institutions pay significantly different bonuses than firms in other industries. However, the result related to the energy and materials sectors continues unchanged after we add control for ownership structure.

6.3.2 Contingent compensation as a percentage of total pay (CP-to-TP)

We use the ratio of contingent compensation to total pay (AB-to-TP) as our dependent variable to test the main hypotheses. Since this dependent variable is restricted at the range of [0, 1], we use the Tobit model to mitigate the possible problem caused by a censored variable. The independent variables are similar to those used in the previous models.

Table 14.1 reports the results of models 1-4. It shows that in the absence of controls for ownership, contingent compensation as proportion of total pay is positively related to the total assets and the market to book ratio and negatively related to the return on assets. However, the results of Model 4 show that as we add controls for ownership concentration, the return on assets becomes insignificant while the debt to equity ratio becomes negatively and significantly related to the contingent compensation of the widely held firms. Table 14.2 shows that as we differentiate between family-controlled and institution-controlled firms, we note that both pay higher proportion of compensation as equity-based. This result is stronger for the institution-controlled firms. Also, we observe that within the family-controlled firms the ratio of contingent compensation to total compensation drops with the return on assets.

[Insert Table 14.1 Here]

[Insert Table 14.2 Here]

Tables 14.1 and 14.2 also show that new CEOs receive higher proportion of their compensation in the form of contingent payments. This result is consistent in all the models. In addition, the tables show that there is a strong industry effect. The contingent payments at financial institutions as a percentage of total pay are lower than other industries while the energy and materials sectors pay more contingent compensation per dollar of total compensation. This result is consistent whether or not we control for ownership structure.

6.4 The relation between compensation and Total Market Return (TMR)

We examine whether the total market return, measured as the capital gains return on the firm's common shares plus the dividend yield, affects bonus compensation or stock-based compensation. We conduct this multivariate analysis without including the market to book ratio. Table 16 shows that the correlation between M/B and TMR is high.

[Insert Table 16 Here]

The TMR data is obtained from the DataStream database. We start our analysis by using the basic regression Model 7.[11] Model 8 adds industry dummy variables to the basic model. Model 9 adds a dummy variable to control for CEO departure and replacement, Model 10 adds a dummy variable to compare the widely-held firms with the concentrated ownership firms. Model 11 adds dummy variables to control for ownership structure and differentiates between widely-held, family-controlled, and institution-controlled firms. In this model, the widely-held firms constitute the base group. Model 12 is the same as model 11 except we use the institution-controlled firms as the base group instead of the widely held.

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q TMR + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years + \varepsilon_{i,t}$	(7)

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q TMR + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years$	(8)
	$+ \delta_{DFin} DFin + \delta_{DEgy} DEgy + \delta_{DMat} DMat + \varepsilon_{i,t}$	

[11] The dependent variable C_i is used to represent compensation and will be used to represent bonus or stock-based compensation, TMR is total market return, and all the other variables are as defined with Equation 1.

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q TMR + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years$	(9)
	$+ \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC + \varepsilon_{i,t}$	

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q TMR + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years$	(10)
	$+ \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{D1YC}D1YC$	
	$+\omega_{Dcon}\, Dcon * \ln(TA) + \omega_{DconROA}Dcon * ROA + \omega_{Dconmb}\, Dcon * TMR + \omega_{DconD/E}\, Dcon * \frac{D}{E} + \varepsilon_{i,t}$	

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years$	(11)
	$+ \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{TMR}TMR + \beta_{D1YC}D1YC$	
	$+\omega_{DF}DF + \omega_{DFTA}\, DF * \ln(TA) + \omega_{DFROA}DF * ROA + \omega_{DFmb}\, DF * M/B + \omega_{DFD/E}\, DF * \frac{D}{E}$	
	$+\omega_{DI}DI + \omega_{DITA}\, DI * \ln(TA) + \omega_{DIROA}DI * ROA + \omega_{DImb}DI * M/B + \omega_{DID/E}\, DI * \frac{D}{E} + \varepsilon_{i,t}$	

$LN(C_i)$	$\alpha_i + \beta_{TA}\ln(TA) + \beta_{ROA}ROA + \beta_Q M/B + \beta_{\frac{D}{E}}\frac{D}{E} + \sum \beta_y\, Dummy\ Years$	(12)
	$+ \delta_{DFin}DFin + \delta_{DEgy}DEgy + \delta_{DMat}DMat + \beta_{TMR}TMR + \beta_{D1YC}D1YC$	
	$+\omega_{DFTA}\, DF * \ln(TA) + \omega_{DFROA}DF * ROA + \omega_{DFmb}DF * M/B + \omega_{DFD/E}\, DF * \frac{D}{E}$	
	$+\omega_{DWTA}\, DW * \ln(TA) + \omega_{DWROA}DW * ROA + \omega_{DWmb}DW * M/B + \omega_{DWD/E}\, DW * \frac{D}{E} + \varepsilon_{i,t}$	

The results of analysing the relation between bonus compensation and TMR are reported in Tables 17.1 and 17.2. The table shows that TMR is not a significant factor in determining bonus compensation. At the same time, the relation between bonus compensation and the other decision and control variables remains unchanged in terms of the direction and significance. In addition, this observation can be repeated after controlling for industry effects, CEO turnover, and ownership structure.

[Insert Table 17.1 Here]

[Insert Table 17.2 Here]

Similarly, we examine the relation between contingent pay and TMR. The results are reported in Tables 18.1 and 18.2. TMR does not have a significant impact on contingent pay. At the same time, the relation between stock-based compensation and the other decision and control variables remains unchanged in terms of the direction and significance. Adding controls for industry effects, CEO turnover, and ownership structure does not change the insignificant relation between stock-based compensation and total market return.

[Insert Table 18.1 Here]

[Insert Table 18.2 Here]

CHAPTER 7

Conclusions and Recommendations for Further Research

This study examines the role that ownership structure plays in the governance of large, publicly traded firms in Canada. This subject is important given the steady rise in the levels of CEO compensation, particularly contingent compensation, over the past two decades. We argue that the split of CEO compensation between salary, bonus, stock-based, and other compensation would be different across different ownership structures.

Overall, our analysis leads to many observations related to the relation between ownership structure and compensation. First, both family-controlled and institution-controlled firms pay higher bonus than widely-held firms and that the bonus in concentrated ownership firms is positively and significantly related to the return on assets. This result provides support to our hypothesis that the family-controlled and institution-controlled firms tie their bonuses to meaningful measures of performance. Second, the analysis suggests that on average the family-controlled and institution-controlled firms pay similar amounts of bonuses but for the family-controlled firms the positive relation between bonus compensation and the return on assets is stronger. This result suggests that the level of monitoring by family-controlled firms is stronger which is consistent with our hypothesis.

We examine the relation between ownership and contingent compensation. We observe that within the widely-held firms contingent compensation is positively related to total assets and negatively related to the return on assets and to the debt to equity ratio. Second, the concentrated ownership group seems to pay higher incentive compensation but this compensation is negatively related to size while its relation to return on assets or to the market to book ratio are insignificant. Splitting the concentrated ownership group between family-controlled and institution-controlled firms reinforces the results reported for the concentrated ownership group. In conclusion, the incentive pay offered by the family-controlled and the institution-controlled firms does not seem to be related to performance and the levels of incentive pay provided by the two groups seem to be similar.

We examine the impact of ownership structure on the compensation per dollar of assets. Several observations emerge. First, both family-controlled and institution-controlled firms pay a lower bonus per dollar of assets than the widely held group. Second, within the family-controlled group we find that the bonus per dollar of assets is positively and significantly related to the

return on assets. Third, the family-controlled firms pay lower bonuses per dollar of assets than the institution-controlled firms and that the return on assets is a positive and significant factor in determining the difference in bonus. Fourth, the impact of the return on assets is stronger for the family controlled firms than for the institution controlled firms. This result provides support to our hypothesis that the family-controlled and institution-controlled firms tie their bonuses to measurable metrics of performance such as return on assets. In addition, the results show that the family-controlled firms provide more monitoring and exhibit stronger pay-performance relation than institution-controlled firms.

Similarly, we examine the impact of ownership structure on the ratio of contingent compensation per dollar of assets. We find that the ratio is negatively related to the return on assets but positively related to the market to book ratio. At concentrated ownership firms, contingent compensation as percentage of assets is insignificantly different from the same ratio at the widely-held firms. In addition, we find no evidence to suggest that the family-controlled and institution-controlled firms pay a different percentage of contingent compensation per dollar of assets than the widely held group. These results suggest that stock-based compensation is not a major tool to control the behaviour of managers but it is offered as part of a competitive compensation package consistent with market practices.

Additional support to this conclusion is obtained when we examine the relation between ownership structure and the ratio of bonus compensation to total compensation. The results show that the ratio in widely-held firms is not significantly different from the same ratio at institution-controlled and family-controlled firms. However, the relation between the return on assets and the ratio is strongest for the family-controlled firms. In contrast, there is no evidence to suggest that the widely-held and the institution-controlled firms display significantly different relations.

Similarly, we examine the impact of the ownership structure on the ratio of contingent compensation to total compensation. The results show that in comparison to widely-held firms both family-controlled and institution-controlled firms pay higher proportion of compensation as equity-based. This result is stronger for the institution-controlled firms. Also, we observe that within the family-controlled firms the ratio of contingent compensation to total compensation drops with the return on assets.

Our results suggest a significant industry effect in determining bonus and stock-based compensation. We find that the financial industry pays less bonus or contingent compensation than the other industries. At the same time, the energy and materials industries seem to pay significantly higher bonus and contingent compensation than the financial industry. When we scale compensation by total assets, we find no differences in the bonus per dollar of assets among the industry groups. In contrast, we find that contingent compensation per dollar of assets at financial institutions is insignificantly lower than other industries while the energy and materials sectors pay significantly higher contingent compensation per dollar of assets than financial institutions or other industries.

Our analysis also compares the compensation of incoming CEOs with the compensation of their predecessors. The results suggest that incoming CEOs often receive lower bonus per dollar of assets than their predecessors. Consistent with these results, we also find that incoming CEOs also receive lower proportion of their compensation in the form of bonus payments. In contrast, the analysis shows that incoming CEOs receive higher proportion of their compensation in the form of contingent payments.

In summary, we make significant contributions to the existing literature by comparing bonus and stock-based compensation across widely-held, institution-controlled, and family-controlled firms. Moreover, we compare and analyze the difference between incoming CEO compensation and outgoing CEO compensation across the three ownership structures. Overall, we obtain several important conclusions. First, we find that the ownership structure is very important in determining the level and structure of CEO compensation. In particular, family-controlled and institution-controlled firms have significantly different compensation structures. Second, we find that bonus compensation is more associated with performance than stock-based compensation. Third, control by a family seems to provide more effective and meaningful monitoring of managers than control by institutions. Fourth, the structure of compensation provided to incoming CEOs is significantly different from the structure of compensation provided to outgoing CEOs. In particular, incoming CEOs seem to obtain less bonus compensation and more stock-based compensation than their predecessors.

Our findings are useful for investors, academics, policy makers, and regulators. All these stakeholders should be aware that there is room for improvement in the relationship between managers and shareholders. Institutions do not seem to be providing active monitoring of

managers. Therefore, the existence of an institutional block holder does not necessarily reduce agency costs. Control by a family seems to provide better monitoring but as documented by the literature it has agency costs of its own. Therefore, there is need for improvement in corporate governance practices. In addition, our results show that the compensation package is a significant tool for influencing the CEO. However, the bonus component seems to be the only form of compensation that is associated with performance which suggests that stock-based compensation is not accomplishing its objectives of aligning the interests of managers and shareholders. We speculate that two factors may be magnifying the problem. First, there is no accurate system that sets the optimal stock-based compensation. Academics and practitioners should focus their attention to develop such a system. Second, there is lack of information regarding the ultimate value of stock-based compensation. The recent regulations which require the disclosure of the value attached to stock-based compensation is a good step in this direction. We suggest that policy makers and regulators should encourage better accounting for stock-based compensation.

This study has limitations. First, prior to 2005 Canadian firms were not required to provide an estimate of the full monetary value of CEO stock-based compensation in their financial statements. Thus, for some observations we use the approximate value estimated using the Black and Scholes (1972) option pricing model. The approximations may introduce some errors. Second, our independent variables do not include CEO characteristics, which, according to previous studies, might have an impact on CEO compensation.

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Appendix I: Tables

Table 1.1: Mean value of CEO monetary compensation in permanent CEOs firms: comparison between family controlled, institution-controlled, and widely-held firms

	2003	2004	2005	2006	2007
Panel A: Family-Controlled					
Salary	779,140	812,010	854,452	892,431	962,269
Annual Bonus	912,965	1,700,900	1,769,673	2,330,298	2,643,697
Contingent Pay	2,758,991	3,767,955	4,406,136	4,024,199	4,477,935
Total Compensation	4,712,431	6,391,648	7,319,985	7,499,857	8,365,905
	2003	2004	2005	2006	2007
Panel B: Institution-Controlled					
Salary	479,306	515,045	577,061	666,922	775,601
Annual Bonus	435,972	574,395	620,760	801,291	1,033,146
Contingent Pay	1,471,428	1,599,960	2,038,916	3,428,518	3,137,185
Total Compensation	2,545,116	2,888,358	3,646,281	5,031,109	5,148,305
	2003	2004	2005	2006	2007
Panel C: Widely-Held					
Salary	487,555	530,926	552,993	580,543	607,251
Annual Bonus	599,530	694,278	869,917	1,030,685	946,963
Contingent Pay	2,128,817	2,061,454	2,242,162	2,116,396	2,133,368
Total Compensation	3,328,682	3,494,418	3,895,404	4,040,169	3,871,169

Table 1.2: Mean value of salary, annual bonus, and contingent pay as a percentage of total pay in permanent CEOs firms: comparison between family controlled, institution-controlled, and widely-held firms

	2003	2004	2005	2006	2007
Panel A: Family-Controlled					
S-to-TP	0.1653	0.1270	0.1167	0.1190	0.1150
AB-to-TP	0.1937	0.2661	0.2418	0.3107	0.3160
CP-to-TP	0.5855	0.5895	0.6019	0.5366	0.5353
	2003	2004	2005	2006	2007
Panel B: Institution-Controlled					
S-to-TP	0.1883	0.1783	0.1583	0.1326	0.1507
AB-to-TP	0.1713	0.1989	0.1702	0.1593	0.2007
CP-to-TP	0.5781	0.5539	0.5592	0.6815	0.6094
	2003	2004	2005	2006	2007
Panel C: Widely-Held					
S-to-TP	0.1465	0.1519	0.1420	0.1437	0.1569
AB-to-TP	0.1801	0.1987	0.2233	0.2551	0.2446
CP-to-TP	0.6395	0.5899	0.5756	0.5238	0.5511

Notes: S-to-TP denotes salary as a percentage of total pay, AB-to-TP denotes annual bonus as a percentage of total pay, and CP-to-TP denotes contingent compensation as a percentage of total pay.

Table 2.1: Descriptive statistics in the transient CEO group

	Mean	s.d.	Min	Med	Max	Mode
New CEOs						
Salary	678,705	388,480	0	586,446	62,288,180	933,333
Annual Bonus	868,823	1,626,077	0	459,776	9,093,013	831,600
Contingent Pay	3,905,164	6,574,777	0	1,665,315	31,907,517	0
Total Pay	5,785,076	7,464,049	873,104	2,937,326	35,165,720	N/A
Old CEOs						
Salary	784,580	629,311	110,500	575,000	3,450,000	600,000
Annual Bonus	652,871	993,679	0	275,252	4,816,720	0
Contingent Pay	2,459,336	5,941,128	0	637,712	31,334,307	0
Total Pay	4,194,576	6,953,677	311,886	2,329,344	37,076,147	N/A
Observations	31					

Note: 1. ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.
2. Data sample include transient CEO firms without changing ownership structures.
3. AB-to-TP denotes annual bonus as a percentage of total pay and CP-to-TP denotes contingent compensation as a percentage of total pay.

Table 2.2: Comparison of the compensation of incoming CEOs and that of their predecessors

Panel A: total sample			
T-test: two sample assuming unequal variances	DIM	t-stats	p-value
Salary	-105875	-0.797	0.215
Annual Bonus	260856	0.762	0.225
Contingent Compensation	1445827	0.908	0.184
Total	1590500	0.868	0.194
Z-test: two sample for means	DIM	z-stats	p-value
S-to-TP	-0.073	-1.692**	0.045
AB-to-TP	-0.011	-0.212	0.416
CP-to-TP	0.109	1.532*	0.063
Panel B: family group			
T-test: two sample assuming unequal variances	DIM	t-stats	p-value
Salary	-388529	-0.824	0.215
Annual Bonus	254098	0.776	0.228
Contingent Compensation	4746786	0.760	0.231
Total	4481346	0.653	0.263
Z-test: two sample for means	DIM	z-stats	p-value
S-to-TP	-0.142	-1.310	0.095
AB-to-TP	0.033	0.350	0.364
CP-to-TP	0.210	1.074	0.141
Panel C: Institution group			
T-test: two sample assuming unequal variances	DIM	t-stats	p-value
Salary	-17245	0.151	0.441
Annual Bonus	153785	0.425	0.338
Contingent Compensation	166215	0.738	0.235
Total	1615033	1.248	0.116
Z-test: two sample for means	DIM	z-stats	p-value
S-to-TP	-0.048	-0.766	0.222
AB-to-TP	-0.037	-0.402	0.344
CP-to-TP	0.131	1.524*	0.064
Panel D: Widely-held group			
T-test: two sample assuming unequal variances	DIM	t-stats	p-value
Salary	-30748	-0.248	0.404
Annual Bonus	-49925	-0.181	0.30
Contingent Compensation	-456202	-0.323	0.375
Total	-278123	-0.145	0.443
Z-test: two sample for means	DIM	z-stats	p-value
S-to-TP	-0.058	-0.792	0.214
AB-to-TP	-0.008	-0.108	0.457
CP-to-TP	0.002	0.145	0.442

Note: 1. ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.
2. Data sample include transient CEO firms without changing ownership structures.
3. DIM denotes differences in mean.

Table 3: Descriptive statistic related to the dependent and control variables

	Mean	s.d.	Min	Med	Max	Mode
Dependent Variables						
Annual Bonus	913,019	1,465,376	0	500,000	12,929,728	0
Contingent Pay	2,885,466	5,149,953	0	1,206,930	63,815,034	0
Control Variables						
ln(TA)	21.77	1.74	16.83	21.56	27.12	21.61
ROA	4.17	7.13	-44.97	3.70	32.02	1.63
M/B	2.73	1.71	0.55	2.35	16.49	1.89
D/E (%)	85.77	135.43	0	44.93	1383.31	0

Notes: 1. Ln (TA) denotes capital expenditure, ROA denotes return on assets, M/B denotes market-to-book value, and D/E denotes debt to equity ratio.
2. Data include both permanent CEO firms and transient CEO firms

Table 4: Descriptive statistic related to the dependent and control Variables in three different ownership structures

Panel A: **Family-controlled group**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Annual Bonus	1,460,940	2,431,252	0	748,750	12,929,728	0
Contingent pay	5,489,968	9,914,024	0	1,326,253	63,815,034	0
Control Variables						
Ln(TA)	22.76	1.41	20.47	22.59	25.61	N/A
ROA	2.54	4.61	-17.29	1.90	12.27	N/A
M/B	2.29	1.21	0.55	1.89	7.68	1.89
D/E (%)	139.76	241.91	0	53.45	1383.31	0
Panel B: **Institution-controlled group**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Annual Bonus	824,449	1,317,417	0	475,000	12,807,300	0
Contingent pay	2,423,975	3,312,135	0	1,287,596	27,404,855	0
Control Variables						
ln(TA)	21.41	1.37	16.83	21.41	24.73	N/A
ROA	4.93	7.91	-41.91	4.18	32.02	N/A
M/B	2.89	1.84	0.61	2.36	12.43	1.51
D/E (%)	65.66	72.80	0	47.17	437.66	0
Panel C: **Widely-Held Group**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Annual Bonus	775,703	944,806	0	476,937	5,000,000	0
Contingent pay	2,271,854	3,066,349	0	1,087,309	17,832,455	0
Control Variables						
ln(TA)	21.65	2.01	17.65	21.24	27.12	21.61
ROA	4.10	7.07	-44.97	3.95	23.48	-0.31
M/B	2.76	1.73	0.60	2.40	16.49	1.60
D/E (%)	84.21	115.01	0	40.99	991.55	0

Notes: 1. Ln (TA) denotes capital expenditure, ROA denotes return on assets, M/B denotes market-to-book ratio, and D/E denotes debt to equity ratio.

2. Data include both permanent CEO firms and transient CEO firms. Observations are 96 in family-controlled group, 228 in institution-controlled group, and 236 in widely held group.

Table 5: Descriptive statistic related to the dependent and control variables in different industries

Panel A: **Financial Industry**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Bonus pay	1,554,841	1,484,468	0	1,400,000	5,000,000	0
Contingent pay	4,402,151	5,583,377	0	1,935,630	20,479,090	0
Control Variables						
Ln(TA)	23.89	2.16	18.87	23.69	27.12	N/A
ROA	2.34	2.73	-1.98	1.41	12.08	1.02
M/B	2.50	1.13	0.76	2.42	6.98	0.76
D/E (%)	114.55	134.36	0	47.68	480.70	0
Panel B: **Energy Industry**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Bonus pay	371,484	488,355	0	287,500	3,874,900	0
Contingent pay	1,966,984	2,468,270	0	883,167	11,711,567	0
Control Variables						
ln(TA)	20.91	1.33	17.65	20.85	23.62	N/A
ROA	6.31	7.26	-11.17	5.39	32.02	N/A
M/B	2.66	1.25	0.64	2.36	6.39	N/A
D/E (%)	89.81	92.15	0	59.33	437.66	0
Panel C: **Material Industry**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Bonus pay	690,189	770,581	0	513,500	4,822,429	0
Contingent pay	2,446,107	2,653,612	0	1,556,225	10,382,308	0
Control Variables						
ln(TA)	21.21	1.17	18.42	21.23	23.94	N/A
ROA	5.97	7.11	-12.72	5.04	30.74	N/A
M/B	3.06	1.90	0.60	2.49	9.34	3.19
D/E (%)	40.40	50.15	0	24.80	300.16	0
Panel D: **Other Industries**						
Dependent Variables	Mean	s.d.	Min	Med	Max	Mode
Bonus pay	970,372	1,775,991	0	548,000	12,929,728	0
Contingent pay	2,865,062	6,228,979	0	1,168,075	63,815,034	0
Control Variables						
ln(TA)	21.57	1.29	16.83	21.53	25.51	N/A
ROA	3.34	7.77	-44.97	3.98	24.10	1.63
M/B	2.70	1.90	0.55	2.24	16.49	2.22
D/E (%)	93.32	164.71	0	47.04	1383.31	0

Notes: 1. Ln (TA) denotes capital expenditure, ROA denotes return on assets, M/B denotes market-to-book value, and D/E denotes debt to equity ratio.

2. Data include both permanent CEO firms and transient CEO firms. Observations are 90 in the financial industry, 90 in the energy industry, 110 in the material industry, and 270 in the other industries.

Table 6.1: T-test: two sample assuming unequal variances (monetary terms across three ownerships)

	Family/Institution	Family/Widely Held	Institution/Widely Held
Annual Bonus	2.420**	2.680***	0.457
Contingent Pay	2.961***	3.120***	0.513

Table 6.2: Descriptive statistics mean value annual bonus and contingent pay

Panel A: Mean	Family	Institution	Widely Held
AB-to-TP	0.236	0.216	0.219
CP-to-TP	0.456	0.468	0.429
Panel B: *z-test:*	Family/Institution	Family/Widely Held	Institution/Widely Held
AB-to-TP	0.789	0.680	-0.158
CP-to-TP	-0.334	0.712	1.442

Note: 1. ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.
2. *Z-test:* two Sample for Means (different ownership structures)
3. Data include both permanent CEO firms and transient CEO firms
4. AB-to-TP denotes annual bonus as a percentage of total pay and CP-to-TP denotes contingent compensation as a percentage of total pay.

Table 7: Descriptive statistics mean value for the control variables

	Family/Institution	Family/Widely Held	Institution/Widely Held
Ln(TA)	7.595***	5.679***	-1.172
ROA	-3.406***	-2.38***	1.191
M/B	-3.449***	-2.819***	0.770
D/E	2.907***	2.153**	2.200**

Note: 1. ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.
2. *Z-test:* two Sample for Means (different ownership structures)
3. Data include both permanent CEO firms and transient CEO firms

Table 8.1: Correlation of variables in the aggressive sample

Panel A						
	ln (AB)	ln (CP)	ln (TA)	ROA	M/B	D/E
ln(AB)	1					
ln(CP)	0.2139	1				
ln(TA)	0.1428	0.2056	1			
ROA	0.2371	-0.0419	-0.0642	1		
M/B	0.0547	0.0629	-0.0919	0.0944	1	
D/E	-0.0687	0.0563	0.3141	-0.1600	0.0120	1
Panel B						
	AB-to-TP	CP-to-TP	ln(TA)	ROA	M/B	D/E
AB-to-TP	1					
CP-to-TP	-0.5885	1				
ln(TA)	-0.0167	0.1723	1			
ROA	0.1830	-0.0651	-0.0642	1		
M/B	-0.0312	0.0961	-0.0919	0.0944	1	
D/E	-0.1240	0.0353	0.3141	-0.1560	0.0120	1
Panel C						
	AB-to-TA	CP-to-TA	ROA	M/B	D/E	
AB-to-TA	1					
CP-to-TA	0.1991	1				
ROA	0.1879	-0.0778	1			
M/B	0.0278	0.2189	0.0944	1		
D/E	-0.1863	-0.0948	-0.1600	0.0120	1	

Notes: 1. data include both permanent CEOs firms and transient CEO firms.
2. ln(AB) denotes natural log of annual bonus, ln(CP) denotes natural log of contingent pay, AB-to-TP denotes annual bonus as a percentage of total pay, CP-to-TP denotes contingent pay as a percentage of total pay, AB-to-TA denotes annual bonus as a percentage of total assets, CP-to-TA denotes contingent pay as a percentage of total assets, TP-to-TA denotes total pay as a percentage of total assets, ln(ta) denotes natural log of total assets, ROA denotes return on assets, M/B denotes market-to-book ratio, D/E denotes debt to equity ratio.

Table 8.2: Correlation of variables in the family-controlled firms

Panel A						
	ln (AB)	ln (CP)	ln (TA)	ROA	M/B	D/E
ln(AB)	1.0000					
ln(CP)	0.0362	1.0000				
ln(TA)	-0.0612	0.1276	1.0000			
ROA	0.4371	-0.2052	-0.2257	1.0000		
M/B	0.1011	-0.0217	0.0811	0.2520	1.0000	
D/E	-0.1287	0.0305	-0.0428	-0.2187	0.3237	1.0000
Panel B						
	AB-to-TP	CP-to-TP	ln(TA)	ROA	M/B	D/E
AB-to-TP	1.0000					
CP-to-TP	-0.6758	1.0000				
ln(TA)	-0.1354	0.1640	1.0000			
ROA	0.3638	-0.3199	-0.2257	1.0000		
M/B	-0.0413	0.0477	0.0811	0.2520	1.0000	
D/E	-0.2121	0.0104	-0.0428	-0.2187	0.3237	1.0000
Panel C						
	AB-to-TA	CP-to-TA	ROA	M/B	D/E	
AB-to-TA	1.0000					
CP-to-TA	0.0885	1.0000				
ROA	0.2971	-0.2699	1.0000			
M/B	-0.0725	0.0061	0.2520	1.0000		
D/E	-0.0360	0.1140	-0.2187	0.3237	1.0000	

Notes: 1. data include family controlled firms.

2. ln(AB) denotes natural log of annual bonus, ln(CP) denotes natural log of contingent pay, AB-to-TP denotes annual bonus as a percentage of total pay, CP-to-TP denotes contingent pay as a percentage of total pay, AB-to-TA denotes annual bonus as a percentage of total assets, CP-to-TA denotes contingent pay as a percentage of total assets, TP-to-TA denotes total pay as a percentage of total assets, ln(TA) denotes natural log of total assets, ROA denotes return on assets, M/B denotes market-to-book ratio, D/E denotes debt to equity ratio.

Table 8.3: Correlation of variables in the institution-controlled firms

Panel A						
	ln (AB)	ln (CP)	ln (TA)	ROA	M/B	D/E
ln(AB)	1.0000					
ln(CP)	0.1905	1.0000				
ln(TA)	-0.0238	0.0098	1.0000			
ROA	0.3605	0.0363	0.0872	1.0000		
M/B	0.1107	0.1095	-0.1661	0.0600	1.0000	
D/E	-0.1242	0.0088	0.2027	-0.0283	0.0926	1.0000
Panel B						
	AB-to-TP	CP-to-TP	ln(TA)	ROA	M/B	D/E
AB-to-TP	1.0000					
CP-to-TP	-0.6347	1.0000				
ln(TA)	0.0197	0.0673	1.0000			
ROA	0.1778	-0.0066	0.0872	1.0000		
M/B	-0.0187	0.1341	-0.1661	0.0600	1.0000	
D/E	-0.1963	0.0904	0.2027	-0.0283	0.0926	1.0000
Panel C						
	AB-to-TA	CP-to-TA	ROA	M/B	D/E	
AB-to-TA	1.0000					
CP-to-TA	0.1577	1.0000				
ROA	0.2560	-0.1152	1.0000			
M/B	0.0418	0.2539	0.0600	1.0000		
D/E	-0.2564	0.0505	-0.0283	0.0926	1.0000	

Notes: 1. data include institution controlled firms.

2. ln(AB) denotes natural log of annual bonus, ln(CP) denotes natural log of contingent pay, AB-to-TP denotes annual bonus as a percentage of total pay, CP-to-TP denotes contingent pay as a percentage of total pay, AB-to-TA denotes annual bonus as a percentage of total assets, CP-to-TA denotes contingent pay as a percentage of total assets, TP-to-TA denotes total pay as a percentage of total assets, ln(TA) denotes natural log of total assets, ROA denotes return on assets, M/B denotes market-to-book ratio, D/E denotes debt to equity ratio.

Table 8.4: Correlation of variables in the widely-held firms

Panel A						
	ln (AB)	ln (CP)	ln (TA)	ROA	M/B	D/E
ln(AB)	1.0000					
ln(CP)	0.3095	1.0000				
ln(TA)	0.3199	0.3782	1.0000			
ROA	0.0750	-0.0847	-0.0933	1.0000		
M/B	-0.0106	0.0424	-0.0211	0.0750	1.0000	
D/E	0.0066	0.1376	0.5780	-0.2474	-0.1536	1.0000
Panel B						
	AB-to-TP	CP-to-TP	ln(TA)	ROA	M/B	D/E
AB-to-TP	1.0000					
CP-to-TP	-0.5078	1.0000				
ln(TA)	-0.0250	0.2611	1.0000			
ROA	0.1581	-0.0645	-0.0933	1.0000		
M/B	-0.0321	0.0758	-0.0211	0.0750	1.0000	
D/E	-0.0528	0.0419	0.5780	-0.2474	-0.1536	1.0000
Panel C						
	AB-to-TA	CP-to-TA	ROA	M/B	D/E	
AB-to-TA	1.0000					
CP-to-TA	0.2269	1.0000				
ROA	0.1233	-0.0635	1.0000			
M/B	0.0054	0.1709	0.0750	1.0000		
D/E	-0.2504	-0.2474	-0.2474	-0.1536	1.0000	

Notes: 1. data include widely-held firms.

2. ln(AB) denotes natural log of annual bonus, ln(CP) denotes natural log of contingent pay, AB-to-TP denotes annual bonus as a percentage of total pay, CP-to-TP denotes contingent pay as a percentage of total pay, AB-to-TA denotes annual bonus as a percentage of total assets, CP-to-TA denotes contingent pay as a percentage of total assets, TP-to-TA denotes total pay as a percentage of total assets, ln(TA) denotes natural log of total assets, ROA denotes return on assets, M/B denotes market-to-book ratio, D/E denotes debt to equity ratio.

Table 9.1: The impact of ownership structure on the natural log of annual bonus (OLS)

In model1, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. *In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 1*	*T-stat*	*2*	*T-stat*	*3*	*T-stat*	*4*	*T-stat*
α	-1.6501	-0.5591	-3.3069	-1.0219	-3.3017	-1.0202	-18.5654	-4.4370***
Ln(TA)	0.5147	3.7519***	0.5964	4.0201***	0.6009	4.0652***	1.4043	7.2911***
ROA	0.1576	5.3582***	0.1538	5.0025***	0.1505	4.9438***	0.0260	0.5016
M/B	0.1318	1.0031	0.1212	0.9246	0.1078	0.8259	-0.2208	-0.9994
D/E	-0.0033	-1.6370	-0.0032	-1.5868	-0.0032	-1.5858	-0.0122	-4.2756***
Dyr04	0.7641	1.1134	0.7476	1.0848	0.7997	1.1543	0.9134	1.3562
Dyr05	1.2122	1.8491*	1.1897	1.8070*	1.3130	1.9933**	1.6056	2.5129**
Dyr06	1.2876	1.9792**	1.2503	1.8996*	1.2995	1.9691**	1.4806	2.3589**
Dyr07	1.0417	1.5481	0.9905	1.4625	0.9804	1.4440	1.3436	2.0263**
Dfin			-0.6837	-0.9580	-0.7181	-1.0061	-1.5933	-2.0838**
Degy			-0.2428	-0.4346	-0.2888	-0.5144	-0.6361	-1.1167
Dmat			0.4733	0.9613	0.4779	0.9708	-0.7076	-1.3563
D1yc					-1.2112	-1.3262	-1.2610	-1.4504
Dcon							28.9372	4.4918***
Dcon*ln(TA)							-1.4380	-4.8760***
Dcon*ROA							0.2053	3.2728***
Dcon*M/B							0.4452	1.6966*
Dcon*D/E							0.0088	2.4625**
Adjusted R-square	0.087		0.086		0.088		0.150	
F-statistic	7.614		5.762		5.481		6.822	
Observations	560		560		560		560	

Table 9.2: Natural log of annual bonus in widely-held, institution-controlled, and family-controlled firms (OLS)

*In model 5, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). Moreover, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*T-stat*	*6*	*T-stat*
α	-19.7558	-4.6390***	11.9361	1.9702**
Ln(TA)	1.4552	7.4315***	-0.0972	-0.3482
ROA	0.0241	0.4649	0.2009	5.4715***
M/B	-0.2094	-0.9423	0.2223	1.5724
D/E	-0.0121	-4.2471***	-0.0088	-1.8478*
Dyr04	0.9867	1.4704	0.9867	1.4704
Dyr05	1.5775	2.4698**	1.5775	2.4698**
Dyr06	1.4743	2.3639**	1.4743	2.3639**
Dyr07	1.3295	2.0242**	1.3295	2.0242**
Dfin	-1.8389	-2.3194**	-1.8389	-2.3194**
Degy	-0.2803	-0.4880	-0.2803	-0.4880
Dmat	-0.5409	-0.9991	-0.5409	-0.9991
D1yc	-1.2526	-1.4444	-1.2526	-1.4444
DF	22.3362	2.3589**	-9.3557	-0.8522
DF*ln(TA)	-1.1513	-2.6934**	0.4011	0.8051
DF*ROA	0.4937	4.2209***	0.3169	2.8597***
DF*M/B	0.2789	0.4921	-0.1528	-0.2790
DF*D/E	0.0105	2.6905***	0.0072	1.3207
DI	31.6919	4.0301***		
DI*ln(TA)	-1.5524	-4.2574***		
DI*ROA	0.1768	2.7932***		
DI*M/B	0.4316	1.6151		
DI*D/E	0.0033	0.6113		
Adjusted R-square	0.159		0.159	
F-statistic	5.799		5.799	
Observations	560		560	

Table 10.1: The impact of ownership structure on the natural log of contingent compensation (OLS)

*In model1, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 1*	*T-stat*	*2*	*T-stat*	*3*	*T-stat*	*4*	*T-stat*
α	-4.3253	-1.6114	-13.568	-3.8456***	-13.5724	-3.8310***	-26.7482	-6.0524***
Ln(TA)	0.6792	5.4893***	1.1033	6.7929***	1.0995	6.7473***	1.7452	8.5551***
ROA	-0.0315	-1.0019	-0.0656	-1.9987**	-0.0629	-1.9135*	-0.0859	-1.9027*
M/B	0.2697	1.9932**	0.2556	1.8801*	0.2667	1.9627*	0.1444	0.5971
D/E	-0.0007	-0.3462	-0.0011	-0.5287	-0.0011	-0.5303	-0.0059	-1.9502*
Dyr04	0.8207	1.0619	0.7383	0.9760	0.6948	0.9187	0.7988	1.0679
Dyr05	1.3577	1.8249*	1.2298	1.7011*	1.1270	1.5434	1.2912	1.7714*
Dyr06	0.6171	0.7877	0.4328	0.5684	0.3917	0.5142	0.5374	0.7057
Dyr07	0.9187	1.1794	0.6707	0.8690	0.6791	0.8780	0.9242	1.2006
Dfin			-2.2535	-2.6250***	-2.2248	-2.5719**	-2.9027	-3.2105***
Degy			1.8168	2.8715***	1.8551	2.9257***	1.7478	2.7077**
Dmat			2.1719	3.8515***	2.1681	3.8380***	1.3828	2.3468**
D1yc					1.0094	1.2034	0.9620	1.1756
Dcon							25.8375	4.3670***
Dcon*ln(TA)							-1.2128	-4.4807***
Dcon*ROA							0.0359	0.5624
Dcon*M/B							0.1252	0.4352
Dcon*D/E							0.0043	1.0701
Adjusted R-squared	0.043		0.088		0.088		0.108	
F-statistic	4.152		5.927		5.539		4.995	
Observations	560		560		560		560	

Table 10.2: Natural log of contingent compensation in widely-held, institution-controlled, and family-controlled firms (OLS)

*In model 5, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). Moreover, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*T-stat*	*6*	*T-stat*
α	-26.9059	-6.0247***	3.0363	0.5229
Ln(TA)	1.7523	8.5198***	0.3571	1.3103
ROA	-0.0871	-1.9162*	-0.0224	-0.4271
M/B	0.1386	0.5689	0.2433	1.4815
D/E	-0.0061	-1.9752**	-0.0044	-1.0231
Dyr04	0.7966	1.0531	0.7966	1.0531
Dyr05	1.3935	1.9001*	1.3935	1.9001
Dyr06	0.6226	0.8141	0.6226	0.8141
Dyr07	1.0040	1.2973	1.0040	1.2973
Dfin	-2.9082	-3.2275***	-2.9082	-3.2275***
Degy	1.8000	2.6277***	1.8000	2.6277***
Dmat	1.2242	2.0911**	1.2242	2.0911**
D1yc	0.8280	1.0160	0.8280	1.0160
DF	18.7768	2.1508**	-11.1654	-1.1608
DF*ln(TA)	-0.9050	-2.3270**	0.4902	1.1330
DF*ROA	-0.1455	-1.1179	-0.2102	-1.5696
DF*M/B	0.2823	0.5404	0.1776	0.3602
DF*D/E	0.0044	0.8960	0.0028	0.4853
DI	29.9422	4.2630***		
DI*ln(TA)	-1.3951	-4.2550***		
DI*ROA	0.0647	0.9386		
DI*M/B	0.1046	0.3532		
DI*D/E	0.0016	0.2972		
Adjusted R-squared	0.108		0.108	
F-statistic	4.076		4.076	
Observations	560		560	

Table 11.1: The impact of ownership structure on the annual bonus as a proportion of total assets (Tobit)

*In model1, use return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 1*	*T-stat*	*2*	*T-stat*	*3*	*T-stat*	*4*	*T-stat*
α	0.0002	2.5188**	0.0002	3.0105***	0.0002	3.1780***	0.0005	4.1727***
ROA	0.00002	3.6438***	0.00002	3.4572***	0.00002	3.3909***	0.000008	1.0858
M/B	0.000009	0.5368	0.000006	0.3944	0.000005	0.2950	-0.00003	-0.9553
D/E	-0.000001	-2.9567***	-0.000001	-2.8902***	-0.000001	-2.9014***	-0.000002	-4.7242***
Dyr04	0.0001	1.2307	0.0001	1.2168	0.0001	1.2836	0.00009	1.1885
Dyr05	0.0001	1.7587*	0.0001	1.7671*	0.0002	1.9174*	0.0002	2.0230**
Dyr06	0.00008	1.1121	0.00008	1.1129	0.0001	1.1806	0.0001	1.2063
Dyr07	0.0001	1.6496*	0.0001	1.6536*	0.0001	1.6172	0.0001	1.7764*
Dfin			-0.0002	-2.6492***	-0.0002	-2.6927**	-0.0001	-1.8260*
Degy			-0.0001	-0.8092	-0.00007	-0.8914	-0.0001	-1.4529
Dmat			-0.000004	-0.0658	-0.000004	-0.0620	-0.000002	-0.0238
D1yc					-0.0002	-1.9539*	-0.0002	-1.9446*
Dcon							-0.0004	-3.0213***
Dcon*ROA							0.00002	1.6394
Dcon*M/B							0.00005	1.4442
Dcon*D/E							0.000001	2.6616***
Adjusted R-square	0.052		0.056		0.058		0.075	
Akaike info criterion	-9.802		-9.802		-9.803		-9.813	
Schwarz criterion	-9.733		-9.709		-9.702		-9.682	
Observations	560		560		560		560	

Table 11.2: Annual bonus as a proportion of total assets in widely-held, institution-controlled, and family-controlled firms (Tobit)

*In model 5, use return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). We add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family-controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*Z-stat*	*6*	*Z-stat*
α	0.0005	4.1301***	0.0002	2.4275**
ROA	0.000008	1.0944	0.00002	2.8867***
M/B	-0.00003	-0.9758	0.00002	1.2283
D/E	-0.000002	-4.8765***	-0.000002	-3.6236***
Dyr04	0.0001	1.2943	0.0001	1.2943
Dyr05	0.0002	2.1752**	0.0002	2.1752**
Dyr06	0.0001	1.3939	0.0001	1.3939
Dyr07	0.0001	1.9003*	0.0001	1.9003*
Dfin	-0.00009	-1.2541	-0.00009	-1.2541
Degy	-0.00008	-1.0340	-0.00008	-1.0340
Dmat	-0.00002	-0.2825	-0.00002	-0.2825
D1yc	-0.0002	-2.3242**	-0.0002	-2.3242**
DF	-0.0005	-3.1721***	-0.0002	-1.6692*
DF*ROA	0.00004	2.7022***	0.00003	1.9143*
DF*M/B	-0.00003	-0.6156	-0.00008	-1.8212*
DF*D/E	0.000002	4.2951***	0.000002	3.5371***
DI	-0.0003	-1.9404*		
DI*ROA	0.00001	1.2409		
DI*M/B	0.00005	1.4602		
DI*D/E	0.0000001	-0.1166		
Adjusted R-square	0.085		0.085	
Akaike info criterion	-9.822		-9.822	
Schwarz criterion	-9.660		-9.660	
Observations	560		560	

Table 12.1: The impact of ownership structure on the contingent compensation as a proportion of total assets (Tobit)

*In model1, use return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 1*	*Z-stat*	*2*	*Z-stat*	*3*	*Z-stat*	*4*	*Z-stat*
α	0.0006	2.0627**	0.0004	1.5622	0.0004	1.3873	0.0006	1.7319*
ROA	-0.00004	-2.2782**	-0.00005	-3.0313***	-0.00005	-2.9291***	-0.00005	-1.8982*
M/B	0.0003	4.1542***	0.0003	4.2522***	0.0003	4.3373***	0.0002	2.3265**
D/E	0.0000	-3.1833***	-0.000001	-2.2295**	0.00000	-2.2581**	0.0000	-2.5873**
Dyr04	-0.0002	-0.4758	-0.0002	-0.4857	-0.0002	-0.5739	-0.0002	-0.5519
Dyr05	-0.0001	-0.3165	-0.0001	-0.2941	-0.0002	-0.4981	-0.0002	-0.4436
Dyr06	-0.0006	-1.7066*	-0.0005	-1.6866*	-0.0006	-1.7607*	-0.0006	-1.7169*
Dyr07	-0.0006	-1.8566*	-0.0006	-1.8565*	-0.0006	-1.8633*	-0.0005	-1.7501*
Dfin			-0.0006	-2.6783***	-0.0006	-2.5737**	-0.0005	-1.9563*
Degy			0.0008	2.5131**	0.0008	2.6140***	0.0008	2.5224**
Dmat			0.0008	2.9579***	0.0008	2.9890***	0.0008	2.8227***
D1yc					0.0007	1.5803	0.0007	1.5993
Dcon							-0.0004	-0.9990
Dcon*ROA							-0.000003	-0.1018
Dcon*M/B							0.0001	0.6395
Dcon*D/E							0.000002	1.2832
Adjusted R-square	0.051		0.088		0.095		0.093	
Akaike info criterion	-7.416		-7.454		-7.458		-7.446	
Schwarz criterion	-7.347		-7.361		-7.357		-7.315	
Observations	560		560		560		560	

Table 12.2: Contingent compensation as a proportion of total assets in widely-held, institution-controlled, and family-controlled firms (Tobit)

*In model 5, use return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). We add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family-controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*Z-stat*	*6*	*Z-stat*
α	0.0007	1.8813*	0.0004	1.0006
ROA	0.0000	-1.8756*	-0.00005	-2.1724**
M/B	0.0002	2.2660**	0.0003	3.4936***
D/E	-0.000003	-2.8055***	0.0000002	0.0765
Dyr04	-0.0002	-0.5644	-0.0002	-0.5644
Dyr05	-0.0002	-0.4225	-0.0002	-0.4225
Dyr06	-0.0005	-1.6851*	-0.0005	-1.6851*
Dyr07	-0.0005	-1.6869*	-0.0005	-1.6869*
Dfin	-0.0004	-1.5971	-0.0004	-1.5971
Degy	0.0007	2.0223**	0.0007	2.0223**
Dmat	0.0007	2.4898**	0.0007	2.4898**
D1yc	0.0007	1.5850	0.0007	1.5850
DF	-0.0004	-1.2073	-0.0002	-0.4803
DF*ROA	0.0000	-0.4345	-0.00001	-0.3104
DF*M/B	-0.0001	-0.8188	-0.0002	-1.5568
DF*D/E	0.000003	2.1373**	-0.0000003	-0.0961
DI	-0.0003	-0.5942		
DI*ROA	-0.000004	-0.1323		
DI*M/B	0.0001	0.6431		
DI*D/E	0.000003	0.8801		
Adjusted R-square	0.095		0.095	
Akaike info criterion	-7.443		-7.443	
Schwarz criterion	-7.281		-7.281	
Observations	560		560	

Table 13.1: The impact of ownership structure on the annual bonus as a proportion of total pay (Tobit)

*In model1, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% level.*

Independent Variable	*Model 1*	*T-stat*	*2*	*T-stat*	*3*	*T-stat*	*4*	*T-stat*
α	0.0905	0.7460	0.3643	2.3812 **	0.3700	2.4166**	0.2155	1.0415
Ln(TA)	0.0032	0.5911	-0.0093	-1.3424	-0.0092	-1.3249	-0.0007	-0.0684
ROA	0.0063	4.7976***	0.0074	5.4197 ***	0.0071	5.2828 ***	0.0049	2.1817 **
M/B	-0.0045	-0.7842	-0.0047	-0.8131	-0.0057	-0.9953	-0.0129	-1.4743
D/E	-0.0002	-2.0458 **	-0.0002	-1.9007 *	-0.0002	-1.9165 *	-0.0002	-1.2373
Dyr04	0.0240	0.8049	0.0263	0.8986	0.0298	1.0196	0.0324	1.0907
Dyr05	0.0432	1.4574	0.0476	1.6387	0.0567	1.9388 *	0.0622	2.0955 **
Dyr06	0.0760	2.4716 **	0.0819	2.7195 ***	0.0852	2.8249 ***	0.0875	2.8999 ***
Dyr07	0.0624	2.0556 **	0.0698	2.3438 **	0.0685	2.3052 **	0.0735	2.4436 **
Dfin			0.0636	1.7578 *	0.0613	1.6849 *	0.0463	1.1563
Degy			-0.0712	-2.7102 ***	-0.0750	-2.8698 ***	-0.0811	-3.0798 ***
Dmat			-0.0425	-1.9338 *	-0.0423	-1.9413 *	-0.0625	-2.6141 ***
D1yc					-0.0941	-2.8782 ***	-0.0965	-2.9541 ***
Dcon							0.3180	1.1278
Dcon*ln(TA)							-0.0163	-1.2575
Dcon*ROA							0.0037	1.3641
Dcon*M/B							0.0118	1.0327
Dcon*D/E							0.0000	0.1033
Adjusted R-square	0.045		0.075		0.083		0.076	
Akaike info criterion	0.159		0.143		0.135		0.143	
Schwarz criterion	0.236		0.244		0.243		0.299	
Observations	560		560		560		560	

Table 13.2: Annual bonus as a proportion of total pay in widely-held, institution-controlled, and family-controlled firms (Tobit)

*In model 5, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). We add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family-controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*Z-stat*	*6*	*Z-stat*
α	0.1923	0.9250	0.4096	1.4503
Ln(TA)	0.0002	0.0243	-0.0113	-0.8612
ROA	0.0048	2.1770 **	0.0072	4.2559 ***
M/B	-0.0124	-1.4140	0.0032	0.3779
D/E	-0.0002	-1.2015	-0.0005	-2.2467 **
Dyr04	0.0339	1.1379	0.0339	1.1379
Dyr05	0.0599	2.0119 **	0.0599	2.0119 **
Dyr06	0.0857	2.8717 ***	0.0857	2.8717 ***
Dyr07	0.0710	2.3805 **	0.0710	2.3805 **
Dfin	0.0435	1.0688	0.0435	1.0688
Degy	-0.0671	-2.5134 **	-0.0671	-2.5134 **
Dmat	-0.0536	-2.2007 **	-0.0536	-2.2007 **
D1yc	-0.0986	-2.9901 ***	-0.0986	-2.9901 ***
DF	0.3970	0.9982	0.1797	0.3883
DF*ln(TA)	-0.0184	-1.0465	-0.0069	-0.3359
DF*ROA	0.0178	2.9426 ***	0.0155	2.6423 ***
DF*M/B	-0.0134	-0.6925	-0.0290	-1.4962
DF*D/E	0.0001	0.6584	0.0004	1.6909
DI	0.2173	0.6146		
DI*ln(TA)	-0.0115	-0.6970		
DI*ROA	0.0023	0.8452		
DI*M/B	0.0156	1.2706		
DI*D/E	-0.0003	-1.0204		
Adjusted R-square	0.083		0.083	
Akaike info criterion	0.140		0.140	
Schwarz criterion	0.326		0.326	
Observations	560		0.083	

Table 14.1: The impact of ownership structure on the contingent compensation as a proportion of total pay (Tobit)

*In model1, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 2, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 3, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 4, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 1*	*Z-stat*	*2*	*Z-stat*	*3*	*Z-stat*	*4*	*Z-stat*
α	-0.4562	-2.6005***	-1.1850	-5.4820***	-1.1814	-5.4880***	-1.6976	-5.9681***
Ln(TA)	0.0381	4.8804***	0.0711	7.2053***	0.0702	7.1432***	0.0953	7.3733***
ROA	-0.0032	-1.5541	-0.0062	-2.9890***	-0.0056	-2.7216***	-0.0052	-1.4761
M/B	0.0233	2.6201***	0.0233	2.6037***	0.0254	2.8972***	0.0200	1.3787
D/E	-0.0001	-0.7813	-0.0001	-1.1694	-0.0001	-1.2016	-0.0004	-2.5275**
Dyr04	0.0254	0.5131	0.0188	0.3917	0.0100	0.2115	0.0144	0.3069
Dyr05	0.0389	0.8017	0.0277	0.5984	0.0066	0.1437	0.0129	0.2775
Dyr06	-0.0258	-0.5159	-0.0406	-0.8612	-0.0490	-1.0503	-0.0427	-0.9081
Dyr07	-0.0173	-0.3562	-0.0364	-0.7680	-0.0349	-0.7399	-0.0242	-0.5094
Dfin			-0.1570	-3.2061***	-0.1501	-3.0390***	-0.1686	-3.1904***
Degy			0.1953	4.5852***	0.2026	4.8187***	0.2011	4.7260***
Dmat			0.1546	4.1607***	0.1538	4.1914***	0.1263	3.2045***
D1yc					0.1996	3.5715***	0.1976	3.5261***
Dcon							0.9688	2.5093**
Dcon*ln(TA)							-0.0452	-2.5691**
Dcon*ROA							-0.0009	-0.2169
Dcon*M/B							0.0058	0.3149
Dcon*D/E							0.0003	1.4012
Adjusted R-square	0.049		0.109		0.134		0.132	
Akaike info criterion	1.035		0.962		0.942		0.949	
Schwarz criterion	1.112		1.062		1.051		1.096	
Observations	560		560		560		560	

Table 14.2: Contingent compensation as a proportion of total pay in widely-held, institution-controlled, and family-controlled firms (Tobit)

*In model 5, use total assets (ln (TA)), return on assets (ROA), market to book ratio (M/B), debt to equity ratio (D/E), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). We add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family-controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 5*	*Z-stat*	*6*	*Z-stat*
α	-1.6953	-5.9276***	-0.5412	-1.4740
Ln(TA)	0.0953	7.3434***	0.0419	2.4206**
ROA	-0.0053	-1.4947	-0.0040	-1.3962
M/B	0.0195	1.3447	0.0205	1.6673*
D/E	-0.0004	-2.5667**	-0.0001	-0.4769
Dyr04	0.0112	0.2363	0.0112	0.2363
Dyr05	0.0183	0.3939	0.0183	0.3939
Dyr06	-0.0394	-0.8419	-0.0394	-0.8419
Dyr07	-0.0226	-0.4750	-0.0226	-0.4750
Dfin	-0.1699	-3.1934***	-0.1699	-3.1934***
Degy	0.1978	4.4247***	0.1978	4.4247***
Dmat	0.1176	2.9843***	0.1176	2.9843***
D1yc	0.1908	3.4065***	0.1908	3.4065***
DF	0.9299	1.6910*	-0.2242	-0.3649
DF*ln(TA)	-0.0454	-1.8756*	0.0079	0.2889
DF*ROA	-0.0197	-2.4735**	-0.0209	-2.6942***
DF*M/B	0.0480	1.5943	0.0470	1.5943
DF*D/E	0.0002	0.7554	-0.0001	-0.2872
DI	1.1541	2.4893**		
DI*ln(TA)	-0.0534	-2.4692**		
DI*ROA	0.0013	0.2805		
DI*M/B	0.0010	0.0519		
DI*D/E	0.0003	0.8486		
Adjusted R-square	0.136		0.136	
Akaike info criterion	0.954		0.954	
Schwarz criterion	1.140		1.140	
Hannan-Quinn criter.	1.027		1.027	
Observations	560		560	

Table 15: Correlation of variables in the family-controlled, institution-controlled, and widely-held firms

Panel A							
	ln (AB)	ln (CP)	ln (ta)	ROA	M/B	D/E	TMR
ln(AB)	1						
ln(CP)	0.2139	1					
ln(ta)	0.1428	0.2056	1				
ROA	0.2371	-0.0419	-0.0642	1			
M/B	0.0547	0.0629	-0.0919	0.0944	1		
D/E	-0.0687	0.0563	0.3141	-0.1600	0.0120	1	
TMR	0.0351	0.0191	-0.1706	0.1263	0.2509	-0.0873	1
Panel B							
	AB-to-TP	CP-to-TP	ln(ta)	ROA	M/B	D/E	TMR
AB-to-TP	1						
CP-to-TP	-0.5885	1					
ln(ta)	-0.0167	0.1723	1				
ROA	0.1830	-0.0651	-0.0642	1			
M/B	-0.0312	0.0961	-0.0919	0.0944	1		
D/E	-0.1240	0.0353	0.3141	-0.1560	0.0120	1	
TMR	0.0323	0.0240	-0.1706	0.1263	0.2509	-0.0873	1
Panel C							
		AB-to-TA	CP-to-TA	ROA	M/B	D/E	TMR
AB-to-TA		1					
CP-to-TA		0.1991	1				
ROA		0.1879	-0.0778	1			
M/B		0.0278	0.2189	0.0944	1		
D/E		-0.1863	-0.0948	-0.1600	0.0120	1	
TMR		0.1495	0.1984	0.1263	0.2509	-0.0873	1

Notes: 1. data include widely-held firms.

2. ln(AB) denotes natural log of annual bonus, ln(CP) denotes natural log of contingent pay, ln(TA) denotes natural log of total assets, ROA denotes return on assets, M/B denotes market to book ratio, TMR denotes total market return ratio, and D/E denotes debt to equity ratio.

Table 16.1: The impact of ownership structure on the natural log of annual bonus (OLS)

*In model9, use total assets (ln (TA)), return on assets (ROA), total market return (TMR), debt to equity ratio (d/e), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 10, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 11, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 12, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 9*	*T-stat*	*10*	*T-stat*	*11*	*T-stat*	*12*	*T-stat*
A	-1.5454	-0.5130	-3.3902	-1.0523	-3.4299	-1.0652	-19.6036	-4.6953***
Ln(TA)	0.5168	3.7199***	0.6051	4.0535***	0.6106	4.1064***	1.4112	7.3240***
ROA	0.1566	5.2311***	0.1521	4.8853***	0.1486	4.8407***	0.0205	0.3876
TMR	0.4111	1.0525	0.5052	1.2611	0.4878	1.2181	0.6854	1.3182
D/E	-0.0032	-1.5048	-0.0031	-1.4458	-0.0031	-1.4582	-0.0112	-3.9489***
Dyr04	0.8465	1.2155	0.8508	1.2178	0.9009	1.2823	0.9274	1.3685
Dyr05	1.2694	1.9345*	1.2448	1.8939*	1.3654	2.0735**	1.4945	2.3406**
Dyr06	1.4263	2.1523**	1.4076	2.0981**	1.4497	2.1546**	1.5865	2.4680**
Dyr07	1.1932	1.7440*	1.1692	1.7017*	1.1513	1.6713*	1.3898	2.0571**
Dfin			-0.7448	-1.0436	-0.7786	-1.0908	-1.6228	-2.1277**
Degy			-0.3771	-0.6636	-0.4177	-0.7326	-0.6913	-1.1919
Dmat			0.5131	1.0361	0.5134	1.0366	-0.5893	-1.1202
D1yc					-1.2368	-1.3439	-1.2003	-1.3737
Dcon							31.1011	4.9057***
Dcon*ln(TA)							-1.4748	-5.0489***
Dcon*ROA							0.2142	3.3102***
Dcon*TMR							-0.5022	-0.6543
Dcon*D/E							0.0082	2.2521**
Adjusted R-square	0.086		0.087		0.089		0.148	
F-statistic	7.597		5.821		5.545		6.717	
Observations	560		560		560		560	

Table 16.2: Natural log of annual bonus in widely-held, institution-controlled, and family-controlled firms (OLS)

*In model 13, use total assets (ln (TA)), return on assets (ROA), total market return (TMR), debt to equity ratio (d/e), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). Moreover, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 13*	*T-stat*	*14*	*T-stat*
α	-20.8925	-4.9475***	13.5344	2.2707**
Ln(TA)	1.4690	7.5444***	-0.1466	-0.5300
ROA	0.0187	0.3553	0.2037	5.1417***
TMR	0.6552	1.2639	-0.0527	-0.0870
D/E	-0.0111	-3.9212***	-0.0078	-1.6359
Dyr04	0.9991	1.4815	0.9991	1.4815
Dyr05	1.4806	2.3224**	1.4806	2.3224**
Dyr06	1.5273	2.3941**	1.5273	2.3941**
Dyr07	1.3596	2.0257**	1.3596	2.0257**
Dfin	-1.9181	-2.4531**	-1.9181	-2.4531**
Degy	-0.3204	-0.5484	-0.3204	-0.5484
Dmat	-0.3792	-0.6973	-0.3792	-0.6973
D1yc	-1.1821	-1.3776	-1.1821	-1.3776
DF	24.4537	2.5635**	-9.9732	-0.9122
DF*ln(TA)	-1.2197	-2.8614***	0.3960	0.8000
DF*ROA	0.4749	4.4327***	0.2899	2.8530***
DF*M/B	2.1278	0.9085	2.8356	1.2057
DF*D/E	0.0094	2.5068**	0.0061	1.1347
DI	34.4269	4.4862***		
DI*ln(TA)	-1.6156	-4.5090***		
DI*ROA	0.1850	2.8174***		
DI*M/B	-0.7079	-0.9026		
DI*D/E	0.0033	0.6055		
Adjusted R-square	0.159		0.159	
F-statistic	5.818		5.818	
Observations	560		560	

Table 17.1: The impact of ownership structure on the natural log of contingent pay (OLS)

*In model9, use total assets (ln (TA)), return on assets (ROA), total market return (TMR), debt to equity ratio (d/e), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. In model 10, we add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). In model 11, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. In model 12, we combine family and institution as the concentrated group (Dcon) to compare to widely-held group. We use the widely-held group as the base group. Dcon is the dummy variable that takes the value of 1 if a firm is concentrated group and 0 otherwise. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 9*	*T-stat*	*10*	*T-stat*	*11*	*T-stat*	*12*	*T-stat*
α	-3.9256	-1.4493	-13.292	-3.908***	-13.2629	-3.8871***	-27.4721	-6.1060***
Ln(TA)	0.6777	5.3508***	1.106	6.940***	1.1022	6.8942***	1.7839	8.5514***
ROA	-0.0321	-1.0074	-0.066	-1.989**	-0.0637	-1.9071*	-0.0894	-1.9506*
TMR	0.6987	1.6289	0.738	1.695*	0.7505	1.7213*	0.6358	1.2311
D/E	-0.0004	-0.2007	-0.001	-0.350	-0.0008	-0.3449	-0.0061	-1.9478*
Dyr04	0.9582	1.2148	0.885	1.145	0.8475	1.0964	0.9637	1.2621
Dyr05	1.4713	1.9590*	1.339	1.838*	1.2494	1.6954*	1.3972	1.9218*
Dyr06	0.8659	1.0956	0.686	0.892	0.6543	0.8508	0.7993	1.0399
Dyr07	1.1827	1.4853	0.943	1.196	0.9562	1.2099	1.2284	1.5348
Dfin			-2.336	-2.752***	-2.3106	-2.7028***	-3.0148	-3.3609***
Degy			1.606	2.502**	1.6366	2.5447**	1.5676	2.4021**
Dmat			2.254	3.995***	2.2541	3.9838***	1.4669	2.5027**
D1yc					0.9196	1.0860	0.8981	1.0910
Dcon							27.0490	4.5100***
Dcon*ln(TA)							-1.2608	-4.5493***
Dcon*ROA							0.0353	0.5407
Dcon*TMR							0.4093	0.4802
Dcon*D/E							0.0049	1.1771
Adjusted R-square	0.041		0.087		0.087		0.109	
F-statistic	3.958		5.837		5.437		5.038	
Observations	560		560		560		560	

Table 17.2: Natural log of contingent pay in widely-held, institution-controlled, and family-controlled firms (OLS)

*In model 13, use total assets (ln (TA)), return on assets (ROA), total market return (TMR), debt to equity ratio (d/e), and year effects as our independent variables. We use year 2003 as the base year and add the four dummy variables Dyr04, Dyr05, Dyr06, and Dyr07 to represent respectively 2004, 2005, 2006, and 2007. We also add industry effects: dummy finance industry (DFin), dummy energy industry (DEgy), and dummy material industry (DMat). Moreover, we add a dummy variable (D1YC) that takes the value of 1 if there is a CEO change in the year and 0 otherwise. The sample is divided between widely-held, institution-controlled, and family controlled with the widely-held group serving as the base group. DF is the dummy variable that takes the value of 1 if a firm is family-controlled and 0 otherwise, while DI is a dummy variable that takes the value of 1 if a firm is institution-controlled and 0 otherwise. Also, we add variables which are DF multiples each independent variables, and DI multiples each independent variables. In model 6, we use the institution-controlled group (DI) as the base group and keep all other variables of the model 5 unchanged. Note: ***, **, and * denote respectively significance at the 1%, 5%, and 10% levels.*

Independent Variable	*Model 13*	*T-stat*	*14*	*T-stat*
α	-27.5014	-6.0868***	3.7031	0.6546
Ln(TA)	1.7852	8.5409***	0.3380	1.2566
ROA	-0.0901	-1.9578*	-0.0270	-0.5047
TMR	0.6211	1.1990	0.8498	1.1897
D/E	-0.0062	-1.9695**	-0.0032	-0.7399
Dyr04	0.9442	1.2255	0.9442	1.2255
Dyr05	1.4785	2.0200**	1.4785	2.0200**
Dyr06	0.8559	1.1061	0.8559	1.1061
Dyr07	1.2802	1.6018	1.2802	1.6018
Dfin	-2.9918	-3.3859***	-2.9918	-3.3859***
Degy	1.6006	2.3313**	1.6006	2.3313**
Dmat	1.3042	2.1974**	1.3042	2.1974**
D1yc	0.7819	0.9557	0.7819	0.9557
DF	19.1567	2.0714**	-12.0478	-1.1966
DF*ln(TA)	-0.9084	-2.1897**	0.5388	1.1725
DF*ROA	-0.1157	-0.7787	-0.1788	-1.1791
DF*M/B	0.5961	0.1725	0.3673	0.1060
DF*D/E	0.0053	1.0954	0.0022	0.3961
DI	31.2045	4.4064***		
DI*ln(TA)	-1.4473	-4.3301***		
DI*ROA	0.0631	0.8968		
DI*M/B	0.2287	0.2635		
DI*D/E	0.0031	0.5622		
Adjusted R-square	0.108		0.108	
F-statistic	4.079		4.079	
Observations	560		560	

Appendix II: Figures

Figure 1.1: Salary in monetary terms paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms (Adjusted for inflation)

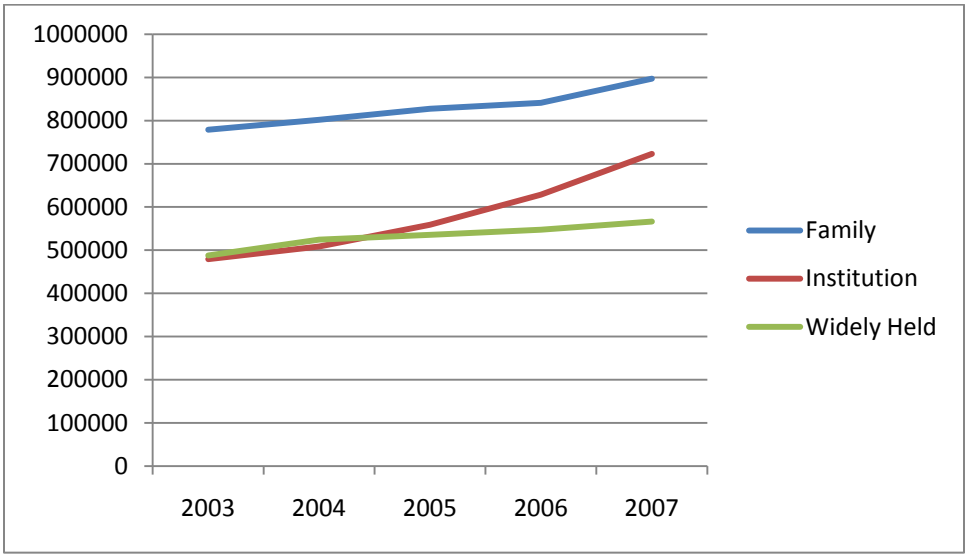


Figure1.2: Bonus in monetary terms paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

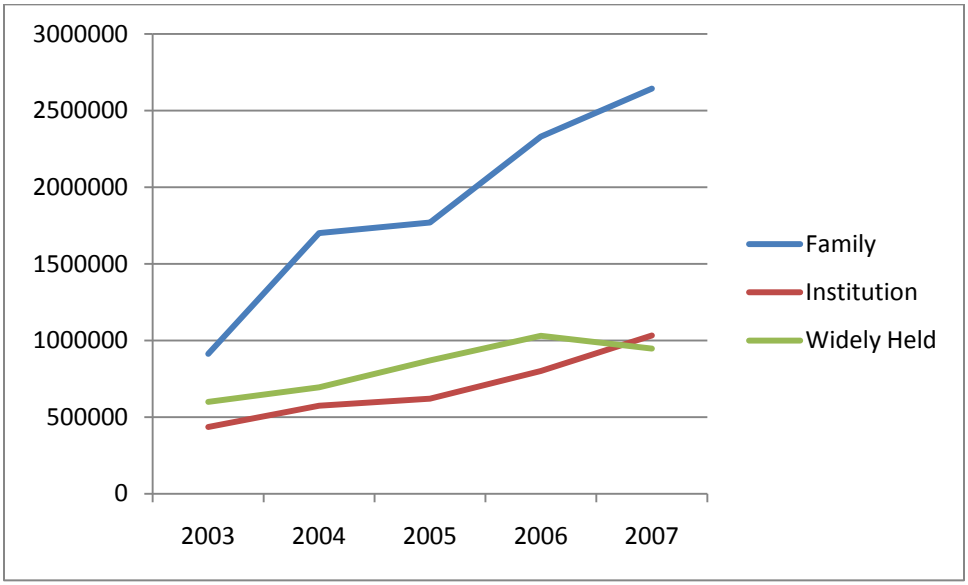


Figure1.3: Contingent compensation in monetary terms paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

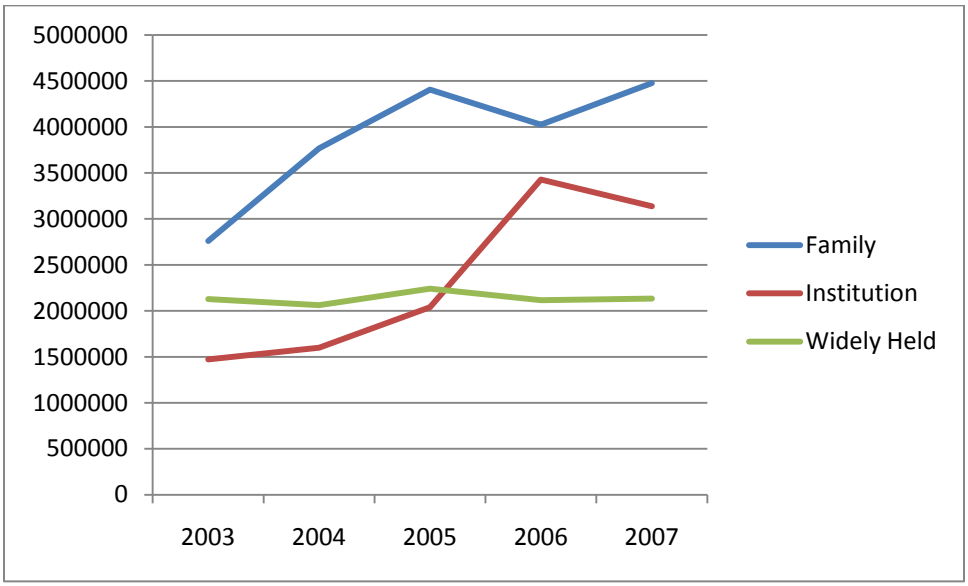


Figure1.4: Total compensation in monetary terms paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

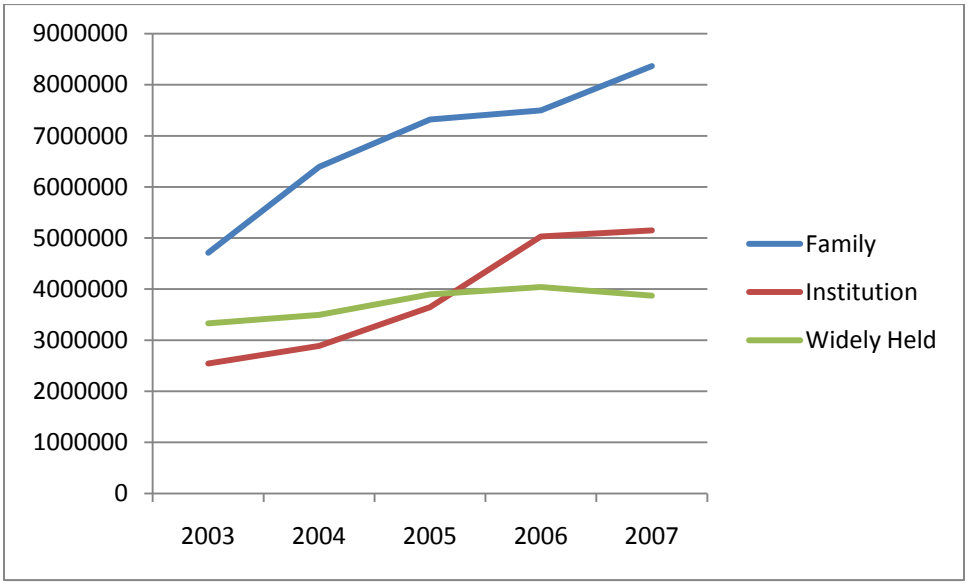


Figure 2.1: Salary as a percentage of total compensation paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

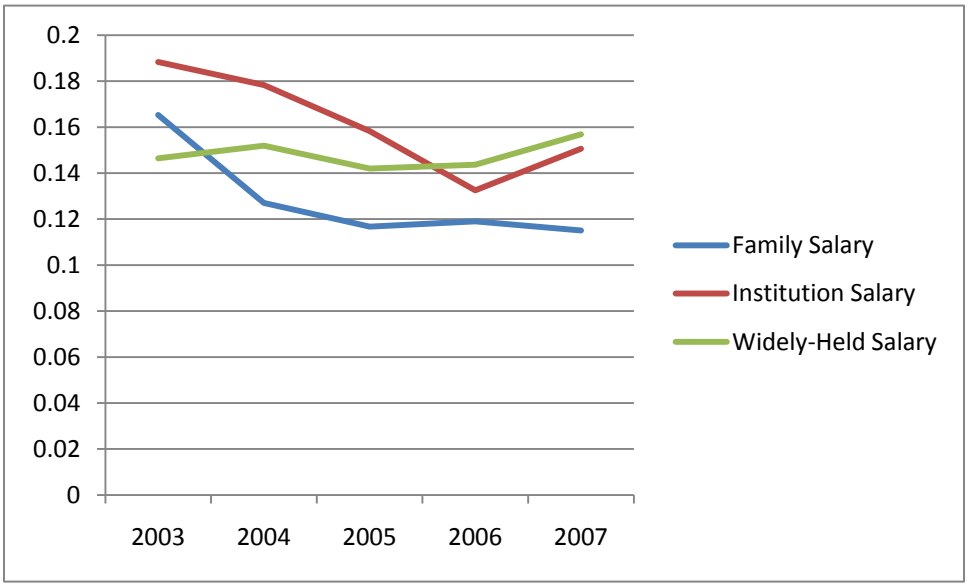


Figure 2.2: Annual Bonus as a percentage of total compensation paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

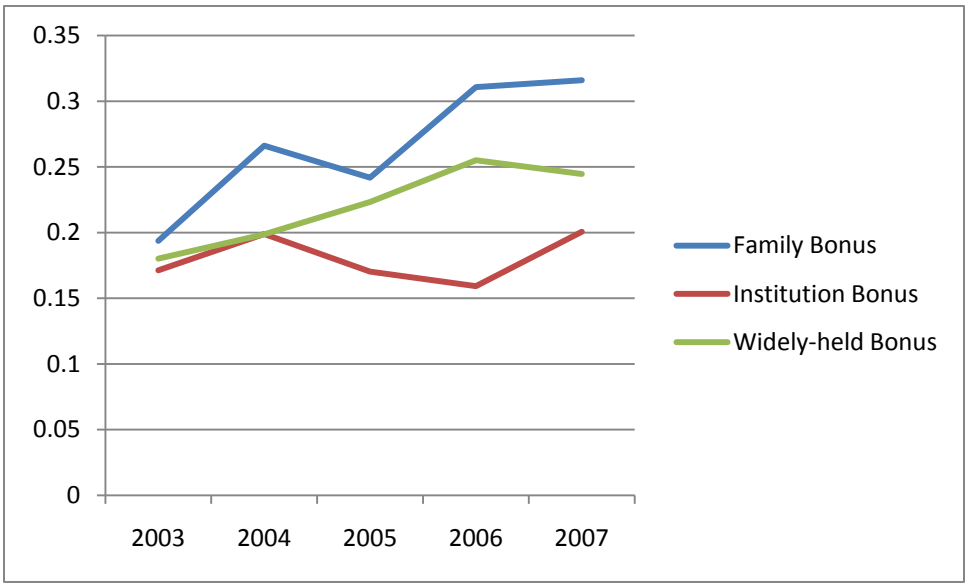


Figure 2.3: Contingent Compensation as a percentage of total compensation paid by permanent CEO firms: comparison between widely-held, institution-controlled, and family controlled firms

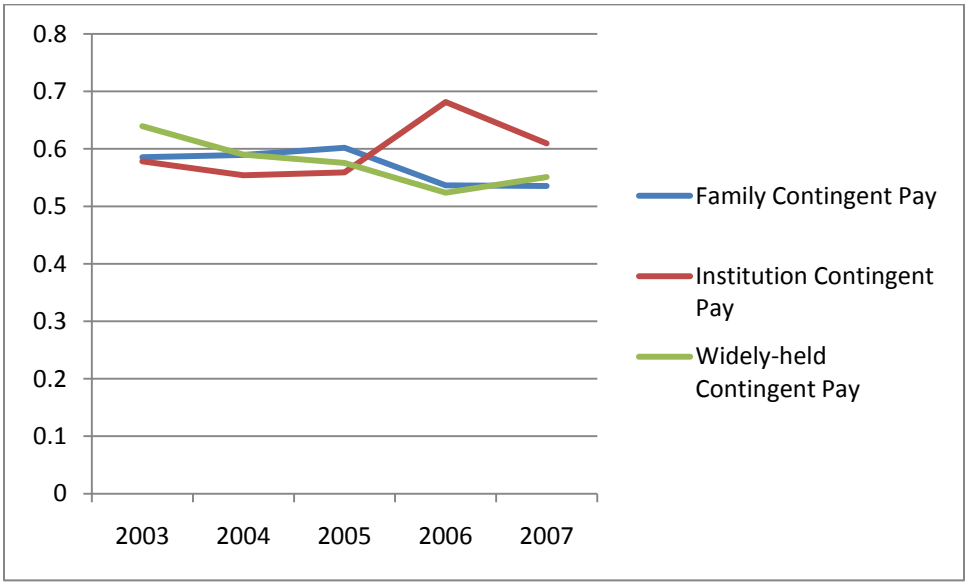


Figure 3.1: Changes in compensation following CEO turnovers in family-controlled firms

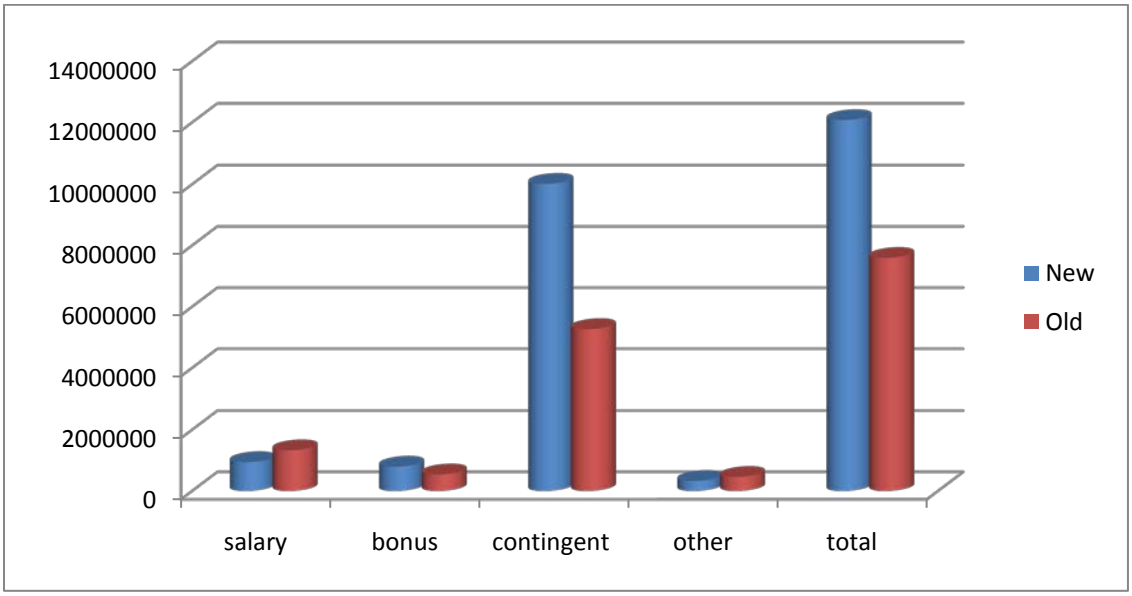


Figure 3.2: Changes in compensation following CEO turnovers in institution-controlled firms

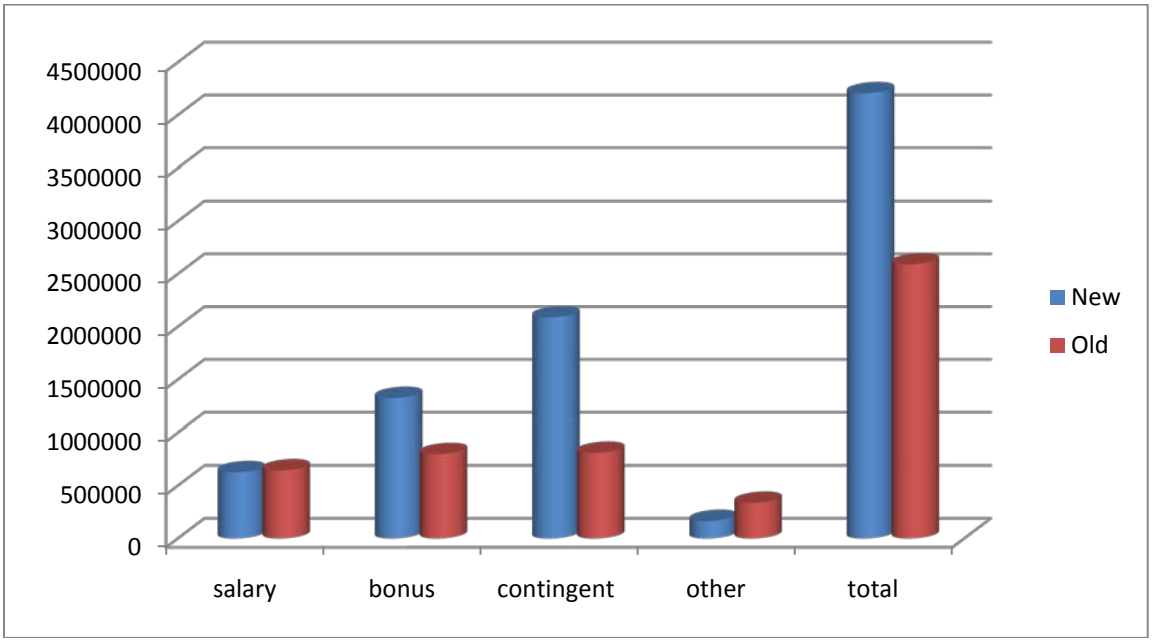


Figure3.3: Changes in compensation following CEO turnovers in widely-held firms

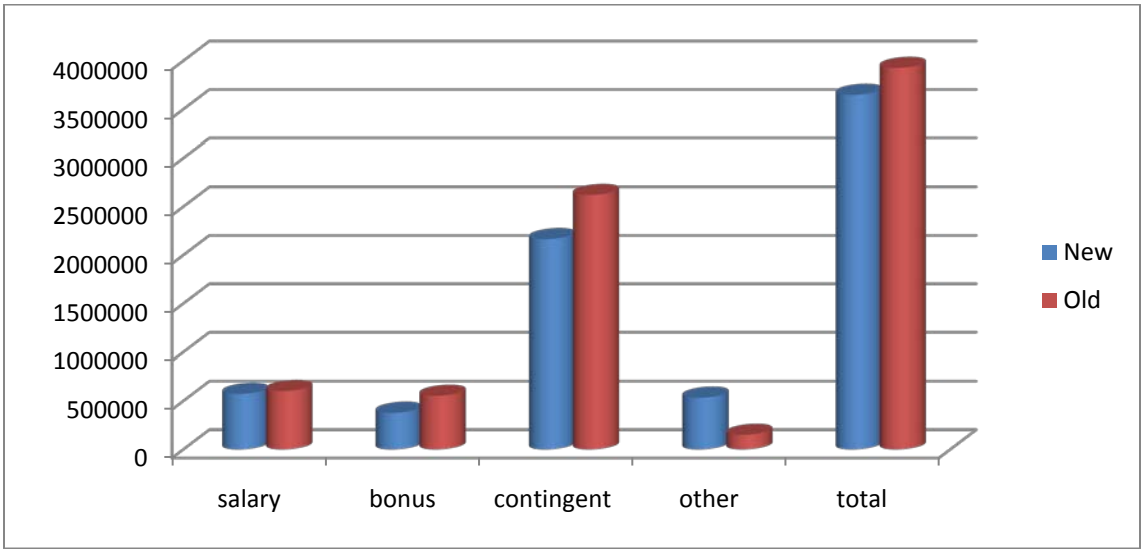


Figure 4.1: Changes in compensation following CEO retirements in family-controlled firms

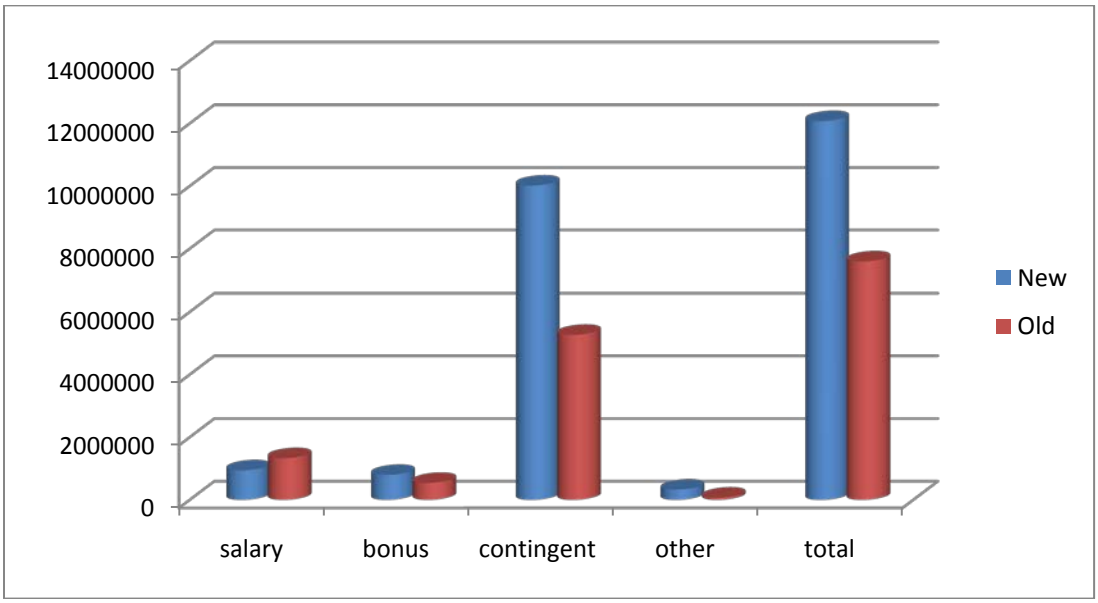
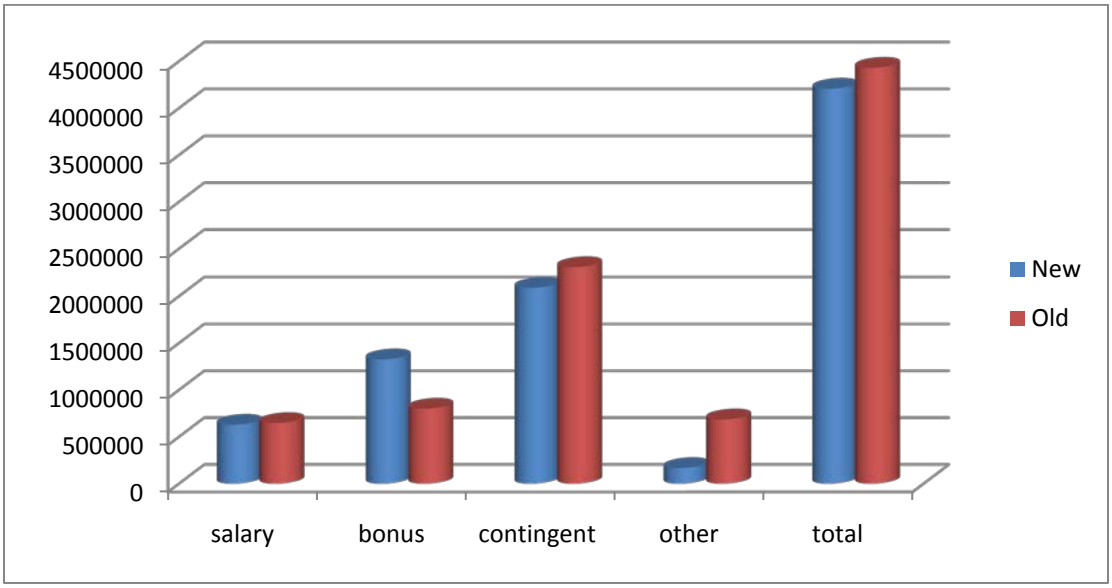
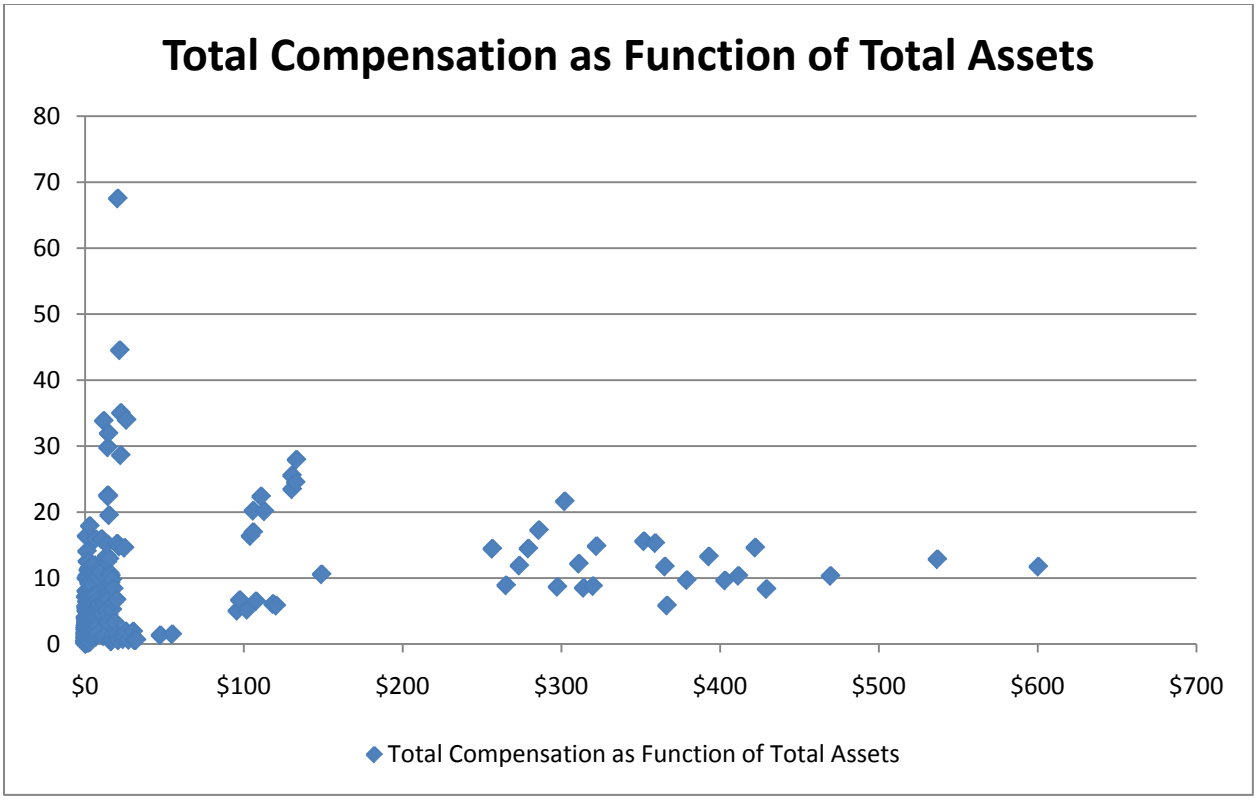


Figure 4.2: Changes in compensation following CEO retirements in institution-controlled firms



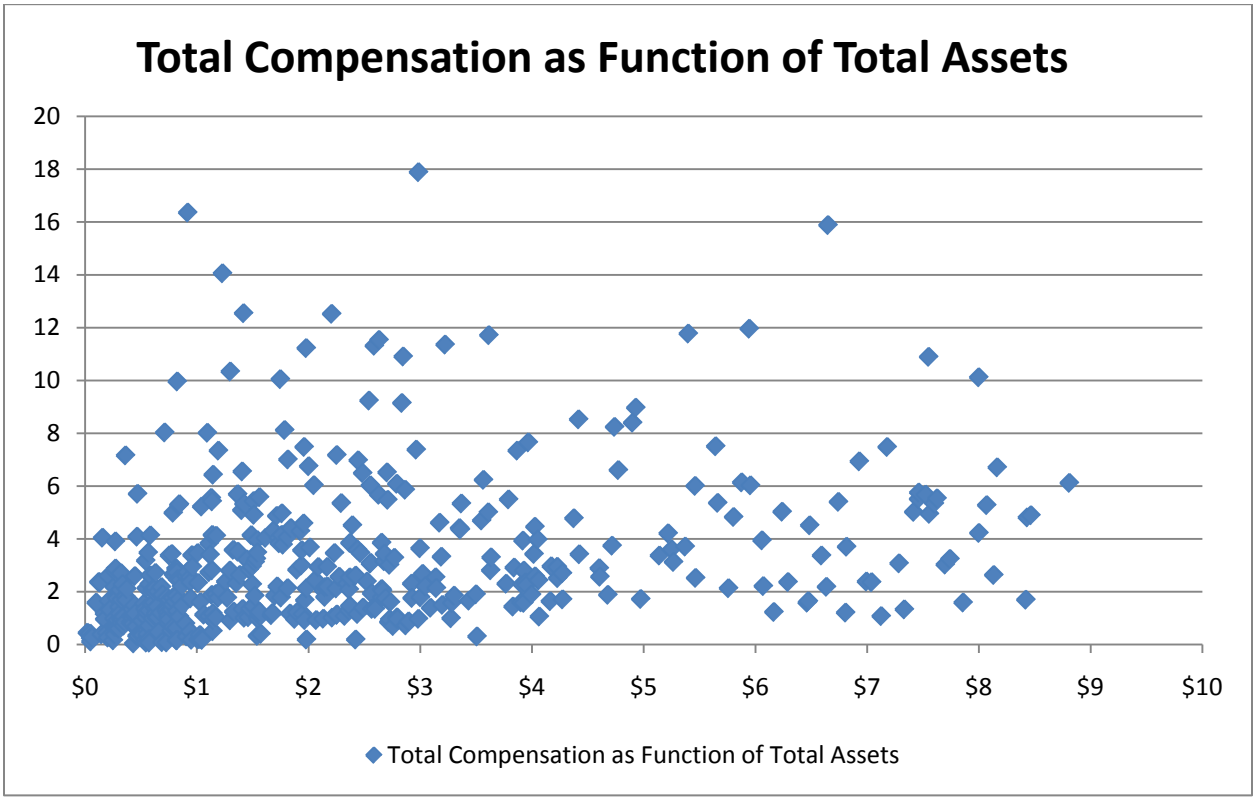
Notes: retirement firms are firms with paying a large amount of retirement fee to CEOs.

Figure 5.1: Total compensation as a function of total assets (all data)



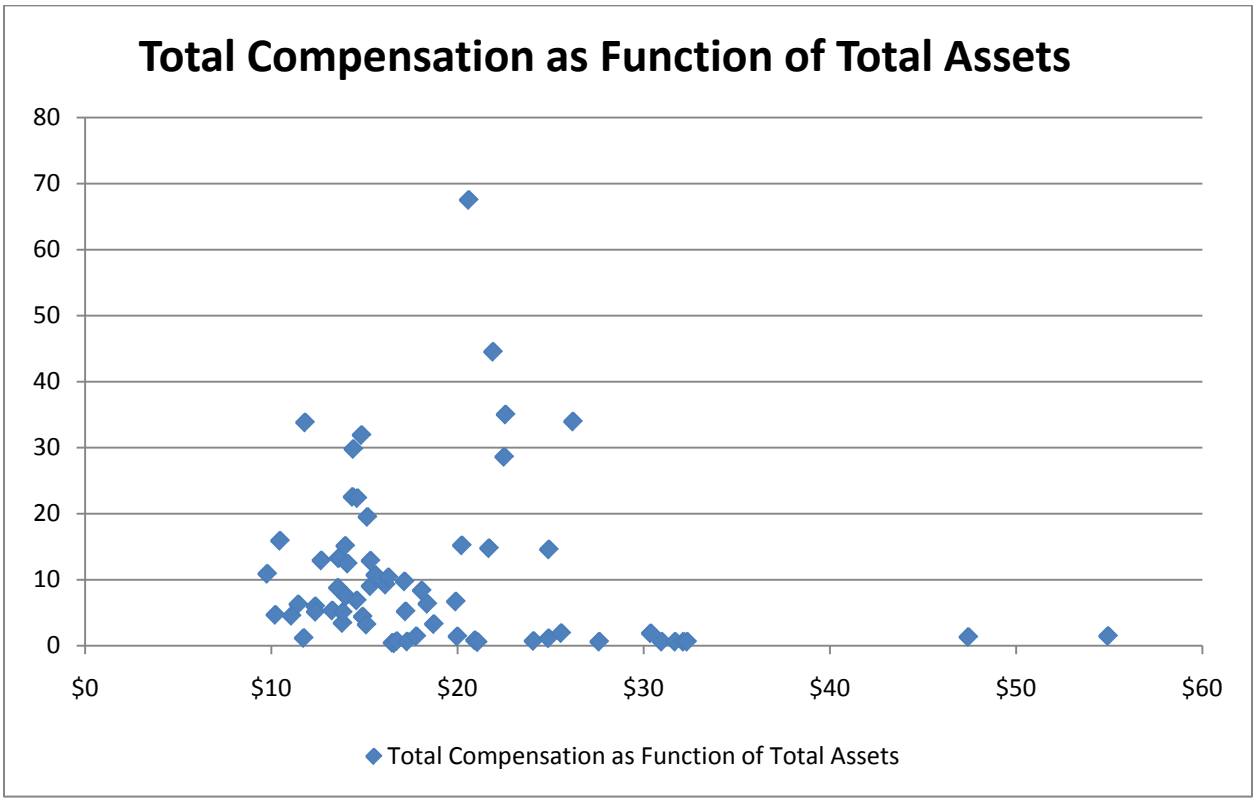
Notes: The horizontal axis is total assets and the vertical axis is total compensation.
The unit of the X-axis is $1 billion and the unit of Y-axis is 1 million.

Figure 5.2: Total compensation as a function of total assets (asset sizes of $20.48 million – 9 billion)



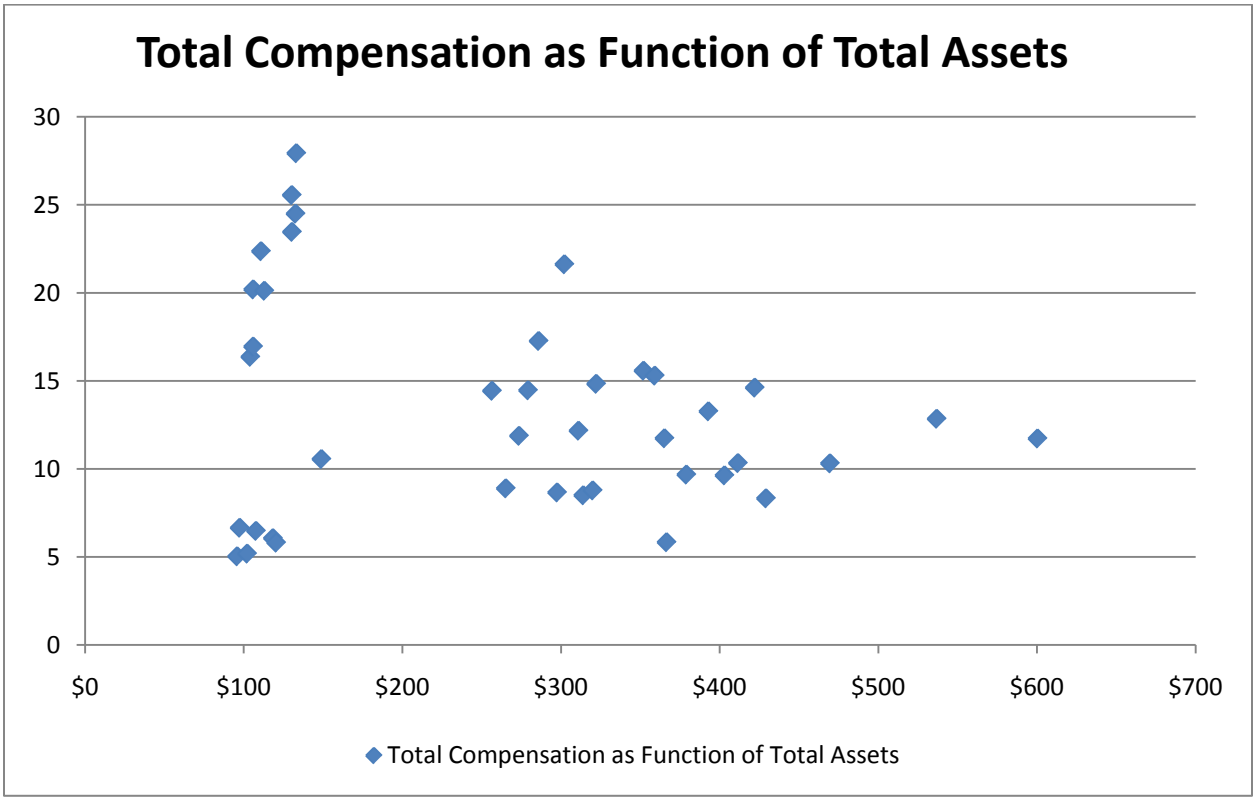
Notes: The horizontal axis is total assets and the vertical axis is total compensation.
The unit of the X-axis is $1 billion and the unit of Y-axis is 1 million.

Figure 5.3: Total compensation as a function of total assets (asset sizes of $9.1 billion – $55 billion)



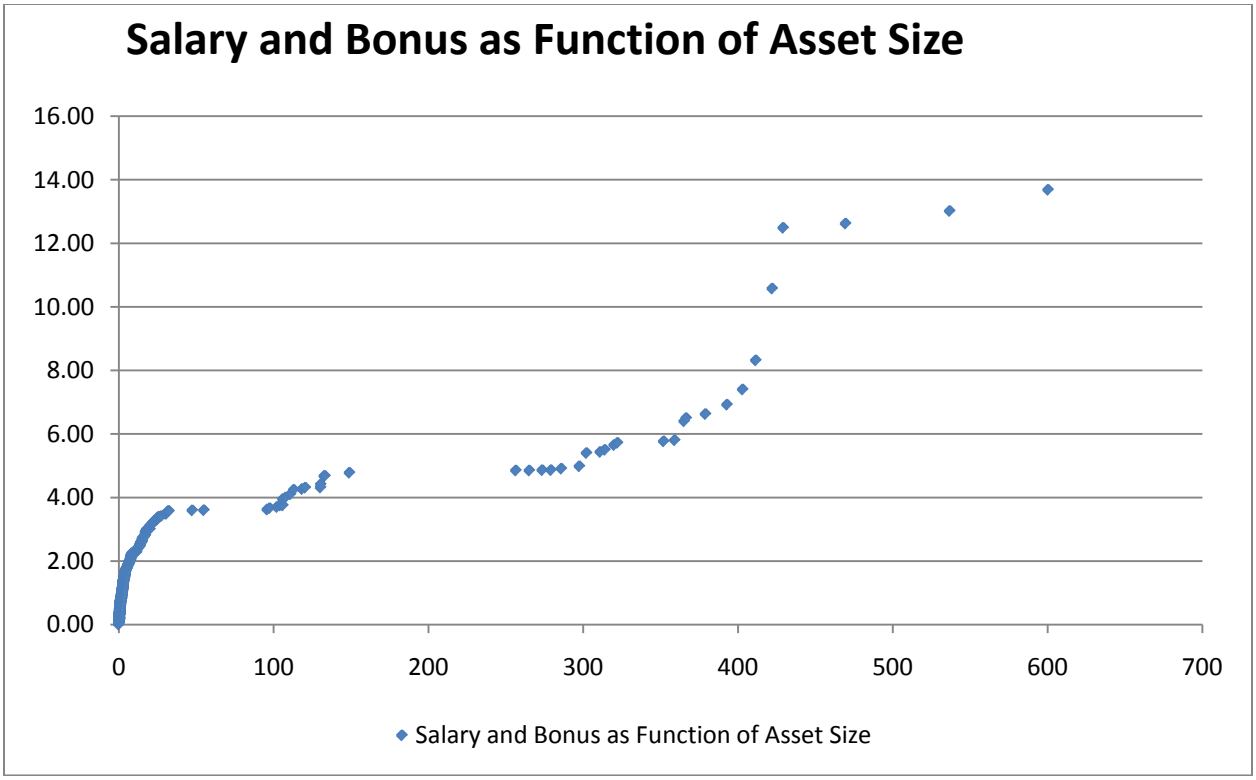
Notes: The horizontal axis is total assets and the vertical axis is total compensation.
The unit of the X-axis is $1 billion and the unit of Y-axis is 1 million.

Figure 5.4: Total compensation as a function of total assets (asset sizes larger than $55 billion)



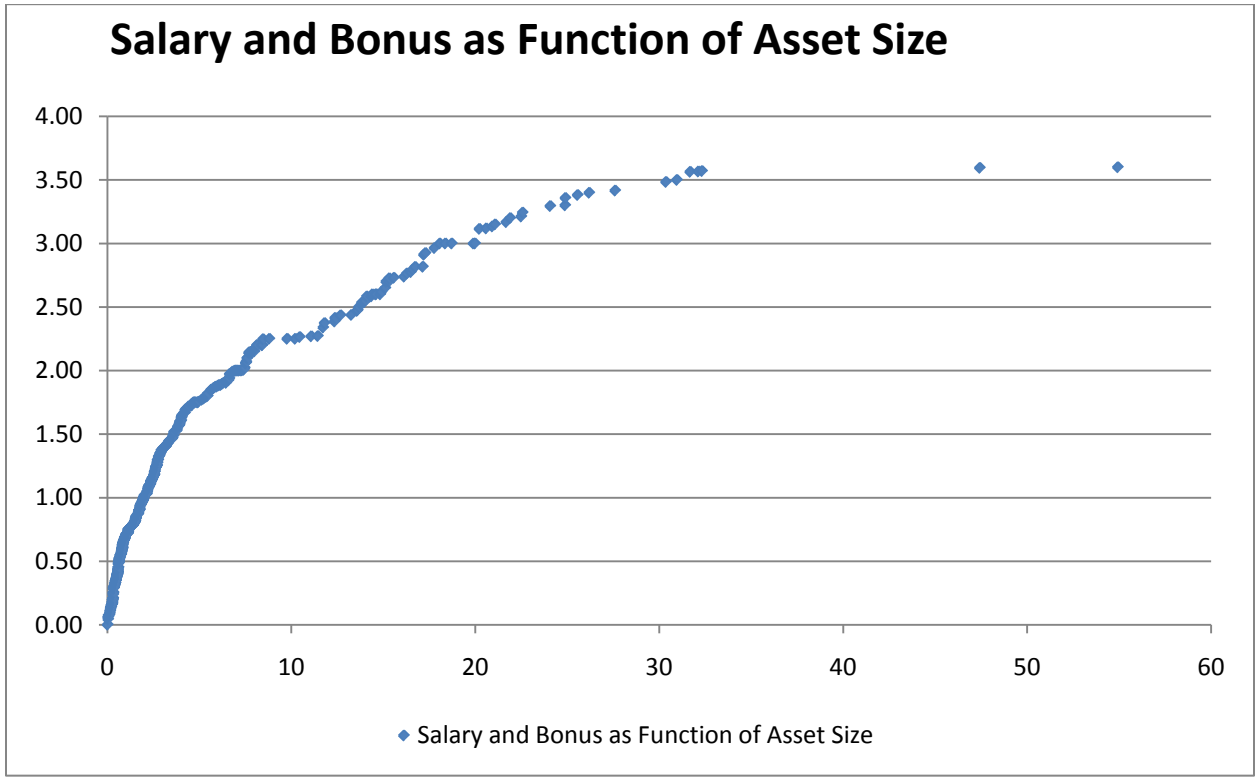
Notes: The horizontal axis is total assets and the vertical axis is total compensation.
The unit of the X-axis is $1 billion and the unit of Y-axis is 1 million.

Figure 6.1: Salary and Bonus are as a function of total assets (all data included)



Notes: The horizontal axis is total assets and the vertical axis is salary and bonus.
The unit of the X-axis is $1billion and the unit of Y-axis is 1 million.

Figure 6.2: Salary and Bonus are as a function of total assets (asset sizes of $20.48 million - $55 billion)



Notes: The horizontal axis is total assets and the vertical axis is salary and bonus.
The unit of the X-axis is $1billion and the unit of Y-axis is 1 million.