"An Analysis of Supplemental Executive Retirement Plans:

Governance, Incentive and Risk-Preference Implications"

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ABSTRACT

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Ambiguous disclosure of Supplemental Executive Retirement Plan (SERP) benefits makes them an attractive choice for CEOs with power over the board to extract rents. However, although SERPs are common and sizable, the research on determinants and consequences of SERPs is virtually absent. Using a historical sample of CEOs of S&P TSX60 firms, the study fills this gap. First, I examine whether the incidence and magnitude of CEO SERP benefits are indeed driven by CEO's power over the board. Second, I investigate consequences of CEO SERPs: the impact on earnings management practices when the anticipated tenure of the CEO is shorter than the firm's optimal investment horizon (i.e., the horizon problem), and the association with CEO's risk preferences. In general, the results confirm the association between CEO SERP benefits and many of the proxies for CEO power. I also find that firm's discretionary accruals – a proxy for earnings management – are positively associated with the horizon problem when CEO SERP benefits are contingent on firm's accounting earnings. The results also indicate that the structure of CEO's SERP has a significant association with CEO's risk-tolerance. Finally, the study provides additional evidence that ignoring SERP benefits significantly underestimates the magnitude of CEO compensation and distorts comparisons among CEO compensation packages.

ACKNOWLEDGEMENTS

DEDICATION

To my parents...

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1. INTRODUCTION

Different forms of executive remuneration exist: base salary, short-term bonuses, long-term cash incentives, stock grants, stock options, deferred share units, stock appreciation rights and various perquisites. According to existing reporting regulations in North America, a corporation is required to annually disclose extensive information on the compensation components awarded to its five highest-paid executives. However, even such elaborate regulations do not ensure complete transparency. One of the items in the remuneration "menu" is a Supplemental Executive Retirement Plan (hereafter, SERP): a commonly used tool to compensate top executives. Disclosure of SERP benefits in corporate proxy statements is vague and often cumbersome. Values of accumulated and/or projected SERP are not disclosed and have to be estimated by shareholders, researchers or any other party interested in the "true" total remuneration of top executives: a costly, time-consuming, and untrivial process which requires a number of actuarial and other assumptions. Furthermore, none of the publicly available executive compensation databases carries the value of SERP benefits. As such, with rare exceptions, in business articles and research papers, a typical measure of total executive pay excludes SERP benefits.

At the same time, stories on very high executive pensions in specific cases have become a hot topic in business media.[1] This largely anecdotal evidence on excessive SERP benefits coupled with the lack of disclosure has led some business observers to refer to SERPs as hidden or "stealth" compensation (Murphy, 1999). Bebchuk and Fried (2004) suggest that SERPs are used to increase executive compensation off the radar screen of shareholders. The "stealth" nature of SERP benefits makes them an attractive choice for managers with power to extract rents (i.e., receive compensation above the level that would have been received under optimal contracting), as the opposition from shareholders is likely to be minimal.

Further fueling the importance of the topic, most recent empirical work (Bebchuk and Jackson Jr., 2005; Sundaram and Yermack, 2007) confirms the anecdotal evidence that SERP benefits of CEOs are common and sizable. Furthermore, the evidence indicates that some CEOs are entitled to significant retirement benefits while others have no retirement arrangements at all.

Investigating determinants of the incidence and magnitude of CEO SERP benefits and assessing the impact of CEO SERPs on firm decisions are two general objectives of the thesis. First, I investigate the rent extraction hypothesis, i.e.

whether the incidence and magnitude of SERP benefits are indeed determined by managerial power. Second, I adopt the horizon-problem framework to investigate whether CEOs with performance-contingent SERPs are incited to manage earnings upwards in their pre-retirement years. Finally, I assess whether risk preferences of CEOs are associated with SERPs. Specifically, I predict that CEO's risk tolerance is a function of the performance-contingency of SERP benefits and the size of accumulated SERP benefits.[2]

The sample of 60 firms that comprised the S&P/TSX60 index in 1997 is adopted for empirical investigations. Encompassing observations for the seven-year period between 1997 and 2003, the sample includes 116 CEOs and 395 observations. In general, results support the rent extraction hypothesis, confirming the association between the size of SERP benefits of CEOs and many of the variables that proxy for managerial power, including corporate governance and ownership structure factors. Results also indicate that firms appear to manage earnings upward when CEOs whose SERPs are contingent on accounting earnings approach retirement. In addition, the contingency of SERP benefits on accounting earnings – as well as the size of accumulated SERP benefits – impacts CEO's risk tolerance. Finally, the study provides additional evidence that

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omitting SERP benefits from a measure of total CEO pay significantly underestimates the magnitude of executive compensation and distorts comparisons among CEO compensation packages.

Section 2 describes the general nature of SERPs and regulations on SERP disclosure. Section 3 highlights existing findings and develops research hypotheses. Section 4 describes the research methodology. Results and their limitations are discussed in Section 5. Section 6 concludes, highlighting key contributions of the study.

2. INSTITUTIONAL BACKGROUND

2.1. Nature of SERPs

Supplemental retirement arrangements exist due to governmental regulations that limit the retirement income under regular pension schemes. In Canada, the *Income Tax Act* sets the limit on the annual income from Registered Pension Plans at $2,111 per year of pension plan membership.[3] Table 1 illustrates the impact of the *Income Tax Act* limitations on annual RPP benefits for retirees with different levels of pensionable earnings and accumulated years of pensionable service. Since seven-digit executive compensation figures are not infrequent, a regular pension leaves executives with a modest fraction of

TABLE 1: Limitations on the RPP Income (*Income Tax Act*, Canada)

Pensionable earnings (PE)	Retirement income from RPPs					
	10 yrs of service		20 yrs of service		35 yrs of service	
	Total	% of PE	Total	% of PE	Total	% of PE
$40,000	$8,000	20.0%	$16,000	40.0%	$28,000	70.0%
$90,000	$18,000	20.0%	$36,000	40.0%	$63,000	70.0%
$200,000	$21,110	10.6%	$42,220	21.1%	$73,885	36.9%
$400,000	$21,110	5.3%	$42,220	10.6%	$73,885	18.5%
$902,000 †	$21,110	2.3%	$42,220	4.7%	$73,885	8.2%
$1,695,000 ‡	$21,110	1.2%	$42,220	2.5%	$73,885	4.4%
$2,500,000	$21,110	0.8%	$42,220	1.7%	$73,885	3.0%

The table above illustrates the impact of the Income Tax Act (Canada) limitations on annual RPP benefits for retirees with different levels of pre-retirement pensionable earnings and years of pensionable service. Annual retirement income is assumed to represent 2% of pensionable earnings for each year of service. † Median base salary of the CEOs of the S&P/TSX60 firms in 2003. ‡ Median cash compensation (base salary and annual bonus) of the CEOs of the S&P/TSX 60 firms in 2003

their pre-retirement income. Under existing regulations, a CEO with 35 years of pensionable service is entitled to a maximum of $73,885 ($2,111 * 35 years) of annual retirement benefits, which, in 2003, represented 8.2% of median base salary of the CEOs of the S&P/TSX 60 firms, and only 4.4% of their total cash compensation (i.e., base salary and annual bonus).[4] In contrast, a $90,000-employee who participated in the RPP for 35 years enjoys post-retirement benefits similar to those of a CEO ($63,000) and, hence, a considerably higher amount in relative terms: 70% of pensionable earnings.

The situation is similar in the United States where defined pension plans are regulated by the *Internal Revenue Code* and the *Employee Retirement Income Security Act*. Specifically, these regulations define the limit on maximum annual compensation for determining benefits under a qualified plan; at present, US$210,000. Consider the example of a CEO who retires in 2006 with a US$1,000,000 pre-retirement base salary, 35 years of pensionable service and the pension plan that calls for 2% of the last base salary multiplied by the number of years of service to be paid to CEO annually upon retirement. In this case, under a regular pension scheme, CEO's retirement benefits would not

exceed US$147,000 per annum (35 * 2% * US$210,000), since pensionable earnings are capped at $210,000.

A SERP is a non-contributory pension plan (i.e., completely funded by the employer) that permits to increase executive's post-retirement income beyond the regular pension limit. In essence, SERP benefits are similar to a post-retirement salary. Under a SERP, a firm enters into a long-term contractual obligation with an executive to make ongoing retirement payments in excess of the regular pension cap until the death of the executive, or sometimes until the death of the surviving spouse. If there is a reasonable expectation that a firm may not honor the contract – e.g., in case of a hostile takeover or bankruptcy – it can be guaranteed by a letter of credit, which can be called upon by the executive at any time. SERPs or arrangements similar to SERPs exist not only in Canada and in the USA, but outside North America as well, in countries where the income from regular pension schemes and/or pensionable earnings are capped by the government. In the United Kingdom, where pensionable earnings are capped at £105,600, these supplemental pensions directly from the employer are most often called *Unapproved Retirement Benefit Schemes*, in France – *Régimes de retraite supplémentaire* (or *Retraite chapeau*), similar pension

arrangements can be found in Australian, Japanese, and German firms. Regardless of the name, supplemental pension plans play a similar role in all these countries – to top-up executive's pension to the level which would have been attained without caps on the income from regular pension plans and/or pensionable earnings.

Most often, the design of a SERP reflects the design of a regular pension plan: a certain percentage (multiplier) of pensionable earnings for each year of pensionable service to be paid annually to a retiree upon reaching the retirement age. In some cases, retirement benefits under SERPs are not associated with the number of years of pensionable service and are determined by pensionable earnings and multiplier only. However, while the general design of a SERP formula is straightforward, the way its components are determined and valued differ significantly from one executive to another. Table 2 summarizes specifications of CEO SERPs in S&P/TSX60 firms for the period between 1997 and 2003. The fact that a firm faces multiple avenues in designing (negotiating) SERPs for (with) its executives is mirrored in different forms that SERPs can take. One of the choices to be made is the determination of pensionable earnings. In some cases, these are limited to the base salary, while in other cases short-

TABLE 2: SERP Components and Their Design

SERP Component	Alternative Designs
General formulae	• $SERP = m_1 * PensEarn * YrsPensSrv - RPP$ • $SERP = m_2 * PensEarn * YrsPensSrv$ • $SERP = m_3 * PensEarn$
Pensionable earnings	• $PensEarn = m_4 * Salary + m_5 * Bonus$ • $PensEarn = Salary + $ MIN $(Bonus; m_5 * Salary)$ • $PensEarn = $ MIN $(Salary + Bonus; m_6 * Salary)$
Pensionable earnings period	• Highest average *PensEarn* during y_1 consecutive years within last y_2 years of service • Average *PensEarn* during last y_2 years of service • Average of the highest y_3 annual *PensEarn* within last y_4 years of service
Years of pensionable service	• $YrsPensSrv = m_7 * YrsSrv + BonusYrsSrv$
Survivor benefit	• No survivor benefit • ($m_8 * SERP$) to be received by retiree's spouse or dependent children annually for life (or for a certain period y_5) after retiree's death
Protection	• Unfunded *SERP* • Funded *SERP* (full amount or partially)
Cap on *SERP*	• No cap on *SERP* • $SERP = $ MIN $(SERP, CapSERP)$
Cap on *YrsPensSrv*	• No cap on *YrsPensSrv* • $YrsPensSrv = $ MIN $(YrsPensSrv, CapYrsPensSrv)$
Adjustment to inflation	• No adjustement • *SERP* to be adjusted relative to changes in the CPI
Minimal retirement age	• Employee starts receiving *SERP* upon reaching *RetAge*
Early retirement	• No early retirement • Employee may start receiving ($m_9 * SERP$) upon reaching *EarlyAge*
Tenure requirements	• At least y_6 years of service required to start receiving *SERP*

The table above illustrates the components of SERPs and existing methods of their design based on the sample of CEOs' SERPs in TSX/S&P60 firms for the period between 1997 and 2003 (60 firm, 116 CEOs, 395 observations)). *SERP* is annual benefits from SERP. *PensEarn* is pensionable earnings. *YrsPensSrv* is the number of years of pensionable service. *RPP* is annual benefits from RPP. *Salary* is base salary. *Bonus* is annual cash bonus. *YrsSrv* is the number of years of actual service. *BonusYrsSrv* is the number of additional years of service granted for pension purposes. *CapSERP* is the upper bound of annual benefits from SERP. *CapYrsPensSrv* is the upper bound of years of pensionable service. *RetAge* is the retirement age at which SERP benefits are payable. *EarlyAge* is the early retirement age at which reduced SERP benefits are payable. m_1~m_9 = multipliers. y_1~y_6 = years.

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and long-term cash incentives (realized or target, fully or partially) are also taken into account. Alternatives also exist with respect to the choice of the period in which pensionable earnings are determined. One existing option is to determine SERP benefits based on the average pay during one or several consecutive years immediately prior to retirement. Another possibility is to use the average of the highest n annual pays or the highest average pay in m consecutive years over a longer period.

The design of other SERP components is also subject to alternatives: whether to provide retirees with survivor benefits, whether to limit the size of SERP benefits, whether to adjust SERP benefits to inflation, whether to allow early retirement, whether to impose tenure requirements, and whether to fund retirement benefits. Furthermore, not only the design of SERP compensation is subject to firm's discretion: values attached to SERPs must be determined as well. The size of the multiplier is critical: a SERP with a multiplier of 2% yields twice the retirement benefit of a SERP with a multiplier of 1%, *ceteris paribus*. A firm may also decide to grant its executives additional years of pensionable service (routinely or in one-time shots), on top of actual years of service. A firm also determines the length of the period in

which pensionable earnings are estimated, the age at which the executive becomes eligible for SERP benefits, the age of early retirement and the reduction in SERP benefits associated with it, the size of survivor benefits, the limit on the size of SERP benefits, and other values attached to SERPs. Finally, it should be noted that a SERP is not carved in stone until executive's retirement: a firm can make changes to SERPs, just as it can make changes to other forms of employee benefits. Consequently, the SERP of the same executive may differ from one year to another. To summarize, SERPs and SERP components can take many forms; ultimately, each option carries an impact on the expected value of executive's pension.

2.2. SERP disclosure

At present, rules on SERP disclosure are identical in the USA and in Canada. According to existing executive compensation disclosure regulations implemented by the Securities and Exchange Commission in 1992 (USA) and the Ontario Securities Commission in 1993 (Canada), a firm must disclose in the annual proxy statement the remuneration – in the previous three years – of its five highest-paid executives. With respect to SERP disclosure, the following requirements apply: firms must disclose the existence of

pension arrangements for the five highest-paid executives as well as methods used to calculate the amount of pension. However, a firm is not required to disclose executive's expected pension or accumulated retirement benefits. Moreover, the format of disclosure is not prescribed. The following excerpt from the 2004 proxy statement of Petro-Canada illustrates an example of SERP disclosure:

> …For Mr. Brenneman, the retirement benefit is equal to 1.5 per cent per year of service, including industry service, times the average of the highest three consecutive years of the sum of base salary plus annual incentive in the final 10 years of service. In the event of the death of Mr. Brenneman after retirement, 60 per cent of the retirement benefit will be continued for the life of his spouse. The SERP provides that no benefit is payable on early retirement prior to normal retirement age without the approval of the Corporation.
>
> The accredited years of service as of December 31, 2003 for Mr. Brenneman is eight years; for his first five years of employment, his accredited service accrues at the rate of two years for every year of actual service.

In this example, as in the vast majority of other cases (see Appendix A for more examples of SERP disclosure), the firm does not disclose the monetary value of accumulated and/or projected CEO pension benefits. The annual *pension*

increment – the amount by which the value of Mr. Brenneman's pension plan has increased over the year – is not disclosed either. Furthermore, the firm does not provide the reader with all necessary information to make the appropriate calculations. One would have to find out how old Mr. Brenneman is, whether he is married, how old his spouse is, and what his salary and bonus were in previous years. In addition, one would have to make numerous assumptions and perform actuarial calculations. Since no publicly-available compensation database – including ExecuComp – carries the information on SERP benefits of top executives, shareholders interested in the true remuneration of Mr. Brenneman face an untrivial task of estimating his pension increment and/or projected pension.[5]

3. DEVELOPMENT OF RESEARCH HYPOTHESES

3.1. Determinants of SERP Benefits

Due to the vagueness of SERP disclosure, executive pension arrangements have been virtually left out of the shareholders' view for decades. Measures of total executive compensation employed in the professional and academic literatures ignore pension increments earned by executives, and a few rare exceptions are based on unrepresentative

samples and the data from the 1960s and 1970s. Burgess (1963) pioneers the estimation of SERP benefits, incorporating them into a measure of total executive compensation alongside other pay components. Lewellen (1968) and Masson (1971) estimate SERP benefits using similar techniques. Finally, Antle and Smith (1985) update the sample of 39 electronics, aerospace and chemical firms used by Masson (1971) to show how the broad measure of executive compensation differs from the traditional measure of compensation limited to cash payouts.

The abovementioned studies highlight an important point: the estimation of SERP benefits using publicly-available data is feasible and does not require any technical skills beyond the knowledge of standard actuarial techniques. Instead, the key reason for the omission of SERP benefits from measures of total pay appears to be a high cost of data collection. Decoding proxy-statements is extremely time-consuming: as Appendix A shows, SERP disclosures may be – and often are – quite cumbersome. In addition, variables necessary to estimate the value of executive's SERP must be collected from different sources. For example, to calculate pensionable earnings of an executive, one must retrieve the historical compensation data for that executive from prior proxy statements. Depending on the

terms of executive's retirement arrangements, up to 10 years of prior compensation data may be required. In other words, it takes significant time to estimate expected SERP benefits of one executive in one specific year. The task becomes extremely more time-consuming if one needs to estimate expected SERP benefits for a sample of executives.

The absence of data on executive pensions sharply contrasts with a significant use of SERPs – about 80% in Canadian firms, and about 90% in American firms (Magnan et al., 1996; Patterson, 2000), numerous well-publicized cases of substantial SERP benefits of retiring executives, and anecdotes that pensions represent a significant source of compensation for some executives (see Endnote 1). As a result, due to the combination of many factors (vagueness of SERP disclosure, lack of objective data, significant usage of SERPs, anecdotes and individual examples of significant SERP benefits), in the literature, SERPs are often referred to as the ultimate form of "stealth", or hidden, compensation (Murphy, 1999).

The most recent academic work attempts to shed some light on SERP benefits. Two studies overcome the absence of representative and current data on SERPs' magnitude by using samples that concentrate on recent periods and are not limited to specific industries. In both cases, SERP

descriptions are hand-collected from primary sources (i.e.,
corporate proxy statements) and translated into numbers,
and then actuarial techniques are applied to obtain values
of CEO SERPs.[6] Specifically, Bebchuk and Jackson Jr. (2005)
estimate the value of pension plans for the two groups of
CEOs of S&P500 firms: those who retired during 2003 and the
first five months of 2004, and those expected to retire
(aged 63 to 67). On average, the annual pension of a
retired CEO is US$1.1 million and the actuarial value of
his SERP at retirement is US$15.1 million.[7] The average
expected pension of an actual CEO is US$1.5 million and the
projected actuarial value of his SERP at retirement is
US$19.6 million. Sundaram and Yermack (2007) adopt a sample
of 237 Fortune 500 firms. Seventy-seven percent of CEOs in
the sample have SERP arrangements. On average, CEO's annual
pension increment is US$1 million, which exceeds his base
salary (US0.9 million) and represents 43% of the total cash
compensation. To summarize, both studies on SERPs that use
current data support the anecdotal evidence that CEO SERP
benefits are sizable. However, the result produces more
questions than answers. Specifically - since CEO SERPs are
common and sizable - two important questions emerge. *Why
does one CEO have a generous supplemental retirement*

arrangement while another CEO has no SERP at all? What determines the size of that arrangement?

Existing research on determinants of executive compensation relies primarily on two paradigms: optimal contracting and managerial power. The optimal contracting view is based on the principal-agent literature (among others, Mirrlees, 1976; Holmstrom, 1979, 1982; Grossman and Hart, 1983), in which managerial compensation is a tool that can incite the agent, or manager, to act in the best interest of the principal, or shareholders, and alleviate the agency conflict.[8] Under the optimal contracting paradigm, boards and compensation committees are assumed to design executive compensation to maximize shareholders' value. Consequently, one would expect executive compensation to be associated with economic factors, such as firm size, performance, and leverage. This theoretical prediction is to a large extent reflected in empirical investigations. Although results differ conditional on methodological choices, empirical studies generally confirm that various economic measures are to a certain extent significant in determining executive compensation (e.g., Murphy, 1999; Core et al., 1999; Bushman and Smith, 2001; Pennathur and Shellor 2002; Craighead et al., 2004).

According to the managerial power view, executives with power are able to influence their own compensation, thereby extracting *rents*, defined as the amount of compensation received over the amount that would have been received under optimal contracting. Consequently, one would expect executive compensation to be associated with factors that proxy for managerial power. Empirical evidence suggests that such links do exist. After controlling for economic determinants of compensation, Core et al. (1999) find that ownership and board structures explain a significant portion of cross-sectional variation in CEO compensation. The authors conclude that CEO compensation is higher in firms with weaker governance mechanisms in place. According to Lambert et al. (1993), a negative association between executive remuneration and the number of outside directors exists. Executive compensation is also positively associated with the percentage of share votes controlled by inside directors (Core, 1997) and the size of the board (Yermack, 1996). These are just a few studies describing how variables that proxy for managerial power affect executive remuneration.

Naturally, regardless of the extent of managerial power, at certain level, the rent extraction is constrained by mechanisms of shareholders' control, including corporate

governance mechanisms. In other words, a positive association between managerial power and executive compensation is offset by shareholders' control. However, SERPs are different from any other form of compensation. The "stealth" nature of SERP benefits implies that executive compensation can be increased *off* the radar screen of shareholders via executive pensions. Bebchuk and Fried (2004), among others, stress that SERPs – due to their obscurity – make an attractive choice for executives with power to extract rents. When rents are extracted via pension benefits, the likelihood and extent of shareholders' response to the rent extraction is minimal compared to shareholders' response to the rent extraction via other, more transparent compensation schemes. One, therefore, would expect the incidence and magnitude of SERP benefits to be strongly associated with factors that proxy for managerial power. In other words, a CEO with more power is more likely to have a SERP arrangement than a CEO with less power. Among CEOs with SERPs, a CEO with more power is more likely to have higher SERP benefits than a CEO with less power. I explore these related associations by examining the following two hypotheses:

H1: *The presence of SERP in CEO compensation arrangements is positively associated with CEO power.*

H2: *The size of CEO's pension increment is positively associated with CEO power.*

Analyzing the two hypotheses provides valuable contribution to several streams of academic research. The empirical evidence on determinants of SERP benefits complements executive compensation studies that explore the nature and antecedents of various existing pay arrangements. In contrast to cash compensation, stock and stock option grants, SERP benefits as a form of CEO pay remain unexplored. To the best of my knowledge, no test of Hypothesis 1 exists in prior studies. Hypothesis 2 is most closely related to the work by Sundaram and Yermack (2007), who investigate determinants of the combination of debt and equity (present value of CEO's pension divided by the value of his stock and options) in CEO compensation. The analysis in this study is conceptually different since it concentrates on SERPs in isolation due to their unique characteristics and insufficient disclosure. Also, the study broadens the theoretical perspective by questioning and relaxing the optimal contracting view of SERP benefits. It explicitly investigates the rent extraction assertion,

exploring whether SERP benefits are indeed driven by managerial power. Consequently, from the conceptual angle, the study contributes to the debate between two main compensation paradigms: optimal contracting *vs*. managerial power. In addition, investigating the link between CEO power and CEO SERP benefits provides additional empirical evidence on consequences of vague compensation disclosure and the role of corporate governance mechanisms. Specifically, a significant positive association between CEO power on the one side and the incidence and magnitude of SERP benefits on the other would highlight the importance of transparent disclosure of all forms of executive compensation. Such result would also underline the importance of corporate governance mechanisms in alleviating the rent extraction problem: a stronger board would diminish CEO's power over the board and his ability to influence his own pay.

3.2. Consequences of SERP Benefits

3.2.1. Earnings Management

Investigating the determinants of CEO SERP benefits is the first broad objective of the study. Investigating the consequences of CEO SERP benefits is the second objective. The impact of executive compensation contracts on firm's

decisions and accounting choices is well documented in the literature (among others, Watts and Zimmerman, 1986; Yermack, 1997; Guidry et al., 1998; Aboody and Kasznik, 2000). However, all prior studies in this research area concentrate on the impact of traditional components of executive compensation (i.e., base salary, cash bonus, stock options) on the decision-making. A potential impact of CEO SERP benefits on firm's decisions and accounting choices remains unexplored.

In general, there exist a number of ways in which a manager can use his judgment to make a particular accounting choice.[9] Academic interest in this area started with a proposition that discretionary accounting choices could be used specifically to manipulate firm's earnings: a practice referred to as earnings management. The chain of infamous corporate scandals in North America further fueled that interest. As a result, over past several decades, discretionary accounting choices in general and – specifically – earnings management have grown to become one of the major topics in the academic accounting literature. One of research directions in the earnings management literature is identifying conditions in which incentives to manage earnings are likely to be strong, and then empirically investigating whether patterns of unexpected

accruals are consistent with these incentives. Among conditions that potentially incite earnings management practices are management compensation contracts. Watts and Zimmerman (1986) develop the bonus plan hypothesis and argue that managers are incited to manage earnings to increase the amount of their bonus compensation. According to Healy (1985), managers do manipulate earnings in response to their bonus plans. Specifically, when the manager expects earnings to be below the lower bound required to earn any bonus or above the upper bound after which no further increases in bonuses are obtained, income-deferring accruals are more likely. However, Gaver et al. (1995) find no evidence of income-deferring accruals when earnings before discretionary accruals fall below the lower bonus plan bound. Holthausen et al. (1995) also find no evidence that managers manipulate earnings downwards when earnings are below the minimum necessary to receive any bonus, but find evidence consistent with the hypothesis that managers manipulate earnings downwards when their bonuses are at the maximum. On the other end, Guidry et al. (1998) show that divisional managers are likely to defer income not only when they are entitled to maximum bonuses permitted under the plan but also when the earnings target in their bonus plan is not expected to be met.

Other compensation arrangements also appear to be linked to discretionary managerial choices. Bartov and Mohanram (2004) hypothesize that compensation drives earnings management decisions and examine large stock option exercises by corporate insiders. The authors document that in the pre-exercise period, discretionary accruals are abnormally high, while in the post exercise period, they are abnormally low: a result consistent with prior evidence that executives opportunistically time the option-grant date (Yermack, 1997) and disclosures around option-grant dates (Aboody and Kasznik, 2000).

A number of studies examine whether earnings management is influenced by the horizon problem, which may occur when the anticipated tenure of the manager is shorter than the firm's optimal investment horizon. In that case, a manager would prefer projects with lower NPV but higher current accounting earnings than projects with higher NPV but lower current earnings (Smith and Watts, 1982). The horizon problem is especially pronounced when the manager approaches retirement (as opposed to leaving the firm and staying on the job market), as his concerns about the discipline from managerial labor markets become weaker or disappear (Gibbons and Murphy, 1992).

Empirical evidence on the impact of the horizon problem on accounting choices is scarce and mixed. According to Pourciau (1993), contrary to expectation, departing executives record accruals and write-offs that decrease earnings during their last year of tenure. DeAngelo (1988) finds that during proxy contests, incumbent managers exercise accounting discretion to improve reported earnings. Wells (2002) finds little empirical support for CEOs undertaking upward earnings management before a CEO change for a sample of Australian firms. Butler and Newman (1989) and Dechow and Sloan (1991) hypothesize that CEOs have incentives to reduce such discretionary expenditures as R&D and advertising in their last years to boost accounting earnings and – as a result – their bonuses. Dechow and Sloan (1991) support the argument by empirical results. Gibbons and Murphy (1992) also find that the growth rate of R&D intensity slows down as the CEO approaches retirement. According to Barker and Mueller (2002) and Lundstrum (2002), CEO's age is negatively associated with R&D spendings. However, after controlling for endogenous CEO turnover and firm performance, Murphy and Zimmerman (1993) find little support for the impact of the horizon problem on R&D expenditures. Specifically, the study finds no evidence of managerial discretion in

strongly performing firms where the CEO retires as part of the normal relay process, i.e. when executive change is an orderly and well-planned event which usually concludes with the departing executive remaining a member of the board of directors (Vancil, 1987). In addition, Cheng (2004) finds no association between CEO turnover and R&D expenditures, speculating that the result may differ from that of Dechow and Sloan (1991) due to a different time frame considered.

To summarize, in general, the existing empirical evidence indicates that managers do make accounting decisions to increase their compensation but fails to establish that managers are more incited to manage earnings to increase their compensation in final years prior to retirement than in any other year. None of existing studies, however, takes into consideration the possibility that some CEOs are considerably more incited to manage earnings in their final pre-retirement years than others due to the nature of their retirement arrangements, as the following discussion suggests.

Overall, CEOs can be classified into three groups according to their retirement arrangements: (1) CEOs without SERP arrangements; (2) CEOs with SERP arrangements in which pensionable earnings consist of base salary only, and are therefore not contingent on firm's accounting

earnings; and (3) CEOs with SERP arrangements in which pensionable earnings are determined based on salary and bonus and are therefore contingent on firm's accounting earnings. An increase in accounting earnings is most beneficial to CEOs from the latter group, as not only their bonus compensation will increase, but also the value of the pension plan. Under existing SERPs, pensionable earnings are usually determined in the last N years prior to retirement (hereafter, *determination years*), so the beneficial impact of accounting earnings on compensation is specifically pronounced when such CEO approaches retirement. The following example illustrates the potential magnitude of the impact of bonus compensation on CEO's pension benefits. Consider a retiring CEO, with 20 years of credited service, aged 60, whose annual pension is to be determined by the product of cash compensation (base salary plus annual bonus) in the last year prior to retirement, his years of credited service and a multiplier of 2%. If the salary of the CEO in the last year prior to retirement is $1,000,000 and the bonus is $0, his annual pension will be ($1,000,000 + 0) * 20 * 0.02 = $400,000 and the actuarial value of the pension plan will be $5,637,378, assuming a discount rate of 5% and life expectancy estimates published by Statistics Canada. If, however, the

salary of the CEO in his last year prior to retirement is $1,000,000 and his bonus is also $1,000,000, CEO's annual pension and the actuarial value of his pension plan will increase to $800,000 and $11,275,156 respectively. In other words, $1,000,000 of bonus compensation would actually increase the wealth of the CEO by $6,637,378 ($1,000,000 + $11,275,156 − $5,637,378), and not by $1,000,000. Neither CEOs without SERPs nor CEOs with SERP arrangements in which pensionable earnings consist of base salary only would enjoy such indirect increases in their wealth. As such, payoffs of income increasing accounting choices in determination years would be high for CEOs whose retirement plans are performance contingent. Such a CEO would be motivated to manage earnings upwards to amplify his post-retirement benefits. Therefore, the prediction concerning the impact of SERPs on earnings management is the following:

H3: *Earnings management is positively associated with the horizon problem when SERP benefits of CEOs are contingent on firm's accounting earnings.*

3.2.2. Risk Preferences

Also inherent in the nature of SERPs is the potential

impact of SERP arrangements on executive's risk-taking behavior. The research in this area is limited to one study by Sundaram and Yermack (2007). The study provides some analysis on the association of the size of CEO's SERP with firm's risk. Specifically, one plot shows that capital investments appear to decline as the value of CEO's SERP increases. Another plot shows that increased SERP benefits also lead to a greater frequency of debt rating upgrades. However, using multivariate regressions, Sundaram and Yermack (2007) fail to find significant support of these relationships.

The analysis in Sundaram and Yermack (2007) omits the fact that SERPs are not homogeneous. Specifically, an important characteristic of SERPs is ignored: the performance-contingency of pension benefits. While some SERP benefits are performance-contingent, others are not. Also, in case of employment termination prior to the normal retirement age, a CEO loses a certain percentage (up to 100%, depending on terms of the SERP) of accumulated SERP benefits. The situation – and specifically, the probability of losing accumulated benefits – should have an impact on CEO's risk-taking behavior, as showed by the models below.

According to the nature of pension arrangements in place in a given year, CEOs can be classified into three groups:

(1) *NOSERP*, which includes CEOs without SERP arrangements;

(2) *SERPSAL*, which includes CEOs with SERP arrangements in which SERP benefits are determined based on salary only, and are therefore not contingent on CEO performance; and

(3) *SERPBON*, which includes CEOs with SERP arrangements in which SERP benefits are determined based on salary and bonus, and are therefore contingent on CEO performance.

Suppose that the present value of expected CEO's SERP benefits is v at the beginning of a given year. Hence, $v = 0$ for *NOSERP*, and $v \geq 0$ for *SERPSAL* and *SERPBON*.[10] Also, suppose that CEO performance in this year can be either good (denoted by superscript +) or poor (denoted by superscript −). Then, expected values of CEO SERP benefits at the end of the year are:

$$E(v^-)_{NOSERP} = 0(1 - \Pi) + 0\Pi = 0 \qquad (1a)$$

$$E(v^+)_{NOSERP} = 0 \qquad (1b)$$

$$E(v^-)_{SERPSAL} = v(1 - \Pi) + pv\Pi = v - v\Pi(1 - p) \qquad (1c)$$

$$E(v^+)_{SERPSAL} = v \qquad (1d)$$

$$E(v^-)_{SERPBON} = v(1 - \Pi) + pv\Pi = v - v\Pi(1 - p) \qquad (1e)$$

$$E(v^+)_{SERPBON} = v + bv \qquad (1f)$$

where:

Π	=	probability of being fired or forced to retire due

		to poor performance
p	=	percentage of SERP benefits received due to early retirement; $0 \leq p < 1$
b	=	percentage increase in the present value of SERP benefits due to good performance and increase in the bonus compensation

As such, in a given year, accumulated SERP benefits of *SERPSAL* increase by 0 in case of good performance, and decrease by $v\Pi(1 - p)$ when the performance is poor:[11]

$$E(v)_{SERPSAL} - v_{SERPSAL} = [- v\Pi(1 - p); 0] \qquad (2)$$

Similarly, in a given year, accumulated SERP benefits of *SERPBON* increase by bv in case of good performance, and decrease by $v\Pi(1 - p)$ in case of poor performance:

$$E(v)_{SERPBON} - v_{SERPBON} = [- v\Pi(1 - p); bv] \qquad (3)$$

Finally, irrespective of the performance, the change in the value of accumulated SERP benefits of *NOSERP* is zero:

$$E(v)_{NOSERP} - v_{NOSERP} = [0; 0] \qquad (4)$$

According to Equations (2) and (3), when the performance is poor, the expected loss of the CEO whose SERP benefits are performance-contingent equals the expected loss of the

CEO whose SERP benefits are based on the base salary only. However, the expected gain of the former CEO is higher (by the amount *bv*), when the performance is good. Ceteris paribus, higher reward incites risk-taking. Therefore, CEOs with performance-contingent SERPs are expected to be more risk-tolerant than CEOs whose SERPs are not contingent on performance.[12] This prediction is tested empirically:

H4: *CEOs whose SERP benefits are contingent on firm performance are more risk-tolerant than CEOs whose SERP benefits are not contingent on firm performance.*

The comparison of CEOs whose SERP benefits are performance-contingent with CEOs who have no SERP arrangements is not that straightforward. According to Equation (4), the expected payoff (loss) is zero for *NOSERP* regardless of performance. According to Equation (3), the expected payoff of *SERPBON* is bv when the performance is good, while the expected loss is $v\Pi(1 - p)$ when the performance is poor. This means that no general prediction with respect to the relative risk-aversion of the two groups of CEOs can be made. On the one hand, contrary to CEOs with no SERP arrangements, CEOs with performance-contingent SERPs have something [$v\Pi(1 - p)$] to lose in case of poor performance, and thus should be relatively more

risk averse. On the other hand, contrary to CEOs with no SERP arrangements, CEOs with performance-contingent SERPs have something to gain (bv) in case of good performance, and thus are incited to take additional risk. Clearly, the risk-tolerance of CEOs with performance-contingent SERPs would differ according to values attached to bv and $v\Pi(1 - p)$.

However, while it appears unfeasible to construct a justifiable *general* hypothesis that would compare CEOs with no SERP benefits and CEOs whose SERP benefits are contingent on performance, it is possible to make relative risk-aversion comparisons in a specific setting: during the final year prior to the expected CEO retirement, when the probability Π of early termination approaches zero. The expected loss of all three groups of CEOs is equal (and equals zero) if the performance is poor in the final year as the CEO will retire at the end of that year anyway.[13] At the same time, if the performance is good, CEOs with performance-contingent SERPs face higher expected payoffs (bv) than CEOs with no retirement arrangements and CEOs whose SERP benefits are determined based on the base salary only (zero). Since, *ceteris paribus*, higher reward incites risk-taking, the following hypothesis is examined:

H5: *In the final year prior to expected retirement, CEOs whose SERP benefits are contingent on firm performance are more risk-tolerant than CEOs with no SERP benefits.*

One would also expect CEO risk-tolerance to vary according to the size of already accumulated SERP benefits. However, the relationship is not that straightforward as in Sundaram and Yermack (2007), who hypothesize that a direct positive association between the two exists. Specifically, the association between risk preferences and the value of SERP should vary according to the performance-contingency of SERP benefits and the probability of early retirement, as showed by the examples that follow.

Suppose, that the present value of SERP benefits of two CEOs at the beginning of a year is v_1 and v_2 respectively, such that $v_1 > v_2$. Also, suppose that SERP benefits of the two CEOs are determined based on salary only, and both CEOs face same Π and p. According to Equation (2), expected annual changes in accumulated SERP benefits at the end of the year for the two CEOs are, respectively:

$$E(v_1)_{SERPSAL} - v_{1SERPSAL} = [- v_1\Pi(1 - p); \ 0] \qquad (5a)$$

$$E(v_2)_{SERPSAL} - v_{2SERPSAL} = [- v_2\Pi(1 - p); \ 0] \qquad (5b)$$

The gain of the two CEOs when the performance is good is

the same. However, since $v_1 > v_2$, the loss of the CEO with more accumulated SERP benefits is higher in case of poor performance than the loss of the CEO with less accumulated SERP benefits. Risk-aversion is therefore expected to be positively associated with the size of accumulated SERP benefits when SERP benefits are not contingent on performance. The only exception is the last year prior to CEO expected retirement when – as discussed above – the expected loss of both CEOs in case of poor performance is the same since Π approaches zero. The following hypothesis is tested empirically:

H6: *Except in the final year prior to expected retirement, the risk-tolerance of CEOs whose SERP benefits are not contingent on firm performance is negatively associated with the size of accumulated SERP benefits.*

If SERP benefits are contingent on performance, the risk behavior of two CEOs with different values of accumulated SERP benefits is not that straightforward. Consider the abovementioned example for the two CEOs whose SERP benefits are performance-contingent. According to Equation (3), expected annual changes in accumulated SERP benefits at the end of the year for these two CEOs are, respectively:

$$E(v_1)_{SERPBON} - v_{1SERPBON} = [- v_1\Pi(1 - p); \ bv_1] \qquad (6a)$$

$$E(v_2)_{SERPBON} - v_{2SERPBON} = [- v_2\Pi(1 - p); \ bv_2] \qquad (6b)$$

On the one hand, the CEO with more accumulated SERP benefits loses more in case of poor performance, and thus is expected to be more risk-averse than the CEO with less accumulated SERP benefits. On the other hand, when the outcome is positive, the CEO with more accumulated SERP benefits gains more (bv_1) than the CEO with less accumulated benefits (bv_2), and thus is more incited to take risks. The risk-tolerance of the two CEOs would differ according to specific values attached to b, Π and p. Consequently, justifying a *general* prediction about the impact of accumulated SERP benefits on CEO risk-tolerance when SERP benefits are performance-contingent appears problematic. However, during the final year prior to expected retirement, a CEO with accumulated SERP benefits v_1 is expected to be more risk-tolerant than the CEO with v_2. If the performance is poor in that year, both CEOs face the same consequences, due to Π approaching zero. If the performance is good, the CEO with higher accumulated SERP benefits enjoys higher returns, and thus is incited to take additional risks. Therefore, the following hypothesis is examined:

H7: *In the final year prior to expected retirement, the risk-tolerance of CEOs whose SERP benefits are contingent on firm performance is positively associated with the size of accumulated SERP benefits.*

Table 3 summarizes research hypotheses on the relative association between CEO risk preferences and SERP benefits (i.e., Hypotheses 4 to 7).

To the best of my knowledge, none of the hypotheses on the impact of CEO SERP benefits on decision-making are examined in the literature. By examining associations of CEO SERP benefits with earnings management and risk preferences, the study fills this gap and makes an important contribution to several streams of the academic research. The analysis of the earnings management hypothesis contributes to the horizon problem literature by investigating a previously unexplored dimension of the relationship between the horizon problem and discretionary accounting choices. Prior evidence in this area is scarce and mixed, with most studies finding no or little impact of the horizon problem on earnings management. However, no prior research considers that CEOs approaching retirement are heterogeneous with respect to their earnings management incentives. Specifically, CEOs with performance-contingent

TABLE 3: Summary of Hypotheses on CEO Risk Preferences

Comparison			Expected risk-tolerance relationship in a given year		Hypothesis
			Years prior to final year	Final year	
SERPBON	vs.	*SERPSAL*	>	>	H4
SERPBON	vs.	*NOSERP*	?	>	H5
SERPSAL$_{HIGH}$	vs.	*SERPSAL*$_{LOW}$	<	=	H6
SERPBON$_{HIGH}$	vs.	*SERPBON*$_{LOW}$	?	>	H7

The table above summarizes research hypotheses on the association between CEO risk-tolerance and SERP benefits (Hypotheses 4 to 7). *SERPBON* are observations when CEO SERP benefits are contingent on firm performance. *SERPSAL* are observations when CEO SERP benefits are not contingent on performance. *NOSERP* are observations when CEO's have no SERP arrangements. Subscripts HIGH and LOW refer to the size of accumulated SERP benefits.

SERPs may be more incited to manage earnings and amplify their retirement benefits than other CEOs. As such, a researcher may conclude that no association between the horizon problem and accounting choices exists *in general*, when in fact such association does exist for one group of CEOs and does not exist for the other. Controlling for CEO SERP benefits in the earnings management test would provide an empirical answer on the issue and thus contribute to the understanding of the horizon problem and its consequences.

Investigating the links between CEO SERP benefits on the one side and earnings management and risk preferences on the other also contributes to the compensation literature and specifically to the stream of research on consequences of executive compensation. Existing studies in this area provide empirical evidence that specific executive compensation components do impact decisions and accounting choices and decisions in one way or another. At the same time, implications of CEO SERP benefits remains unexplored – even though SERP benefits are common, sizable and represent a unique post-retirement compensation arrangement, incomparable to other pay components. The only existing research in this direction, Sundaram and Yermack (2007), finds no impact of CEO SERP benefits on risk preferences. However, the authors do not consider that CEOs

have heterogeneous risk preferences due to specifics of their SERP arrangements. The analysis in this study accounts for the heterogeneity. In addition, the study applies a broader concept of decision-making, investigating a previously unexplored association of CEO SERP benefits with earnings management and, therefore, contributing to a broad stream of academic literature on earnings management incentives.

4. METHODOLOGY

4.1. Data

The sample of 60 firms that comprised the S&P/TSX60 index in 1997 is used for the analysis (see Appendix B for the list of firms). The S&P/TSX60 Index is comprised of Canada's largest publicly traded firms listed on the Toronto Stock Exchange and more than 60% of which are cross-listed in the USA. The proportion of CEO SERP benefits to cash compensation in larger firms is expected to be more pronounced due to a greater disproportion between pensionable earnings and post-retirement income from the RPP. Since any form of executive compensation is positively associated with firm size (among others, Jensen and Murphy, 1990; Lambert et al., 1991; Core et al., 1999; Craighead et al., 2004), CEOs in larger firms are better

remunerated. As Table 1 shows, higher pre-retirement cash compensation translates into greater disproportion between pensionable earnings and RPP benefits and – therefore – a greater role of a supplemental pension plan in preserving pre-retirement cash-inflows for a CEO.[14] Since supplemental retirement plans are most important for better-compensated CEOs, associations of SERP benefits with CEO power, earnings management incentives, and risk preferences are expected to be especially pronounced in larger firms.

The sample encompasses the seven-year period between 1997 and 2003 and includes 60 firms, 116 CEOs, and 395 observations. A historical sample selection rule is crucial for the research since accumulated SERP benefits and pension increments are calculated based upon historical compensation data. Descriptions of SERPs, compensation, governance and ownership data are retrieved directly from annual proxy statements. When CEO's age is not disclosed in the proxy statement, it is retrieved via Lexis-Nexis databases and Internet search engines. Death probability tables are retrieved from the Statistics Canada publications. Financial data is collected from Compustat. Missing observations are retrieved from Report on Business Top 1000 publications and corporate financial statements. To account for inflation, all monetary values are converted

into 2003 dollars using historic CPIs. Appendix C lists all variables used in the analysis and sources of data.

4.2. Estimation of Annual Pension Increment

Following Masson (1971), Antle and Smith (1985) and Sundaram and Yermack (2007), I estimate the pension increment (i.e., the value of expected retirement benefits accumulated by the executive in a given year) in year t as the actuarially adjusted difference between the present value of the pension plan in year t and the present value of the pension plan in year t-1.

In the first step, the value of the annual pension already accumulated by the CEO is estimated. SERP formula, multiplier and years of pensionable service accumulated are disclosed in the proxy statement and do not have to be estimated. Pensionable earnings are typically not disclosed. Instead, a firm discloses information on components of pensionable earnings (i.e., base salary or some combination of base salary and other incentives) and the period over which pensionable earnings should be estimated (i.e., annual pensionable earnings immediately prior to retirement or the average of highest annual pensionable earnings over a longer period). Thus, in most cases, to estimate pensionable earnings in year t, the

information on CEO's compensation in prior years must be collected from earlier proxy statements. For any given CEO at any given year t, compensation data for at least three prior years, $t-1$ to $t-3$, is available.[15] For any prior year in which the information on CEO compensation is unavailable, I assume that the salary is equal to the salary in the earliest year for which the compensation information is available, while the bonus is equal to the average bonus in years for which the compensation information is available.[16]

In the second step, the annual pension already accumulated by the CEO and death probability tables published by Statistics Canada are used to estimate the present value of the SERP. For simplicity, it is assumed that pension benefits are paid annually at the end of a year. When the age of the CEO is not disclosed in the proxy statement, it is retrieved via the Blue Book of Canadian Business, Who's Who in Canadian Business, LexisNexis or Google. Any survivorship benefits are conservatively ignored as I am unable to gather information on the marital status of CEOs and the age of their spouses. I assume that current CEOs with SERPs will retire upon reaching the age at which they qualify for unreduced SERP benefits, which in most cases is the age of normal retirement specified in

proxy statements. In one case, in which the CEO has already reached the age of normal retirement but continues serving in his position in 2003 (the last year in the sample), it is assumed that he will retire in 2004.

Finally, in the last step, CEO's pension increment in year t is estimated by subtracting the present value of SERP in year $t-1$ adjusted for one-year discount rate from the present value of SERP in year t.

4.3. Models of SERP Determinants

SERPs are individual and may differ from one CEO to another even within a particular firm. However, multiple annual observations for a particular CEO are expected to be correlated. Since the data is clustered, and within-cluster correlation is reasonably expected, regressions rely on standard panel data models that account for CEO-specific effects (i.e., Huber-White standard errors).

Table 4 describes models of SERP determinants and variables used in the analysis. Specifically, Column 4 pinpoints at hypothesized determinants of the presence/absence of a SERP in CEO's compensation arrangements. The dependent variable is dichotomous: 1 for observations with SERPs, 0 for observations without. A probit model is used in the analysis.[17] Since no study on

TABLE 4: Specification of Models of SERP Determinants

Variable	Description	Exp. sign	H1	H2	Selected literature
Dependent					
SERP	1 for observations with SERP, 0 otherwise	n/a	●		-
Increment	Annual pension increment ($000)	n/a		●	-
CEO power					
BoardSize	Number of directors	+	●	●	Yermack (1996), Core et al. (1999), Ghosh and Sirmans (2004), Grinstein and Hribar (2004), He and Conyon (2004), Brick et al. (2006), Sundaram and Yermack (2007)
UnrelatedDir	Proportion of unrelated directors on the Board	–	●	●	Lambert et al. (1993), Mehran (1995), Harvey and Shrieves (2001), Grinstein and Hribar (2004), He and Conyon (2004), Brick et al. (2006), Sundaram and Yermack (2007)
Blockholder	1 if the firm has a shareholder who owns at least 10% of its shares outstanding, 0 otherwise	–	●	●	Mehran (1995), Core et al. (1999), Bertrand and Mullainathan (2000), Craighead et al. (2004), Ghosh and Sirmans (2004), He and Conyon (2004)
TenureDir	Number of years an average unrelated director has served on the Board	?	●	●	Vafeas (2003), Byrd et al. (2006)
ShareDir	Proportion of firm's shares outstanding held by an average unrelated director	–	●	●	Core (1997), Cyert et al. (2002), Ghosh and Sirmans (2004), He and Conyon (2004)
TenureCEO	Number of years the CEO occupies his position	+	●	●	Berger et al. (1997), Harvey and Shrieves (2001), Brickley et al. (2003), He and Conyon (2004), Brick et al. (2006), Sundaram and Yermack (2007)
ShareCEO	Proportion of firm's shares outstanding held by the CEO	?	●	●	Mehran (1995), Core et al. (1999), Harvey and Shrieves (2001), Ghosh and Sirmans (2004), He and Conyon (2004), Brick et al. (2006)
CEOChairman	1 if the CEO is the Chairman of the Board, 0 otherwise	+	●	●	Core et al. (1999), Cyert et al. (2002), Ghosh and Sirmans (2004), Grinstein and Hribar (2004), He and Conyon (2004), Brick et al. (2006)
CEOInternal	1 if the CEO served on the Board before appointment, 0 otherwise	?	●	●	Brick et al. (2006), Sundaram and Yermack (2007)

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Economic					
Size	Natural log of revenue	+	●	●	Jensen and Murphy (1990), Lambert et al. (1991), Core et al. (1999), Murphy (1999), Harvey and Shrieves (2001), Brickley et al. (2003), Eldenburg and Krishnan (2003), Craighead et al. (2004), Ghosh and Sirmans (2004), Grinstein and Hribar (2004), Brick et al. (2006), Sundaram and Yermack (2007)
Performance	Net income ($000,000)	+	●	●	Murphy (1999), Vafeas and Afxentiou (1998), Carpenter and Sanders (2002), Craighead et al. (2004), Ghosh and Sirmans (2004), Grinstein and Hribar (2004), Brick et al. (2006)
Leverage	Debt-to-equity ratio	+	●	●	Harvey and Shrieves (2001), Craighead et al. (2004), Ghosh and Sirmans (2004), Brick et al. (2006), Sundaram and Yermack (2007)
Other					
Age	The age of the CEO	+	●	●	Harvey and Shrieves (2001), Brickley et al. (2003), He and Conyon (2004), Brick et al. (2006)
FirstYear	1 if the year is the year when the CEO is hired, 0 otherwise	+		●	-
LastYear	1 if the year is the year when the CEO retires, 0 otherwise	+		●	-

The table describes models of determinants of the incidence (H1) and magnitude (H2) of CEO SERP benefits, indicates predicted effects, and provides references to selected prior studies in which given independent variables are employed as compensation determinants.

determinants of CEO SERP benefits exists, independent variables are specified according to prior research on determinants of other executive compensation forms (Column 6). Variables that proxy for CEO power and their predicted effects are standard in the literature and include size of the board, percentage of unrelated directors on the board, presence of a large blockholder, tenure of unrelated directors, share ownership by unrelated directors, tenure of CEO, share ownership by CEO, CEO-Chairman duality, and whether the CEO served on firm's board prior to being appointed to his position. Specifically, CEO power is associated with larger boards of directors due to greater coordination problems within the board. Consequently, a positive association between the size of the board and CEO compensation is expected. CEO power is negatively associated with the proportion of unrelated directors on the board, since insiders are more likely to be influenced by the CEO. As a result, CEO compensation is expected to be negatively linked to the proportion of unrelated directors. Blockholder monitoring is another control mechanisms limiting CEO's power, so the association between the presence of a large blockholder and CEO compensation is expected to be negative. CEO compensation is also expected to be negatively associated with the ownership of unrelated

directors. Higher dependence of the wealth of unrelated directors on firm's results provides additional motivation for unrelated directors to act in the best interest of shareholders, thereby offsetting CEO power over the board. The number of years a CEO occupies his position is another proxy for CEO power over the board: over time, a surviving CEO is likely to develop friendly relationship with directors and/or gain directors' credibility. Consequently, CEO compensation is expected to be positively associated with CEO tenure. In addition, a CEO who performs the role of the Chairman of the Board has greater power over board's decisions. A positive association between CEO-Chairman duality and CEO compensation is therefore expected.

In several cases, however, the predicted effect of explanatory variables is unclear. Tenure of unrelated directors may signify closer ties between CEO and management in which case the predicted impact on CEO remuneration is positive. Alternatively, it may signify directors' experience and prudence in which case the effect on CEO's compensation is opposite. Share ownership by CEO may signify alignment of his interests with those of shareholders in which case the predicted impact on remuneration is negative. Alternatively, it may signify CEO's power and influence in which case the effect is

positive. Finally, a CEO that served on the board prior to his appointment may have closer ties with other directors than an outside CEO. In this case, the projected impact on CEO remuneration is positive. However, an outside CEO is likely to have less knowledge of the firm than a CEO that served on the firm's board before and – assuming risk-aversion – would require a premium for taking risks and running the firm. Consequently, an outside CEO would be more "expensive" than a CEO that served on the board before.

Control variables and directions of their association with the independent variable are also specified according to prior studies on executive compensation determinants. The group of explanatory economic variables includes proxies for firm's size (log revenue), performance (net income), and leverage (debt-equity ratio).[18] A positive association of CEO compensation with these firm-level factors is well-documented in the literature. The last group includes CEO's age – another variable that may have an impact on the presence/absence of SERP. I control for CEO's age suspecting that one's concern about retirement benefits grows as the retirement approaches.

A similar model is used to determine factors that impact the size of the pension increment, as Column 5 shows. The

independent variable is the annual pension increment, estimated using techniques described in the previous section.[19] Two additional explanatory factors are considered: *FirstYear* and *LastYear*. These two variables indicate observations that correspond to the first (last) year a CEO occupies his position. The inclusion of first and last year dummy variables is motivated by anecdotal evidence that additional years of pensionable service are granted to top executives when they join the firm (as additional incentive) or immediately prior to retirement (to close the gap between executive's pre- and post-retirement benefits). Also, if Hypothesis 3 is supported, on average, CEO's pension increment is expected to be higher in the final pre-retirement year. To summarize, a positive relationship is expected between *FirstYear* and *LastYear* on one side and the magnitude of pension increment on the other.

4.4. Models of SERP Consequences

4.4.1. Impact on Earnings Management

To verify whether the horizon problem incites earnings management when CEO SERP-benefits are performance contingent, I rely on the extended version of a widely-used Modified Jones model (Dechow et al., 1995). First, a

measure of discretionary, or abnormal, accruals is estimated to proxy for earnings management. Then, discretionary accruals are regressed on the dichotomous variable that partitions the sample into observations with and without hypothesized earnings management according to the factor of interest. The regression is controlled for common firm-level economic factors that impact firm's discretionary accounting choices and decisions. A significant coefficient on the partitioning variable is interpreted as a sign of earnings management due to the factor of interest. Such methodological framework is standard for earnings management tests based on the Modified Jones model (among others, Klein, 2002; Butler et al., 2004; Menon and Williams, 2004). The discussion that follows provides a more detailed specification of the research method.

In general, accounting accruals can be classified into normal and abnormal, or discretionary, components - a framework outlined by McNichols and Wilson (1988):

$$TACC = NDACC + DACC \tag{7}$$

where:

$TACC$	=	total accruals

NDACC	=	non-discretionary accruals
DACC	=	discretionary accruals

Discretionary accruals are considered to be the outcome of managerial opportunistic choices and represent a standard proxy for earnings management. To calculate discretionary accruals, I first measure total accruals using the cash-flow method suggested by Hribar and Collins (2002) who show that the more traditional balance sheet approach is potentially contaminated by measurement errors:

$$TACC_{it} = EBXI_{it} - CFOCO_{it} \qquad (8)$$

where *TACC* is as defined earlier and:

i, t	=	firm and year indicators
EBXI	=	earnings before extraordinary items and discontinued operations
CFOCO	=	operating cash-flows from continuing operations

To measure discretionary accruals, I rely on the extended version of the widely used Modified Jones model (Dechow et al., 1995), in which:

$$TACC_{it}/A_{it-1} = \alpha 1/A_{it-1} + \beta(\Delta REV_{it} - \Delta REC_{it})/A_{it-1} + \gamma PPE_{it}/A_{it-1} + \delta CFO_{it}/A_{it-1} + \varepsilon_{it} \qquad (9)$$

where *TACC* is as defined earlier and:

A	=	total assets
ΔREV	=	change in sales revenue
ΔREC	=	change in accounts receivable
PPE	=	property, plant and equipment
CFO	=	operating cash-flows

Discretionary accruals are then defined as the residual in Equation (9), i.e.:

$$DACC_{it} = TACC_{it}/A_{it-1} - [\alpha 1/A_{it-1} + \beta(\Delta REV_{it} - \Delta REV_{it})/A_{it-1} + \gamma PPE_{it}/A_{it-1} + \delta CFO_{it}/A_{it-1}] \qquad (10)$$

Finally, to test whether earnings management is associated with the horizon problem when CEO SERP benefits are contingent on firm's performance, discretionary accruals (DACC) are regressed on the dummy variable that partitions the sample into observations with and without hypothesized earnings management, controlling for major factors that impact the measure of discretionary accruals.

$$DACC_{it} = \beta_0 + \boldsymbol{\beta_1 HORIZON_{it}*BONSERP_{it}} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 GROWTH_{it} + \beta_5 PERF_{it-1} + \beta_6 LCFO_{it} + \varepsilon \qquad (11)$$

where DACC is as defined earlier and:

HORIZON	=	proxy for the horizon problem, either of the following dummy variables: $HORIZON^{DET}$: equal to one if t is a determination year, zero otherwise $HORIZON^0$: equal to one if t is the last year prior to CEO's retirement, zero otherwise
BONSERP	=	dummy variable equal to one if CEO SERP benefits are determined based on bonus compensation, zero otherwise
SIZE	=	natural log of total assets
LEV	=	total debt / total beginning assets
GROWTH	=	book value of equity / market value of equity
PERF	=	income before extraordinary items / total beginning assets
LCFO	=	natural log of cash-flows from operations

In the Equation (11), the partitioning variable is the interaction of the horizon problem with the performance-contingency of SERP benefits. According to Hypothesis 3, the β_1 coefficient is expected to be significantly positive. To clarify whether the horizon problem appears in the last year prior to CEO retirement or when the determination period begins, two alternative proxies for the horizon problem are employed: $HORIZON^{DET}$ and $HORIZON^0$. In the first

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case, the horizon problem spans over a longer period of time: earnings management is hypothesized in all determination years. In the second case, the horizon problem affects a shorter period: earnings management is hypothesized only in the final year prior to CEO's retirement. The model is run separately for each proxy. The variable of interest is a dichotomous variable that takes the value of one in observations with hypothesized earnings management, and the value of zero in observations with no hypothesized earnings management. As in prior studies, the regression is controlled for common firm-level factors that may affect discretionary accounting choices and decisions: performance (Klein, 2002; Chung and Kallapur, 2003; Butler et al., 2004), growth opportunities (Klein, 2002; Menon and Williams 2004, Butler et al., 2004), leverage (DeFond and Jiambalvo, 1994; Becker et al., 1998; Kim et al., 2003; Butler et al., 2004), and operational cash-flows (Becker et al., 1998; Chung and Kallapur, 2003; Frankel et al., 2002; Kim et al., 2003; Menon and Williams, 2004).[20] ROA is used as a proxy for firm performance, debt-assets ratio – as a proxy for leverage, and book-to-market ratio – as a proxy for growth opportunities. Although the measure of discretionary accruals is deflated by total assets (Equation 10), an association between *DACC* and firm size

may still exist (e.g., Kim et al., 2003; Menon and Williams, 2004). The log of assets - a proxy for firm size - is included in the earnings management test as another control variable.

4.4.2. Impact on Risk Preferences

Four separate multivariate models are estimated to investigate Hypotheses 4 to 7. The main limitation of the models is common to most empirical studies on risk preferences: it is difficult to estimate a reliable measure of risk tolerance. The study alleviates the problem by employing two alternative publicly-available proxies for CEO risk tolerance: firm's distance-to-default, and firm's capital and R&D expenditures. The distance-to-default is defined as the number of standard deviations of decline in a firm's asset value that would push it into default.[21] Capital and R&D expenditures are deflated by the beginning of period total assets to control for firm size. Separate multivariate regressions are run for each proxy. Since no measure represents a perfect estimation of CEO risk-tolerance, using several proxies that have been justified and employed in prior studies (e.g., Hamada, 1972; Bowman, 1979; Ross, 2004; Moers and Peek, 2004; Sundaram and

Yermack, 2007) is beneficial for the reliability of results.

Specifically, to test Hypothesis 4, the following model is estimated (firm and period subscripts are omitted for brevity):

$$RISKTOL = \gamma_0 + \boldsymbol{\delta_1 BONSAL} + \gamma_1 SIZE + \gamma_2 LEV + \gamma_3 PERF +$$

$$\gamma_4 AGE + \varepsilon \tag{12}$$

where *SIZE*, *LEV*, and *PERF* are as identified previously and:

RISKTOL	=	proxy for CEO's risk-tolerance, either of the following variables: *DTD*: firm's distance-to-default *CAPEXP*: firm's capital and R&D expenditures deflated by lagged total assets
BONSAL	=	dummy variable equal to one if CEO's SERP benefits are performance-contingent, and zero if CEO's SERP benefits are not contingent on performance
AGE	=	natural log of CEO's age

Hypothesis 5 is tested using the following model:

$$RISKTOL = \gamma_0 + \delta_2 BONNO + \boldsymbol{\delta_3 BONNO*LAST} + \gamma_1 SIZE + \gamma_2 LEV +$$

$$\gamma_3 PERF + \gamma_4 AGE + \varepsilon \tag{13}$$

where:

| BONNO | = | dummy variable equal to one when CEO's SERP benefits are performance-contingent, and zero when CEO has no SERP benefits |
| LAST | = | dummy variable equal to one if the year is the last year prior to retirement, zero otherwise |

and other variables are as identified earlier. Hypothesis 6 is examined using the following model:

$$RISKTOL = \gamma_0 + \delta_4 PVSAL + \boldsymbol{\delta_5 PVSAL^* NOTLAST} + \gamma_1 SIZE + \gamma_2 LEV + \gamma_3 PERF + \gamma_4 AGE + \varepsilon \tag{14}$$

where:

| PVSAL | = | present value of accumulated SERP benefits of a CEO whose SERP is not contingent on performance |
| NOTLAST | = | dummy variable equal to one if the year is *not* the last year prior to retirement, zero otherwise |

and other variables are as identified in previous equations. Finally, Hypothesis 7 is tested by running the following regression:

$$RISKTOL = \gamma_0 + \delta_6 PVBON + \boldsymbol{\delta_7 PVBON^* LAST} + \gamma_1 SIZE + \gamma_2 LEV + \gamma_3 PERF + \gamma_4 AGE + \varepsilon \tag{15}$$

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where:

PVBON	=	present value of accumulated SERP benefits of a CEO whose SERP is performance-contingent

and other variables are as identified earlier.

If predicted associations between SERP benefits and CEO risk preferences are supported, coefficients on δ_1 (Hypothesis 4), δ_3 (Hypothesis 5), and δ_7 (Hypothesis 7) are expected to be positive and significant, while the coefficient on δ_5 (Hypothesis 6) is expected to be negative and significant. Regressions are controlled for common firm-level factors that potentially impact managerial propensity to undertake risky projects: size, leverage, and past performance (proxied, respectively, by log total assets, debt-assets ratio, and ROA). Specifically, the influence of firm size on capital and R&D spending is well-documented in the literature. Larger firms are expected to have greater resources to exploit innovations and develop sustained R&D programs (Schumpeter, 1942). A number of empirical studies support the prediction by confirming a positive association between capital and R&D expenditures with firm size (e.g., Baysinger and Hoskisson, 1989; Baysinger et al., 1991). In contrast, the relationship between capital and R&D expenditures and firm leverage is

expected to be negative. High leverage prioritizes current cash-flows for debt service, thereby discouraging managers from investments into riskier long-term projects. In general, empirical studies support the negative association between firm's leverage and capital and R&D expenditures (e.g., Long and Ravenscraft, 1993; Barker and Mueller, 2002), however this relationship is not always statistically or economically significant (Hitt et al., 1991). Finally, the evidence on the association between past performance and capital and R&D expenditures is somewhat mixed. Cyert and March (1963) suggest that poor past performance incites experimenting with innovative activities. Hitt et al. (1991) support this perspective empirically by confirming a negative association between past financial performance and R&D spending. The majority of later studies, however, find a positive relationship between the two variables (e.g., Hundley et al., 1996; Barker and Mueller, 2002). A possible explanation is that past profitability justifies managerial actions, gives managers confidence and encourages undertaking even riskier long-term projects.

The age of the CEO is included in regressions as another control variable. However, the evidence on the link between CEO's age and risk-tolerance proxies is mixed. Some prior

research suggests that younger CEOs are concerned about being disciplined by the managerial labor market in case of poor results, whereas for CEOs approaching retirement such career concerns are less relevant (e.g., Fama, 1980; Gibbons and Murphy, 1992). In addition, older CEOs are likely to possess more personal wealth that younger CEOs and may therefore be less risk-averse (Lewellen et al., 1987). However, CEOs approaching retirement may prioritize short-term performance and reduce capital and R&D expenditures (Dechow and Sloan, 1991). According to Lundstrum (2002) and Barker and Mueller (2002), CEO age has a negative association with R&D spending.

5. RESULTS

5.1. SERP Benefits and Rent Extraction

5.1.1. Descriptive Statistics and Univariate Analysis

Out of 395 observations in the sample, 307 (77.7%) are observations with SERPs, a result similar to the one obtained by Sundaram and Yermack (2007) for their sample of 237 Fortune 500 firms. I am unable to calculate the value of pension increment in 24 CEO-years. The most common reason is the fact that in some SERPs, pensionable earnings are based on *target* cash bonuses, which are usually undisclosed. Other reasons include the absence of

information on normal retirement age and unclear SERP descriptions. This reduces the test of Hypothesis 2 to 283 observations.

Table 5 summarizes the descriptive statistics on raw data (Panel A) and data winsorized at the 1% level (Panel B), while Table 6 shows correlations among independent variables. Most firms in the sample are large and profitable. The median firm reports annual sales of $4.8 billion and has $253 million in net income, while the average debt-to-equity ratio is 50.9%. An average board in the sample is comprised of 13 directors, of who about three-quarters are unrelated. On average, a director has spent 7 years on the board and owns about 0.129% of firm's shares outstanding. About 50% of firms have a large blockholder. Approximately a quarter of CEOs assume the Chairman's role. Slightly more than half of CEOs served on the board of their firm before being appointed to the CEO position. The average CEO is 55 years old, has been in the office for 6 years and owns 0.767% of firm's shares outstanding. Winsorizing the data at the 1% level (Panel B) removes potential outliers related primarily to economic variables: firm's revenue, net income, and debt-equity ratio.

TABLE 5: Descriptive Statistics

Panel A: Raw data

Variable	Mean	Standard Deviation	Minimum	Median	Maximum	Number of Observations
SERP	0.778	0.4166	0	1	1	395
Increment	938	1,594	-1,719	485	12,016	371
BoardSize	12.8	3.6	5	12	32	395
UnrelatedDir	0.733	0.155	0.375	0.778	0.941	395
Blockholder	0.494	0.501	0	0	1	395
TenureDir	7.0	2.7	1	6.7	16	395
ShareDir	0.00129	0.00723	<0.00001	0.00005	0.05580	395
TenureCEO	6.2	5.3	1	5	34	395
ShareCEO	0.00767	0.02778	0	0.00028	0.24219	395
CEOChairman	0.276	0.448	0	0	1	395
CEOInternal	0.567	0.496	0	1	1	395
Size	8.387	1.119	3.795	8.417	10.635	395
Performance	249	3,310	-44,157	253	5,993	395
Leverage	0.792	0.816	0	0.509	5.064	395
Age	54.8	6.7	35	55	71	395

Panel B: Winsorized data

Variable	Mean	Standard Deviation	Minimum	Median	Maximum	Number of Observations
SERP	0.778	0.4166	0	1	1	395
Increment	924	1,461	-677	485	8,355	371
BoardSize	12.8	3.5	5	12	24	395
UnrelatedDir	0.734	0.155	0.400	0.778	0.933	395
Blockholder	0.494	0.501	0	0	1	395
TenureDir	7.0	2.7	2	6.7	14	395
ShareDir	0.00035	0.00095	<0.00001	0.00005	0.00471	395
TenureCEO	6.2	5.0	1	5	24	395
ShareCEO	0.00727	0.02474	0	0.00028	0.17838	395
CEOChairman	0.276	0.448	0	0	1	395
CEOInternal	0.567	0.496	0	1	1	395
Size	8.395	1.082	5.696	8.417	10.211	395
Performance	424	767	-2,242	253	3,005	395
Leverage	0.753	0.683	0.023	0.509	2.568	395
Age	54.8	6.6	37	55	68	395

The table reports descriptive statistics on the sample of 395 observations (60 S&P/TSX60 firm, 116 CEOs, years 1997-2003). Monetary values are in 2003 dollars. Panel A reports descriptive statistics on raw (unwinsorized) data. Panel B reports descriptive statistics on data winsorized at the 1% level. See Table 4 for definition of variables.

TABLE 6: Correlations among Independent Variables

#	Variable	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
I	BoardSize		-0.12 (0.04)	-0.14 (0.2)	0.50 (0.00)	0.11 (0.06)	0.10 (0.11)	-0.07 (0.27)	0.27 (0.00)	0.11 (0.06)	0.26 (0.00)	0.31 (0.00)	0.50 (0.00)	0.21 (0.00)
II	UnrelatedDir	-0.05 (0.38)		-0.46 (0.00)	0.36 (0.00)	0.31 (0.00)	-0.06 (0.29)	-0.09 (0.14)	0.12 (0.04)	-0.09 (0.13)	-0.07 (0.25)	0.05 (0.36)	0.15 (0.01)	-0.12 (0.05)
III	Blockholder	-0.22 (0.00)	-0.54 (0.00)		-0.43 (0.00)	-0.23 (0.00)	0.04 (0.46)	0.02 (0.79)	-0.28 (0.00)	-0.05 (0.41)	-0.08 (0.16)	0.20 (0.00)	-0.30 (0.00)	0.04 (0.47)
IV	TenureDir	0.77 (0.00)	0.32 (0.00)	-0.42 (0.00)		0.37 (0.00)	0.11 (0.07)	-0.03 (0.58)	0.39 (0.00)	0.05 (0.43)	0.00 (0.94)	0.26 (0.00)	0.45 (0.00)	0.19 (0.00)
V	ShareDir	0.04 (0.48)	0.07 (0.22)	0.09 (0.12)	0.02 (0.73)		0.06 (0.32)	0.15 (0.01)	0.09 (0.14)	-0.14 (0.02)	-0.30 (0.00)	-0.06 (0.29)	0.25 (0.00)	0.09 (0.13)
VI	TenureCEO	0.07 (0.24)	-0.19 (0.00)	0.11 (0.06)	0.04 (0.49)	-0.03 (0.67)		0.40 (0.00)	0.31 (0.00)	0.14 (0.02)	-0.17 (0.00)	-0.02 (0.77)	0.02 (0.72)	0.42 (0.00)
VII	ShareCEO	0.13 (0.02)	-0.30 (0.00)	0.20 (0.00)	-0.04 (0.49)	-0.05 (0.44)	0.16 (0.01)		-0.01 (0.88)	0.25 (0.00)	-0.24 (0.00)	-0.14 (0.02)	0.15 (0.01)	0.12 (0.05)
VIII	CEOChairman	0.36 (0.00)	0.12 (0.04)	-0.28 (0.00)	0.47 (0.00)	-0.04 (0.52)	0.27 (0.00)	-0.09 (0.14)		0.34 (0.00)	0.28 (0.00)	0.29 (0.00)	0.28 (0.00)	0.41 (0.00)
IX	CEOInternal	0.17 (0.00)	-0.10 (0.10)	-0.05 (0.41)	0.15 (0.01)	-0.14 (0.02)	0.13 (0.03)	0.13 (0.03)	0.34 (0.00)		0.18 (0.00)	0.19 (0.00)	0.13 (0.03)	0.30 (0.00)
X	Revenue	0.27 (0.00)	-0.07 (0.24)	-0.15 (0.01)	0.17 (0.01)	-0.15 (0.01)	0.05 (0.41)	0.05 (0.41)	0.27 (0.00)	0.22 (0.00)		0.54 (0.00)	0.11 (0.07)	0.00 (0.97)
XI	Net income	0.12 (0.01)	0.01 (0.86)	0.03 (0.63)	0.15 (0.01)	0.01 (0.85)	0.02 (0.76)	0.02 (0.76)	0.12 (0.05)	-0.02 (0.65)	-0.09 (0.11)		0.10 (0.08)	-0.05 (0.42)
XII	Leverage	0.69 (0.00)	0.19 (0.00)	-0.36 (0.00)	0.71 (0.00)	-0.07 (0.27)	0.03 (0.56)	-0.08 (0.20)	0.44 (0.00)	0.22 (0.00)	0.18 (0.00)	0.11 (0.06)		0.09 (0.14)
XIII	Age	-0.19 (0.00)	-0.01 (0.86)	-0.00 (0.93)	0.22 (0.00)	0.05 (0.41)	0.41 (0.00)	-0.14 (0.02)	0.40 (0.00)	0.33 (0.00)	-0.02 (0.76)	0.03 (0.65)	0.09 (0.14)	

The table reports correlations between independent variables with significance levels in parentheses. Pearson correlations appear below the diagonal, Spearman correlations above the diagonal. See Table 4 for definition of variables.

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Results on the magnitude of SERP benefits are similar to those obtained by Sundaram and Yermack (2007). The average annual pension increment of a CEO is about $0.9 million when considering the whole sample. For comparison, the average annual cash compensation (salary and bonus) is $1.9 million. As expected, median compensation figures are lower: cash compensation is $1.4 million while pension increment is $0.5 million. However, as in Sundaram and Yermack (2007), the result on average pension increment is based on *all* observations including zeros in almost 23% of CEO-years with no SERP. Besides, I am unable to calculate pension increment for 24 observations, which likely further biases the average pension increment downward. To account for these two problems, Table 7 extends the analysis on the magnitude of pension increment by comparing cash benefits of CEOs with and without SERPs.[22] On average, the annual cash pay of a CEO without retirement arrangements is $1.8 million, slightly lower than the annual cash pay of a CEO with SERP ($2.0 million). A CEO with SERP, however, enjoys an additional $1.2 million in the form of pension increment. In other words, for every $1 of cash compensation, a CEO with retirement arrangements gets an additional present-value equivalent of 62 cents in SERP benefits. The difference between the two groups of CEOs

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TABLE 7: Annual Cash Pay and Pension Increment of CEOs (in $000)

Annual Benefit	Mean		Median		Standard Deviation	
	Without SERP (n = 88)	With SERP (n=283)	Without SERP (n = 88)	With SERP (n=283)	Without SERP (n = 88)	With SERP (n=283)
Cash pay	1,816	1,979	840	1,574 ***	3,365	1,471 ***
Pension increment	0	1,230	0	776	n/a	1,725
Total	1,816	3,209 ***	840	2,652 ***	3,365	2,471 ***

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

The table displays t-test statistics for mean, median, and standard deviation differences in annual cash pay and pension increment of CEOs with and without SERP arrangements (S&P/TSX60 firms, 371 observations, years 1997–2003). Monetary values are in 2003 dollars.

becomes even more striking when median values are considered: the median cash compensation of CEOs with SERPs is almost twice as high as the median cash compensation of CEOs without SERPs ($1.6 million vs. $0.8 million). In addition, a median CEO with SERP has an extra $0.8 million annually via pension increment: a figure nearly as high as the cash compensation of a median CEO without SERP. These results provide a support to prior evidence that SERP benefits are sizable. The compensation of CEOs with retirement arrangements is significantly undervalued if expected retirement benefits are not taken into account.

Table 8 highlights other differences between observations with and without SERPs. With respect to proxies for CEO power, observations with SERPs are characterized by larger boards, higher proportion of unrelated directors, weaker involvement of outside directors in share ownership, and longer tenure of outside directors. Observations with SERPs are also positively associated with stock ownership and prior directorship in the firm, as well as CEO age, firm size and leverage. Among all these significant differences between observations with and without SERPs, only the result on the proportion of unrelated directors contradicts expectations.

TABLE 8: Differences Between CEOs With and Without SERPs

Variable	SERP=0	SERP=1	Δ
CEO Power			
BoardSize	10.7	13.5	2.8***
UnrelatedDir	0.645	0.759	0.114***
Blockholder	0.546	0.479	-0.067
TenureDir	6.2	7.2	1.0***
ShareDir	0.00321	0.00074	-0.00247**
TenureCEO	7.5	5.9	-1.6
ShareCEO	0.02209	0.00354	-0.01855***
CEOChairman	0.296	0.270	-0.026
CEOInternal	0.386	0.619	0.233***
Economic			
Size	7.363	8.681	6,092***
Performance	164	274	110
Leverage	0.511	0.873	0.362***
Other			
Age	52.0	55.7	3.7***

*** Significant at the 1% level; ** Significant at the 5% level

The table displays t-test statistics for mean differences between 307 observations with SERPs and 88 observations without SERPs (CEOs of S&P/TSX60 firms, years 1997-2003). Monetary values are in 2003 dollars. See Table 4 for definition of variables.

Finally, Figure 1 displays frequency distributions of cash compensation only and cash compensation adjusted for pension increment for the total sample, excluding 24 observations for which pension increment could not be calculated. Although the correlation between two measures is high and significant (0.80)[23], the graphs suggest that the distribution changes considerably when pension increments are omitted. Most large observations (above $5 million) disappear. The peak near the mean looks more distinct and the decline looks more rapid. The visual impression is supported by numbers. The kurtosis of the cash compensation distribution is 80.2, while the kurtosis of the sum of cash compensation and pension increment is only 26.1. Moreover, the distribution becomes more skewed when pension increment is ignored: the skewness of the cash compensation distribution is 6.9, while the skewness of the sum of cash compensation and pension increment is 3.8.

To summarize, descriptive statistics confirm that SERPs are frequent and SERP benefits are sizable. They also show that omitting pension increment significantly underestimates the magnitude and distorts the distribution of CEO remuneration. Furthermore, firms that offer SERPs to their CEOs appear to differ from those that make no such

FIGURE 1: Frequency Distributions of Cash Pay and Pension Increment

Panel A. Cash Pay (in $000,000)

Skewness: 6.9 Kurtosis: 80.2

Panel B. Cash Pay and Pension Increment (in $000,000)

Skewness: 3.8 Kurtosis: 26.1
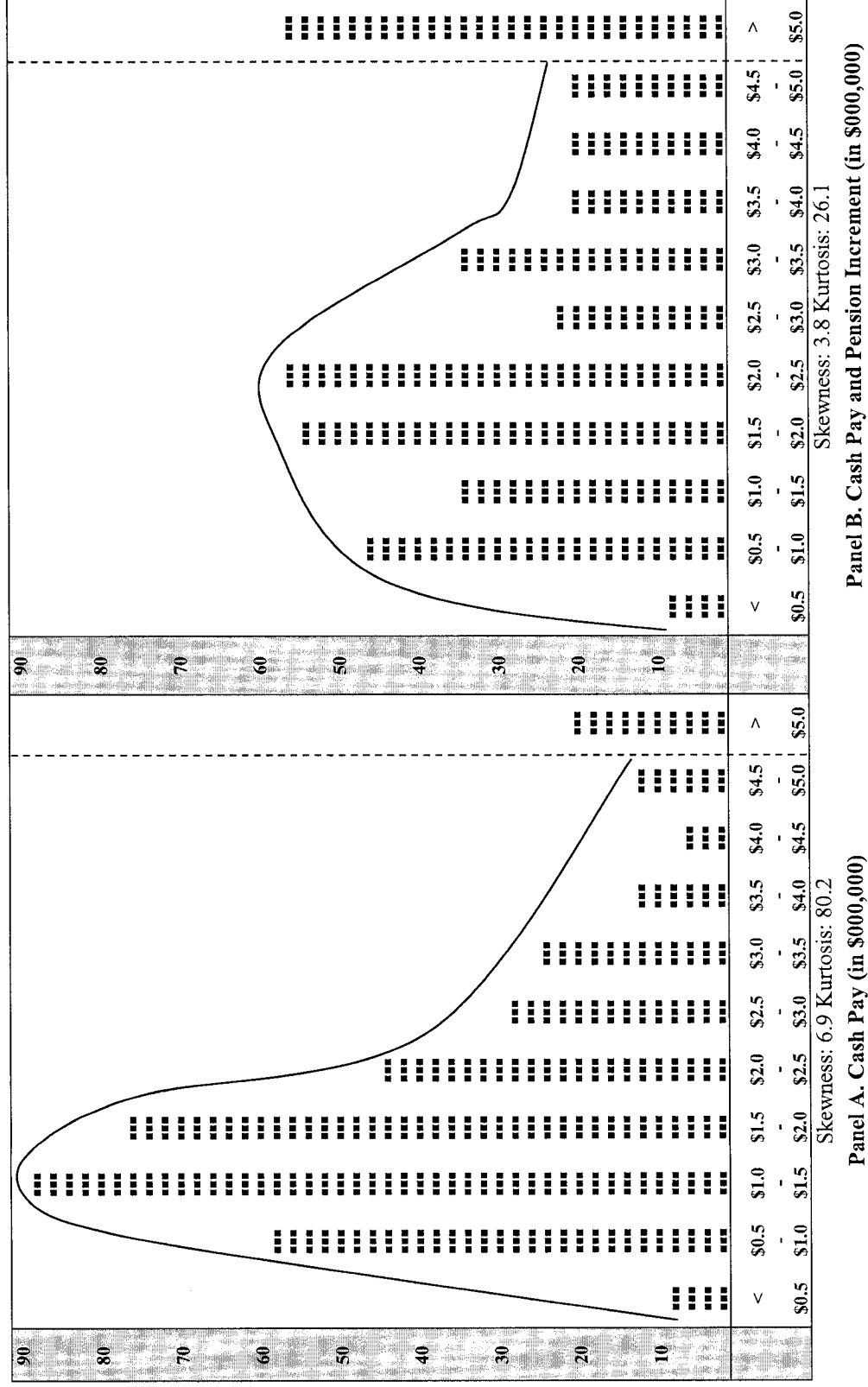
Panel A displays frequency distribution of annual cash pay of CEOs of S&P/TSX60 firms (371 CEO-years, years 1997-2003). Panel B displays frequency distribution of the sum of annual cash pay and pension increment. Monetary values are in 2003 dollars.

offer on a number of counts, including most proxies for CEO power.

5.1.2. Multivariate Analysis

Table 9 summarizes results of probit regressions on determinants of SERP presence/absence. To remove the potential effect of outliers, all variables in this and subsequent multivariate models are winsorized at the 1% level.[24] McFadden's pseudo R-squared for the model is 0.450. A number of variables that proxy for CEO power display a significant association with SERP presence/absence. Specifically, CEO SERPs are positively associated with larger boards (0.175; $p<0.01$) and tenure of unrelated directors (0.103; $p<0.01$). The latter result supports the hypothesis that outside directors become more closely tied to management as time passes, which favors decision-making in management interests. Ownership structure variables are also important. The proportion of firm's shares owned on average by outside directors is negatively related (-53.908; $p<0.01$) to the presence of SERP in CEO compensation. The result is consistent with the expectation that the CEO has less power over the board since outside directors are more effective when their remuneration is tied to firm value. However, CEOs that own more of their

TABLE 9: Determinants of SERP Incidence

Variable	Predicted Sign	Model 1: Economic	Model 2: CEO Power	Model 3: All Factors
CEO Power				
BoardSize	+		0.202***	0.175***
UnrelatedDir	–		3.389	3.559
Blockholder	–		0.472**	0.253
TenureDir	?		0.104***	0.103***
ShareDir	–		-50.651***	-53.908***
TenureCEO	+		-0.004	0.021
ShareCEO	?		-12.532***	-10.348**
CEOChairman	+		0.544	0.029
CEOInternal	?		0.194	-0.028
Economic				
Size	+	0.759***		0.710***
Performance	+	<0.001		<0.001
Leverage	+	0.200		-0.282
Other				
Age	+	0.047***	0.044***	0.049***
Pseudo R^2 (McFadden's)		0.281	0.333	0.450

*** Significant at the 1% level; ** Significant at the 5% level

The table displays parameter estimates of SERP presence/absence determinants in the sample of 395 CEO-years (S&P/TSX60 firms, years 1997-2003). Models are probit with robust Huber-White standard errors. See Table 4 for definition of variables. To mitigate any influence from outliers all variables are winsorized at the 1% level. One-tailed test if directional prediction, two-tailed test otherwise.

firms are less likely to have SERPs. This result contradicts the managerial power view that the number of shares owned by the CEO translates into his influence on the board decisions and supports the alternative hypothesis that share ownership aligns interests of management and shareholders.

The results also suggest that neither performance nor leverage impact whether the CEO has a supplemental pension or not. However, larger firms are more likely to offer SERPs to their CEOs (0.710; $p<0.01$). The result is unsurprising: CEOs in larger firms enjoy higher cash compensation so the gap between their pre-retirement cash pays and post-retirement *regular* pensions is wider. Such CEOs will need supplemental pension arrangements more than CEOs with lower cash compensation. Finally, the results also confirm that older CEOs are more likely to have SERP arrangements (0.049; $p<0.01$). This evidence is consistent with expectations that older executives are more concerned about retirement benefits.

Focusing on CEOs with supplemental retirement plans, Table 10 assesses determinants of their annual pension increment. As in the previous test, three separate regressions with different combinations of the three groups of independent variables are estimated. The adjusted R-

TABLE 10: Determinants of Annual Pension Increment

Variable	Predicted Sign	Model 1: Economic	Model 2: CEO Power	Model 3: All Factors
CEO Power				
BoardSize	+		-10.6	0.1
UnrelatedDir	-		-1,408.5**	-1,215.1**
Blockholder	-		-309.2**	-348.8****
TenureDir	?		-0.9	1.9
ShareDir	-		813,186.3	834,529.2
TenureCEO	+		-44.3**	-27.5
ShareCEO	?		-236.4	-2,043.8
CEOChairman	+		826.9***	714.3***
CEOInternal	?		-514.7***	-490.2***
Economic				
Size	+	299.4***		247.3**
Performance	+	<0.1		0.1
Leverage	+	-145.7		-318.1**
Other				
Age	+	-22.0	-20.4	-26.9
FirstYear	+	-90.8	-128.9	-101.3
LastYear	+	975.4***	957.6***	971.2***
Adjusted R^2		0.148	0.345	0.413

*** Significant at the 1% level; ** Significant at the 5% level

The table displays parameter estimates of pension increment determinants in the sample of 283 CEO-years with SERPs (S&P/TSX60 firms, years 1997-2003). Models are estimated using OLS with robust Huber-White standard errors. See Table 4 for definition of variables. To mitigate any influence from outliers all variables are winsorized at the 1% level. One-tailed test if directional prediction, two-tailed test otherwise.

squared for the main model is 0.413. The results show that a number of proxies for managerial power also have a significant impact on the size of CEO's SERP benefits. Board composition is associated with the dependent variable: pension increment is higher when the proportion of unrelated directors on the board is lower (-1,215.1; $p<0.05$), and CEO's influence on the board is – consequently – stronger. Also, the size of SERP benefits is considerably lower in firms with major blockholders (-348.8; $p<0.01$), who act as a control mechanism for CEO's actions. CEO-Chairman duality is another variable that positively influences the size of CEO's pension (714.3; $p<0.01$). A CEO who occupies the position of the Chairman of the Board enjoys considerably higher annual pension increment ($0.7 million) than "just a CEO": another result consistent with expectations. However, a CEO that served on the board of the firm prior to being promoted to the CEO position – and thus has closer relationship with and more power over the board – enjoys lower SERP benefits than an outside CEO (-490.2; $p<0.01$). This result supports the alternative hypothesis that an inside CEO is less costly than an outside CEO as the latter – being less familiar with the firm – requires additional compensation for taking risks of running the business.

The results also suggest that firm size is another determinant of pension increment. The positive association is expected since better paid CEOs from larger firms need higher SERP benefits to compensate for the gap between pre-retirement cash pay and *regular* pension. Contrary to expectations, the size of SERP benefits has a negative association with firm leverage (-318.1; $p<0.05$), although the association is statistically significant only in one model and is not significant in the other. A possible explanation is that firms with higher leverage are less likely to honor future obligations, including obligations related to pension plans, which makes SERP benefits less appealing to a CEO. Finally, firms appear to award abnormally high pension increments to CEOs in the last year prior to their retirement, as coefficients on *LastYear* suggest (971.2; $p<0.01$). The economic significance is substantial: on average, the pension increment in the last year prior to CEO's retirement exceeds a pension increment in any other year by almost $1 million. The result is in line with the anecdotal evidence that firms attempt to narrow the difference between CEO pre-retirement compensation and annual pension down when CEO retirement is on the horizon. Another potential explanation is that firm's earnings are managed upwards in the final year prior

to CEO's retirement thereby increasing, on average, CEO's pension increment in that year.

To summarize, the results suggest that strong links exist between supplemental CEO pensions and CEO power. Many of the variables that proxy for CEO power play a significant role in explaining SERP benefits: board composition (size and proportion of unrelated directors), ownership structure (presence of a blockholder and share ownership by unrelated directors), tenure of unrelated directors, and CEO-Chairman duality. The results also indicate that CEO's SERP benefits are positively associated with firm size and CEO's age, supporting expectations that better paid CEOs require additional retirement arrangements to preserve their cash-inflows after retirement, and that one's concern about retirement benefits grows as retirement approaches. Finally, the study finds that firms compensate their CEOs with abnormally high SERP benefits in the last year prior to CEO's retirement. This association may reflect income-increasing earnings management in the final CEO's year to amplify the value of SERP benefits or *unexpected* grants of additional years of credited service to narrow down the gap between CEO's pre-retirement cash compensation and post-retirement pension.

In two cases, however, the results seem not to fit the managerial power framework. Presumably more powerful internal CEOs are less likely to have SERPs, which can be explained by the risk premium factor. An outside CEO is likely to have less knowledge of the firm than a CEO that served on the firm's board before and – assuming risk-aversion – would require a premium for taking risks and running the firm. Consequently, an outside CEO would be more "expensive" than a CEO that served on the board before. Also, CEO share ownership is negatively related to SERP incidence, supporting a well documented optimal contracting hypothesis that share ownership aligns interests of management and shareholders. As such, although the relation between CEO power and SERP benefits is strong and significant, it is not fully exclusive.

5.2. SERP Benefits and Earnings Management

5.2.1. Univariate Analysis

The sample contains 73 CEOs that retired during the 1997-2003 period. Figure 2 illustrates the breakdown of CEOs according to their retirement arrangements. 20 CEOs retired with no supplemental retirement plans. 19 CEOs had SERPs that were not performance-contingent. Finally, 34 CEOs had SERPs contingent on firms' accounting earnings.

FIGURE 2: Pension Arrangements of Retiring CEOs

20; 27%

34; 47%

19; 26%

☐ No SERP

■ SERP non-contingent on accounting earnings

▨ SERP contingent on accounting earnings
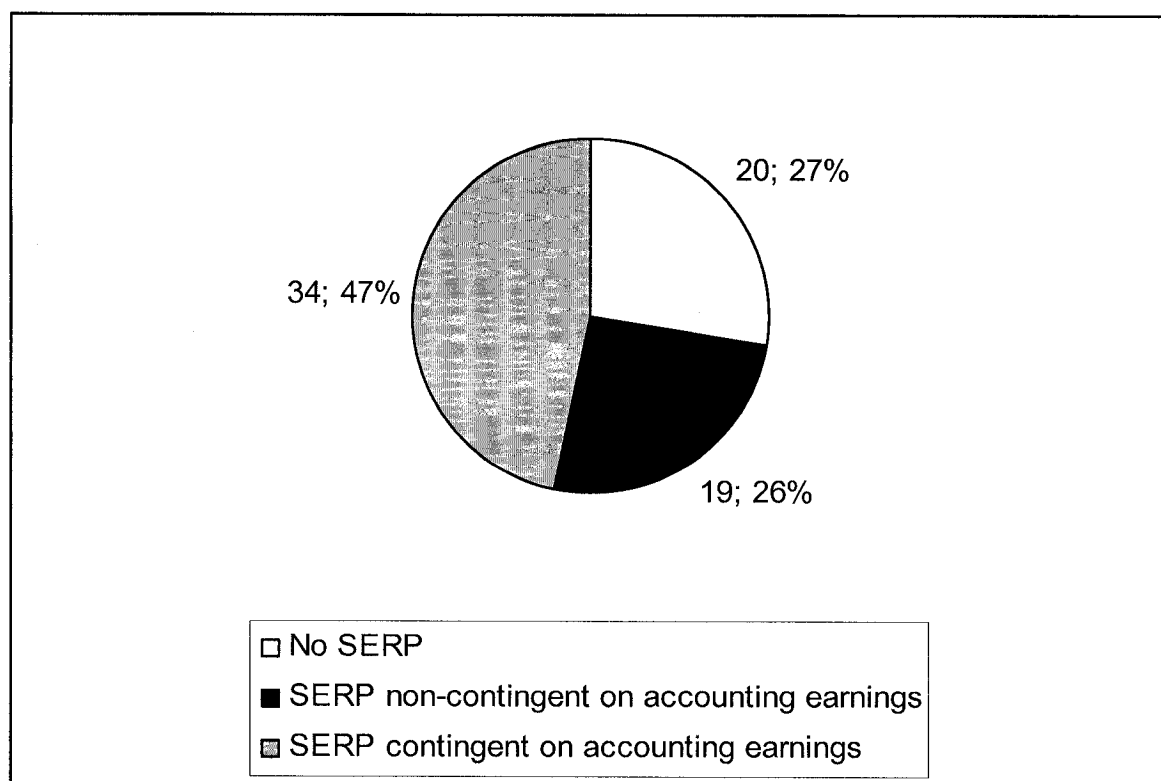
If the horizon problem does affect accounting choices and earnings are managed upwards in last years prior to CEO's retirement, the next CEO will have limited means to manage earnings upwards in his first years due to accrual reversals. To alleviate the potential impact of the horizon problem associated with the departure of the previous CEO, the following criterion is imposed: a retiring CEO must have held the position for more than two full years. As a result, two observations are eliminated leaving 32 retired CEOs with performance-contingent SERPs. In total, there are 99 determination years for CEOs with performance-contingent SERPs during the 1997-2003 period, an average of 3.1 years per CEO. Since the total number of observations in the sample is 395, 25.1% of observations represent determination years, while the remaining 74.9% represent non-determination years. Determination years are defined as years in which CEO's pensionable earnings are determined.

Table 11 displays descriptive statistics for observations with and without hypothesized earnings management. Two definitions of the horizon problem are verified in the study: $HORIZON^{DET}$ = 1 and $HORIZON^0$ = 1. In the first scenario, the hypothesized earnings management occurs when CEOs with performance-contingent SERPs are in their determinations years. In this case, the sample is

TABLE 11: Comparison of Subsamples With/Without Hypothesized Earnings Management

Panel A: $HORIZON = HORIZON^{DET}$

Variable	Mean		Standard Deviation	Median
Observations with hypothesized earnings management (n=99)				
ASSETS (millions)	58136		84704	11778
LEV	0.309		0.187	0.243
REV (millions)	10146		7976	6243
PERF	0.009		0.144	0.020
CFO (millions)	408		2903	706
DACC	0.004		0.152	0.006
$DACC^{ABS}$	0.065		0.145	0.037
Other observations (n=296)				
ASSETS (millions)	29981	***	69696	7090
LEV	0.351		0.241	0.323
REV (millions)	6535	***	6747	4084
PERF	0.014		0.112	0.028
CFO (millions)	532		2298	502
DACC	-0.001	***	0.112	0.002
$DACC^{ABS}$	0.030	***	0.099	0.016

Panel B: $HORIZON = HORIZON^{0}$

Variable	Mean		Standard Deviation	Median
Observations with hypothesized earnings management (n=32)				
ASSETS (millions)	49484		108025	11868
LEV	0.331		0.222	0.288
REV (millions)	10034		8869	6110
PERF	-0.022		0.314	0.024
CFO (millions)	845		4177	573
DACC	0.002		0.333	0.017
$DACC^{ABS}$	0.045		0.326	0.024
Other observations (n=363)				
ASSETS (millions)	35936		76667	8648
LEV	0.341		0.231	0.309
REV (millions)	7207	**	7138	4397
PERF	0.016		0.102	0.027
CFO (millions)	469		2391	520
DACC	<0.000		0.102	0.012
$DACC^{ABS}$	0.038		0.091	0.024

*** Significant at the 1% level; ** Significant at the 5% level

The table reports descriptive statistics for observations with and without hypothesized earnings management drawn from the sample of TSX/S&P60 firms for the 1999-2003 period. Significance levels are for two-tailed t-tests for differences in means between observations with and without hypothesized earnings management. Monetary values are in 2003 dollars. ASSETS is total assets, LEV is the ratio of debt to total assets, REV is total sales, PERF is the return on assets, CFO is cash-flows from operations, DACC is abnormal accruals generated by the modified Jones model, $DACC^{ABS}$ is the absolute value of DACC.

partitioned as according to Panel A of Table 11, with 99 observations in which earnings management is hypothesized, and 296 observations with no hypothetical earnings management. On average, observations with hypothesized earnings management have total assets of $58,136 million, revenue of $10,146 million, cash-flows from operations of $408 million, debt-to-assets ratio of 0.309 and ROA of 0.009. In contrast, average values for remaining observations are the following: total assets of $29,981 million, revenue of $6,535 million, cash-flows from operations of $532 million, debt-to-assets ratio of 0.351 and ROA of 0.014. T-test for differences in means indicate that observations with hypothesized earnings management are characterized by higher total assets and revenue. In addition, observation with hypothesized earnings management are characterized by significantly higher discretionary accruals (*DACC*) as derived from Equation (9) and absolute values of abnormal accruals ($DACC^{ABS}$), an alternative commonly-used proxy for earnings management. Specifically, mean (median) discretionary accruals are 0.004 (0.006) in observations with hypothesized earnings management, and -0.001 (0.002) otherwise. Respective mean (median) absolute values of abnormal accruals are 0.065 (0.037) versus 0.038 (0.016).

In the second scenario, the hypothesized earnings management occurs when CEOs with performance-contingent SERPs are in their final year prior to retirement. In this case, the sample is partitioned as according to Panel B of the Table 11, with 32 observations in which earnings management is hypothesized, and 363 observations with no hypothetical earnings management. Then, on average, observations with hypothesized earnings management have total assets of $49,484 million, revenue of $10,034 million, cash-flows from operations of $845 million, debt-to-assets ratio of 0.331 and ROA of -0.022. Average values for remaining observations are the following: total assets of $35,936 million, revenue of $7,207 million, cash-flows from operations of $469 million, debt-to-assets ratio of 0.341 and ROA of 0.016. T-test for differences in means indicate that observations with hypothesized earnings management are characterized by higher revenue when the sample is portioned this way. Other differences between subsamples are not significant, including differences between discretionary accruals and unsigned discretionary accruals. Mean (median) discretionary accruals are 0.002 (0.017) in observations with hypothesized earnings management, and <0.000 (0.012) otherwise. Respective mean

(median) absolute values of abnormal accruals are 0.049 (0.024) versus 0.045 (0.024).

To summarize, the univariate analysis provide preliminary evidence that greater discretion over accruals is displayed when CEO's with performance-contingent SERPs are in their determination years. The result supports the notion that the horizon problem appears *earlier* than in the final year prior to CEO's retirement. Multivariate analysis is conducted to further investigate this matter.

5.2.2. Multivariate Analysis

Equation (11) is estimated, using four separate regressions with either $DACC$ or $DACC^{ABS}$ as the independent variable and either $HORIZON^{DET}$ or $HORIZON^0$ as the proxy for the horizon problem. The variable of interest is the interaction between the horizon problem and the performance-contingency of CEO's supplemental pension arrangements, $HORIZON*BONSERP$.

Table 12 reports the results of the regressions. The adjusted R-squared for the models range from 0.215 (dependent variable: absolute abnormal accruals) to 0.346 (dependent variable: signed abnormal accruals). In general the results support the univariate analysis. After controlling for size, leverage, profitability, growth

TABLE 12: Regression on Signed and Absolute Abnormal Accruals

Panel A: $HORIZON = HORIZON^{DET}$

Variable	Dependent = $DACC$		Dependent = $DACC^{ABS}$	
HORIZON*BONSERP	0.0090	***	0.0513	**
SIZE	-0.0098	***	-0.0084	
LEV	0.0314	**	-0.0557	**
GROWTH	0.0041	***	-0.0196	
PERF	1.0038	***	-0.7722	***
LCFO	-0.2945	***	0.2967	***
Adjusted R^2	0.346		0.218	

Panel B: $HORIZON = HORIZON^0$

Variable	Dependent = $DACC$		Dependent = $DACC^{ABS}$	
HORIZON*BONSERP	0.0067	*	0.0188	*
SIZE	-0.0079	***	-0.0580	
LEV	0.0303	**	-0.0487	**
GROWTH	0.0034	***	-0.0264	
PERF	1.0052	***	-0.7643	***
LCFO	-0.2922	***	0.2985	***
Adjusted R^2	0.345		0.215	

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

The table displays parameter estimates of the determinants of abnormal accruals for the sample of TSX/S&P60 firms for the 1999-2003 period. Models are estimated using OLS with robust Huber-White standard errors. Dependent variables are signed ($DACC$) and unsigned ($DACC^{ABS}$) abnormal accruals. $HORIZON^{DET}$ is a dummy variable equal to one if the year is a determination year, $HORIZON^0$ is a dummy variable equal to one if a year is a last year prior to CEO's retirement, $BONSERP$ is a dummy variable equal to one if CEO's SERP is performance-contingent, $SIZE$ is the natural log of total assets, LEV is the ratio of debt to total assets, $GROWTH$ is the book-market ratio, $PERF$ is the return on assets, $LCFO$ is the natural log of cash-flows from operations. Significance levels are for two-tailed t-tests. To mitigate any influence from outliers all variables are winsorized at the 1% level.

opportunities and operational cash-flows, firms in which CEOs with performance-contingent SERPs are in their determinations years are characterized by larger abnormal accruals (Panel A). Coefficients on the *HORIZON*BONSERP* interaction are statistically significant when signed abnormal accruals are used as the dependent variable (0.009; $p<0.01$) and when absolute abnormal accruals are employed (0.051; $p<0.05$). In other words, earnings management appears to be positively associated with the horizon problem when SERP benefits of the CEO are contingent on firm's accounting earnings.

The results display marginally significant difference in signed (0.007, $p<0.10$) and absolute (0.019, $p<0.10$) abnormal accruals when CEOs reach the *last* year of their employment (Panel B). This can be explained by the fact that observations corresponding to determination years *other than the last year* are included in the sub-sample with no hypothesized earnings management, whereas earnings management does exist in these years, as confirmed by results in Panel A. As an additional test, the model is estimated without observations in determination years *other than the last year*. When observations corresponding to the last year of CEOs' employment are compared with observations in non-determination years only, coefficients

on signed and unsigned abnormal accruals are positive and significant at the 5% level. Overall, the results underline an important point: the horizon problem is not limited to the last year prior to CEO's retirement but to the determination period in general. Income-increasing earnings management is present in all years in which CEO's pensionable earnings are determined, and not only in the last year prior to CEO's retirement.

To summarize, Hypothesis 3 is supported. The results lead to the conclusion that a positive association between earnings management and the horizon problem exists when CEO SERPs are contingent on firm's performance. When considered alone, neither the horizon problem nor the performance-contingency of CEO's SERP has an impact on abnormal accruals. Finally, the analysis indicates that the impact of the horizon problem on earnings management surfaces not in the last year prior to CEO's retirement, but earlier – when the determination period starts.

5.3. SERP Benefits and Risk Preferences

5.3.1. Univariate Analysis

The univariate analysis indicates that three of the four hypotheses on the association between CEO's risk preferences and SERP benefits are supported. Table 13

compares mean distances-to-default and capital and R&D expenditures across observations of interest. The only hypothesized relationship rejected by univariate analysis is the predicted link between the value of performance-contingent SERP benefits and risk preferences in the last year prior to CEO's retirement (Hypothesis 7). The comparison between *SERPBON* observations with the highest value of accumulated SERP benefits (top 50%) and *SERPBON* observations with the lowest value of accumulated SERP benefits (bottom 50%) displays no significant difference in either risk-tolerance proxy.

All other results provide evidence in favor of predicted links. On average, CEOs whose SERP benefits are performance-contingent display higher risk tolerance than CEOs whose SERP benefits are not contingent on performance (Hypothesis 4). Mean *DTD* and *CAPEXP* are significantly higher in the former subsample.

Similarly, CEOs with performance contingent SERPs appear to be more risk-tolerant than CEOs with no supplemental retirement arrangements in the last year prior to retirement. Both proxies for risk-tolerance display the expected relationship. The difference in capital and R&D expenditures is especially pronounced: $841.9 million vs. $444.7 million.

TABLE 13: Risk Tolerance by CEO's SERP Structure

Hypothesis	Period	Observations	Predicted Sign	DTD	CAPEXP
H4	NOTLAST and LAST	SERPBON SERPSAL	>	2.94 2.35 **	939.4 745.4 **
H5	LAST	SERPBON NOSERP	>	2.80 2.12 **	841.9 444.7 ***
H6	NOTLAST	$SERPSAL_{UPPER}$ $SERPSAL_{LOWER}$	<	2.02 2.76 ***	705.8 855.0 *
H7	LAST	$SERPBON_{UPPER}$ $SERPBON_{LOWER}$	>	2.97 2.68	865.1 814.9

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

The table reports means for observations grouped according to CEO SERP structure in the sample of TSX/S&P60 firms for the 1999-2003 period. Significance levels are for one-tailed t-tests for differences in means. Monetary values are in 2003 dollars. DTD is firm's distance-to-default. CAPEXP is firm's capital and R&D expenditures. NOTLAST are observations that correspond to years that precede the final year prior to CEO's termination. LAST are observations that correspond to the final year prior to CEO's termination. SERPBON are observations that correspond to CEO's with performance-contingent SERPs. SERPSAL are observations that correspond to CEO's with SERPs that are not contingent on performance. NOSERP are observations that correspond to CEO's with no SERP. Subscripts UPPER and LOWER correspond to top (bottom) 50% of observations divided according to the value of accumulated SERP benefits.

Finally, Hypothesis 6 is also supported by univariate results. Risk-tolerance appears to be associated with the size of SERP benefits that are not contingent on performance in the years preceding the last year prior to CEO's retirement. The comparison between *SERPSAL* observations with the highest value of accumulated SERP benefits (top 50%) and *SERPSAL* observations with the lowest value of accumulated SERP benefits (bottom 50%) reveals that the distance-to-default in the later group is on average higher. Capital expenditures are marginally higher in the bottom 50% observations as well.

5.3.2. Multivariate Analysis

Four separate models (Equations 12 to 15) are run to test the hypotheses concerning associations between risk-tolerance proxies and CEO's SERP benefits. The results of the regressions are presented in Table 14. The adjusted R-squared values range from 0.198 to 0.454 for models in which the independent variable is firm's capital expenditures, and from 0.360 to 0.545 for models in which the independent variable is firm's distance to default. Most control variables display expected relationships with dependent variables. Risk-tolerance proxies are negatively

TABLE 14: Determinants of Risk Tolerance

Variable	H5 DTD	H5 CAPEXP	H6 DTD	H6 CAPEXP	H7 DTD	H7 CAPEXP	H8 DTD	H8 CAPEXP
SIZE	0.249 **	0.021 ***	0.447 *	0.009 ***	0.163 *	0.025 ***	0.308 **	0.015 ***
LEV	-0.498 ***	-0.012	-0.581 ***	-0.007	-0.694 ***	-0.016	-0.470 **	0.013
PERF	0.233 *	0.073 ***	0.407 *	0.041 **	0.590 *	0.463 ***	0.501 *	0.026 *
AGE	-0.785 *	-0.113 ***	-1.003	-0.026	-0.816 *	-0.123 **	-0.763	-0.091 **
BONSAL	0.240 **	0.020 **						
BONNO			0.026	-0.012				
BONNO*LAST			0.212 **	0.008 **				
PVSAL					0.097	-0.002		
PVSAL*NOTLAST					-0.328 ***	-0.011 *		
PVBON							0.085	0.001
PVBON*LAST							0.126 *	-0.001
Adjusted R²	0.463	0.371	0.360	0.198	0.545	0.454	0.529	0.396

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

The table displays parameter estimates of the determinants of risk tolerance proxies for the sample of TSX/S&P60 firms for the 1999-2003 period. Models are estimated using OLS with robust Huber-White standard errors. Dependent variables are firm's distance-to-default (*DTD*) and capital and R&D expenditures deflated by lagged total assets (*CAPEXP*). *SIZE* is the natural log of total assets, *LEV* is the ratio of debt to total assets, *PERF* is the return on assets, *AGE* is the natural log of CEO's age. *BONSAL* is a dummy variable equal to one for observations when CEO's SERP is performance-contingent, and zero for observations when CEO's SERP is not contingent on performance. *BONNO* is a dummy variable equal to one for observations when CEO's SERP is performance-contingent, and zero for observations when CEO's have no SERP. *PVSAL* is the value of accumulated SERP benefits of the CEO whose SERP benefits are not contingent on performance. *PVBON* is the value of accumulated SERP benefits of the CEO whose SERP benefits are performance-contingent. *LAST* are observations that correspond to the final year prior to CEO's termination. *NOTLAST* are observations that correspond to years that precede the final year prior to CEO's termination. To mitigate any influence from outliers all variables are winsorized at the 1% level.

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associated with firm's leverage and CEO's age, and positively – with size. The association with past performance is positive as well – a result in line with the proposition that profitability justifies past actions, gives managers confidence and encourages undertaking riskier projects. In general, the relationships hold across the models.

The test of Hypothesis 5 reveals that the explanatory variable *BONSAL* which partitions the sample of CEOs with SERP according to performance-contingency of their SERP benefits has positive and significant associations with distance-to-default (0.240; $p<0.05$) and capital and R&D expenditures (0.020; $p<0.05$). As such, CEOs whose SERP benefits are contingent on performance appear to be more risk-tolerant than CEOs whose SERP benefits are not contingent on performance. A broader implication is that SERPs are indeed not homogenous and their structure significantly impacts risk preferences.

The results also provide empirical support for Hypothesis 6. Coefficient on the *BONNO*LAST* interaction is positive and significant when either risk-tolerance proxy is used. In isolation, the explanatory variable *BONNO* displays no significant association with either distance-to-default or capital and R&D expenditures. In other words, CEOs whose

SERP benefits are contingent on performance appear to be more risk-tolerant than CEOs with no SERP benefits, but *only* in the final year prior to expected retirement.

Similarly, the analysis provides with evidence in favor of Hypothesis 7. As predicted, the coefficient on the *PVSAL*NOTLAST* interaction is negative. The association is weakly significant (-0.011; p<0.10) when capital and R&D expenditures are used as the dependent variable, but strongly significant (-0.328; p<0.01) when distance-to-default is used as a proxy for risk preferences. When the time frame is ignored, the association between accumulated SERP benefits and risk-tolerance proxies is marginally significant in one model and not significant in the other. As such, the risk-tolerance of CEOs whose SERP benefits are not contingent on performance appears to be negatively associated with the size of accumulated SERP benefits specifically in the years preceding the final year prior to CEO's retirement, but not in the final year. In other words, on average, a CEO with higher accumulated SERP benefits is more risk-averse than a CEO with lower accumulated SERP benefits, when SERPs are not contingent on performance and when CEOs are not about to retire.

Finally, the support of Hypothesis 8 is limited. The association between capital and R&D expenditures on one

side and the interaction of interest (*PVBON*LAST*) on the other is statistically insignificant. When distance-to-default is used as an alternative risk-tolerance proxy, the association is only weakly significant, albeit positive, as predicted (0.126; p<0.10). As such, the results fail to convince that the risk-tolerance of CEOs whose SERP benefits are contingent on performance is positively associated with the size of accumulated SERP benefits in the last year prior to CEO's retirement. In years other than the last year, the size of accumulated performance-contingent SERP benefits does not appear to be linked to risk-tolerance proxies as well: coefficients on *PVBON* are statistically insignificant.

To summarize, the results confirm three of the four hypotheses on links between SERP benefits and risk preferences. First, CEOs whose SERP benefits are contingent on performance appear to be more risk-tolerant than CEOs whose SERP benefits are not contingent on performance. Second, CEOs whose SERP benefits are contingent on performance are more risk-tolerant than CEOs with no SERP benefits *but only* in the last year prior to retirement. Otherwise, no significant difference in risk preferences of the two groups exists. Third, risk-tolerance is negatively associated with the size of accumulated SERP benefits when

SERP benefits are not contingent on performance. The only exception is the last year prior to CEO's retirement when the size of SERP benefits does not affect risk preferences. In general, the results provide a strong support to the assertion that the relationship between CEO's SERP and risk preferences exists, it is not homogenous and varies according to the performance-contingency of SERP benefits.

5.4. Limitations and Additional Tests
5.4.1. Predicted Excess Compensation

For additional insight on the role of CEO power in CEO SERP benefits, I investigate the association of predicted excess compensation with the presence of SERP in CEO's compensation arrangements. Predicted excess compensation represents the predicted component of compensation arising from variables in excess of standard economic determinants of compensation, and has a documented significant negative association with subsequent firm operating performance and subsequent firm stock returns (Core et al., 1999; Chalmers et al., 2006). In light of strong links between CEO power and CEO SERP benefits, a positive association between predicted excess compensation and SERP presence is expected. In other words, predicted excess compensation of CEOs with SERP arrangements is expected to he higher than

predicted excess compensation of CEOs without SERP arrangements.

Following Core et al. (1999), the estimation of predicted excess compensation is performed in several steps. First, CEO's compensation (adjusted for pension increment) is regressed on compensation determinants listed in Table 4: i.e., CEO power proxies, economic and other explanatory variables. Then, the estimated coefficients are used to calculate for each observation the predicted component of compensation arising from variables other than economic. Finally, the result is deflated by CEO's compensation to account for scale differences across observations, yielding a measure of predicted excess compensation (Core et al., 1999)[25]. To investigate its association with SERP presence, predicted excess compensation is regressed on the SERP dummy (1 for observations with SERP, 0 otherwise), controlling for economic compensation determinants listed in Table 4 (size, performance, and leverage).

Results are reported in Table 15. Univariate analysis indicates that predicted excess compensation is positively associated with SERP presence. On average, predicted excess compensation is 43.5% for observations with SERP, and 7.0% for observations without SERP (Panel A). The difference is statistically significant. The result is confirmed by the

TABLE 15: Predicted Excess Compensation and SERP Presence

Panel A: Univariate analysis

	SERP = 0	SERP = 1
Predicted excess compensation, mean	0.070	0.435***

Panel B: Multivariate analysis
$(ExcessComp = \beta_0 + \beta_1 SERP + \beta_2 Size + \beta_3 Performance + \beta_4 Leverage)$

Variable	Coefficient
SERP	0.381***
Size	-0.093
Performance	<0.001
Leverage	0.287**
Adjusted R^2	0.274

*** Significant at the 1% level; ** Significant at the 5% level

Panel A reports t-test statistics for mean differences in predicted excess compensation of CEOs with and without SERP arrangements (S&P/TSX60 firms, 371 observations, years 1997-2003). Panel B reports parameter estimates of the determinants of predicted excess compensation. The model is estimated using OLS with robust Huber-White standard errors. *ExcessComp* is the predicted excess compensation. *SERP* is a dummy variable equal to one for observations with SERP and zero otherwise. *Size* is the natural log of revenue. *Performance* is the net income. *Leverage* is the ratio of debt to equity. Significance levels are for two-tailed t-tests. To mitigate any influence from outliers all variables are winsorized at the 1% level.

multivariate regression (Panel B): the coefficient on the SERP dummy is positive and significant (0.381; p<0.01) thereby supporting the expectation of a positive association between predicted excess compensation and SERP presence. The finding fits the rent extraction framework and complements the empirical evidence on Hypotheses 1 and 2. CEO SEPR benefits are positively associated with CEO power which leads to higher predicted excess compensation.

5.4.2. Other Tests

The study is one of the first steps in understanding the nature, determinants and consequences of executive retirement benefits. It is subject to certain limitations. Specifically, comments should be addressed to the pension increment estimation methodology. The analysis of expected retirement benefits does not account for survivor benefits, which may or may not be significant depending on CEO's marital status and the age of the spouse. Clearly, ceteris paribus, the expected value of a SERP of a single CEO would be substantially lower than the expected value of a SERP of a married CEO whose spouse is 30 years younger. However, being unable to find out the marital status of CEOs using publicly available sources, I assume – conservatively – no survivor benefits.[26] Another possibility is to assume that

all CEOs *are* married to persons of opposite sex and that spouses are of the same age as CEOs. As expected, redoing the analysis using this assumption yields very similar – univariate and multivariate – results. According to most SERPs, survivor benefits are limited to about 60% of executive's pension and the life expectancy of females at age 60 is longer than that of males by about four years only. As a result, the actuarial value of the incremental pension benefit due to survivor benefits is insignificant when the abovementioned assumption is used.[27]

Another assumption used in study is that an actual CEO would retire upon reaching the age of normal retirement or – if he has a SERP – at whichever age he would qualify for unreduced SERP benefits, which may or may not be the same as the age of normal retirement depending on a SERP. As such, the analysis does not account for the probability of early termination, potentially overestimating the expected value of SERPs of *actual* CEOs. The evidence, however, suggests that the magnitude of potential overestimation should not be significant. Lewellen (1968) suggests that even if it was possible to estimate the probability of resignation for each age, the discount would be very small and resulting values of expected pension would be only slightly different from those obtained by assuming normal

retirement. For additional insight, I compare the average pension increment of actual CEOs and retired CEOs. 116 observations on actual CEOs with SERPs yield an average pension increment of $1,020,000. 167 observations on retired CEOs with SERPs yield an average pension increment of $1,346,000. In other words, on average, pension increments of retired CEOs are actually higher than pension increments of actual CEOs, not lower. However, in contrast to observations on actual CEOs, the observation on retired CEOs include pension increments in the last year prior to CEO retirement, that – as Table 10 shows – are significantly higher than pension increments in any other year. When 47 pre-retirement year observations are excluded from the comparison, the average pension increment of retired CEOs is $1,094,000, the figure similar to the average pension increment of actual CEOs. From this standpoint, there is no evidence that the expected value of retirement plans of actual CEOs is overestimated.

SERPs are expected to be more relevant for higher paid-executives and therefore more common in larger firms. Table 9 supports the prediction, confirming a positive association between firm size and the incidence of CEO supplemental retirement arrangements. To verify whether links between CEO power proxies and the incidence of SERP

benefits are confounded by firm size effects, I test Hypothesis 1 using a matching sample. Observations without SERPs (88 observations) are matched with the same number of observations with SERPs based on natural log of firm revenue, a proxy for firm size. Then, the model of SERP determinants (Hypothesis 1) is estimated for the sample. Overall, the results remain qualitatively unchanged, confirming the main finding. The incidence of CEO SERP benefits is positively associated with CEO age, board size, and directors' tenure, and negatively – with CEO share ownership (marginally significant) and director share ownership.

Several additional tests are performed to analyze the sensitivity of the earnings management test. First, to verify that abnormal accruals are associated with the HORIZON*BONSERP interaction and not with HORIZON and/or BONSEPR separately, all regressions are run with HORIZON and BONSERP instead of HORIZON*BONSERP, or with HORIZON, BONSEPR and HORIZON*BONSERP simultaneously. When considered separately, neither HORIZON nor BONSEPR has a statistically significant association with abnormal accruals.[28] Second, estimating total accruals with the balance sheet approach instead of the cash-flow approach does not affect the results qualitatively. Under the balance sheet approach,

total accruals are calculated as change in current assets minus change in current liabilities minus change in cash and cash equivalents plus change in short-term debt minus change depreciation and amortization expense, and then deflated by lagged total assets to control for scale differences. Third, the results remain qualitatively unchanged when the Jones model (Jones, 1991) is used to estimate abnormal accruals, instead of the modified Jones model. In the model, abnormal accruals are estimated as the residual from the regression of current accruals on the reciprocal of total assets, change in revenue and property, plant and equipment, with all variables deflated by lagged total assets (i.e., Equation (9) without operational cash-flows and changes in receivables). Fourth, the results remain qualitatively unchanged when the proxy for size is not included in the earnings management regression. The results are also qualitatively unchanged when the absolute value of abnormal *current* accruals is used. For this purpose, current accruals are defined as the change in non-cash working capital. The abnormal component is the residual from the regression of current accruals on the reciprocal of total assets, change in revenue minus change in receivables, and operating cash-flows, with all variables deflated by lagged total assets (i.e., Equation

(9) without *PPE*). Finally, the results are not affected by the inclusion of book-to-market ratio as an additional explanatory variable in the Modified Jones model. In all alternative models, the coefficient on the *HORIZON*BONSERP* interaction remains significant when *HORIZON = HORIZON*^{DET}. Associations are marginally significant (at the 10% level) when *HORIZON = HORIZON*^{0}, and absolute abnormal accruals are used as the dependent variable. Finally, when *HORIZON = HORIZON*^{0}, but the dependent variable is the signed value of abnormal accruals, the coefficient on the *HORIZON*BONSERP* interaction becomes significant when the Jones model is used and remains marginally significant in all other alternative models.

As Table 5 shows, the choice of winsorized data affects primarily economic variables with significant outliers (firm's revenue, net income, and debt-equity ratio) and has little impact on other variables, including proxies for CEO power. However, to verify whether results are sensitive to the use of winsorized data, I estimate all multivariate regressions with raw data. The robustness test yields several differences related to the significance of coefficients on control variables.[29] However, none of key results or conclusions is affected qualitatively if raw data is used instead of winsorized data.

Table 6 shows relatively high correlations between several independent variables in the model of SERP determinants. The result is not unexpected since multiple proxies for CEO power are used. Correlations among indicators of CEO power are not likely to affect key results and conclusions: the study focuses on the general association between CEO SERP benefits and CEO power and not on individual associations of CEO SERP benefits with specific indicators of CEO power (e.g., absence of a large blockholder). Nevertheless, to alleviate a potential issue of multicollinearity, independent variables that have a relatively high (less than -0.35 and more than 0.35) and significant correlation with other independent variables are dropped – one at a time – from models of SERP determinants. Regressions of the incidence and magnitude of CEO SERP benefits are sequentially estimated without *TenureDir*, *Age*, *Blockholder*, and *BoardSize*. The key conclusion on the association of CEO SERP benefits with CEO power remains unaffected.

One could also raise a comment with respect to the choice of explanatory variables for empirical models. Although the model used to test the rent extraction hypothesis is based on prior studies and does capture major economic and governance effects, other variables may potentially have an

impact on SERP presence and/or size of SERP benefits. Additional potential proxies for CEO power include, among others, the proportion of old outside directors on the board, the proportion of outside directors who sit on three or more boards and variables on the compensation committee structure. An attempt to collect the abovementioned data using public sources was unsuccessful as the number of missing observations turned out to be too high. Therefore, the matter is left to future research. However, since multiple proxies for CEO power are already used in the study, the general result on associations between CEO power and SERP benefits is not expected to be affected by the inclusion of additional proxies for CEO power. Another question is whether results in all models are robust to choices of size, performance and leverage measures. To verify the sensitivity of results, all models are re-estimated with alternative proxies for firm-level economic factors. Using alternative proxies for firm size (assets, log assets, revenue, log revenue), accounting performance (net income, ROA, EBIT) and leverage (debt-assets ratio, debt-equity ratio) does not qualitatively affect results and conclusions. Similarly, the results are not affected if log capital and R&D expenditures is used as a risk-

tolerance proxy, instead of capital and R&D expenditures deflated by total assets.[30]

Including the dummy variable for financial institutions in all models does not qualitatively affect any results. However, the lack of control for industry effects is a potential limitation of the study. For example, it is possible that the incidence and/or magnitude of SERPs differ across sectors (e.g., due to heterogeneous demand for and supply of qualified CEOs). With 60 firms in the sample, I am unable to account for potential industry factors. In addition, the results of this study should not be generalized to the population of public firms, as the analysis concentrates on larger firms. SERP benefits are expected to be more prevalent and sizable in larger firms due to a greater disproportion between CEO's pre-retirement cash pay and *regular* pension. Multivariate models do confirm that the presence and magnitude of SERP benefits is related – among other factors – to firm size. Also, caution should be exercised when extending results to firm's officers other than the CEO. Specifically, the presence and size of expected retirement benefits of lower-level officers may not be affected by CEO influence variables the way CEO benefits are affected. A study on SERPs of lower-level officers would constitute an interesting extension.

6. CONCLUSIONS

The objective of the thesis is to investigate determinants and consequences of supplemental executive retirement benefits. Prior research in this area is virtually non-existent. The thesis takes two general directions: investigating determinants of the incidence and magnitude of CEO SERP benefits and exploring the impact of CEO SERP benefits on firm's decisions.

The first direction examines descriptive properties of supplemental retirement benefits of CEOs and investigates their determinants. The descriptive statistics confirm prior evidence that CEO SERPs are common and sizable and show that expected retirement benefits are not distributed uniformly across CEOs. The results indicate that omitting expected retirement benefits considerably affects the picture of CEO compensation, significantly underestimating its magnitude and distorting comparisons among CEO compensation packages. The descriptive statistics on the magnitude and distribution of SERP benefits are important for researchers in the area of executive remuneration. Virtually all compensation studies that employ a certain proxy for total executive compensation ignore pension increments.

Business observers note that the "stealth" nature of SERP benefits makes them an attractive choice for managers with power to extract rents. The study models the presence of SERPs in CEO compensation arrangements and the magnitude of CEO SERP benefits as functions of CEO power, controlling for economic and other factors that may impact dependent variables. The analysis uncovers strong links between supplemental CEO pensions and many of the proxies for CEO power. The result provides important contributions to three increasingly popular lines of research: the nature of different forms of executive compensation, consequences of information asymmetry between management and shareholders, and the role of corporate governance. Specifically, the association between CEO power and SERP benefits illustrates the importance of transparent disclosure of all forms of executive compensation. An opaque and unclear disclosure of a specific CEO compensation component leads to a higher compensation via that component when the CEO is powerful: a sign of rent extraction, when the amount of compensation received exceeds the amount of compensation that would have been received under optimal contracting. At the same time, the result underlines the importance of corporate governance mechanisms in place: the size of the board, the proportion of unrelated directors, the presence of a major

blockholder and other proxies for "good" governance diminish CEO's power and therefore decrease the likelihood and magnitude of rent extraction via SERP benefits. More generally, from the theoretical standpoint, the result contributes to the ongoing debate between two main compensation paradigms: optimal contracting vs. managerial power. Although CEO power is not the sole determinant of SERP benefits, the associations are strong enough to put the findings in line with the later stream of research. The study extends prior evidences (among others, Lambert et al., 1993; Yermack, 1996; Core et al., 1999) that executive compensation reality deviates from the optimal contracting assumption.

The second direction analyzes the impact of CEO SERP benefits on firm's decisions. Specifically, the association of CEO SERP benefits with earnings management practices is investigated. The rationale for the investigation is inherent in the design of SERPs. An increase in accounting earnings is extremely beneficial for CEOs whose SERPs are performance-contingent, as not only their bonus compensation will increase, but also the value of the pension plan. Since pensionable earnings are usually determined in the last few years prior to retirement (determination years), the beneficial impact of accounting

earnings on compensation is especially pronounced when such CEOs approach retirement (the horizon problem).

The proxy for earnings management used in the analysis is the measure of abnormal accruals derived from the Modified Jones model. Controlling for commonly-used explanatory variables, abnormal accruals are regressed on the interaction of the horizon problem with the performance-contingency of CEO's supplemental retirement plan. Consequently, the study makes an important contribution to the horizon problem literature by looking at a previously unexplored dimension of the relationship between the horizon problem and discretionary accounting choices. Prior evidence in this area is scarce and mixed, with most studies finding no or little association between the two variables (among others, Murphy and Zimmerman, 1993; Wells, 2002; Cheng, 2004). However, no prior research considers that CEOs that approach retirement are heterogeneous with respect to their earnings management incentives. As such, a researcher may conclude that no association between the horizon problem and accounting choices exists *in general*, when in fact such association does exist for one group of CEOs and does not exist for the other. The findings in this study confirm that the nature of CEO's retirement arrangements affects the relationship between the horizon

problem and accounting discretion. Consistently with most of the prior literature, I find no association between the horizon problem and earnings management *in general*, i.e., when CEO's retirement arrangements are ignored. However, the uniformity of this picture changes when CEO SERP benefits are introduced as a moderating factor. A positive association between earnings management proxies and the horizon problem *does* exist when CEO SERPs are contingent on firm's performance: a new result for the horizon problem and earnings management literatures.

The impact of CEO SERP benefits on CEO's risk preferences is also investigated. Existing evidence in this area is limited. Prior literature investigates the impact of SERP's value on risk preferences but fails to capture statistically significant associations. However, the analysis omits the fact that SERPs are not homogenous: specifically, while some SERP benefits are performance-contingent, others are not. To account for this heterogeneity, an analytical model is developed. The model predicts that the relationship between CEO's risk-tolerance and CEO's SERP benefits varies according to the performance-contingency of SERP benefits (contingent on performance or not), and (b) the period considered (last year prior to expected CEO's retirement or any other year).

To verify the predicted relationships, four hypotheses are tested empirically. Controlling for commonly-used explanatory factors, proxies for risk-tolerance are regressed on variables that partition the sample according to the nature of CEO's retirement arrangements and variables that correspond to the period with respect to CEO's retirement date. Since it is difficult to estimate the reliable measure of CEO's risk tolerance (the main limitation of most empirical studies on risk preferences), two alternative and conceptually different proxies are used to alleviate the problem: firm's distance-to-default and capital and R&D expenditures deflated by total assets. Higher values in the dependent variables correspond to more risk-tolerance and lower values correspond to more risk-aversion. All empirical models are run separately for each proxy. In general, the results confirm analytical predictions. Specifically, CEOs whose SERP benefits are contingent on performance appear to be more risk-tolerant than CEOs whose SERP benefits are not contingent on performance. Also, CEO's risk-tolerance is negatively associated with the size of accumulated SERP benefits when SERP benefits are not contingent on performance. To summarize, empirical findings suggest that the relationship between CEO SERP benefits and risk preferences does exist

and varies according to the performance-contingency of SERP benefits. The result is important in light of the study by Sundaram and Yermack (2007) that does not take into account the heterogeneity of SERPs with respect to their performance-contingency and consequently finds no association of risk preferences with CEO SERP benefits. More generally, the result provides additional evidence to the stream of academic literature which investigates the impact of executive compensation arrangements on firm's decisions and accounting choices.

In light of the findings, several other future research opportunities arise. One avenue is the analysis of the impact of CEO SERP benefits on firm value. The evidence on the association of CEO SERP benefits with firm's decisions and accounting choices highlights several potential research extensions. A valid question is whether the market reacts to various changes in CEO retirement arrangements (e.g., changes in the performance-contingency of SERP benefits). Another option is investigating whether the commencement of the determination period for CEO SERP benefits is reflected in market values.

An interesting avenue for future studies relates to forthcoming changes on SERP disclosure regulations in the USA. In July 2006, the SEC voted in favor of the proposal

S7-03-06, *Executive Compensation and Related Party Disclosure*. Among the amendments is the enhanced disclosure of executive retirement plans. A reorganized Summary Compensation Table in a Proxy Statement will include pension increment accrued during the year under the Other Compensation column. A separate table, entitled the Retirement Plan Potential Annual Payments and Benefits Table, will disclose projected annual retirement benefits payable to each named executive officer. To summarize, SERP benefits will become considerably more transparent than they have been so far.[31] Due to this reason, it will be more difficult for CEOs with power to use SERPs as a mean to increase their compensation. One therefore should expect a weakening of the association between CEO power and the magnitude of CEO SERP benefits following the implementation of new regulations. Whether the links between CEO power and retirement arrangements will indeed change is a question for future empirical research. Another important research implication of forthcoming regulations on SERP disclosure is the data availability issue. Since data gathering will become considerable less costly, one should expect an increase in the number of executive compensation studies that account for SERP benefits.

To summarize, the study is one of the first steps in exploring the nature and consequences of supplemental executive retirement benefits. Overall, the results strongly suggest that not only SERPs matter, but they also represent a unique form of compensation that – due to its design, nature and regulatory surroundings – has a unique association with firm's internal environment (i.e., corporate governance and ownership structure) and actions (i.e., earnings management and risk-tolerance). SERPs are not to be ignored: the key conclusion to be taken into consideration by future studies on executive compensation.

ENDNOTES

[1] Business media has featured numerous stories on significant executive pension benefits in specific cases. *La Presse* covers the intention of the Association for the Protection of Quebec Savers and Investors to sue the Compensation Committee of the Board of Directors of Bombardier Inc. for awarding the former CEO of the company Paul Tellier an abusive amount of post-employment benefits which includes the present-value pension equivalent of $8 million. Paul Tellier was employed at Bombardier for only two years and was laid off due to unsatisfactory performance (Hélène Baril, *Michaud veut poursuivre Bombardier*, La Presse, 05.15.2005). *The Washington Post* investigates retirement benefits of the former CEO of General Electric Co. Jack Welch whose present-value pension equivalent amounts to US$170 million (Michael Barbaro, *A king's ransom in retirement benefits: GE pays ex-CEO millions a year in pension, perks,* Washington Post, 09.07.2002). *The New York Times* discusses a substantial magnitude of CEO pensions at Pfizer, Exxon Mobil, and UnitedHealth Group (Gretchen Morgenson, *Jackpot du jour: It pays to quit,* New York Times, 10.31.2004). These are just several examples. Bebchuk and Fried (2004) and Bebchuk and Jackson Jr. (2005) provide a more complete overview of most recent business articles on executive retirement benefits.

[2] SERP benefits are not the only component excluded from measures of total executive pay. Other typically omitted remuneration components are insurance plans, deferred compensation arrangements, and post-retirement perquisites. This research focuses specifically on SERPs due to several reasons. First, none of the other "stealth" components are

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likely to be as sizable and/or widespread as SERP benefits (see, e.g., Bebchuk and Fried, 2004). Second, in contrast to other "hidden" remuneration components, in most cases, SERP benefits can be estimated using publicly-available data, albeit the estimation is time-consuming and costly. Existing disclosure requirements do not allow estimating values of post-retirement perquisites and insurance plans. Sundaram and Yermack (2007) note that disclosure is extremely limited with respect to deferred compensation and values attached to deferred compensation can be estimated only in the minority of cases. Third, associations of SERP benefits with hypothesized determinants and consequences are to a large extent unique to SERP benefits and may not be generalized to other "stealth" compensation components. For example, there appears to be no reason to associate insurance plans with earnings management incentives.

[3] Unless noted otherwise, all monetary values in the study are expressed in Canadian dollars.

[4] The calculations assume that annual retirement income represents 2% of pensionable earnings for each year of pensionable service. Alternative multipliers (i.e., 1.5%, 1.75%, 2.5%) that are commonly used in RPPs yield qualitatively similar results, showing a wide gap between CEO's RPP benefits and pre-retirement cash compensation.

[5] Regulations that govern the disclosure of executive compensation should be distinguished from regulations that govern the disclosure of firm's *total* pension obligation. Regulations on the disclosure of executive compensation require firms to disclose – in proxy statements

- the information on pension plans of five-highest paid executives. Regulations on the disclosure of firm's *total* pension obligation require firms to disclose – in footnotes to financial statements – the information on the total pension obligation to *all* employees. The disclosure of *total* pension obligation is considerably more elaborate than the disclosure of executive's pension plans. For example, a firm must disclose its *total* accumulated pension benefit obligation and pension benefits expected to be paid to *all* employees in each of the next five fiscal years, and in the aggregate for the five fiscal years thereafter. Firm's *total* pension obligations are out of the focus of this study. To the best of my knowledge, there exist no objective way to derive the value of a specific pension plan (e.g., CEO's SERP) based on the value of *total* pension obligations of a firm.

[6] The estimation process is described in details in Part 4.2.

[7] For brevity, masculine pronouns (i.e., *he*, *his*, *him*) are used throughout the text as gender-neutral pronouns.

[8] A comprehensive analysis of the principal-agent literature is beyond the scope of this paper. Hart and Holmstrom (1987), among others, provide a comprehensive overview.

[9] Most common examples of accounting choices include the choice of depreciation (straight-line or accelerated) and valuation (FIFO, LIFO, or weighted-average) methods, as well as estimations of future events (e.g., deferred taxes, losses from bad debts, pension obligations and salvage values). A manager can also choose to defer or incur R&D,

marketing or any other business expenses: decisions that would ultimately impact firm's financial reports.

[10] $v = 0$ for *SERPSAL* and *SERPBON* at the beginning of Year 1 of executive's employment

[11] For brevity, I ignore *normal* increases in the present value of SERP benefits - i.e. technical increases due to the accumulation of the additional year of credited service. The value of these technical increases is marginal; besides, their values are equal for *SERPSAL* and *SERPBON* (a certain proportion of *v*) and therefore do not affect most model predictions. For similar reasons, changes in base salary due to good (poor) performance are ignored.

[12] The relationship between CEO's risk-tolerance and the performance-contingency of CEO's SERP is not expected to be endogenous. The reason is grounded in the design of existing SERP arrangements: in all cases, performance-contingent SERP benefits are calculated based on bonuses *in addition to* base salaries, not on bonuses *instead of* base salaries. Consequently, regardless of his risk preferences, a CEO would prefer a performance-contingent SERP in which pensionable earnings are based on salary *and* bonus to a SERP in which pensionable earnings are based on the salary only. SERP benefits are at least as high in the first case (if the performance is poor and the bonus is zero throughout the determination period) and likely to be higher (if the bonus is higher than zero in at least one determination year), but can never be lower. In other words, there is no downside effect or risk involved. As such,

CEO's initial risk preferences are not expected to impact the performance-contingency of SERP benefits.

[13] The key point is that the expected loss of all CEOs is equal, and not that it equals zero. Certainly, the true expected loss due to the poor performance is higher than zero for all CEOs. For example, a CEO faces costs related to the loss of reputation. However, such losses are assumed to be homogeneous across the three groups of CEOs.

[14] Consider two retiring CEOs with SERPs, with 35 years of credited service, whose annual pension is to be determined by the product of pre-retirement cash compensation, years of credited service and a multiplier of 2%. Pre-retirement cash compensation of CEO A is $200,000. Pre-retirement cash compensation of CEO B is $1,000,000. In that case, CEO A is entitled to annual pension of $140,000, of which 52.8% ($73,885) is from the RPP, and 47.2% ($140,000 - $73,885) is from the SERP. CEO B is entitled to annual pension of $700,000, of which only 10.6% ($73,885) is from the RPP, and 89.4% is from the SERP.

[15] The first year of observations is 1997 but I also have access the 1996 proxy statements. Since a proxy statement contains information on executive's compensation during last three years, for any 1997 observation there are three years of prior remuneration data.

[16] In two cases in the sample, firms reported the projected value of CEO's annual pension. However, as actuarial and other assumptions were never made transparent, I ignored that information and estimated the value of the annual pension already accumulated by the CEO in the

manner described in the text. This ensures uniformity of assumptions across all observations. In addition, a robustness test shows that using the reported values of projected CEO's annual pensions in these two cases does not affect any results qualitatively.

[17] Alternatively, the estimation is performed with a logit model. The choice of the model does not qualitatively affect the results.

[18] Using alternative measures for firm size, performance and leverage does not qualitatively affect the results. See Part 5.4 for details.

[19] The absolute value of pension increment is used as the independent variable because, unlike other compensation components, pension increment in a given year can be negative. Therefore, the log of pension increment cannot be employed as the independent variable in the model. There are several situations that lead to a negative pension increment. A firm may change one or several SERP provisions in a way that decreases the value of accumulated SERP benefits (e.g., decrease the multiplier). Also, pensionable earnings may be based on CEO's compensation in final years, but CEO's compensation may be higher in earlier years. Consequently, despite the accumulation of additional year of pensionable service, the value of accumulated SERP benefits may decrease in a given year.

[20] These are just several studies in which discretionary accruals are found to be associated with respective firm-level factors.

[21] The default point and the distance-to-default are estimated using standard procedures found in the literature (among others, Crouhy et al., 2001; Sundaram and Yermack, 2007).

[22] Pension increments are compared specifically to annual cash compensation (base salary and cash bonus) and not to the total pay package (which may also include deferred share units, stock and stock option grants, long-term incentive plans, perquisites, and other benefits) for several reasons. As described earlier, SERPs exist because of regulations that limit the size of regular pensions. Their stated objective is to preserve executive's *cash*-inflows after retirement. SERP benefits are calculated based on pensionable earnings which in turn represent a certain function of executive's base salary and cash bonus only. This link between SERP benefits and cash compensation raises several fruitful questions. *What is the magnitude of SERP benefits (in the present-value equivalent) earned by a CEO in a particular year for a dollar of cash earned? Are SERP benefits distributed uniformly with respect to cash compensation?* Comparing pension increments specifically with cash compensation addresses these questions.

[23] Pearson (Spearman) correlation is 0.80 (0.81), significant at the 1% level. A high correlation between cash compensation and cash compensation adjusted for pension increments is reasonably expected: e.g., in observations without retirement benefits (88 out of 371 observations), the two measures are equal.

[24] Alternatively, data is winsorized at the 2.5% level. Results are not qualitatively affected by the choice of winsorizing levels.

[25] Alternatively, predicted excess compensation is deflated by *predicted* compensation (i.e., the predicted component of compensation arising from all variables). The choice of deflator does not qualitatively affect the results.

[26] In addition, the estimation could be improved by considering the probability of divorce of married CEOs and the probability of marriage of single CEOs, although effects of these two events would (at least partially) cancel each other out in a sample.

[27] The actuarial value of survivor benefits is even less significant, if the CEO is a female. However, such instances are uncommon. Of 116 CEOs in the sample, 115 are males (the only exception is Belinda Stronach, a former CEO of Magna International).

[28] Risk-tolerance models are also estimated with all main effects and interactions, as a robustness check (i.e., Equations 13 and 15 with additional explanatory variable *LAST*, and Equation 14 with additional explanatory variable *NOTLAST*). Results are not qualitatively affected by the inclusion of all main effects.

[29] In five cases, using raw data in multivariate regressions changes the significance of coefficients on control variables. In the test of Hypothesis 2, the negative association between leverage and the magnitude of the annual pension increment becomes marginally

significant (-230.6, p<0.10). In the test of Hypothesis 5, the association between leverage and capital expenditures becomes marginally significant (-0.036, p<0.10), while the association between performance and capital expenditures becomes marginally significant (0.020, p<0.10). In the test of Hypothesis 6, the association between performance and distance-to-default becomes statistically insignificant. Finally, in the test of Hypothesis 7, the association between size and distance-to-default becomes marginally significant (0.212, p<0.10).

[30] Using natural logs of the board size, directors' tenure, CEO age, and CEO tenure instead of respective absolute values in models of SERP determinants (Hypotheses 1 and 2) does not affect the results either.

[31] The new regulations will come into effect in 2007 in the USA, but not in Canada. In Canada, executive compensation disclosure is currently under review and similar changes can be reasonably expected. However, no official proposals or other moves in this direction have been made yet. Rules on SERP disclosure - as described in the text - remain, therefore, unchanged in Canada.

REFERENCES

Aboody, D., and R. Kasznik (2000). CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics* 29, 73-100.

Antle, R., and A. Smith (1985). Measuring executive compensation: Methods and an application. *Journal of Accounting Research* 23, 296-325.

Barker, V., and G. Mueller (2002). CEO characteristics and firm R&D spending. *Management Science* 48, 782-801.

Bartov, E., F. Gul, and J. Tsui (2000). Discretionary-accruals model and audit qualifications. *Journal of Accounting and Economics* 30, 421-452.

Bartov, E., and P. Mohanram (2004). Private information, earnings manipulations, and executive stock-option exercises. *Accounting Review* 79, 889-920.

Baysinger, B., and R. Hoskisson (1989). Diversification strategy and R&D intensity in multiproduct firms. *Academy of Management Journal* 32, 310-332.

Baysinger, B., R. Kosnik, and T. Turk (1991). Effects of boad and ownership structure on corporate R&D strategy. *Academy of Management Journal* 34, 205-214.

Bebchuk, L., and J. Fried (2004). Managerial power and stealth compensation. *Berkeley Business Law Journal* 1, 291-326.

Bebchuk, L., and R. Jackson Jr. (2005), Putting executive pensions on the radar screen. *Journal of Corporation Law* 30, 823-855.

Becker, C., M. DeFond, J. Jiambalvo, and K. Subramanyam (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research* 15, 1-24.

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Berger, P., E. Ofek, and D. Yermack (1997). Managerial entrenchment and capital structure decisions. *Journal of Finance* 52, 1411-1438.

Bertrand, M., and S. Mullainathan (2001). Are CEOs rewarded for luck? The ones without principals are. *Quarterly Journal of Economics* 16, 901-32.

Bowman, R. (1979). The theoretical relationship between systematic risk and financial (accounting) variables. *The Journal of Finance* 34, 617-638.

Brick, I., O. Palmon, and J. Wald (2006). CEO compensation, director compensation and firm performance: Evidence of cronyism? *Journal of Corporate Finance* 12, 403-423.

Brickley, J., L. Van Horn, and G. Wedig (2003). Board structure and executive compensation in nonprofit organizations: Evidence from hospitals. Published in *Proceedings of the Organizational Economics of Health Care Conference 2003,* University of Rochester, Rochester, NY.

Burgess, L. (1963). *Top executive pay package.* New York, NY: Macmillan.

Bushman, R., and A. Smith (2001). Financial accounting information and corporate governance. *Journal of Accounting and Economics* 32, 237-333.

Butler, M., A. Leone and M. Willenborg (2004). An empirical analysis of auditor reporting and its association with abnormal accruals. *Journal of Accounting and Economics* 37, 139-165.

Butler, S., and H. Newman (1989). Agency control mechanism effectiveness and decision making in an executive's final year with a firm. *Journal of Institutional and Theoretical Economics* 145, 451-464.

Byrd, J., E. Cooperman, and G. Wolfe (2006). Director tenure and the compensation of bank CEOs. Working paper, University of Colorado, Denver, CO.

Carpenter, M., and G. Sanders (2002). Top management team compensation: The missing link between CEO pay and firm performance? *Strategic Management Journal* 23, 367-375.

Chalmers, K., P.-S. Koh, and G. Stapledon (2006). The determinants of CEO compensation: Rent extraction or labour demand. *The British Accounting Review* 38, 259-275.

Cheng, S. (2004). R&D expenditures and CEO compensation. *The Accounting Review* 79, 305-328.

Chung, H., and S. Kallapur (2003). Client importance, non-audit services, and abnormal accruals. *The Accounting Review* 78, 931-955.

Core, J. (1997). The directors and officers insurance premium: An outside assessment of the cost of weak corporate governance. Working paper, University of Pennsylvania, Philadelphia, PA.

Core, J., R. Holthausen, and D. Larcker (1999). Corporate governance, Chief Executive Officer compensation, and firm performance. *Journal of Financial Economics* 51, 371-406.

Craighead, J., M. Magnan, and L. Thorne (2004). The impact of mandated disclosure on performance-based CEO compensation. *Contemporary Accounting Research* 21, 369-398.

Crouhy, M., D. Galai, and R. Mark (2001). *Risk management*. New York, NY: McGraw-Hill.

Cyert, R., S. Kang, and P. Kumar (2002). Corporate governance, takeovers, and top-management compensation theory and evidence. *Management Science* 48, 453-469.

Cyert, R., and J. March (1963). A behavioral theory of the firm. Englewood Cliffs, NJ: Prentice-Hall.

DeAngelo, L. (1988). Managerial competition, information costs, and corporate governance, the use of accounting performance measures in proxy contests. *Journal of Accounting and Economics* 10, 3-36.

Dechow, P., and R. Sloan (1991). Executive incentives and the horizon problem: An empirical investigation, *Journal of Accounting and Economics* 14, 51-89.

Dechow, P., R. Sloan, and R. Sweeney (1995). Detecting earnings management. *The Accounting Review* 70, 193-225.

DeFond, M., and J. Jiambalvo (1994). Debt covenant violation and manipulation of accruals. Journal of Accounting and Economics 17, 145-176.

Eldenburg, L., and R. Krishnan (2003). Public versus private governance: A study of incentives and operational performance. *Journal of Accounting and Economics* 35, 377-404.

Fama, E. (1980). Agency problems and the theory of the firm. *Journal of Political Economy* 88, 288-307.

Frankel, R., M. Johnson, and K. Nelson (2002). The relationship between audit fees for nonaudit services and earnings quality. *The Accounting Review* 77 (Supplement), 71-105.

Gaver, J., K. Gaver, and J. Austin (1995). Additional evidence on bonus plans and income management. *Journal of Accounting and Economics* 19, 3-28.

Ghosh, C., and C. Sirmans (2004). On REIT CEO Compensation: Does Board Structure Matter? *Journal of Real Estate Finance and Economics* 30, 429-445.

Gibbons, R., and K. Murphy (1992). Does executive compensation affect investment? *Journal of Applied Corporate Finance* 5, 99-109.

Grinstein, Y., and P. Hribar (2004). CEO compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics* 73, 119-143.

Grossman, S., and O. Hart (1983). An analysis of the principal-agent problem. *Econometrica* 51, 7-45.

Guidry, F., A. Leone, and S. Rock (1999). Earnings-based bonus plans and earnings management by business unit managers. *Journal of Accounting and Economics* 26, 113-142.

Hamada, R. (1972). The effect of the firm's capital structure on the systematic risk of common stocks. *The Journal of Finance* 27, 435.

Hart, O., and B. Holmstrom (1987). The theory of contracts. In *Advances in economic theory: Fifth World Congress* edited by T. Bewley. Cambridge, UK: University Press.

Harvey, K., and R. Shrieves (2001). Executive compensation structure and corporate governance choices. *Journal of Financial Research* 24, 495-512.

He, L., and M. Conyon (2004). CEO compensation, incentives and governance in new enterprise firms. *Journal of Derivatives Accounting* 1, 47-60.

Healy, P. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics* 7, 85-107.

Hitt, M., R. Hoskisson, R. Ireland, and J. Harrison (1991). Effects of acquisitions on R&D inputs and outputs. *Academy of Management Journal* 34, 693-706.

Holmstrom, B. (1979). Moral hazard and observability. *Bell Journal of Economics* 10, 74-91.

Holmstrom, B. (1982). Moral hazard in teams. *Bell Journal of Economics* 13, 324-3340.

Holthausen, R., D. Larcker, and R. Sloan (1995). Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics* 19, 29-74.

Hribar, P., and D. Collins (2002). Errors in estimating accruals: Implications for empirical research. *Journal of Accounting Research* 40, 105-134.

Hundley, G., C. Jacobson, and S. Park (1996). Effects of probability and liquidity on R&D intensity: Japanese and U.S. companies compared. *Academy of Management Journal* 39, 1659-1674.

Jensen, M., and K. Murphy (1990). Performance pay and top-management incentives. *Journal of Political Economy* 98, 225-264.

Jones, J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research* 29, 193-228.

Kim, J., R. Chung, and M. Firth (2003). Auditor conservatism, asymmetric monitoring, and earnings management. *Contemporary Accounting Research* 20, 441-464.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 22, 375-400.

Lambert, R., D. Larcker, and K. Weigelt (1991). How sensitive is executive compensation to organizational size? *Strategic Management Journal* 12, 395-402.

Lambert, R., D. Larcker, and K. Weigelt (1993). The structure of organizational incentives. *Administrative Science Quarterly* 38, 438-461.

Lewellen, W. (1968). Executive compensation in large industrial corporations. New York, NY: National Bureau of Economic Research.

Lewellen, W., C. Loderer, and K. Martin (1987). Executive compensation and executive incentive problems: An empirical analysis. *Journal of Accounting and Economics* 9, 287-310.

Long, W., and D. Ravenscraft (1993). LBOs, debt and R&D intensity. *Strategic Management Journal* 14, 119-135.

Lundstrum, L. (2002). Corporate investment myopia: A horserace of the theories. *Journal of Corporate Finance: Contracting, Governance, and Organization* 8, 353-371.

Magnan, M., S. St-Onge, and L. Thorne (1996). Performance organisationnelle et rémunération des dirigeants : une comparaison Canada — Etats-Unis. *Revue canadienne des sciences de l'administration* 13, 102-118.

Masson, R. (1971). Executive motivations, earnings and consequent equity performance. *Journal of Political Economy* 79, 1278-1292.

McNichols, M., and P. Wilson (1994). Evidence of earnings management from the provision for bad debts. *Journal of Accounting Research* 26 (supplement), 157-180.

Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics* 38, 163-184.

Menon, K., and D. Williams (2004). Formar audit partners and abnormal accruals. *The Accounting Review* 79, 1095-1118.

Mirrlees, J. (1976). The optimal structure of incentives and authority within an organization. *Bell Journal of Economics* 7, 105-131.

Moers, F., and E. Peek (2004). An empirical analysis of the role of risk aversion in executive compensation contracts. Working Paper, Maastricht University, Maastricht, Netherlands.

Murphy, K. (1999). Executive compensation. In *Handbook of Labor Economics*. Vol. 3, edited by O. Ashenfelter and D. Card. New York, NY: North Holland.

Murphy, K. (2001). Performance standards in incentive contracts. *Journal of Accounting and Economics* 30, 245-278.

Murphy, K., and J. Zimmerman (1993). Financial performance surrounding CEO turnover. Journal of Accounting and Economics 16, 273-315.

Patterson, M. (2000). KPMG's 1999 SERP survey. *Journal of Deferred Compensation* 5, 47-62.

Pennathur, A., and R. Shellor (2002). The determinants of REIT CEO compensation. *Journal of Real Estate Finance and Economics* 25, 99-113.

Pourciau, S. (1993). Earnings management and nonroutine executive changes. *Journal of Accounting and Economics* 16, 317-336.

Ross, S. (2004). Compensation, incentives, and the duality of risk aversion and riskiness. *The Journal of Finance* 59, 207-225.

Smith, C., and R. Watts (1982). Incentive and tax effects of executive compensation plans. *Australian Journal of Management* 7, 139-157.

Schumpeter, J. (1942). Capitalism, socialism and democracy. New York, NY: Harper and Row.

Sundaram, R., and D. Yermack (2007). Pay me later: Inside debt and its role in managerial compensation. *Journal of Finance* (forthcoming).

Vafeas, N. (2003). Length of board tenure and outside director independence. *Journal of Business Finance & Accounting* 30, 1043-1064.

Vafeas, N., and Z. Afxentiou (1998). The association between the SEC's 1992 compensation disclosure rule and executive compensation policy changes. *Journal of Accounting and Public Policy* 17, 27-54.

Vancil, R. (1987). *Passing the baton: Managing the process of CEO succession*. Boston, MA: Harvard Business School Press.

Watts, R., and J. Zimmerman (1986). *Positive accounting theory*. Englewood Cliffs, NJ: Prentice-Hall.

Wells, P. (2002). Earnings management surrounding CEO changes. *Accounting and Finance* 42, 169-193.

Yermack, D. (1996). Higher market valuation for firms with a small board of directors. *Journal of Financial Economics* 40, 185-211.

Yermack, D. (1997). Good timing: CEO stock option awards and company news announcements. *Journal of Finance* 52, 449-476.

APPENDIX A: Examples of SERP Disclosure

Agrium Inc., 2001 (CEO: John Van Brunt)

With the exception of Mr. Gearheard, the named executive officers are members of the Agrium Inc. Retirement Plan and are either participating in the non-contributory, defined benefit part of the plan (the "DB Plan") or the non-contributory, defined contribution part of the plan (the "DC Plan").

The plan is registered under the *Income Tax Act* and the *Alberta Employment Pension Plans Act*. The plan is subject to the maximum pension and contribution limits imposed under the *Income Tax Act*.

In addition to the benefits provided under either the DB Plan or the DC Plan, the named executive officers, other than Mr. Gearheard, receive supplementary benefits under the Agrium Inc. Supplemental Executive Retirement Plan (the "Supplementary Plan"). Executive officers who are members of the DB Plan receive a total pension from the DB and Supplementary Plans of 1.4% of their best 3-year average earnings ("Best Average Earnings") up to the 36-month average yearly maximum pensionable earnings under the Canada Pension Plan ("Average YMPE") plus 2% of Best Average Earnings in excess of the Average YMPE, multiplied by years of service up to 35 years, plus 1.4% of Best Average Earnings multiplied by years of service in excess of 35 years. ...An executive's remuneration includes basic salary. At the end of 2000, the named executive officers participating in the Plan had the following years of service: John M. Van Brunt – 35...

Bombardier Inc., 2002 (CEO: Robert Brown)

Senior Officers, including the Named Executive Officers, participate in two non-contributory defined benefit pension plans. Benefits payable from the basic plan correspond to 2% of average earnings in the three continuous years of service during which they were paid their highest salary (up to a maximum salary of $86,111) times the number of years of credited service.

Since January 1, 2001, the supplemental plan provides (depending on the management level) for additional benefits of 1.75% of average earnings in excess of $86,111 times the number of years of credited service or 2.25% or 2.50% of average earnings times the number of years of credited service, less the pension payable from the basic plan and any benefits payable from other pension plans of the Corporation. Benefits are reduced by 1/3 of 1% for each month between the date of early retirement and the date of a participant's 60th birthday or, if earlier, the date at which the participant's age plus his years of credited service total 85. No benefits are payable from the supplemental plan if a participant has not completed five years of service.

...Upon the death of a participant, the spouse will be entitled to a benefit equal to 60% of the benefit to which such participant was entitled. If the participant has no spouse at the time of retirement, the benefits will be paid, after death, to the designated beneficiary until such time as 120 monthly installments, in the aggregate, have been paid to the participant and to the designated beneficiary. All benefits payable from these plans are in addition to government social security benefits. Only base salary is taken into consideration in calculating pension benefits.

Years of credited service as at January 31, 2002 for each of the Named Executive Officers hereafter mentioned are: Robert E. Brown 15 years...

National Bank of Canada, 2003 (CEO: Réal Raymond)

With the exception of G.F. Kym Anthony and Germain Carrière, the Named Executive Officers of the Bank participate in a defined benefit pension plan. This plan is fully funded according to the most recent actuarial valuation. For each year of service credited, the plan grants a pension equal to 2% of average eligible earnings, defined as the average earnings for the 60 highest-paid consecutive months. Compensation consequently varies according to level. For Officers at the level of President, it is based on the salary and the annual bonus. For the Senior Vice-President level, the calculation is based on salary and 25% of the annual bonus (up to a maximum of 20% of salary). This pension is then reduced by the pension acquired under the Canada or Quebec pension plans ("CPP/QPP") while the Named Executive Officer participated in the Bank pension plan, except for the years of participation prior to January 1, 1990 which are reduced by 50%. However, this benefit cannot exceed the maximum pension prescribed under the *Income Tax Act* (Canada), currently $1,722 per year of service credited. The normal retirement age is 60. However, the plan allows for early retirement, with the employer's consent, as of 55 years of age. Benefits then payable are reduced by the lesser of 4% for each year of early retirement prior to age 60 or 2% for each year by which the sum of the participant's age and years of service falls short of 90.

Years of service credited on the normal retirement date for the purposes of the pension plan have been estimated as follows: Réal Raymond: 34 years... The pension is payable for life. Upon the participant's death, 60% of the pension is payable to the spouse. If there is no spouse, part of the pension is payable to the dependent children.

Potash Corporation of Saskatchewan Inc., 2004 (CEO: William Doyle)

The Corporation maintains a Supplemental Retirement Income Plan (the ""Supplemental Plan") which provides a supplementary pension benefit for certain of the Corporation's officers and key managers. Under

the basic terms of the Supplemental Plan, a pension benefit is provided in an amount equal to 2% of the average of the participant's three highest years' earnings multiplied by the participant's years of pensionable service (to a maximum of 35 years), minus any annual retirement benefit payable under the PCS Plan or certain other tax qualified plans. For the purposes of the Supplemental Plan, earnings are defined as the participant's annual base pay plus 100% of all bonuses paid or payable for such year pursuant to the Short-Term Incentive Plan. The normal retirement age pursuant to the Supplemental Plan is 65, with a reduction in benefits for early retirement prior to age 62. No benefits pursuant to the Supplemental Plan are payable if termination occurs prior to age 55. Benefits payable to employees who have reached the minimum age (55) for retirement pursuant to the Supplemental Plan are secured by letters of credit provided by the Corporation and are generally pa id in the form of an annuity for life, or at a participant's election, in a single lump sum payment equal to the actuarial present value of the annual benefit provided by the Supplemental Plan.

For a designated group of senior officers, including Mr. Doyle, Mr. Brownlee and Mr. Moore, the benefit payable under the Supplemental Plan is an amount equal to: (i) 5% of the average of the senior officer's three highest years' earnings multiplied by the senior officer's years of pensionable service (to a maximum of 10 years), plus (ii) 2% of the average of the senior officer's three highest years of earnings multiplied by the senior officer's years of pensionable service in excess of 25 years to a maximum of 10 additional years, minus (iii) any annual retirement benefit payable under the PCS Plan and certain other tax qualified plans.

As of December 31, 2003, the average of the three highest years' earnings for purposes of the Supplemental Plan for each Named Executive Officer participating in the Supplemental Plan were as follows: $1,444,083 for Mr. Doyle, $520,675 for Mr. Brownlee and $461,572 for Mr. Moore. The estimated credited years of service at assumed retirement age of 65 for each of the Named Executive Officers participating in the Supplemental Plan are as follows: 28 years for Mr. Doyle...

APPENDIX B: List of Sample Firms

Abitibi-Consolidated Inc.

Agrium Inc.

Alberta Energy Company

Alcan Aluminum Limited

Anderson Exploration Limited

ATI Technologies Inc.

Bank of Montreal

Bank of Nova Scotia

Barrick Gold Corporation

BCE Inc.

BioChem Pharma Inc.

Bombardier Inc.

Canadian Imperial Bank of Commerce

Canadian National Railway Company

Canadian Natural Resources Limited

Canadian Pacific Limited

Canadian Occidental Petroleum Limited

Canadian Tire Corporation Limited

Dofasco Inc.

EdperBrascan Corporation

Enbridge Inc.

Euro-Nevada Mining Corporation

Falconbridge Limited

GEAC Computer Corporation

Gulf Canada Resources Limited

Hudson's Bay Company

Imasco Limited

Imperial Oil Limited

Inco Limited

Laidlaw Inc.

Loblaw Companies Limited

Macmillan Bloedel Limited

Magna International Inc.

Mitel Corporation

Moore Corporation Limited

National Bank of Canada

Newbridge Networks Corporation

Newcourt Credit Group

Noranda Inc.

Nortel Networks Corporation

Nova Corporation

Petro-Canada

Placer Dome Inc.

Poco Petroleums Limited

Potash Corporation of Saskatchewan Inc.

Renaissance Energy Limited

Royal Bank of Canada

The Seagram Company Limited

Shaw Cablesystems Limited

Suncor Energy Inc.

Talisman Energy Inc.

Teck Corporation

Teleglobe Inc.

Telus Corporation

The Thomson Corporation

Toronto-Dominion Bank

Transalta Utilities Corporation

TransCanada Pipelines Limited

United Dominion Industries Limited

Westcoast Energy Inc.

APPENDIX C: Sources of Data

Variable	Source
Accounts receivable	Compustat, Financial statements
Age of CEO	Proxy statements, Lexis-Nexis, Google
Blockholder presence	Proxy statements
Book-market ratio	Compustat, ROB Top 1000, Financial statements
Capital expenditures	Compustat, Financial statements
Cash compensation	Proxy statements
Cash-flow from operations	Compustat, Financial statements
CEO-Chairman duality	Proxy statements
CEO-insider duality	Proxy statements
Consumer price index	Statistics Canada
Death probability tables	Statistics Canada
Debt-assets ratio	Compustat, ROB Top 1000, Financial statements
Debt-equity ratio	Compustat, ROB Top 1000, Financial statements
Determination period	Proxy statements
Distance-to-default	Compustat, ROB Top 1000, Financial statements
Earnings before extraordinary items and discontinued operations	Compustat, Financial statements
First/last year of CEO's employment	Proxy statements
Net income	Compustat, ROB Top 1000, Financial statements
Number of directors	Proxy statements
Pensionable earnings	Proxy statements
Performance-contingency of SERP benefits	Proxy statements
Property, plan t and equipment	Compustat, Financial statements
Proportion of unrelated directors	Proxy statements
Return on assets	Compustat, ROB Top 1000, Financial statements
Revenue	Compustat, ROB Top 1000, Financial statements
SERP presence	Proxy statements
SERP benefits formula	Proxy statements
Share ownership by CEO	Proxy statements
Share ownership by unrelated directors	Proxy statements
Tenure of CEO	Proxy statements
Total assets	Compustat, ROB Top 1000, Financial statements
Years of credited service	Proxy statements
Years of service of unrelated directors	Proxy statements

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