The Effect of Canadian Tax Policy on Executive Equity Grants: Corporate Tax Planning and Managerial Power

by

Khin Phyo Hlaing

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Doctor of Philosophy
in
Accounting

Waterloo, Ontario, Canada, 2018

Examining Committee Membership

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner	Dr. Amin Mawani Associate Professor of Accounting
Co-Supervisor	Dr. Changling Chen Associate Professor of Accounting
Co-Supervisor	Dr. Kenneth Klassen Professor of Accounting
Internal Member	Dr. Neil Brisley Associate Professor of Finance
Internal Member	Dr. Andrew Bauer Assistant Professor of Accounting
Internal-external Member	Dr. Anindya Sen Professor of Economics

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This study examines how the tax treatment of corporate tax-deductible restricted share units and employee tax-favoured stock options at the employer and employee level affect the extent of their use in executive equity compensation packages among public firms. I appeal to two theories, namely, corporate tax planning and managerial power, to address the research question. I hand-collect executive compensation data of 143 top non-financial Canadian firms traded on the Toronto Stock Exchange for the 2005-2015 period. I find some evidence that firms expecting a high tax rate use the proportion of executive equity compensation via corporate tax-deductible RSUs to a greater extent compared to firms expecting a low tax rate at the vesting year. The results are consistent with the inference that managers demanding a higher level of employee tax-favoured options in their total equity compensation when they have power to influence the executive compensation. The results also support that managerial power weakens the positive association between firms expecting a high tax rate at the vesting year and the use of corporate tax-deductible RSUs in executive equity compensation. The findings suggest that tax policy that artificially distinguishes among types of equity compensation, such as the current Canadian legislation, affects executive equity compensation design.

Acknowledgements

I would like to express my sincere gratitude to my supervisors, Dr. Changling Chen and Dr. Ken Klassen, for their encouragement, guidance, and mentorship through the whole process of my doctoral thesis. Changling and Ken have been extremely generous with their time and advice. From my supervisors, I have learnt how to be precise with my thoughts and clear in the delivery of these thoughts. I feel immensely grateful to have the opportunity to learn from Changling and Ken.

I am also grateful for the feedback and direction provided by the other members of my dissertation committee: Neil Brisley and Andrew Bauer. Their helpful and timely feedback was valuable in improving this thesis.

This dissertation has also benefited from the comments of Christine Weidman, Satiprasad Bandyopadhyay, Pat O'Brien, Tony Wirjanto, Ranjini Jha, Theresa Libby, Brad Pomeroy, Tu Nguyen, Alan Macnaughton, Joyce Tian, Krista Fiolleau, Theo Stratopoulos, Alan Webb, Duane Kennedy, and Adam Vitalis.

I have benefited tremendously from my interaction with a number of faculty and staff at the University of Waterloo, especially Sally Gunz (and her husband John McCutcheon), Satiprasad Bandyopadhyay, and Jenny Rothwell. Sally and Sati have been such great mentors throughout my time at the University of Waterloo. John has always been generous with his time and advice. Jenny has been a great friend and provided a tremendous emotional support. They have always supported me at both professional and personal levels. These friends and mentors are instrumental in helping me get through this process.

Last, but not the least, the completion of this dissertation would not have been possible without tremendous love and support of my family and friends. I have made life-long friends at the University of Waterloo. The friendship of Vijay Dipti Kumar, Minna Hong, Andrea Stapleton, and Betty Xing has made this whole process more manageable, worthwhile, and enjoyable. Especially I want to thank Dipti, Minna, Andrea, and Betty for being my rock and spiritual guidance. I could go on listing endless things my friends have done for me to succeed. I could not have made it through this process without your love.

Dedication

To my father U Hlaing Soon, my mother Daw Sein Sein, my sisters, Khin Su Su Hlaing and Dway Mya Mya Hlaing, and my brother Tun Phyoe. Thank you for being my greatest supporters, and for giving me all the confidence, encouragement, opportunity and love in the world to pursue and succeed this academic career.

Table of Contents

Examining Committee Membership ii
AUTHOR'S DECLARATION iii
Abstract iv
Acknowledgements v
Dedication vi
Table of Contents vii
List of Figures ix
List of Tables x
Chapter 1 Introduction 1
1.1 Motivation 1
1.2 Corporate Tax Planning and Executive Equity Compensation 3
1.3 Managerial Power and Executive Equity Compensation 6
1.4 Summary of the Main Findings 7
1.5 Contributions 9
1.6 Outline of the Study 11
Chapter 2 Tax Rules on Executive Compensation 12
2.1 Introduction 12
2.2 Tax consequences of cash and deferred tax compensation 12
2.3 Tax consequences of option-based equity compensation grants 13
2.4 Tax consequences of share-based equity compensation 15
2.5 Difference in Tax Treatments Between Share-based and Option-based Compensation 17
2.6 Conclusions 19
Chapter 3 Literature Review 20
3.1 Introduction 20
3.2 Studies Based on Optimal Contracting Theory 21
3.2.1 Archival Studies in Tax Accounting Research 21
3.2.2 Archival Studies in Financial Accounting Research 22
3.2.3 Analytical Studies on Determinants of Equity Compensation Structure 23
3.3 Studies Based on Managerial Power Theory 25
3.4 Conclusions 26
Chapter 4 Hypotheses Development 28
4.1 Introduction 28
4.2 Corporate tax planning hypothesis 28

4.3 Managerial Power Hypothesis 31
4.4 The effect of managerial power on executive equity mix across corporate tax status 34
4.5 Conclusions 35
Chapter 5 Research Design 37
5.1 Introduction 37
5.2 Measurement of the dependent variable: RSU ratio 37
5.3 Proxies for corporate tax planning 39
5.3.1 Trichotomous measures of corporate tax status at grant year 40
5.3.2 Trichotomous measures of corporate tax status during vesting period 41
5.3.3 Ex ante marginal tax rate 44
5.4 Measurement of managerial power 49
5.5 Regression model 51
5.6 Control variables 54
5.7 Conclusions 57
Chapter 6 Sample Selection and Empirical Analysis 58
6.1 Introduction 58
6.2 Sample selection 59
6.3 Descriptive statistics and Correlations 62
6.4 Main Results from pooled regression tests 64
6.5 Specification checks 67
6.6 Additional analyses 69
6.7 Monitoring costs 74
6.8 Shareholder Activism 75
6.9 Discussion on the limitation of using ex ante corporate marginal tax rates 77
6.10 Conclusions 78
Chapter 7 Conclusion 79
Bibliography 80
Appendix A Figures 87
Appendix B A Simplified Tax Incentive Model 97
Appendix C Procedure to Simulate a Stream of Future Corporate Taxable Income Using a Non-Parametric Model 102
Appendix D Variable Descriptions 104
Appendix E Tables 109

List of Figures

Figure 1 Classification of Employment-Related Equity Grants Based on Their Tax Consequences... 87
Figure 2 Change in Canadian Executive Compensation Structure During the Sample Period..... 88
Figure 3 Corporate and Top Marginal Personal Tax Rate Changes Between 2000-2015 89
Figure 4 Algorithm to Compute Future Tax Loss Carryforwards (An example)..... 90
Figure 5 Illustration of Data Requirement to Simulate Corporate Marginal Tax Rate in Canada 91
Figure 6 How Corporate Marginal Tax Rate is Computed..... 92

List of Tables

TABLE 1 Sample Selection 109
TABLE 2 Summary Statistics of Dependent Variables ($ amounts in millions) 112
TABLE 3 Summary Statistics of Independent Variables Used in Hypothesis testing 114
TABLE 4 Pearson Correlation Matrix 116
TABLE 5 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses 117
TABLE 6 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power Using an OLS Model 118
TABLE 7 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power Using a Firm Fixed Effects Model 119
TABLE 8 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses and Managerial Power Levels for a Non-Family Firm Subsample 120
TABLE 9 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power After Reclassifying Expected Corporate Marginal Tax Rate and Managerial Power Variables as Indicator Variables 121
TABLE 10 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses and Managerial Power Levels for Non-Family Firm CEO, CFO and Other Executive Subsamples 123
TABLE 11 The Relation Between Executive Equity Compensation Structure and Corporate Tax Planning and Managerial Power Using a Subsample of CEOs, CFOs and Other Executives 124
TABLE 12 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statues and Managerial Power Levels for a Reduced Non-Family Firm Subsample 125
TABLE 13 The Relation Between Executive Equity Compensation Structure and Corporate Tax Planning and Managerial Power After Controlling for Idiosyncratic Risk and Shareholder Activism 126

Chapter 1
Introduction

"Among the many factors that must be taken into consideration in determining an appropriate compensation package for executives, one of the most important and complex is taxation. The tax treatment of each element of the compensation package may have a significant impact upon the overall compensation package. Of course, while attempting to avoid creating an excessive tax burden for the executive who receives the package, the employer will also seek to optimize its own contribution from a taxation perspective." (Stikeman Elliot 2014, p. 37)

"The mix of cash, equity and other forms of compensation must be consistent with risk alignment. The mix will vary depending on the employee's position and role. The firm should be able to explain the rationale for its mix." (Financial Stability Forum: FSF Principles for Sound Compensation Practices, p. 3)

1.1 Motivation

An executive compensation package consists primarily of cash compensation (salary and annual bonus), stock option-based grants, and share-based grants, which are subject to different tax rules. In Canada, cash compensation is immediately tax-deductible from the corporate taxable income at the employer level and taxable at the employee level. Among option-based grants, at-the-money stock options are widely used, and compensation expenses related to such grants are not eligible for corporate tax deduction at any point in time. At the employee level, only half of the gain from at-the-money stock option exercises is taxable as employment income at the exercise date (hence, known as "one-half deduction"). Among share-based grants, 100 percent of the realized value of restricted share units (RSUs) and performance share units (PSUs)[1] satisfied with cash payment or repurchased shares is

[1] Restricted share units (RSUs), also known as phantom units in Canada, are the rights to receive shares or the fair market value of the shares granted to employees with a vesting period of a maximum of three years (Geddes 2010; Lee 2010; Colquhoun et al. 2012). Performance share units (PSUs), similar to RSUs, vest based on predetermined performance measures (Geddes 2010; Lee 2010; Colquhoun et al. 2012).

included in computing taxable employment income, and an equivalent amount is deductible from corporate taxable income (hereafter called "corporate tax deductible RSUs") upon the vesting of these shares. Thus, at-the-money stock options are more tax-favoured to the employees (hereafter called "employee tax-favoured stock options") than share-based grants for a dollar of pre-tax benefit.

Stikeman Elliot (2014) suggests that the differences in tax treatment of each component of the compensation package may affect the executive compensation design. Prior studies (e.g., Matsunaga et al. 1992; Klassen and Mawani 2000) also find some effects of taxes on cash and equity compensation structure; however, these studies predate certain changes in financial reporting rules and an increasing trend of RSUs in executive compensation packages. As of 2004 in Canada, accounting rules require employers to report employment-related stock option grants using the fair value method. As a result, the structure of equity compensation changed from primarily stock options to a mix of RSUs and stock options. As shown in Figure 1, Canadian employers in my sample use a mix of tax-deductible RSUs (25% of total annual compensation on average), and employee tax-favoured stock options (21% of total annual compensation on average) in current executive compensation packages. Furthermore, as depicted in Figure 2, 2004-2005 compensation packages consisted primarily of stock options and shifted to increased use of RSU grants in later years (2010-2015) from a mere 10% to 50% of total equity compensation.[2] Therefore, renewed research is necessary to understand how various factors influence the current equity compensation structure. In this study, using a unique Canadian tax setting, I investigate how differential tax treatments on employee tax-favoured stock options and corporate tax-deductible RSUs affect the executive

[2] This compensation structure change is also observed in the U.S. (Carter et al. 2007; Aboody and Kasznik 2008; Frydman and Jenter 2010; Murphy 2012).

equity compensation structure by examining two factors, corporate tax planning and managerial power. I further examine whether managerial power mitigates firm-specific corporate tax planning.

[Figure 1 is about here.]

[Figure 2 is about here.]

Canadian tax rules on equity compensation, particularly those on stock options, have been at the center of tax policy discussions in recent years (e.g., Geddes 2009; Crosbie et al. 2015; Liberal Party 2015; Tedds 2015). In 2017, the federal Liberal Party attempted to repeal the stock option deduction allowance, which many termed as a "stock option loophole" (Scotti 2017) and has been described as too generous to the highly paid executives (Tedds 2015). Additionally, it has been proposed that corporate tax-deductible RSUs are inefficient because it is difficult for firms to meet requirements for corporate tax deductibility in order to use these instruments in compensation packages (Geddes 2009). Although taxes at the employer and employee levels are accepted as important considerations in structuring executive compensation packages by practitioners, prior research provides limited evidence on the implications of Canadian tax rules on executive equity compensation structure. This study, therefore, provides valuable evidence to the tax policy discussion and the effect of employer and employee taxes on corporate compensation decisions.

1.2 Corporate Tax Planning and Executive Equity Compensation

Extant literature shows that firms determine the mix of compensation elements, such as cash and equity, based not only on equity's motivational effects but also on their tax and financial reporting incentives (Shackelford and Shevlin 2001). For example, using Canadian data, Klassen and Mawani (2000) find evidence of a trade-off between tax and financial

reporting incentives in corporate option granting behavior. Prior to 2004, Canadian accounting rules allowed firms to use the intrinsic value method[3] to recognize option-related compensation expense, which implied that at-the-money or out-of-the-money options result in no expense on income statement, thereby allowing firms to increase their pre-tax income by compensating managers with such options.[4] The increased reported pre-tax income also produced forgone tax deductions because stock option compensation was not tax deductible at the corporate level at any time. Using this unique Canadian setting, Klassen and Mawani (2000) show that when a firm's earnings are below target, the firm uses stock option compensation to a greater extent to avoid charging compensation expense against earnings, consistent with the financial reporting incentives hypothesis. In contrast, when a firm's tax paying status is high in the grant year, the firm uses a greater level of tax-deductible cash compensation, consistent with the tax incentives hypothesis.

However, the above-mentioned studies predate financial reporting rules introduced in 2004 and the wide-spread use of RSUs in executive compensation packages. As of 2004, Canadian financial accounting rules require employers to report expense on employment-related stock option grants using the fair value method. Since that time, the structure of equity compensation among Canadian firms has changed from primarily of stock options in 1993-1995[5] to a mix of RSUs and stock options in the 2006-2015[6] period, as shown in Figure

[3] Under the intrinsic value method, the option value at the grant date is the difference between the market value of the underlying stock and the exercise price of the stock option. Since the market value of the underlying stock at the grant date is the same as the exercise price of at-the-money stock options, the intrinsic value of the stock option at the grant date is zero.

[4] Similar change in financial reporting standards incurred in the U.S. effective June 15, 2005.

[5] Stock options accounted for 60 percent of total compensation (see Klassen and Mawani (2000), Table 2, p.238) in the 1993-1995 period.

[6] All types of RSUs account for 27 percent of total equity compensation, and stock options account for 21 percent of total equity compensation in my sample.

2.[7] Therefore, renewed research is necessary to understand how tax policies affect Canadian firms in determining the current equity compensation structure after the option expensing rule removes the financial incentive for stock option compensation.

Taxation is a highly important element in structuring compensation packages (Stikeman Elliot 2014), and this is especially true in Canada because of the corporate tax reporting disincentives of stock options by Canadian tax rules. As taxes affect the after-tax cost of the equity compensation to the employer and the after-tax value of the equity grant to the employee (Katuščák 2009; Widdicks and Zhao 2014), differences in tax treatment of RSUs and stock options provide employers and employees with tax planning opportunities.

Similar to other tax regimes (such as U.S. tax regime), Canadian tax rules allow corporations' reported operating losses to offset positive pretax income reported in the prior three years resulting in tax refunds. Any unused portion of losses can be carried forward up to 20 years to offset future positive taxable income. Therefore, corporations' expected marginal tax rates, defined as the present value of the change in future tax payable for an additional dollar of current taxable income, may range from zero to the highest statutory tax rate. In contrast, executives' marginal tax rates are typically the highest of the personal statutory tax rates because their annual cash compensation is sufficiently high. Thus, corporations have a higher incentive to engage in dynamic tax planning than executives.

To demonstrate the effect of expected corporate tax rates on the cost of various equity grants, holding the after-tax value of equity grants to the employee constant at $100 and using the 2015 top marginal personal tax rate (49.5%), Table B.2 of Appendix B shows that for Canadian companies, the difference in after-tax costs of granting tax-deductible RSUs

[7] This compensation structure change is also observed in the U.S. (Carter et al. 2007; Aboody and Kasznik 2008; Frydman and Jenter 2010; Murphy 2012).

and employee tax-favoured options ranges from −$6 (=$27−$33) to $65 (=$98−$33) when the expected corporate marginal tax rate decreases from 36% to 0%. In contrast, as shown in Table A.3 of Appendix A, there is no such difference in the tax cost of granting different equity instruments in the U.S. because U.S. tax rules on equity grants do not significantly differ across RSUs and employee stock options.[8] The takeaway from the numeric examples in Appendix A is that the after-tax cost of corporate tax-deductible RSUs decreases with increasing marginal tax rates due to differential tax treatments on equity compensation in Canada and that employee tax-favoured stock options grants are costly to firms facing a high marginal tax rate. Therefore, I assert that firms consider the degree to which compensation offers a tax shield when determining the mix of executive equity compensation and minimize the after-tax cost of hiring their senior management.

1.3 Managerial Power and Executive Equity Compensation

In estimating the after-tax cost of each equity component, corporate tax planning implicitly assumes that managers are indifferent between tax-deductible RSUs and employee tax-favoured options when after-tax payouts are expected to be the same. In reality, managers may perceive that equity compensation packages containing stock options are more valuable than packages containing restricted shares, holding the cost to the employer the same (Hodge et al. 2009).[9] If managers are able to influence the executive compensation structure as managerial power theory contends, and managers find stock options more valuable than restricted shares – as the survey conducted by Hodge et al. (2009) shows – the

[8] Under U.S. tax regime, both option and share-based equity grants are tax-deductible at the employer level, and all realized gains from these grants are included in employment income at the employee level. I discuss tax consequences of equity grants in the U.S. in Chapter 2.

[9] This difference in perception is contradictory to economic theory, which assumes that managers discount the Black-Scholes value of stock options due to a greater degree of risk associated with stock option grants. The authors (Hodge et al. 2009) suggest that this difference in perception is due to employees' optimism towards a firm's future growth.

compensation package likely contains a greater proportion of stock options because managers perceive these to have the highest value. Therefore, I hypothesize that the proportion of stock options in the executive equity compensation mix increases with managerial power.

Literature on the effect of taxes on executive compensation design is silent on the trade-offs that managers face. For example, when firms are expecting a high marginal tax rate, are managers willing to relinquish their own interest to reduce firm's effective tax rates? Prior literature (e.g., Desai and Dharmapala 2006; Dyreng et al. 2010) contends that top executives are under pressure to reduce the corporate effective tax rate. Therefore, it is likely that the negative effect of managerial power on the use of tax-deductible RSUs is mitigated when firms are expecting a high marginal tax rate. In contrast, when firms are facing a low marginal tax rate (specifically, less than 32.9%), both managers and firms should prefer employee tax-favoured options to corporate tax-deductible RSUs as shown in Inequality (2), derived based on Table B.1 (see Appendix B). Hence, I argue that the effect of managerial power on the use of employee tax-favoured stock options differs across corporate tax statuses.

1.4 Summary of the Main Findings

To test my hypotheses, I collect the executive compensation data of 143 non-financial Canadian firms included in the Toronto Stock Exchange 200 Index for the period 2005-2015. The testing sample consists of 138 non-financial firms for the period 2006-2015.[10] My sample includes both family-owned and non-family owned firms. For further testing of the hypotheses, I use a subsample of non-family owned firms for two reasons. First, the power relationship between the board and family member executives is more complicated to capture

[10] Some firms did not disclose compensation data of all top five executives prior to 2008. Firm-years without compensation data for all top five executives were dropped from my sample.

among family-run firms.[11] Second, as explained in Chapter 2, family member executives may not be eligible for 50 percent deduction of stock option exercises in computing employment income.

I use the RSU ratio, computed as the fair market value of executives' corporate tax-deductible grants divided by the sum of the fair market value of executives' corporate tax-deductible grants and the Black-Scholes value of executives' stock option grants, as a proxy for executive equity compensation structure. Controlling for firm-level cross-sectional differences, I examine the association between the RSU ratio and proxies of corporate tax incentives and managerial power using both the full testing sample and a non-family owned firm subsample. Using an OLS model, I find evidence consistent with both corporate tax planning and managerial power hypotheses. The evidence does not support that managerial power mitigates the effect of corporate tax planning on executive equity mix.

As a specification check, I estimate a fixed effects model. This firm-specific fixed effects model provides an implicit control for firm-specific omitted variables, such as investors' preference for upward potential but not downside risk and peer (e.g., U.S. firms) influence on the compensation structure, which affect the proportion of corporate tax-deductible RSUs in executive equity compensation mix. Test of the hypotheses using the fixed effects model is considerably more supportive of the hypothesis that the effect of corporate tax planning on RSU ratio weakens with increasing managerial power using observations of non-family run firms, indicating managers' self interest in maximizing their own wealth. The evidence does not support the corporate tax planning hypothesis. Additional analyses using the expected marginal tax rate as an explanatory variable also

[11] See García-Ramos and García-Olalla (2011) for a detailed discussion on corporate governance differences between family run and non-family run firms.

show that the positive relation between the corporate tax-deductible RSUs and corporate tax rate weakens among firms with weak boards of directors across all subsamples. These results imply that Canadian tax policy on executive compensation has a stronger effect on executive equity structure among firms with relatively weak corporate governance and Canadian tax policy should not be subsidizing firms with relatively weak corporate governance.

1.5 Contributions

This study contributes to the extant literature and practitioners' discussion in several ways. First, prior literature on the impact of taxes on executive compensation examines the trade-off between financial reporting and tax reporting incentives prior to mandatory stock option expensing (e.g., Yermack 1995; Klassen and Mawani 2000), firms' employee option cancellation behavior (e.g., Matsunaga et al. 1992; Mawani 2003), and the decision to grant stock options (e.g., Bird 2018). I contribute to this stream of literature by revealing the impact of future tax incentives of share-based grants at the employer level and option-based grants at the employee level on the executive equity compensation structure using ex ante corporate tax rates.

Second, this study contributes to prior research documenting the effect of managerial power on executive equity compensation design (e.g., Yermack 1995; Gerakos 2010; van Essen et al. 2012; Abernethy et al. 2015; Bird 2018). My research adds insight into the determinants of an equity compensation structure by examining the direct impact of managerial power in choosing employee-preferred stock options, indicating that managerial power is an important factor, incremental to the firm-specific economic factors as contended by the optimal contracting theory.

Third, my research also adds some insights to the debate on the effect of investor level

taxes on corporate decisions. Graham's (2003) review on taxes and corporate finance argue that the effect of investor level taxes on corporate policies is mixed. Since managers hold a considerable portion of a corporation's shares, managers are super-investors in a sense, and thus, manager level taxes are similar to investor level taxes. My research complements the studies (e.g., Amiram et al. 2017) that examine the level of corporate tax avoidance in imputation countries, where taxes at the corporate level are incorporated into the investor level as tax credits to lessen double taxation, by testing the effects of "shareholder-manager" and corporate level taxes on compensation decision in Canada, an imputation country.

Additionally, my findings have potential implications to tax policymakers, academics, and compensation consultants in Canada. The risk-focused executive compensation package, which links the executive compensation and risk outcome, is regarded as the cornerstone of current compensation practices, as advocated by the 2009 Financial Stability Forum Principles (FSF). Therefore, the compensation decision should be based on risk and outcome incentives, and not on tax incentives. Because tax regimes are slow in making changes to align with current compensation practices, policymakers, academics, and compensation consultants in Canada are concerned that tax policies encouraging employers to use one equity grant over the other may hinder firms from structuring risk-focused compensation packages (e.g., Geddes 2009). Given the scarcity of empirical evidence on the effect of taxes on shares and options mix in executive compensation, my research provides stakeholders with some empirical evidence of how tax treatment differences affect managers' equity mix, which is used to strengthen the link between executive compensation outcome and risk outcome, the main focus under FSF Principles (Geddes 2009).

1.6 Outline of the Study

This dissertation consists of seven chapters. The introduction chapter (Chapter 1) provides a general motivation for the study, discusses the reasons for choosing the tax policies and managerial power effect on the executive equity compensation, outlines the main results of the studies comprising the dissertation and offers the contributions of this study. Chapter 2 provides a summary of the Canadian tax rules on various types of executive compensation components including cash compensation. Chapter 3 provides a comprehensive literature review, including both the effects of tax implications and managerial power on the general executive compensation level and form. This literature review focuses on the tax accounting research before the introduction of the new financial reporting rules on stock option compensation expense (circa 2005). Studies of managerial power on a general level of executive compensation are addressed in a separate section within Chapter 3. Chapter 4 develops the hypotheses for this dissertation study. Chapter 5 describes the research design, which includes the development of corporate tax planning and managerial power proxies. Chapter 6 explains the sample selection, discusses the findings, and provides additional tests. Chapter 7 concludes.

Chapter 2

Tax Rules on Executive Compensation

2.1 Introduction

In this chapter, I discuss tax consequences of each component of an executive compensation package at both the employer and employee levels under current Canadian Tax regime. An executive compensation package generally consists of cash (salary, annual incentives and cash bonus), option-based grants (e.g., at-the-money stock options, stock options with tandem stock appreciation rights, standalone stock appreciation rights), share-based grants (e.g., restricted shares, performance shares, RSUs, PSUs), post-retirement plans (e.g., deferred share units or "DSUs", pensions), and perquisites (Murphy 2012; Bird 2018). These compensation components are subject to different tax rules.[12] In the first part of this chapter (Section 2.2), I describe the tax consequences of a typical cash compensation package and general deferred tax grants. The second part of the chapter (Section 2.3) describes the tax consequences of option-based compensation. The third part of the chapter (Section 2.4) details the tax consequences of share-based compensation. The fourth and final part of the chapter summarizes and discusses the differences in tax treatment between the option and share-based components emphasized in prior sections. The chapter concludes by describing why Canadian tax setting provides a unique opportunity to address the effect of taxes at the employer and employee levels on corporate compensation policies.

2.2 Tax consequences of cash and deferred tax compensation

Typically, half of an executive compensation package consists of cash salary and

[12] This dissertation does not cover DSUs, pensions and perquisites, which are trivial in proportion compared to other components. Thus, this chapter does not discuss the tax consequences of these compensation instruments.

annual cash bonuses ("cash compensation"). Cash compensation becomes taxable employment income at the payment date and a corresponding amount is deductible from the corporate taxable income, subject to applicable anti-avoidance rules. [13]

Meanwhile, the remaining half of the typical executive compensation is comprised of deferred tax instruments, such as share-based and option-based grants. These deferred tax instruments become taxable when employees exercise option-based grants, restrictions on share-based instruments lapse, or certain performance criteria are met. In the following two sections, I discuss the tax consequences of option-based and share-based compensation.

2.3 Tax consequences of option-based equity compensation grants

The majority of option-based grants include at-the-money stock options, standalone stock appreciation rights ("SARs"), and stock options with tandem stock appreciation rights ("TSARs").

Employee stock options (At-the-money or out-of-the-money stock options). An executive stock option is a contract, which gives employees the right, not the obligation, to purchase shares of their employer at a predetermined price, termed the exercise price, prior to the stock options' expiration date, which is typically about 10 years from the grant date (Hall and Murphy 2002). The employees must hold the employee stock options for a pre-determined length of time before they are permitted to exercise the options. This required holding period, the vesting period, is usually 3-5 years (Tedds 2015). Any compensation paid in the form of the stock options becomes taxable when the employees exercise the

[13] Paragraph 6(1)(a) requires employment-related cash compensation to be included in employment income at the payment date, and subsection 37(9) allows the employer a tax deduction of the corresponding amount subject to some anti-avoidance rules (see Section 245 for details.). In Canada, such rules have been in place since 1986 (Lee 2010). In the U.S., firms are subject to a maximum of $1 million tax deduction for the non performance-based compensation (i.e., salary) of each of the top four executives and the CEO (Hall and Liebman 2000).

options and the amount taxed is computed as the difference between the fair market value of the shares at the exercise date and the exercise price pursuant to paragraph 7(1)(a).[14]

At the employee level, the taxable employment income from the option-related grant is only 50% of the difference between the fair market value of the shares at the exercise date and the exercise price, as provided under paragraph 110(1)(d) subject to some necessary conditions. The conditions to be met are: (1) the exercise price must not be lower than the fair market value of the share at the grant date; (2) the employee must have at an arm's length relationship[15] with the issuer of the shares; and (3) the shares must be prescribed shares. At the employer level, under current rules in paragraph 7(3)(b) of the *Income Tax Act* of Canada (*The Act*), at-the-money or out-of-the-money option grants are not tax deductible at any time. Hence, Canadian employee stock options are considered employee tax-favoured compensation instruments (Stikeman Elliot 2014; Geddes 2010). The tax treatment of stock options in Canada is unique and considered one of the most generous tax treatments at the employee level. This type of stock option, known as at-the-money stock option, is a prevalent form of equity grants among Canadian firms. Based on the sample of firms included in this study, data suggest that employee tax-favoured stock options account for 20.5% of the total compensation in Canada.

Stock appreciation rights (SARs) and tandem stock appreciation rights (Tandem SARs or TSARs). Stock appreciation rights (SARs) are similar in incentive structure to stock

[14] *Incentive stock options in the U.S.* These options are subject to special tax treatment. Employees receive capital gain tax treatment for the gain on the exercise of stock options. However, these options are no longer popular in the U.S. Since nonqualified stock options account for 95% of employee stock options in the U.S. (Hall and Liebman 2000; Frydman and Molly 2011), this study assumes that all stock options granted in the U.S. during the proposed sample period are nonqualified stock options. The detail of their tax treatment will not be explained in this study.

[15] *The Act* defines an arm's length transaction as follows. An employee and the corporation may not be considered at an arm's length if he/she owns more than 10% of the shares of any class of the corporation through his/her related persons, such as family members. Therefore, I also conduct analyses using non-family run firms where transactions between executives and corporations are likely to be at an arm's length.

options. The employee gets a payment in cash or shares equivalent to the stock price appreciation over a predetermined period. SARs are generally used to limit the dilution from the issuance of the shares that occurs with the exercise of employee stock options. In lieu of receiving shares, a tandem SAR allows an employee to elect cash payment equal to the spread between the exercise price of the option and the fair market value (Geddes 2010). In Canada, for stand-alone SAR plans, employers receive a tax deduction for cash or repurchased share payouts whereas the SAR grant is 100% taxable at the employee level. The employees may receive a one-half deduction only if the employer agrees to forgo the corporate tax deduction. [16] SAR plans are not frequently used in Canada and account for only 1% of the total compensation for my sample firms. Thus, my analyses do not include SARs and TSARs.

2.4 Tax consequences of share-based equity compensation

The term share-based equity compensation in my dissertation refers to restricted shares, performance shares, RSUs, and PSUs, which are used prevalently in compensation packages. Tax consequences of share-based compensation can be found in the paragraph 7 of *the Act.*

Restricted stocks. The employee who receives a restricted share cannot resell the share for a specified period of time. Employees do not typically pay for restricted stocks. Thus, restricted shares are in effect stock options with zero exercise price (Lambert and Larcker 2004) and are subject to a vesting schedule. In the case that an employee leaves the employment prior to vesting, the employee forfeits their restricted stock. If an employee's shares fail to become vested, employers may refund any amount employees have paid to their employers for the restricted stocks, subject to the conditions stipulated in the compensation

[16] In U.S., tax treatment on SARs are the same as that of stock options or RSUs, that is, the employers get a tax deduction at vesting, and the employees pay income taxes on 100% of the SAR grants.

contracts. In Canada, at the employee level, a restricted share grant immediately becomes taxable at the grant date, regardless of the resale restriction. At the same time, employers may not claim a tax deduction on restricted share grants at any time. Non-deferrable tax on potentially forfeitable assets makes restricted share plans unpopular in Canada (Geddes 2010) and practitioners and employers perceive this type of equity grant as costly to both the employer and employee. In my sample data, restricted shares account for only 2% of the total executive compensation (see Figure 1) and as shown Appendix B, Table B.2, the cost of using restricted shares is higher than all other equity instruments (see Panel C vs. Panel A & Panel B) when the expected marginal tax rates at vesting year range from 0% to 36%.

Restricted Share Units (RSUs) with payout in cash or repurchased shares. Restricted share units (RSUs) are similar in nature to restricted shares. One significant difference is that actual shares are not issued at the grant date under a typical RSU plan. Instead, one unit of RSU delivers a share or cash equivalent of a share to the employee at vesting, at which point in time the RSU grant becomes taxable. The amount taxable to the employee is the market value of the shares at vesting, less any amount the employee paid for the shares. A typical RSU plan does not require employees to pay for the shares; therefore, RSUs are technically options with zero exercise price. Since the exercise price is lower than the fair market value of the share at the grant date, RSU grants are not eligible for the 50% deduction stipulated in paragraph 110(1)(d). Instead, the employee pays taxes on 100% of the RSU grant and the employer receives a tax deduction for RSU grants, which are delivered in the form of cash or shares repurchased in the open market to the employees at vesting. Post the option expensing rule adopted in 2004, the use of tax-deductible RSU grants has increased in Canada. In my

sample for the period 2005-2015, data suggest that tax-deductible RSUs represent 25% of the total executive compensation (Figure 1).

2.5 Difference in Tax Treatments Between Share-based and Option-based Compensation

In summary, Canadian firms receive an equivalent tax deduction for the RSUs and PSUs with payout in cash or repurchased shares, and standalone SARs with a cash payout. In contrast, employers do not receive tax deductions for grants of stock options, restricted shares, RSUs, or PSUs that are fulfilled with treasury or newly issued shares. At the employee level, at-the-money stock options are the most tax-favoured among all equity compensation instruments because only half of the gain from a stock option exercise is taxable at the exercise date (known as "one-half deduction").[17] The employer's and employee's combined tax cost of equity compensation of restricted shares is the highest in Canada because employers are not eligible for a tax deduction at any time, and employees are required to pay tax on the RSUs at the grant date without any deferral advantage of equity grants.

In contrast, the U.S. tax rules are fairly neutral on equity grants. All equity-based compensation grants are tax-deductible at the employer level whereas employees are required to report all equity grants as employment income at the vesting date (exercise date) for share-based grants (option-based grants). Section 83 of the U.S. Tax Code stipulates the tax treatment of restricted stock. At the employee level, restricted stock grants are taxed at vesting by default. By making a Section 83(b) election, employees can elect to pay tax on restricted share-based employment income at the grant date. The employer gets tax deduction equivalent to employment income, on the date the employee chooses to declare

[17] The1984 federal budget introduced this provision, paragraph 110 (1) (d) of *the Act.*

their income, i.e., either at vesting or at grant date. Employees pay taxes on restricted share grants at the grant date if they choose a Section 83(b) election. The Section 83(b) election is not available for equity-based compensation paid in the form of RSUs. Employers never get a tax deduction for granting incentive stock options in the U.S. (Graham 2008), which is very similar to the tax treatment of at-the-money regular stock options at the employer level in Canada. Since nonqualified stock options account for 95% of employee stock options in the U.S. (Hall and Liebman 2000; Frydman and Molly 2011), this study assumes that all stock options granted in the U.S. during the proposed sample period are nonqualified stock options. As a result, the tax costs are similar across all equity instruments as shown in Table A.3 of Appendix A.

Based on tax consequences at the employer and employee level in Canada, as previously discussed, I categorize equity compensation into three distinct groups as shown in Figure 1. The first group consists of instruments that are tax deductible at the employer level (25 percent of total compensation) and are ineligible for one-half deduction (or 100% taxable) at the employee level. Since the majority of RSU grants are corporate tax-deductible I use the terms "tax-deductible RSUs" and "RSU grants" interchangeably. Furthermore, I use the term RSU grants to capture RSUs and PSUs settled with cash or repurchased shares at the vesting date and cash settled SARs.

The second group consists of instruments that are non tax-deductible at the employer level (20.5 percent of total compensation), and are eligible for one-half deduction at the employee level, i.e., at-the-money employee stock options and SARs that are fulfilled with shares (hereinafter called "employee tax-favoured options" or "option grants").

The third group consists of employment-related equity instruments that are neither tax deductible at the employer level nor eligible for "one-half deduction" at the employee level. Specifically, these instruments are restricted shares, RSUs and PSUs that are fulfilled with newly issued or treasury shares are not tax-deductible**.** This group accounts for only approximately 2 percent of total compensation in my sample and is not generally consistent with an efficient tax planning hypothesis; therefore, I will exclude this type of equity compensation in my tests.

2.6 Conclusions

In this chapter, I discuss the differences in tax treatments among equity compensation instruments. Based on the tax consequences at the employer and employee levels, I categorize the equity instruments into three distinct groups: corporate tax deductible RSUs, employee tax-favoured stock options, and non corporate tax-deductible RSUs. I also provide the composition of these instruments as a percentage of total compensation. Furthermore, in Appendix A, I analyze the estimated tax cost to the employer of each equity grant by applying current Canadian tax rules. It shows that the difference in the costs of equity grants changes with the expected corporate marginal tax rate under current Canadian tax rules on equity-based compensation, but not under the U.S. tax rules. This suggests that the Canadian tax institutional setting is better suited relative to the U.S. setting to test the effect of taxes on the structure of executive equity compensation.

Chapter 3

Literature Review

3.1 Introduction

In this chapter, I introduce extant research that is pertinent to my thesis. Two main themes are important in my work: corporate tax planning and managerial power. The existing literature generally appeals to two theories influencing the design and level of executive compensation: optimal contracting theory and managerial power theory. Optimal contracting theory, a more traditional view, contends that equity-based compensation keeps an executive's incentive level within an appropriate firm-specific range determined by shareholders' value maximization (Core and Guay 1999; Jensen and Meckling 1976; Murphy 2002). Managerial power theory contends that managers extract rents by influencing the compensation policies that determine the level and form of executive compensation, and that optimal contracting theory alone is inadequate to explain the determinants of executive compensation (Bebchuk et al. 2002; Bebchuk and Fried 2003; 2005). The remainder of this chapter is organized as follows. Section 3.2 reviews the literature on the determinants of executive compensation literature in tax accounting, financial accounting, and finance based on optimal contracting theory. Section 3.3 discusses the literature that examines the effect of managerial power on executive compensation. Section 3.4 concludes this chapter by providing the contributions of this study to the extant literature.

3.2 Studies Based on Optimal Contracting Theory

3.2.1 Archival Studies in Tax Accounting Research

The Scholes-Wolfson's framework, which is a variation of optimal contracting theory, suggests that a firm's behavior (determinants of compensation structure) can be explained by considering all parties (e.g., both the employer and the employee), all taxes, and all costs (e.g., financial reporting and agency costs) (Scholes et al. 2015). Under this framework, Shackelford and Shevlin (2001) contend that a firm determines the mix of various compensation elements based on tax and financial reporting incentives at the employer and employee level. Consistent with their conjecture, Mawani (2003)[18] and Klassen and Mawani (2000)[19] show that tax and financial reporting incentives influence stock option cancellation and stock option grants among Canadian firms. Since stock option grants in Canada are not tax-deductible at any time, firms must forgo tax deductions in order to achieve the financial reporting benefits of not expensing option grants prior to 2004, which indicates that the unique Canadian institutional setting is ideally suited to observe a firm's choice based on such trade-offs between the tax and financial reporting incentives.

Primarily using U.S. data, another stream of tax accounting literature examines the effect of tax policy changes on executive compensation. According to tax theory, tax considerations, such as differences in tax deductibility at the employer and employee level and the length of tax deferral of compensation elements, affect the structure of executive compensation (Frydman and Molly 2011; Hall and Liebman 2000; Scholes et al. 2015). However, some studies find no such relation between tax rate changes and compensation

[18] Matsunaga, Shevlin, and Shores (1992) investigate the disqualifying of employee stock options using U.S. data, which is similar to the study of Mawani (2003).
[19] Yermack (1995) and Matsunaga (1995) examine a similar objective using U.S. firms' data and U.S. tax policies.

design. For instance, Hall and Liebman (2000) examine the effect of U.S. tax reforms in the 1980s on the structure of executive compensation and find no evidence that tax changes influence stock option grants. In contrast, using the Canadian 2010 tax reform as an exogenous shock, Bird (2018) explores the effect of taxes on executive compensation by examining the effect of changes on the aggressive practice of stock option tax deductions on compensation structure in Canada. Prior to 2010, some firms took a tax deduction and executives took a "one-half deduction" on tandem stock options. However, such "double-dipping" was never the intended objective of the tax policy and most firms did not engage in such activity.[20] In 2010, the tax policy explicitly prohibited this double-dipping. My study complements Bird (2018) by examining the combined effect of both stock options' "one-half deduction" and the corporate tax deductibility of RSUs on equity compensation structure and how this tax planning is influenced by executive power.

3.2.2 Archival Studies in Financial Accounting Research

Research regarding the use of stock options in executive compensation tends to focus on the effect of financial reporting incentives and changes in shareholders' taxes on firms' equity compensation structure using U.S. sample firms. For instance, Carter et al. (2007) find that the predominant use of stock option grants prior to the passage of SFAS 123R (FASB 2004) can be explained by financial reporting incentives. Conversely, Aboody and Kasznik (2008) suggest that the observed growth in restricted shares is followed by the 2003 dividend tax rate reduction—an exogenous shock. Because the value of stock options decreases with dividend payouts, managers paid with stock options should prefer share repurchases to dividends. Since restricted shares are dividend protected, managers are more

[20] Only 28 firms out of TSX 600 firms used TSARs during the sample period of Bird's (2018) study.

likely to authorize the payout of dividends when they are paid with restricted shares (Irving et al. 2011). Therefore, restricted shares help align shareholders' preference for dividends with managers' preference post-2003.[21] On a related issue, Babenko and Tserlukevich (2009) show that firms prefer stock option grants to fixed cash compensation because stock options provide higher tax savings for firms in the U.S.

3.2.3 Analytical Studies on Determinants of Equity Compensation Structure

Using theoretical models, researchers investigate the relative merits of share-based and option-based compensation (e.g., Feltham and Wu 2001; Hall and Murphy 2002; Lambert and Larcker 2004; Oyer and Schaefer 2005; Widdicks and Zhao 2014). Based on different assumptions incorporated into the agency models, inferences on the optimal form of equity-based compensation are mixed. For instance, Oyer and Schaefer (2005) and Lambert and Larcker (2004) find that options are generally more efficient in incentive alignment than restricted shares because the perceived value of options is higher to optimistic employees than that of restricted shares. Meanwhile, Kadan and Swinkels (2008) show that bankruptcy risk is positively associated with share-based compensation and options are better suited for firms where such risk is not a primary concern. In contrast, Hall and Murphy (2002) find that restricted stocks work more efficiently than stock options when the equity-based compensation is used to substitute cash compensation, and stock options generally dominate restricted stocks when incentives are granted on top of existing pay packages. Incorporating tax considerations, Widdicks and Zhao (2014) show that incentive stock options are less

[21] If I use a U.S. control sample group in future research, the U.S. control sample should also be in the 2005−2015 period, which ensures that the 2003 reduction in dividend tax rate in the U.S. does not the affect the firm compensation policies.

efficient than restricted shares in U.S. regardless of corporate tax rates.[22] While most models predict that firms should prefer one form of equity grants to the other, empirical evidence and the preliminary data in this study suggest that firms use a mix of option-based and share-based grants in current compensation practice (Bird 2018; Carter et al. 2007).

Some theoretical papers also examine the determinants of the share-based and option-based compensation mix; however, they commonly assume that firms can theoretically use both shares and options in their compensation mix despite few firms doing so prior to 2000. For example, Feltham and Wu (2001) find that share-based compensation is optimal when the manager's effort does not increase the firm's operating risk, and option-based compensation is optimal when the manager's effort changes both expected stock price and the firm's operating risk. Accordingly, the authors contend that mature manufacturing or retail firms and regulated firms are more likely to use share-based grants whereas young, high growth firms are more likely to use option-based grants. Consistently, Boyle et al. (2011) find that a firm's volatility influences the mix of equity compensation. Specifically, they find that firms with higher stock volatility use a greater proportion of stock options with the authors attribute to the value of stock options increasing with volatility.

Since there is little difference in tax treatments among equity compensation components in the U.S. setting (see Chapter 2), or variation in the U.S. corporate or personal tax rate over the past 15 years, the above-mentioned literature on executive compensation mix neglects the impact of taxes. As shown in Figure 3, U.S. corporate tax rates have not changed (mainly at 40%) during the sample period (2005-2015). In contrast, the combined

[22] Taxation of incentive stock options is similar to that of at-the-money employee tax-favoured options in Canada. Incentive stock options are not prevalent in the U.S. (Hall and Liebman 2000; Frydman and Molly 2011).

provincial and federal corporate tax rate in Ontario, Canada gradually declined from 36.12% to 26.5% during the sample period.

[Figure 3 about here.]

3.3 Studies Based on Managerial Power Theory

Another approach for understanding executive compensation focuses on the influence of managerial power. While not as prevalent as the research on optimal contracting theory (Bebchuk et al. 2002), academic research on managerial power contends that managerial power shapes the level and composition of executive compensation packages (e.g., Bebchuk and Fried 2003; 2004). Thus, compensation packages may not help align the agent-principal interests, as maintained by optimal contracting theory. Managerial hegemony theory, a variation of managerial power theory, asserts that directors are not true representatives of the shareholders as assumed by agency theory (Hermanson et al. 2012). This theory suggests that outside directors often join the board at the recommendation of management and rely on management for company and industry information. Since the boards and executives are not entirely independent, Hermanson et al. (2012) argue that to some degree directors are unlikely to challenge management's compensation. Thus, Bebchuk et al. (2002) suggest that board structure and ownership structure affect managerial power. Consistent with this conjecture, prior studies (e.g., Abernethy et al. 2015, Gerakos 2010; van Essen et al. 2012) use board structures, such as board size and percentage of insiders and ownership structure to determine how much influence management has on the board.

Consistent with the managerial power theory, prior literature finds evidence that managers use compensation packages to extract rent from shareholders. For example, managers' equity compensation via tandem stock option grants decreases post-2010

following tax policy change in Canada, implying that managers were over compensated with tandem stock option grants prior to the 2010 tax policy change (Bird 2018). Similarly, there is an association between stock option grants and favourable stock price movement (Yermack 1995), indicating that managers influence such "timely" option grants in their favour. Abernethy et al. (2015) find that the CEOs have power to influence the choice of performance measures used to access their performance, which is attached to performance-vested stock option plans, suggesting that managers can choose a performance target lower than the market performance. Conversely, Gerakos (2010) does not find evidence supporting a positive association between CEO power and the level of pensions.[23] Therefore, accounting research provides mixed evidence on whether managerial power affects compensation design that is intended to align the agent-principal interests. My study adds to this line of research by examining the direct effect of managerial power on corporate compensation policies in a unique Canadian tax setting where managers and firms face differing tax incentives as previously discussed.

3.4 Conclusions

In summary, this chapter reviews research that examines the various explanations for observed executive compensation design. It also distinguishes two competing themes that attempt to explain executive compensation. Almost all studies in this review, irrespective of how they explain the observed compensation design, have yet to comprehensively consider whether (and in which direction) managers' self-interest affects the compensation design in the presence of corporate and executive tax incentives. I extend this line of research by considering the effect of both managerial power and tax planning based on Scholes-

[23] See Frydman and Jenter (2010); Murphy (2012), van Essen et al. (2012) for a detailed review describing the influence of managerial power on executive compensation, mainly in terms of managerial rent extraction.

Wolfson's framework on executive equity compensation structure in a Canadian setting where tax incentives are distinct among different types of equity compensation. Additionally, I further examine whether managers can successfully demand their preferred equity component when managers' and firms' preferences (and/or tax incentives) differ.

Chapter 4

Hypotheses Development

4.1 Introduction

In this chapter, I develop testable hypotheses appealing to two competing themes reviewed in the previous chapter. The chapter begins by describing how corporate tax planning affects the structure of executive equity compensation in Section 4.2. Section 4.3 of this chapter relates managerial power to the equity compensation structure to the extent that managers' preference for stock options is high. Section 4.4 expands on how managers' preference for one equity form weakens the effect of corporate tax planning on executive equity compensation structure. Section 4.5 concludes with a summary of the chapter.

4.2 Corporate tax planning hypothesis

A more traditional perspective of prior literature asserts that firms increase shareholders' value by engaging in corporate tax planning. By reducing corporate taxes payable, corporations reduce resources transferred to the government, thereby maximizing after-tax cash flows and profits, and increasing the residual claims for the shareholders (Scholes et al. 2015). Empirical evidence also supports that U.S. firms use executive stock options and restricted share grants to gain future tax benefits when executives exercise their option grants (e.g., Babenko and Tserlukevich 2009) or when restricted share grants vest (Blouin and Carter 2010). Based on this traditional value-enhancing view of corporate tax planning,[24] I argue that firms optimize tax payable by compensating employees with tax-

[24] This traditional view has been challenged by findings in recent studies. For example, Desai et al. (2007) argue that corporate tax planning decreases firm value because some corporate tax planning provides venues for rent extraction by the insiders and decreases shareholders' wealth. Consistent with the theory advanced by Desai et al. (2007), Desai and Dharmapala (2009) do not find significant relation between tax avoidance and

deductible cash or equity grants when firms face higher marginal tax rates, holding the expected value of compensation to the employees the same.[25]

A typical share-based plan in Canada, such as a tax deductible RSU grant, becomes tax deductible to the employer when the grant vests; however, stock options are not tax deductible by the corporation at any time. Because these two equity instruments are subject to substantially different tax treatment at the employer level, Canadian public firms have the opportunity to reduce future tax payable at the vesting year by using corporate tax-deductible RSU grants rather than non tax-deductible employee tax-favoured stock options. Therefore, I posit that when a Canadian firm *expects* a high marginal tax rate *in the vesting year*, its incentive to use tax-deductible RSU grants increases relative to a firm that expects a low marginal tax rate, which results in a greater ratio of RSU grants to total equity compensation and leads to a change in the executive equity compensation structure.

In Appendix A, I provide a tax incentive model demonstrating the change in after-tax cost of tax-deductible RSUs with varying expected corporate marginal tax rates. As shown in Table B.2 of Appendix B, the cost of tax-deductible RSU grants in Canada decreases with increasing expected corporate marginal tax rates, whereas the cost of employee tax-favoured stock options does not change with expected corporate marginal tax rates. Therefore, to reduce the cost of executive equity compensation (and increase after-tax profit and firm value), employers can choose to grant a higher level of tax-deductible RSUs relative to non tax-deductible stock options (employee tax-favoured options) when the value of the RSUs'

---

firm value, except for well-governed firms, indicating that tax planning does not always increase firm value as hypothesized in prior literature. This study does not cover the consequence of corporate tax planning, that is, firm value.

[25] Prior literature (e.g., Matsunaga et al. 1992; Klassen and Mawani 2000; Mawani 2003) examines the use of tax deductible cash compensation when firms face higher tax status.

tax deduction is higher at the vesting.[26] I contend that expected corporate marginal tax rates in the vesting year conceptually affects the executive equity compensation structure as a result of the differences in after-tax cost of equity grants to the employer in Canada. Using the ratio of corporate tax-deductible RSUs to the sum of corporate tax-deductible and non corporate tax-deductible employee tax-favoured stock option grants (hereinafter "the RSU ratio") as an operational variable to represent the executive equity compensation structure, I hypothesize as follows:

H1: The RSU ratio is positively related to a Canadian corporation's expected marginal tax rate.

While I predict that firms engage in a tax optimization strategy when structuring executive compensation packages, there are reasons why firms may not do so. First, tax considerations may not be a primary determinant of executive equity compensation structure. Agency theory suggests that shareholders expect the board to use a carefully considered executive compensation package to ensure that agents do not engage in opportunistic behavior (Jensen and Meckling 1976). From an agency theory perspective, a firm's compensation committee considers compensation risks and adverse incentives and provides the agents a risk-managed equity compensation mix (Hermanson et al. 2012). Second, the Scholes-Wolfson framework suggests that efficient tax planning accounts for all parties, all taxes and all costs (Scholes and Wolfson 1992; Scholes et al. 2015). If the cost of incentive misalignment, such as a deviation from firm-specific optimal incentive level (Core and Guay 1999), exceeds the joint tax benefits gained in the vesting year, employers may not use equity compensation in corporate tax planning. Third, employers often use compensation packages

[26] I assume at this point that both RSUs and stock options are equally efficient in aligning shareholders' and manager's interest and have no variation in indirect costs, such as monitoring costs, except the after-tax direct costs to the employer.

that are similar to their peers to attract executive talent, which may dominate tax considerations in structuring compensation packages. A firm's compensation practice may, therefore, be isomorphic among industry peers. Accordingly, I may not observe an association between expected marginal tax rates and the executive equity compensation design.

4.3 Managerial Power Hypothesis

I next address whether managerial power is related to executive equity design. While agency theory suggests that executive compensation packages are structured to align managers' and shareholders' interests (Fama 1980; Jensen and Meckling 1976; van Essen et al. 2012), managerial power theory suggests that managers are able to influence their own compensation package; therefore, compensation packages may not be able to alleviate the agency problem (Bebchuk and Fried 2005; Bebchuk et al. 2002). Managerial hegemony theory complements managerial theory by suggesting that boards are, on average, closer to top executives than to the shareholders and reliant on management for company and industry information (Hermanson et al. 2012). As a result, boards are more likely to side with managers (Hermanson et al. 2012; Bebchuk et al. 2002) and may not challenge managers' demand for excessive compensation or the form of compensation (Hermanson et al. 2012) that favours managers' after-tax payout.

In a Canadian tax setting, tax consequences of stock options at the employee level may be a strong explanation for managers' preference for stock options over restricted shares or restricted share units. Specifically, the favourable tax treatment of stock options at the employee level ("one-half deduction") is one very large attraction of stock option grants in Canada and some news outlet even called this generous tax treatment at the employee level

as a "stock option tax loophole" that favours highly paid executives (e.g., Scotti 2017). Therefore, I argue that "one-half deduction" will be attractive to tax savvy highly compensated executives if executives do not expect that the firm will grant substantially higher pre-tax value of RSU grants to compensate for the executives' tax hit. Such expectation violates the maintained assumption in Scholes-Wolfson framework and explicit in Table B.2 (that generates H1). If one holds the pre-tax $1 value of options or shares the same, I expect managers would prefer stock options. In addition to the one-half deduction of stock options, the tax deferral length of stock options is more flexible than RSUs. Most RSUs vest in three years (Geddes 2010; Lee 2010; Colquhoun et al. 2012), whereas a typical stock option expires in 10 years (Hall and Murphy 2002). By choosing stock option exercise date prudently, managers may be able to use stock options for their personal tax planning and defer their employment-related income taxes longer.

Employee optimism may also be one of the explanations for managers' preference for stock options. A survey by Hodge et al. (2009) suggests that managers do not understand how to value stock-based compensation and managers' perceived values of stock options and restricted shares are vastly different from firms' valuation. Using participants who are most likely to join mid-level management ranks, Hodge et al. (2009) find that managers are more likely to value stock options higher than the Black-Scholes value, a finding echoed by Devers et al. (2007), and restricted shares lower than its fair market value. These survey findings imply that managers prefer $1 fair value stock option compensation to $1 fair value restricted shares in the U.S. setting where there is essentially no taxation difference between the two. Therefore, on the expected value of the equity grants, there is a deadweight loss that arises between the value perceived by the recipient and the cost to the grantor (Hall and Murphy

2002). Differences in perceived value may arise due to managers' optimism of their employer's future performance or managers' preference for a potentially large gain from stock option exercises despite a small probability of achieving such a gain (Spalt 2013; Sun and Widdicks 2016). Combining employee optimism, a highly tax favourable nature of stock options at the employee level, and a longer length of tax deferral, I argue that employees may likely favour stock option grants to corporate tax-deductible RSUs.

If managers can influence the board as the managerial hegemony theory contends, the executive equity compensation may consist of a greater portion of stock options that are perceived as more valuable and tax favourable to employees, leading to a change in executive compensation structure when the board is weak. Assuming executive compensation equity grants consist of corporate tax-deductible RSUs and employee tax-favoured stock options only, I expect a negative association between managerial power and the RSU ratio in Canada.

I posit the second hypothesis as follows:

H2: The RSU ratio is negatively related to managerial power among Canadian firms.

While executives may have the power to influence their compensation package, there are several reasons why they may not demand more stock options in their equity compensation. First, stock option grants are associated with "bad reputation" because the public and the government allege that stock option grants lead to excessive risk-taking, and managers engage in stock option backdating to extract rent (Chen et al. 2006; Geddes 2009; Hall and Murphy 2002). Fama (1980) argues that CEOs know that labour market discipline might impose costs on managers that are aggressive in extracting rents by downgrading their human capital value. Second, the economic theory argues that managers discount the Black-Scholes value of the stock options, which is the cost to the firm, because of suboptimal

diversification of managers' wealth and risk-averse agents (Hodge et al. 2009). Therefore, risk-averse managers discount the Black-Scholes value of stock options due to a greater degree of risk associated with stock option grants as prior research suggests. Therefore, employees may potentially prefer less-risky corporate tax-deductible restricted share units. For these reasons, I may not observe the relation proposed in hypothesis two.

4.4 The effect of managerial power on executive equity mix across corporate tax status

This section addresses whether managers have power to negotiate with firms and demand a higher level of employee tax-favoured stock options, despite potential corporate tax disincentives, thereby affecting their executive equity compensation structure. When a firm expects a high marginal tax rate, the Scholes-Wolfson framework of multilateral tax planning suggests that the tax deductible RSUs become more tax efficient and employers can reduce the after-tax cost of equity compensation by granting a greater level of tax deductible RSUs to its executives.[27] When managerial power is sufficiently high, managers may be able to capture some or all of the firm's tax savings by receiving extra equity compensation. This extra equity compensation may be in the form of tax deductible RSUs or employee tax-favoured options. If managers prefer to capture the tax savings in the form of employee tax-favoured stock options because, as discussed in Section 4.3, managers value $1 fair value of stock options more than $1 fair value of restricted shares, I expect a negative interaction effect of managerial power on the relation between the RSU ratio and corporate tax status (expected marginal tax rates). My third hypothesis is therefore as follows:

[27] The level of tax deductible RSUs may not be 100% of total equity grant because of firm's tendency to use stock options to motivate employees to accept risky projects with positive net present value. Empirical evidence implies that stock options are considered better suited to motivate risk-averse managers by providing incentives to take more risk on behalf of risk-neutral shareholders (e.g., Rajgopal and Shevlin 2002).

H3: The RSU ratio and a Canadian corporation's expected marginal tax rate is less positive in the presence of increasing managerial power.

While theory suggests that the relation between RSUs and corporate marginal tax rates weakens with increasing managerial power, there are reasons why I may not observe this. Prior literature suggests the importance of achieving *optimal* corporate tax benefits and prior studies (e.g., Desai and Dharmapala 2006; Dyreng et al. 2010) posit that high-level executives get pressure from shareholders to reduce the firm's effective tax rate. Therefore, when the corporate tax rates are expected to be high, managers may forego their preferred stock option grants in favour of tax-deductible RSUs to increase future tax benefits and reduce effective tax rate. If so, the incremental effect of managerial power on the RSU ratio may be undetectable in my data when firms are expecting to have a particularly high corporate tax rate.

Conversely, under the Scholes-Wolfson framework of multilateral tax planning, the employer and employee jointly optimize the tax benefits at the expense of the tax authority (e.g., Matsunaga et al. 1992; Mawani 2003). When the corporate tax incentive (i.e., marginal tax rate) is expected to be sufficiently low, both parties are better off by granting more employee tax-favoured options than tax-deductible RSUs, as shown in Table B.2 of Appendix B. Taken together, managerial power may appear to dominate corporate tax incentives in determining the equity mix when firms are facing low corporate tax rates.

4.5 Conclusions

In this chapter, I posit three hypotheses to be tested in subsequent empirical analyses. I present my first hypothesis in support of a relation between corporate tax incentives and executive equity compensation structure. I present the second hypothesis in support of a

relation between managerial power and executive equity compensation structure. I present my third and final hypothesis in support of a mitigating effect of managerial power on the relation between corporate tax incentives and executive equity compensation structure.

Chapter 5

Research Design

5.1 Introduction

In this chapter, I describe all aspects related to the operationalization of dependent and independent variables. In Section 5.2, I outline how I construct a proxy for executive equity compensation structure, the primary dependent variable. This proxy is consistent with how other studies measure the proxy for an overall executive compensation structure, such as the ratio of cash to total compensation. In Section 5.3, I describe how I operationalize expected corporate tax incentives, a key independent variable. Specifically, I report two proxies that I use for corporate tax planning, how I simulate ex ante corporate taxable income and how ex ante corporate marginal tax rates are computed. I also include the detailed algorithm I use to simulate the proxies. Section 5.4 describes how I operationalize the proxy for managerial power, the other key independent variable. In Section 5.5, I provide the empirical model that is used to test Hypotheses 1 through 3. Empirically, I test the model using OLS method, bootstrap, as well as firm fixed effects in the next chapter. In Section 5.6, I describe rationales for control variables that prior literature finds are associated with the dependent variable. Overall, this chapter includes seven sections including this introduction and a conclusion.

5.2 Measurement of the dependent variable: RSU ratio

I construct a proxy for the executive equity compensation mix (hereafter "the RSU ratio"), for testing H1, H2, and H3 as follows:

$$\boldsymbol{RSU\_ratio_{i,j,t}} = \frac{\boldsymbol{RSU\ grant_{i,j,t}}}{\boldsymbol{RSU\ grant_{i,j,t} + Option\ grant_{i,j,t}}}$$

The numerator of the RSU ratio is $\boldsymbol{RSU\ grant_{i,j,t}}$, which is the grant date fair value of RSUs and PSUs settled in cash or repurchased shares granted (i.e., the total grant date value of tax-deductible RSUs) to executive i of firm j at grant year t. The denominator of the RSU ratio is the sum of $\boldsymbol{RSU\ grant_{i,j,t}}$ and $\boldsymbol{Option\ grant_{i,j,t}}$, which is the Black-Scholes value of employee tax-favoured stock options granted to executive i of firm j at grant year t.

I hand-collected the grant date fair value of RSU grants and the Black-Scholes value of employee stock options granted to each executive from the summary table of annual executive compensation, which is available in the management information circulars. I read the stock-based compensation plan section of the management information circulars (and annual reports) to identify whether the RSU grants are satisfied by cash, repurchased shares, newly issued shares, or treasury shares. If the RSU grants are described as to be satisfied by cash or repurchased shares at a vesting date, I classify these grants as corporate tax-deductible RSUs. I also read the stock option plan section of the management information circulars to confirm that the employee stock options are granted at-the-money or out-of-the-money and hence, are tax-favoured at the employee level. The majority of the option grants are at-the-money stock options. Prior to 2008, firms are not required to disclose the value of stock options and shares granted, therefore few companies report the number as well as the value of stock options and shares granted. If these values are missing, I check the annual report. Most firms disclosed the Black-Scholes value of stock option grants and fair value of share-based grants in their annual reports. If these values were not disclosed, the grant date value of the stock options was estimated by applying Black-Scholes as suggested by Noreen and Wolfson (1981), which also accounts for dividend payments, if any. When there is insufficient information to compute the Black Sholes of stock option grants, I dropped these

observations. I calculated the values of share-based grants as the number of share-based grants multiplied by the share price at the end of the grant year.[28]

Some firms grant standalone stock appreciation rights (SARs) or SARs together with stock options (tandem SARs or TSARs) in which case employees can choose to exercise SARs or options. Following Mehran (1995), I assume that SARs and options should have similar values. I also assume that the tandem stock appreciation rights (TSARs) provide no additional value to the recipients. I classify SARs and TSARs separately and exclude the observations with SARs and TSARS from my analysis.

5.3 Proxies for corporate tax planning

In this section, I explain trichotomous measures of corporate tax status at the grant year and marginal tax rates, which are often used in the literature as grant date corporate tax planning proxies. I next describe how I modify and develop corporate tax status and marginal tax rates for the vesting year, which are used as explanatory variables for corporate tax planning in this study.

1) Section 5.3.1 describes trichotomous measures of corporate tax status at grant year ("Proxy 1") as suggested by Plesko (2003), Shevlin (1990), Graham (1996) and Klassen and Mawani (2000).
2) Section 5.3.2 describes trichotomous measures of corporate tax status during vesting period to capture a firm's corporate tax planning using the expected corporate tax status of vesting years ("Proxy 2").
3) Section 5.3.3 explains ex ante marginal tax rate at the vesting year ("Proxy 3"), which is commonly used in U.S.-based studies (e.g., Blouin et al. 2010; Shevlin

[28] The missing values of share-based and option-based compensation belong to the years prior to 2008.

1990; Graham 1996), with some adjustments to adapt to Canadian tax provisions to capture a firm's tendency to use a firm-specific expected marginal tax rate for tax planning.

It is noteworthy that proxy 1 is the basis for developing proxy 2, and proxy 2 and proxy 3 are used to test this study's hypotheses on equity compensations that involve expected corporate tax status at the vesting year.

5.3.1 Trichotomous measures of corporate tax status at grant year

Prior research in tax accounting (e.g., Klassen and Mawani 2000; Core and Guay 2001; Blouin and Carter 2010) uses Plesko's (2003) trichotomous measure of a firm's tax-paying status at grant year as a proxy for corporate tax planning. Using Plesko's measure, Klassen and Mawani (2000) classify the tax-paying status of a firm at the grant year as low if the firm has a negative taxable income and non zero non-capital loss carryforwards ("TLCF"); high if the firm has a positive taxable income and no non-capital loss carryforwards; and moderate if the firm has a positive taxable income and non zero tax loss carryforwards, or a negative taxable income and non zero tax loss carryforwards. I use similar methodology in this study to identify the expected future tax-paying status at the grant year, assuming that firms use grant year tax status for corporate tax planning.

Following Blouin et al. (2010) and Mills and Graham (2008), I compute the taxable income at grant year as follows. Using financial statement data available on COMPUSTAT, Canadian firms' taxable income before tax and interest at grant year (TIBTI) is:

$$TIBTI = PI + INT - DTE + PT\_EX\_DIS + SPI$$

where *PI* is the pretax income at grant year*; INT* is the interest expense at grant year; *DTE* is deferred income at grant year; *PT_EX_DIS* is pretax income from extraordinary items and discontinued operations; and *SPI* is special items at grant year.

I classify the grant year tax-paying status of a firm as high and assign the indicator variable HIGH_TAX_G as one if the firm has positive taxable income (TIBTI>0) and no non-capital loss carryforwards in the three years prior to the grant year (TLCF=0) and zero, otherwise. I classify the grant year tax-paying status of a firm as low and assign the indicator variable LOW_TAX_G as one if the firm has negative taxable income (TIBTI<=0) and positive non-capital loss carryforwards (TLCF>0) in the three years prior to the grant year and zero, otherwise. I classify the rest of the firm-year observations as moderate tax paying status at the grant year and assign MOD_TAX_G as one if the firm-year observations are neither low nor high and zero, otherwise.

5.3.2 Trichotomous measures of corporate tax status during vesting period

Expected tax-paying status during the vesting period of the equity grants is likely to influence a firm's choice to grant tax-deductible RSUs, since the tax deduction is expected to be realized in the year when the RSU grants fully vest or the executive chooses to exercise his vested stock options. Future taxable income and expected tax loss carryforwards during the vesting period are required to estimate the trichotomous measures of corporate tax status in the vesting year as previously explained.

I developed a program to project the future taxable income during the vesting period. Since most RSU and stock option plans vest in three years, I first simulated the expected taxable income of the future three years following the grant year and used a non-parametric model to estimate future taxable income. Prior research uses a random walk model (e.g.,

Shelvin 1990) and non-parametric model (e.g. Blouin et al. 2010). However, the random walk assumption does not work well in estimating future taxable income (Blouin et al. 2010) because the model assumes that the error terms are normally distributed. Since taxable income may or may not follow the normality assumption of residuals used in the random walk model, I followed a non-parametric model developed by Blouin et al. (2010).

The future taxable income of a sample firm is based on how other firms perform in the previous years in terms of assets growth and changes in their performance, which is measured as TIBTI (see Section 5.3.1) divided by average total assets, or ROA. In Appendix B, I describe the procedure used to simulate the future taxable income using a non-parametric model which I adapted from Blouin et al. (2010).

Next, I compute the tax loss carryforward for the year t+1 and year t+2, based on tax loss carryforwards of year t-2, t-1, and t, historical data available in COMPUSTAT, simulated future taxable income for the year t+1, t+2, and t+3, and historical taxable income for t-2, t-1, and t.

Three prior years historical data are required because a loss in the year 2005, for example, can be offset with positive taxable income in the year 2002, provided some of the positive taxable income is available, i.e., no losses carryforward from years prior to the year 2002. If the positive taxable income in 2002 is completely offset, any remaining loss can be used to offset positive taxable income in 2003. If the positive taxable income in 2003 is completely offset, any remaining loss can then be used to offset positive taxable income in 2004. If any loss remains, it may be saved as tax loss carryforwards and may be used to offset future positive taxable income up to 20 years (i.e., 2006-2025). If the taxable income in any of those years is negative, that negative income is added to the tax loss carryforwards

and a first-in-first-out approach is applied to offset any current year positive income with the tax loss carryforwards. Tax losses that cannot be carried back 3 years or forward 20 years expire and are usually removed from the "inventory" of tax loss carryforwards.

To give an example of how tax loss carryforwards (hereafter "TLCF") are estimated in a more general setting, assume TLCF(t)=0, and TIBTI(t-2)=($1000), TIBTI(t-1)=($2000) and TIBTI(t)=($3000). Assume simulated TIBTI(t+1)=$1000 and TIBTI(t+2)=$1500. Since tax loss carryforward at t is zero, there is no carryforward loss to t+1 year from prior years. Since taxable income at year t+1 is positive, there is no tax loss to carryback to prior 3 years. Therefore, TLCF(t+1) will be zero. Next, consider TIBTI(t+2). Since it is also a positive income, there is no tax loss to carryforward to the future years. Hence, TLCF(t+2) will also be zero. In the next scenario, assume TLCF(t)=0, and TIBTI(t-2)=($1000), TIBTI(t-1)=($2000) and TIBTI(t)=($3000), but TIBTI(t+1)=($1000) and TIBTI(t+2)=$500. In this case, since the tax loss carryforward at t is zero, there is no carryforward loss to t+1 year from prior years. Since taxable income at year t+1 is negative, this loss can be carried back to prior 3 years; however, all prior three years also experienced losses, so TLCF(t+1) will be $1000, which can be used to offset future positive taxable income. Since TIBTI(t+2) is positive $500, TLCF(t+1) =$1000>0, TLCF(t+1) should be offset against positive TIBTI(t+2). Since TIBTI(t+2) is less than TLCF(t+1), the unused portion of TLCF(t+1) will be TLCF(t+2), i.e., TLCF(t+2) equals the absolute value of TIBTI(t+2) minus TLCF(t+1).

Figure 4 presents the algorithm developed for a general scenario when tax loss carryforward for year t is zero and taxable income for the year t-2, t-1, and t are negative. There are 8 different scenarios for the combination of taxable income, at year t-2, t-1, and t

when tax loss carryforward at year t equals zero, and one scenario with non zero tax loss carryforwards at year t.

[Figure 4 about here]

After the computation of tax loss carryforward for years t+1 and t+2, I apply Plesko's (2003) methodology to classify a firm's tax paying statuses at year t+1, t+2 and t+3. As stated in section 5.3.1, I classify the vesting year (t+1) tax-paying status of a firm as high (low) if the firm has positive (negative) taxable income at the vesting year t+1 ($TIBTI_{t+1}$) and no (non-zero) non-capital loss carryforwards in the year prior to year t+1 ($tlcf_t$). I classify the rest of firm-year observations as moderate tax paying status at year t+1. A similar classification is made for year t+2 and t+3. Since I simulated 50 distinct paths of projected vesting period taxable income, I took an average of 50 tax-paying statuses and used the average as the expected tax paying status.

I classify corporate tax status at vesting year as HIGH_TAX_V (LOW_TAX_V) if the tax paying statuses at year t+1, t+2, and t+3 are all in high (low) expected tax statuses and MOD_TAX_V otherwise.

5.3.3 Ex ante marginal tax rate

Prior research (e.g., Graham 1996; Graham and Mills 2008) shows that simulated tax variable is the best proxy for the perfect foresight marginal tax rate (MTR) and is considered superior in testing hypotheses, such as corporate decision on executive compensation, instead of using more readily available data such as the existence of tax loss carryforwards at the grant year to identify the corporate tax status employed in prior literature (Blouin et al. 2010; Graham 2003; Shevlin 1990; Graham and Mills 2008). Although the marginal tax rates are frequently used in U.S. based research studies, very few studies use the simulated corporate

marginal tax rates associated with Canadian firms due to the complex nature of estimating tax-code-consistent marginal tax rates that account for the carryback and carry forward tax treatment of net operating losses (tax losses carryforward). In this study, I develop a simulated marginal tax rate for each Canadian firm-year and use it as a proxy for corporate tax planning. I first simulate the ex ante taxable income by following Blouin et al.'s (2010) model of predicting 50 different paths of future taxable income as explained in section 5.3.2 (and Appendix B) and compute the marginal tax rates during the vesting period by implementing Shevlin's (1990) algorithm.

The marginal tax rate of a corporation is defined as the present value of an increase in current and future tax liability on an extra dollar of current taxable income (Shevlin 1990; Graham 1996; Blouin et al. 2010). As explained in Section 5.3.2, due to the current Canadian tax rules allowing losses to carryback three years and carryforward 20 years to offset prior and future positive taxable income, the potential tax expense on an additional dollar of income earned today depends on current income, three prior years of income, and 20 years of future income. Since the majority of Canadian firms' RSU grants vest in three years as indicated in the annual management information circulars, I choose to simulate the marginal tax rates for three years following the grant year. Therefore, the simulation procedure involves estimating 23 years of future taxable income.

In sum, the rule that allows firms to carryforward tax losses to offset with future positive income up to 20 years requires simulating 20 years of future taxable income. The rule that allows three year carryback losses to offset year 20 positive taxable income affects the tax liability of Year 20. For example, a non-zero probability of negative taxable income in Year 21, 22 and 23 affects the tax liability of Year 20 and thus, computing marginal tax

rate for year t requires simulating future taxable income for additional three years beyond Year t+20. Figure 5(a) summarizes why this study requires a stream of 23 years of taxable income to compute the marginal tax rate at grant year (computing an incremental tax liability for an additional income earned in year t).

[Figure 5 about here]

If a researcher requires forecasting the marginal tax rate for the vesting year, let's say marginal tax rate at Year t+3, it involves estimating a stream of 26 years of future taxable income, i.e., estimating the taxable income of Year t+1 to t+26. Year t+4 to t+23 are required to allow for tax losses in t+3 to carryforward 20 years, and Year t+24 to Year t+26 are required to allow for the effect of the three-year loss carryback rule on the tax liability of Year t+23. As a result, computing the marginal tax rate for the vesting year requires simulation of 26 years of future taxable income. Figure 5(b) summarizes the future taxable income streams required to compute the marginal tax rate at the vesting year (computing an incremental tax liability for an additional income earned in year t+3).

In addition to estimating a stream of future taxable income, as suggested in Shelvin (1990), expected statutory tax rates and expected interest rates for the next 26 years are required. I extrapolate the current statutory tax rate to the next 26 years and use Bank of Canada's prime rate as the discount rate to compute the present value of future taxable income.[29] Since future interest rates are also required, I similarly extrapolate the current interest rate to the following 26 years. The marginal tax rate computation also requires the estimation of future tax loss carryforwards. I compute the future tax loss carryforwards using the procedure detailed in Section 5.3.2.

[29] This extrapolation may be an oversimplification; however, it is the most reasonable assumption given the lack of information I have regarding future tax rates and interest rates. Therefore, the simulated corporate taxable income and corporate marginal tax rates may be perceived as noisy measures.

I next apply Shevlin's (1990) method of computing future corporate marginal tax rates. In the following section, I present an algorithm of how I estimate future corporate marginal tax rates. The algorithm to compute corporate marginal tax rates is based on four different scenarios as described in Shevlin (1990). The main algorithm is presented in Figure 6(a). Figure 6(b) to 6(e) present how the corporate marginal tax rate is determined for each of four scenarios.

[Figure 6 about here.]

Scenario 1 (See Figure 6(b).): When the current taxable income is negative with zero tax loss carryforward from previous years, the negative taxable income can be carried back to the prior three years, provided some of prior three years' positive taxable income is still available to offset with the loss. Therefore, the corporate marginal tax rate of the current year depends on whether the taxable incomes of the previous three years are positive and sufficient to offset the current loss. If both conditions are met, the corporate marginal tax rate is the same as the current statutory tax rate. If both conditions are not met, the loss can carryforward for up to 20 years. This tax loss carryforward remainder calls for Scenario 2, with the tax loss carryforward being non-zero at the end of year t. The corporate marginal tax rate then depends on the amount of the tax loss carryforward, the amount of future taxable income stream, and the existence of negative future taxable income, which is determined by testing when future taxable income is completely offset. This test is covered in Scenario 2.

Scenario 2 (See Figure 6(c).): When the current taxable income is negative with a non-zero tax loss carryforward from previous years, the negative taxable income cannot carryback to the prior three years; however, the 20 year carryforward rule allows this tax loss to offset

future taxable income. If all future 23 years are expected to have positive taxable income, the corporate marginal tax rate is determined for period in which the entire tax loss is offset against the taxable income. Thus, the corporate marginal tax rate is computed as the expected statutory tax rate of the year of complete offset, discounted using the expected interest rate of that year. If such a condition is not met, that is, there is a non-zero probability of negative taxable income, the three-year loss carryback rule affects the tax liability of the year that a firm is expected to offset its tax loss remainder. Such condition is tested in Scenario 3.

Scenario 3 (See Figure 6(d).): When the current taxable income is positive with a zero tax loss carryforward from previous years, the corporate marginal tax rate of current taxable income depends on whether the taxable income of the future 3 years have a non-zero probability of expecting negative taxable income. If the simulation program does not generate negative income, the corporate marginal tax rate is similar to the statutory tax rate. Otherwise, the corporate marginal tax rate is the statutory tax rate at year t minus the statutory tax rate at year n, discounted by the interest rate at Year n: n represents the year when the positive taxable income at year t is completely offset by expected losses.

Scenario 4 (See Figure 6(e).): When the current taxable income is positive with a non-zero tax loss carryforward from previous years, the tax loss carryforward is first offset against the positive income. If there is no remaining tax loss, this scenario meets the condition to apply Scenario 3, which is a positive taxable income with a zero tax loss carryforward. Otherwise, tax loss carryforward exceeds the current year positive taxable income. Thus, the carryforward loss fully offsets the current year positive taxable income and leaves a non-zero tax loss carryforward for future years, which is in fact Scenario 2.

By following the procedures detailed above, I simulate the corporate marginal tax rate at grant year, at one year after the grant year, and for each year up to and including three years following the grant year. The simulated corporate marginal tax rates are presented together with the summary statistics in Chapter 6.

5.4 Measurement of managerial power

Prior studies such as Abernethy et al. (2015), Gerakos (2010), and van Essen et al. (2012) measure managerial power as a composite measure of four board-related proxies, two of which capture heightened illegitimate executive power and two that capture constrained executive power. The justifications for using these variables are as follows. [30]

Board size. Managerial power increases with the size of the board, which is measured by the natural logarithmic function of the number of directors. Bigger boards are slower in decision-making and reluctant to criticize managerial performance and hence, function less effectively (Yermack 1996). Accordingly, executives of firms with bigger boards have more control over the board.

Proportion of insiders as board members. The inside directors have more power over the careers of other managers. Therefore, managerial power rises with an increasing

[30] Prior research (e.g., van Essen et al. 2015) also uses *Number of board committees the executive serves on (MEMBER)* and *Executive tenure* (TENURE). By using these components, managerial power is in effect a measure of the extent of power executives has on the board in decision-making. Some proxies, specifically MEMBER and TENURE used in this measure have some limitations. (1) In this study, specifically for Canadian executives, the data are not readily available and the hand-collection of data such as the number of boards and executive tenure can be quite tasking. Additionally, not all Canadian executives, except board members, have such data made available in LinkedIn or Bloomberg or annual statements or proxy statements. The missing executive-specific information to construct the managerial power of each executive will further reduce my sample size and may potentially affect the power of the tests. (2) The measure MEMBER may not capture the level of power an executive exerts on the board. The number of boards an executive serves on may affect how the board perceives the executive only if all or majority of board members generally serve on fewer boards than the executive. Without accounting for the board member's demand in the labour market, this MEMBER variable may not capture the extent of an executive's power on the board. Additionally, many top five executives do not serve on any board, and therefore, using this proxy may provide little to no variation in measuring the managerial power distance among top five executives.

proportion of insiders on the board (Byrd and Hickman 1992).

Proportion of firm ownership of the largest shareholders. The largest owners have the power to nominate directors, and are active in the monitoring of managerial activities, executive compensation plans, and other board decisions (Smith 1996; Shleifer and Vishny 1997). Therefore, ownership concentration, measured as the total percentage of the outstanding shares owned by shareholders who own at least 5% of the outstanding shares, constrains managerial power.

Percentage of institutional ownership. Institutional owners have expertise and are more active monitors of firm's compensation practices (Hartzell and Starks 2003). Therefore, institutional ownership, measured as the percentage of the total ownership of institutional investors, constrains managerial power.

To overcome data limitation and reduce the burden of manual data collection, I look into the executive pay slice (EPS) variable constructed by Bebchuk et al. (2011) as one of the managerial power proxies. Bebchuk et al. (2011) define executive pay slice [31] as the proportion of the total compensation paid to the top five executives that goes to an executive. The authors find that the EPS incrementally explains the characteristics of firm's top executives in addition to the executive being a member of the board and the executive power distance from other top executives. They therefore argue that the EPS represents the relative power held by the executive, the power to extract rent, and the management hierarchy. The total compensation used in computing the EPS includes salary, bonus, other annual pay, the total value of restricted stock grants, the Black-Scholes value of stock option grants, long-term incentives payout, if any, and all other total compensation. This construct of using total

[31] I am grateful to the faculty members at the University of Waterloo for suggesting this variable during my dissertation proposal.

compensation allows the regression model to control for firm characteristics that affect the average level of executive compensation within the firm.

I hand-collected firm-specific *BOARD SIZE* and *INSIDERS* annual data from management information circulars for the sample period. Ferreira and Matos (2008) have made *OWNERSHIP CONCENTRATION* and *INSTITUTIONAL OWNERSHIP* data available via FactSet database. I employ principal component analysis (PCA) and create a factor score that weighs each of the observed items at the firm level. The value of the composite measure (POWER) increases with the level of managerial power (Abernethy et al. 2015). The mean, median, standard deviation, and interquartile measures of the POWER variable are similar to that of Abernethy et al. (2015). I complement the POWER variable with the Executive Pay Slice (EPS) in the regression model in the following section to represent the power held by each executive within the firm.

5.5 Regression model

My research design is based on the work of Carter et al. (2007) who investigate the effect of financial reporting concerns on the use of stock options and restricted stocks during the period 1995-2001 as described previously, and on the work of Klassen and Mawani (2000) who investigate the effect of trade-off between financial and tax reporting incentives on the use of cash and stock options during the period 1993-1995 as described in previous sections.

Some of the challenges of analyzing the effect of tax reporting incentives on the design of executive equity compensation are estimating future corporate taxable income, computing corporate marginal tax rate and controlling for many non-tax factors that could be important. Carter et al.'s (2007) main research question involves investigating the effect of financial

reporting incentives and the effect of the accounting rule on the reporting of stock option expense, which may be a likely cause for firms shifting from stock option compensation to restricted shares compensation. Although they do not consider tax issues, their regression model includes the non-tax variables that are relevant to my research question.

Incorporating the non-tax variables used in Carter et al. (2007), I estimate the following model to test the effect of corporate tax planning and managerial power on the executive equity design.

$$\mathbf{RSU\_ratio_{i,j,t}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 MTR_{i,j,t+3}} + \boldsymbol{\beta_2 Power_{i,j,t-1}} + \boldsymbol{\beta_3 MTR_{i,j,t+3} * Power_{i,j,t-1}} + \sum_{i=4}^{n} \boldsymbol{\beta_i X} + \boldsymbol{\varepsilon_{i,j,t}}$$

Equation (1)

where i is the executive, j is the firm, and t is the grant year. $\mathrm{RSU\_ratio_{i,j,t}}$ denotes executive equity compensation mix for the executive i of firm j, at the grant year t. $\mathrm{MTR_{j,t+3}}$ is expected corporate tax incentives at the vesting year, which is approximated at three years following the grant year t. In this study, I use two different proxies to capture corporate tax planning at vesting year: (1) dichotomous measures of expected corporate tax-paying status at the vesting year, and (2) expected corporate marginal tax rate, which is the present value of the change in taxes payable in the present and future for a dollar increase in taxable income at the vesting year. $\mathrm{Power_{i,j,t-1}}$ denotes managerial power, which constitutes two measures, a factor created from principal component analysis of four board-related variables as previously discussed in Section 5.4, which are measured at the year prior to the grant year at firm j, *and* Executive Pay Slice (EPS), which is the proportion of the total compensation paid to the top five executives that goes to the executive i at grant year t. Control variables (X) include cash constraint *(*CASH_CONSTR) for firm j at the grant year t*;* dividend payout

(DIV_PAYOUT) for firm j; earnings volatility ($EARN\_VOL$) measured at year *t-1;* Stock volatility ($STOCK\_VOL$) measured at the year following the grant year, $t + 1$; bankruptcy risk *(Z-SCORE)* measured for firm j at the grant year *t*; firm size (LN_ASSET) measured for firm j at the end of grant year t; growth opportunities (BOOK_MKT) measured for firm *j* at the end of grant year t; firm performance (RET) measured at grant year t for firm j, and industry controls ($INDUSTRY$) using COMPUSTAT categories. I describe the rationale for including these control variables and their measurements in next section (Section 5.6). Variable descriptions are also summarized in Appendix D.

H1 predicts the proportion of tax-deductible RSU grants in the total equity compensation (the RSU ratio) increases with the expected corporate marginal tax rate among Canadian firms. If so, there should be a positive coefficient on the expected corporate marginal tax rate or corporate tax status *(*MTR*)* at the vesting year *(*β_1*)* in Equation (1). H2 predicts that the proportion of tax-deductible RSU grants in the total equity compensation (the RSU ratio) decreases with managerial power among Canadian firms. If so, there should be a negative coefficient on the managerial power proxy POWER in Equation (1) β_2. Since the managerial power proxy has two components POWER and EPS*,* I use two notations, β_2^1 and β_2^2*,* to represent β_2. H2 implies a negative coefficient on POWER (β_2^1) and EPS (β_2^2). H3 predicts that managerial power should mitigate the association between corporate tax planning and the RSU ratio among Canadian executives. Thus, the coefficient on the interaction term between corporate tax planning and managerial power ($MTR * POWER$) (β_3^1) and ($MTR * EPS$) (β_3^2*)* is predicted to be negative. As a result of two components of the $POWER$ proxy, I use β_3^1 and β_3^2 to represent the interaction term β_3.

5.6 Control variables

The rationale underlying the effect of control variables on the RSU ratio, how these control variables are measured, and their predicted signs are as follows.

Firms that are expected to face cash flow constraints at vesting (CASH_CONSTR). Firms require a significant amount of cash if they pledge to satisfy RSUs and PSUs with cash payout or non-treasury share payout (i.e., tax deductible RSU grants) whereas stock options do not require cash outflow and are sometimes used by firms that need to conserve cash (Lee 2010). Accordingly, firms expecting to experience a cash shortage in the future may prefer to use stock options. I measure cash flow constraints as the average realized cash flow constraints of a three-year period ending with the grant year ($t-2$, $t-1$, and t).[32] Following Core and Guay (1999), cash flow constraint is constructed as, [(Common and preferred dividends + net cash flow from investing activities – cash flow provided by operating activities)/total assets] and can range from negative to positive numbers. By construct, the larger numbers represent higher cash flow constraints and vice versa. I expect a negative relation between cash flow constraint and the RSU ratio.

Dividend payout (DIV_PAYOUT). Stock option holders are not entitled to the dividend payout whilst most RSU holders receive dividends (Carter et al. 2007). Thus, if firms are currently paying high dividends, the executives will prefer dividend-paying shares rather than stock options. I expect a positive relation between dividend payout and the RSU ratio. Following Carter et al. (2007), the average dividend payout is computed as the average

[32] One may argue that it is more appropriate to use cash flow constraints at the vesting years ($t+1$,$t+2$, and $t+3$). However, data requirement to compute future cash flow constraints will severely limit the number of observations available for hypotheses testing. Since firms may set aside some amount of current cash to repurchase shares in the market before the RSUs vest, using current cash flow constraint as a proxy for expected cash flow constraints at the vesting year is reasonable.

of dividends per share over a three-year period ending with the year prior to the grant year ($t-3$, $t-2$, and $t-1$)).

Firms' earnings volatility. Carter et al. (2007) argue that firms with higher earnings volatility may grant restricted shares because share-based grants provide the recipient with consistently positive compensation. They also note that the probability of stock options being in the money may be higher for firms with higher earnings volatility and did not formalize a directional prediction. Earnings volatility is measured as the variance of return on assets (ROA) over a ten-year period prior to the grant year t.

Stock volatility. Prior research finds that firms with higher stock volatility use a greater proportion of stock options because the value of stock options increases with volatility (e.g., Boyle et al. 2011) or employees' preference for a large outcome with small probability of achieving that outcome[33] (e.g., Spalt 2013). Volatility is measured as the standard deviation of unadjusted daily returns over the 12 months following the grant year t. I expect a negative relation between stock volatility and the RSU ratio.

Bankruptcy risk. Kadan and Swinkels (2008) find that firms facing bankruptcy risk are highly likely to use a higher proportion of share-based grants. Thus, I predict a positive association between bankruptcy risk, measured by Altman's Z-score (see Altman (1968)), and the RSU ratio. See Appendix D for how the Altman's Z-score is computed.

Firm-specific factors that affect the level of equity compensation: firm size, investment opportunities, and performance. Consistent with the control variables used in the study by Carter et al. (2007), I consider firm size, investment opportunities and stock

[33] The literature terms such preference as employees' preference for a lottery ticket, implying that option gains are similar to lottery winnings.

performance that affect the level of equity compensation (cash to equity ratio) directly and may affect the RSU ratio indirectly.

Firm size and investment opportunities. Prior literature (e.g., Smith and Watts 1992) contends that large firms, and firms with high investment opportunities are more difficult to monitor; therefore, such firms are more likely to use equity compensation because equity compensation is known to align agent and principal interests. Since prior research does not clarify whether monitoring is more effective using either restricted shares or stock options, I am unable to predict the direction of the RSU ratio with firm size and investment opportunities. I can only conjecture that both restricted shares and stock options have a positive relation with firm size and investment opportunities, to the extent that both are equally efficient in monitoring. Following Carter et al. (2007), firm size is measured as the natural log of total assets and investment opportunities as the book-to-market ratio at the end of the grant year. By construct, the RSU ratio has a positive relation with the natural log of total assets and a negative relation with book-to-market ratio.

Stock performance. Murphy (1985) finds that the level of equity compensation is positively correlated with stock performance. Prior studies measure stock performance as cumulative monthly stock return in the grant year t (Carter et al. 2007). Assuming the level of both restricted shares and stock options grants are positively associated with stock performance, I predict that the RSU ratio is positively associated with the stock performance.

Industry effect. Further, I include industry indicator variables. The industry indicator variables capture cross sectional differences in labour market conditions in different industries and how these differences affect compensation practices across industries (Oyer

and Schaefer 2005; Carter et al. 2007). To correct serial correlation and heteroscedasticity, I include yearly indicators in my regression model (Carter et al. 2007).

5.7 Conclusions

This chapter reviews the construction of my dependent variable, executive equity compensation structure and the two independent variables: corporate tax planning incentives and managerial power proxies. Given that a major contribution of this thesis is the introduction of the ex ante corporate taxable income simulation and marginal corporate tax rate for Canadian firms and the construction of Canadian executive compensation data, this section devotes considerable attention to describing how the underlying data is constructed. Equation (1) in this chapter forms the basis of my tests for Hypothesis 1 through 3, and I provide the description and measurement of control variables and the rationale behind these control variables. The results are reported in Chapter 6.

Chapter 6

Sample Selection and Empirical Analysis

6.1 Introduction

In this chapter, I first describe my sample selection process. Using the sample data, I test my three hypotheses and thus examine the relation between executive equity compensation structure and corporate tax planning and managerial power. I empirically examine Equation (1) from section 5.5 using executive-level samples of data, over the time period 2005-2015. This chapter includes seven sections, including this introduction and conclusion.

Section 6.2 of this chapter describes how I choose my sample and the rationale for the sample period. I hand-collected executive compensation data of top five executives for TSX 200 firms during the period 2005-2015. This sample period choice helps with avoiding confounding factors, such as financial reporting incentives of stock option compensation, examined in prior accounting studies and the choice to collect the compensation data of multiple executives within a firm across multiple years increases my sample observations. These two choices balance the need for a realistic sample size for test power with the demands of hand data collection.

Section 6.3 reports the descriptive statistics pertinent to my hypotheses test. This section also includes a review of a Pearson correlation table for my main explanatory variables of interest and control variables.

Section 6.4 reports the results of the pooled regression tests using an OLS model. Section 6.5 reports a number of different estimations in an effort to validate the results

documented in the previous section, including clustering standard errors at the firm level and employing firm fixed effects. Section 6.6 includes additional analyses using a different tax planning proxy, and robustness checks across subsamples. Section 6.7 and 6.8 devote to assessing the effects of firm-specific risk and shareholder activism on the previous findings. Section 6.9 discusses the limitations of the ex ante corporate marginal tax rate measure and Section 6.10 concludes the chapter.

6.2 Sample selection

I focus on a sample of Canadian public nonfinancial companies traded on the Toronto Stock Exchange (200 TSX Canadian firms) during the fiscal years 2005−2015. I restrict the sample to firms whose management information circulars, hence annual executive compensation data, are available in the SEDAR[34] filing system (www.sedar.com) and annual financial statement information is available in COMPUSTAT. Consistent with prior literature (e.g., Abernethy et al. 2015), I exclude financial firms in my sample because these firms are subject to different regulatory standards and leverage levels. These restrictions reduce the sample to 143 non-financial firms. To avoid potential confounds related to financial reporting incentives of granting stock options as examined in prior studies, the sample period in this study begins after the first year of mandatory expensing of stock options. My choice of sample firms and sample period is also subject to the cost consideration of the hand-collection of executive compensation and managerial power data.

I hand-collected compensation-related data of top executives of these 143 firms. The 'Summary Compensation Table' of the annual Management Information Circular provides the names of the executives, their current position, and the cash and equity compensation

[34] SEDAR stands for the System for Electronic Document Analysis and Retrieval.

components of a firm's five most highly compensated officers.[35] I read footnotes and equity-based plan information to identify the type and payout structure of share-based and option-based grants. From the summary table of executive compensation of each grant year, I hand-collected the grant date fair value of RSU grants and the Black-Scholes value of employee stock options granted to each executive. I read the stock-based compensation plan section of the management information circulars (and annual reports) to identify whether the RSU grants are satisfied by cash, repurchased shares, newly issued shares, or treasury shares. If the RSU grants are to be satisfied or satisfiable by cash or repurchased shares, I classify the grants as tax-deductible RSUs. I also read the stock option plan section of the management information circulars to confirm that the employee stock options are granted at-the-money or out-of-the-money, the majority of which are at-the-money stock options, and hence are tax-favoured at the employee level. I classify SARs and TSARs separately and these observations are not included in my analysis.

My initial sample has 7,509 executive-years (143 unique non-financial Canadian firms and 1,705 unique executives). In hypothesis testing, the number of observations is significantly less because not all executive-year observations have the required data. I remove 514 executive compensation data observations of some firm-years because some firms do not disclose all top five executive compensation data in some years.[36] I remove additional 1,395 observations as a result of missing control variables in some years. As previously explained, some firms do not grant equity compensation in some years to some top executives or the firms may grant only non-tax-deductible RSUs or restricted shares as

[35] Firms are required to provide such information in 2008. Information provided prior to 2008 was not as complete as that post-2007.
[36] Top five executive compensation data are required to compute executive pay slice (EPS), a proxy for each executive's power within a firm.

equity incentives. There are 345 observations with non-tax-deductible RSUs or restricted shares grants and 1,030 observations with zero equity compensation. Since RSU ratio is defined as the proportion of tax-deductible RSU grants to the sum of tax-deductible RSU grants and the employee tax-favoured options, these observations are not included in testing the hypotheses. A total of 45 observations are also removed because there is not enough data to compute the corporate marginal tax rate and managerial power variables for certain years. My full sample has 3,983 executive-years (127 unique nonfinancial Canadian firms) that are used in hypotheses testing.

As explained in Chapter 2, family member executives may not be eligible for a 50% reduction allowed for employee stock option grants because these transactions are not considered as at arms' length. Additionally, the power dynamic between family member executives and the board may be unusual as these executives may hold a higher degree of social and economic power over non-family board members (García-Ramos and García-Olalla 2011). Therefore, it is necessary to test the hypotheses using non-family run firm subsample. Based on the data made available to the public through the Clarkson Centre for Business Ethics and Board Effectiveness (CCBE), I identify Canadian family owned firms listed on the Toronto Stock Exchange. According to the June 2013 CCBE report,[37] 16 firms in my sample are identified as family firms by CCBE.[38] Thus, 509 observations of family firms are eliminated from the full sample. The testing non-family firm subsample consists of 3,474 executive-years. After removing 197 executive-year observations, which are identified

[37] There are 23 individual family-controlled companies.

[38] The 2013 CCBE Report defines a family firm as follows. "We deemed an issuer to be family controlled if at least 30% voting control was held by a family member or group that has either: a) experienced one or more events of generational turnover or; b) family member(s) are in a clear position to succeed to the next family generation" (Spizzirri and Fullbrook 2013, p.1)

as influential observations[39], a total of 3,983 observations in full sample and 3,474 observations in non-family run firms sample are used in hypotheses testing. Panel A of Table 1 summarizes the sample selection process.

[Table 1 about here.]

Panel B of Table 1 reports the distribution of observations across the sample period. Although the initial executive-years are evenly distributed across the sample period, the observations used in hypotheses testing are not. Specifically, there are no observations from fiscal year 2005 because many firms do not report top five executive compensation data in that year and compensation data for the top five executives are required to compute Executive Pay Slice (EPS), the variable to measure the power of each executive within a firm.

Panel C of Table 1 presents the industry composition of the sample firms. The mining industry and the energy sector (i.e., petroleum and natural gas extraction) constitute a large percentage of the sample firms. These results are not surprising as many big companies in Canada are in these industries; however, this concentration in a few industries may limit the generalizability of my findings.

6.3 Descriptive statistics and Correlations

Table 2 reports summary statistics for the dependent variable, the RSU ratio as well as the Cash Ratio (Cash compensation divided by total compensation) and components of executive compensation that are used to compute the RSU ratio. Panel A presents summary statistics for the RSU ratio and executive compensation components that are used to compute

[39] An outlier, with a large residual, may or may not affect the fitted equation. An influential observation, with a small residual, can significantly change the estimates of the fitted equation (Draper and John 1981). Therefore, in this study, I remove influential observations using Cook's D method.

the RSU ratio for the 5,600 executive-years in the initial sample. Panel B shows the same statistics for the 3,983 executive-years in the full sample for hypotheses testing and Panel C exhibits the same statistics for the 3,474 executive-years in the non-family firm only subsample. Although the majority of executives in the initial sample receive a portion of their compensation in equity grants, about 20 percent of executives in the sample do not receive equity compensation in the form of corporate tax-deductible RSUs or employee tax-favoured stock options.

[Table 2 about here.]

Table 3 presents summary statistics for independent variables in Equation (1). Panel A presents summary statistics for all the continuous variables for the 3,983 executive-years in the full sample for hypotheses testing whereas Panel B exhibits the same statistics for the 3,474 executive-years for the non-family firm subsample. As reported in Table 3, the mean (median) of the expected corporate marginal tax rates of the firms in the full sample is similar to that of the non-family firm subsample at -0.19 (-0.19). The mean (median) of managerial power measures of the firms in the full sample is somewhat bigger at -0.09 (0.02) than for the firms in the non-family firm subsample at -0.21 (-0.12). This suggests a slight negative shift of the distribution and is consistent with the speculation that family firms may have different power dynamics between the board members and family-member executives.[40]

[Table 3 about here.]

Table 4 presents the bivariate correlations among test variables. The correlation table indicates that firms with higher corporate marginal tax rates tend to use tax-deductible RSUs to a lesser extent, and managerial power decreases with increased use of tax-deductible

[40] I run a t-test to analyze the difference in managerial power measures between family and non-family firms. Un-tabulated results show that the difference in the means of managerial power between these two groups are statistically significant from zero at one percent level, as speculated.

RSUs. Most of the correlations among control variables are small (less than 0.30 and variance inflation factor (VIF) <10), thus, multicollinearity is not an issue (see Marquaridt (1970)).[41]

[Table 4 about here.]

To provide some insight into the relation between the RSU ratio and the corporate tax statuses proposed in Section 5.3.2, I present the RSU ratio across corporate tax statuses for the full sample as well as non-family firm subsample in Table 5. The mean value of the RSU ratio is 0.458 (0.422) for firms expecting a high (low) tax status in the full sample. The mean value of the RSU ratio is 0.467 (0.436) for firms expecting a high (low) tax status in the non-family firm subsample.

[Table 5 about here.]

6.4 Main Results from pooled regression tests

I first estimate the mean coefficients and t-statistics from standard errors of pooled OLS[42] regression Equation (1) using the entire sample of 3,983 executive-year observations between 2006 and 2015. The results are presented in Column (1) of Table 6. I remove the influence of outliers by using Cook's (1977) distance (Cook's *D*) method. I identify an observation as an outlier if the value of its Cook's *D* is above 4/(n-k-1), where n = number of

[41] Literature in Econometrics recommends various acceptable levels of VIF. VIF value of 10 is generally acceptable (Marquaridt 1970).

[42] My dataset includes multiple year observations, and multiple executive compensation data for a give firm-year. Therefore, it is expected that the RSU ratio within each firm may not be independent. This type of dataset violates the OLS assumption of error terms being independent. As a result, the estimated coefficients and standard errors may be biased. To overcome this caveat, I use a robust regression to re-estimate Equation (1). Robust regression accounts for the imperfections mentioned in the dataset and makes adjustments in the estimates and standard errors using the Huber-White sandwich estimators. The results, untabulated, do not change the inferences.

Other imperfections of my dataset: it is highly imbalanced because some smaller firms made fewer executive compensation data available during the sample period; the dependent variable RSU ratio is a fraction and hence, the distribution of RSU ratio may be highly skewed. It is suggested that a regression with bootstrap standard errors helps reduce a potential non-normality due to skewed distribution of the dependent variable and heteroskedasticity. The bootstrap standard errors are estimated based on subsamples drawing from the sample dataset with replacement (Davidson and MacKinnon 1993). The results are similar to that using OLS method.

observations and k = number of independent variables, as suggested by Belsley et al. (1980).

One of the key variables in column (1) is HIGH_TAX_V, which equals one if firms are expecting high corporate tax status at vesting year, and zero otherwise. The estimated coefficient on HIGH_TAX_V is of the predicted sign and statistically significant at the 1 percent level ($\beta_1 = +0.055, t = +2.71$) using a one-tailed test. This suggests that, on average, firms expecting a high corporate tax rate at the vesting year increase the proportion of equity grants via tax-deductible RSUs by about 6 percent relative to firms expecting a low corporate tax rate at the vesting year. This provides evidence that firms expecting a high tax rate at the vesting year use tax-deductible RSUs to a greater extent in equity compensation mix.

[Table 6 about here]

The second key variable in column (1) is POWER (managerial power). The estimated coefficient on POWER is also significant in the predicted direction at the 1 percent level ($\beta_2^1 = -0.056, t = -8.01$). The estimated coefficient on POWER indicates that, on average, firms decrease the proportion of the equity grants via tax-deductible RSUs by about 6 percent for a one standard deviation change in POWER. The estimated coefficient on EPS is positive, but not statistically different from zero ($\beta_2^2 = +0.048, t = +0.89$). Thus, managers (or firms with weak boards of directors) seem to influence their own compensation via the equity compensation mix, and managers may prefer a greater portion of employee tax-favoured stock options in their equity compensation mix.

The estimated coefficient on the interaction term HIGH_TAX_V*POWER is significant and positive ($\beta_3^1 = +0.020, t = +1.84$), which is opposite to the predicted in H3. In contrast, the estimated coefficient on the interaction term HIGH_TAX_V*EPS is negative,

but not statistically different from zero ($\beta_3^2 = -0.067, t = -0.78$). Thus, the results fail to support the prediction of H3. One possible explanation for this finding is as follows. For firms expecting a higher tax status, taxes play a more influential role and managers are likely to experience a high pressure from shareholders to reduce the firm's effective tax rate. If so, managers may accept reduced use of employee tax-favoured stock options in their compensation package when firms are facing a high tax status.

To alleviate concerns that family-member executives and the board members may have a different power dynamic in family firms, I reestimate the Equation (1) by eliminating family firms from the full sample. The results are presented in column (2) of Table 6.

Using the subsample of non-family firms, estimates of the coefficients of variables of interest are similar to that of the full sample. Specifically, the estimated coefficient on HIGH_TAX_V is of the predicted sign and statistically significant at the 1 percent level ($\beta_1 = +0.054, t = +2.38$), the estimate of the coefficient on POWER is negative, consistent with the predicted direction ($\beta_2^1 = -0.045, t = -6.22$), and the estimated coefficient of the interaction term HIGH_TAX_V*POWER is positive and statistically significant at 5 percent level ($\beta_3^1 = +0.021, t = +1.78$). The estimate of the coefficient on EPS is positive, but not significantly different from zero ($\beta_2^2 = +0.053, t = +0.91$), and the estimated coefficient on the interaction term HIGH_TAX_V*EPS is negative and also not statistically different from zero ($\beta_3^2 = -0.058, t = -0.61$). Taken together, the results can be interpreted as follows. Firms use tax-deductible RSUs to a greater extent in equity mix when they expect a higher tax rate. When the tax paying status is low, a one standard deviation change in the managerial power decreases the RSU ratio by 0.05; however, when the tax playing status is high, the same increase in managerial power increases the RSU ratio by 0.02. The individual

executive does not seem to have a lot of influence on his/her equity compensation mix. This finding suggests that managers may forego employee tax-favoured stock options when firms are expecting a high tax rate.[43]

6.5 Specification checks

Fixed effects model

The effect of corporate tax planning and managerial power on equity compensation structure is also estimated in a fixed effects model. The fixed effects model controls for the effects of firm-specific correlated omitted variables, such as shareholders' preference for upward potential but not downside risk or shareholders' preference to use the same compensation structure as their peer or other firm-specific correlated omitted variables that exist in the cross-sectional panel data. This model will also alleviate concerns about my pooled estimation results being potentially driven by a lack of independence of observations within firms (WWAC, n.d).

[Table 7 about here.]

With this model, the results are more consistent with the directional predictions. The estimated coefficients on expected corporate marginal tax rate (HIGH_TAX_V) and managerial power (POWER) are consistent with predictions and statistically significant at the 1 percent level using the full sample (See column (1) of Table 7. ($\beta_1 = +0.043, t = +2.65$ and $\beta_2^1 = -0.036, t = -5.32$)). The estimated coefficient on the interaction term (HIGH_TAX_V*POWER) is negative as predicted but fails to reach statistical significance ($\beta_3^1 = -0.01, t = -1.04$). The estimated coefficient on EPS is positive and weakly significant at 10 percent level ($\beta_2^2 = +0.049, t = +1.30$) and the estimated coefficient on

[43] I run F-tests to validate the predictive ability of the unrestricted regression model for both full and family firms sample. The overall F statistic is significant at the one percent level. Therefore, the null hypothesis that all the variables of interest simultaneously have no effect on the RSU ratio can be rejected.

the interaction term (HIGH_TAX_V*EPS) is negative as predicted but is not statistically different from zero ($\beta_3^2 = -0.049, t = -0.83$).

In column (2) of Table 7, the results of a fixed effects model using non-family run firm subsample are presented. The directions of the estimated coefficients are generally consistent with the predictions and statistically significant at a 5 percent level, except that of EPS, whose coefficient is opposite of the prediction but lacks statistical significance. The coefficients on HIGH_TAX_V and HIGH_TAX_V*EPS also are not statistically different from zero. The results consistently support H2 and H3 predictions. The individual executive power does not seem to have a significant effect on his/her equity compensation mix based on the estimated coefficients on EPS. The results suggest that when firms have stronger boards, firms facing a higher tax status use the corporate tax-deductible RSUs to a greater extent relative to firms facing a lower tax status, consistent with corporate tax planning hypothesis; such corporate tax planning is not evident when firms have weak boards, showing a sign of executive's influence on equity compensation mix.[44]

In this study, I assume that senior executives within the same firm face similar personal tax incentives, which may not be accurate. Thus, in the next section (Section 6.6), I reestimate Equation (2) using a fixed effects model for the subsample of CEOs to alleviate the concern of the differences in personal tax incentives among different levels of executives within a firm.

[44] I validate the unrestricted model using F-tests. Consistently, the F statistics are significant at the one percent level, rejecting the null hypothesis that all the explanatory variables are simultaneously zero; however, I cannot reject the null hypothesis that EPS and HIGH_TAX_V*EPS are zero. The predictive ability of the unrestricted model may not extend to the inclusion of individual executive power proxy within the firm. Additionally, an F-test (untabulated) reveals the difference between the coefficients on POWER and HIGH_TAX_V*POWER is not statistically different from zero.

One noteworthy observation from the results presented in Table 7 is that the estimates of HIGH_TAX_V and POWER presented in column (1) are statistically significant using the full sample whereas the estimates of POWER and the interaction term HIGH_TAX_V*POWER presented in column (2) are statistically significant using the non-family firm subsample. I speculate that the results are different due to the significant variation in POWER measures between two dependent groups. The summary statistics shown in Table 3 Panel A and B of two groups affirm such speculation. Because the POWER variable has a higher degree of variation, albeit slow change across time within a firm, compared to HIGH_TAX_V in this regression, the POWER variable may be driving the results. To test this assertion, I provide additional analysis in Section 6.6 reclassifying both tax incentives and managerial power as categorical variables.

In summary, a fixed effects model using a non-family run firm subsample provides results that are consistent with the hypothesis that managerial power (or weak boards of directors) may hinder effective corporate tax planning despite a firm's high corporate tax status. The empirical evidence is not consistent with the view that firms' tax incentives alone determines executive equity compensation structure. The difference in managerial power measures between the family firms and non-family firms is significant and thus result in differences in estimates and inferences.

6.6 Additional analyses

I conduct additional analyses intended to provide a richer understanding of the relation between the RSU ratio and corporate tax planning, and how managerial power affects this relation. Specifically, I examine whether (1) firms increase the use of corporate tax-deductible RSUs when tax incentives are high despite managers' potential influence, (2) the

primary results are robust to the corporate marginal tax rate as an alternative independent variable because corporate marginal tax rates are known to improve the understanding of compensation and tax strategy, and (3) CEO-only/CFO-only/Other Executive-only subsamples alleviate any differing personal tax incentives among top executives within a firm.

To avoid the concerns that the corporate marginal tax rates and managerial power variables are slow changing over time and within-firm variation is also minimal, I redefine the tax variable, MTR, as follows. I recompute MTR_V, a corporate tax planning variable, as an indicator variable TOP_TAX, taking the value of 1 for observations with MTR_V in the top quintile, and zero otherwise. Similarly, I create an indicator variable, HIGH_POWER, taking the value of 1 for observations with POWER in the top quintile, and zero otherwise. To be consistent with the HIGH_POWER classification, I also follow a similar procedure for Executive Pay Slice, resulting in HIGH_Executive Pay Slice ("HIGH_EPS"), an indicator variable, taking the value of 1 for observations with EPS in the top quintile, and zero otherwise.

I next estimate the modified version of Equation (1) by incorporating TOP_TAX and HIGH_POWER explanatory variables resulting in Equation (2) as follows:

$$\mathbf{RSU\_ratio_{i,j,t}} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\mathbf{TOP\_TAX_{i,j,t+3}} + \boldsymbol{\beta_2}\mathbf{HIGH\_POWER_{i,j,t-1}} + \boldsymbol{\beta_3}\mathbf{TOP\_TAX_{i,j,t+3}} * \mathbf{HIGH\_POWER_{i,j,t-1}} + \sum_{i=4}^{n} \boldsymbol{\beta_i}\,\mathbf{Controls} + \boldsymbol{\varepsilon_{i,j,t}}$$

Equation (2)

Equation (2) provides increased test power by creating a greater difference in expected corporate marginal tax rates and managerial power.[45]

To provide some insight into the relation between the RSU ratio and the expected corporate tax rates and managerial power levels, I present the RSU ratio across corporate tax rates and managerial power levels for the non-family firm subsample in Table 8. The mean value of the RSU ratio is 0.359 (0.469) for non-family firms expecting a high (low) tax rate. This finding is interpreted as the corporate tax rates have a negative association with the RSU ratio, not consistent with my prediction in H1. The mean value of the RSU ratio is 0.457 (0.445) for firms showing higher (lower) executive power in the non-family firm subsample. The mean value of the RSU ratio is 0.474 (0.441) for firms showing higher (lower) executive pay slice in the non-family firm subsample.

[Table 8 about here.]

I next estimate the Equation (2) using a firm fixed effects model with all non-family executive observations. The results are presented in Table 9.

[Table 9 about here.]

Results of estimating Equation (2) are similar to prior results. However, it is noteworthy that the coefficient on HIGH_POWER is negative and weakly significant at 10 percent level ($\beta_2^1 = -0.02, t = -1.28$), consistent with H2, and the coefficient on HIGH_EPS is positive and statistically significant at 5 percent level ($\beta_2^2 = +0.02, t = +1.95$), opposite to H2 prediction. Such inconsistent findings on the effect of POWER on the RSU ratio may be as a result of top executives with differing personal tax incentives. This firm fixed effects model shown in column (1) supports H3 that managerial power

[45] For instance, executive power level may shift from the lowest to the highest when new executives bring in more expertise (and hence, the board relies more on executives). Managers, therefore, may have power to negotiate equity compensation package of their preference.

weakens the impact of corporate tax planning on the RSU ratio. Additionally, the directions of the control variables are consistent with findings in the prior literature except that of stock performance. Since expected higher stock performance increases the probability of stock options being in the money, it is not surprising to observe a negative coefficient.

In summary, results indicate that high powered managers are more likely to be involved in creating their equity compensation design, and thus, weak corporate governance may hinder firms from using the most tax efficient compensation components, holding all else constant.

To alleviate the concern of the differences in personal tax incentives among different levels of executives within a firm, as previously discussed, I next reestimate Equation (2) using the subsamples of CEOs, CFOs, and other executives. I first present the summary statistics of the RSU ratios of CEO, CFO, and other executive subsamples across the corporate tax rates (high versus low) and managerial power level (high versus low) in Table 10. The mean value of the RSU ratio is 0.369 (0.487) for firms of the CEO subsample expecting a high (low) tax rate. The mean value of the RSU ratio is 0.331 (0.468) for firms of the CFO subsample expecting a high (low) tax rate. The mean value of the RSU ratio is 0.365 (0.464) for firms of the other executive subsample expecting a high (low) tax rate. These findings are interpreted as the corporate tax rates have a negative association with the RSU ratio, not consistent with my prediction in H1, across all subsamples. The mean value of the RSU ratio is 0.491 (0.456) for firms showing higher (lower) executive power in the CEO subsample. The mean value of the RSU ratio is 0.435 (0.441) for firms showing higher (lower) executive power in the CFO subsample. The mean value of the RSU ratio is 0.454 (0.442) for firms showing higher (lower) executive power in the other executive subsample.

Except the CFO subsample, the findings are not consistent with my prediction in H2. The mean value of the RSU ratio is 0.307 (0.485) for firms showing higher (lower) executive pay slice in the CEO subsample. The mean value of the RSU ratio is 0.207 (0.446) for firms showing higher (lower) executive pay slice in the CFO subsample. The mean value of the RSU ratio is 0.446 (0.444) for firms showing higher (lower) executive pay slice in the other executive subsample. The findings are consistent with my prediction in H2, except in the case of the other executive subsample.

[Table 10 about here.]

The results of estimating Equation (2) are reported in Table 11. Column (1) reports the results using the CEOs subsample, column (2) reports the results using the CFO subsample and column (3) reports the results using the other executives subsample.

[Table 11 about here]

The empirical evidence supports the assertion that managerial power weakens the effect of corporate tax planning on RSU ratio, albeit with weak t-statistics. The weak results may be due to a small number of observations (about 670 executive-year observations) in the CEO and CFO subsamples. The results using CEO only and CFO only subsamples do not show inconsistent directions on managerial power measures (POWER and EPS), supporting my previous conjecture that top executives may have differing personal tax incentives. The results on Other Executive only subsample share similar issues reported in Table 9. A take away from these findings is that future research should consider differences in individual tax incentives among top executives.

6.7 Monitoring costs

In this section, I include firm-specific idiosyncratic risk to operationalize the monitoring costs, following Core and Guay (1999). Prior literature, particularly Core and Guay (1999), contends that the level of executive equity compensation grant can be explained by firm and executive-specific economic determinants, such as firm size, growth opportunities, monitoring costs, and executive risk preference measured by executive tenure. In their study, Core and Guay (1999) use idiosyncratic risk as a measure of monitoring costs. I control for firm-specific risk, measured by the variance of the residuals from a 36-month market model in the year prior to the equity grant, following Core and Guay (1999). Prior studies (e.g., May 1995; Guay 1999; Bova et al. 2014) find that idiosyncratic risk has a negative association with employee stock holdings and a positive association with option holdings. I assume that current grants are a proxy for executive equity holdings and predict a positive association with idiosyncratic risk and the RSU ratio. I find the correlation between idiosyncratic risk and stock performance high (about -0.41) due to their similar construct (untabulated).

I next present the summary statistics of the RSU ratios of the reduced subsample across the corporate tax rates (high versus low) and managerial power level (high versus low) in Table 12. The mean value of the RSU ratio is 0.435 (0.512) for firms expecting a high (low) tax rate. These findings are interpreted as the corporate tax rates have a negative association with the RSU ratio, not consistent with my prediction in H1. The mean value of the RSU ratio is 0.528 (0.492) for firms showing higher (lower) executive power. The mean value of the RSU ratio is 0.524 (0.494) for firms showing higher (lower) executive pay slice. The findings are not consistent with my prediction in H2.

I reestimate Equation (2) using a firm fixed effects model. Results tabulated in column (1) of Table 13 show that idiosyncratic risk has a significant positive association with the RSU ratio as predicted ($coefficient = +0.024;\ t-stat = +1.75$), while previous inferences do not change significantly.

[Table 12 about here.]

[Table 13 about here.]

6.8 Shareholder Activism

In this section, I consider how shareholder activism influences corporate tax planning via shareholders' power, as an opposing force to managerial power. Shareholder activism[46] is defined as the active monitoring of traditionally passive large investors by submitting shareholder proposals during proxy seasons (Smith 1996). Prior literature (e.g., Ferri and Sandino 2009) finds that shareholder activism, measured by the presence of a shareholder proposal on employee stock option expensing, affects compensation practices and leads firms to expense employee stock options during the 2003 and 2004 proxy seasons using a sample of U.S. firms. Therefore, the presence of a shareholder proposal on executive compensation may constrain firms on the level and form of executive compensation because it indicates increased monitoring on executive compensation by the large shareholders. I hand-collected my sample firms targeted by executive compensation proposals using the data made available by the Shareholder Association for Research & Education (SHARE) in Canada. In some years, only 25 sample firms are targeted. Unlike Gillian and Starks (2000), I did not identify whether the executive compensation proposals were submitted by the large shareholders and whether the proposals were successfully passed. I simply use an indicator variable assigned

[46] This test follows from a suggestion by faculty, summarized in my proposal letter, to examine the effect of shareholder activism.

as one for the presence of shareholder proposals related to executive compensation in the year prior to the grant year ($t-1$), and zero otherwise. I expect a positive association between the executive compensation structure and shareholder activism because the presence of the shareholder activism may constrain the impact of managerial power on the executive equity mix. The correlation between the shareholder activism proxy and managerial power proxies are negative (untabulated). I reestimate Equation (2) using a firm fixed effects model. The results tabulated in column 2 of Table 13 show that the presence of shareholder activism has a significant positive association with the RSU ratio as predicted ($coefficient = +0.044;\ t-stat = +2.04$), but inferences do not change significantly.

To test whether the results reported in Table 13 are not due to the change in the sample composition, I reestimate Equation (2) using a fixed effects model, the same sample composition as in Table 13's regression model, and HIGH_TAX_V as the corporate tax planning proxy without controlling for idiosyncratic risk and shareholder activism. The results (untabulated) are similar when the regression model includes idiosyncratic risk and shareholder activism as control variables. The results support H1 and H2, and weakly support H3. The coefficient on HIGH_EPS is consistently positive and significant, indicating that individual tax incentives may differ among top executives.

I also reestimate Equation (2) using a firm fixed model and employing bootstrap standard errors by replacing the independent indicator variables in Equation (2) (i.e., TOP_TAX/HMTR_V, POWER, and EPS) with representative continuous variables. Specifically, when HMTR_V is equal to one (zero), I assign a 30% (9%) corporate marginal tax rate to represent the highest (lowest) corporate tax rates. When HIGH_POWER is equal to one (zero), I assign the value of -0.9 (+0.55) to represent the interquartile measures of

POWER. When HIGH_EPS is equal to one (zero), I assign the value of 0.23 (0.13) to represent the interquartile measures of EPS (see Panel B of Table 3). The results (untabulated) show that the effect sizes are different, but the inferences remain the same, except in the case of ex ante corporate marginal tax rates, the limitations of which will be discussed later.

In summary, after controlling for idiosyncratic risk and shareholder activism, the results are consistent with the hypotheses that both corporate tax planning and managerial power affect the RSU ratio, and the expected mitigating effect of managerial power on the relation between RSU ratio and corporate tax planning is observed when firms have weak boards.

6.9 Discussion on the limitation of using ex ante corporate marginal tax rates

The caveats of using the simulated expected corporate marginal tax rates are as follows. As shown in Panel A of Table 3, the simulated corporate marginal tax rates of the sample firms at the vesting year range from 0 to 31% during my sample period. Both Canadian employers and employees prefer employee tax-favoured stock options when the expected corporate marginal tax rates are below 33%, which is demonstrated in Inequality (2) of Appendix B. Given the range of corporate marginal tax rates used in this study, corporate marginal tax rates are not high enough to provide corporate tax incentives in using a greater extent of corporate tax-deductible RSUs in executive compensation packages. Thus, it is expected not to observe the relation between corporate tax planning and the executive equity mix when the corporate marginal tax rates are used as a corporate tax planning proxy. Another limitation is the measurement error associated with the corporate marginal tax rate simulation. As previously explained in Section 5.3.3, computing the corporate marginal tax

rates at the vesting year requires the simulation of a stream of future taxable income and the extrapolation of future interest rates and statutory tax rates up to 26 years. Compared to trichotomous measures of corporate tax status, which require the simulation of future taxable income up to three years as described in Section 5.3.2, the expected corporate marginal tax rates are noisy and could be perceived as less reliable than corporate tax statuses. Because of these reasons, the results based on simulated corporate marginal tax rates are not as robust as those based on the trichotomous measures of the expected corporate tax status, and the inferences may not be reliable.

6.10 Conclusions

In summary, evidence presented in this chapter is generally consistent with the view that the executive equity compensation structure can be explained by both corporate tax planning and managerial power. The empirical results also support that a greater level of tax incentives may go to managers when the board is weak. The evidence is generally consistent with predictions among non-family run firms inferring that managerial power of family firm's executives may not be captured by conventional proxies.

Chapter 7

Conclusion

This paper examines the incremental predictability of tax planning and executive power on the design of equity compensation after controlling for economic determinants of compensation structure. The mix of tax-deductible RSUs and employee tax-favoured options is considered a representation of equity compensation structure as a result of the tension between executive preference and firms' tax incentives.

The RSU ratio is regressed on corporate tax planning and managerial power proxies while controlling for cash constraints, dividend payout, earnings volatility, stock volatility, bankruptcy risk, firm size, stock performance, growth opportunities, idiosyncratic risk, and the presence of shareholder activism. The empirical results support that managerial power explains the mix of tax-deductible RSUs and employee tax-favoured options granted to executives, particularly among firms that have weaker boards. The results indicate that Canadian tax policy that treats the RSUs and stock options differently affects how firms determine the equity compensation mix, and weak boards may increase the effect size of managerial power.

The study contributes to the literature on the determinants of executive equity compensation structure by providing evidence consistent with managers influencing their own compensation structure and differences in tax consequences at the firm and employee level may provide managers with a high tax incentive to do so. The evidence in this paper is particularly pertinent in light of recent Canadian tax policy discussion that questions the benefits of tax incentives at the employee level for stock option grants.

Bibliography

Abernethy, M. A., Y. F. Kuang, and B. Qin. 2015. The influence of CEO power on compensation contract design. *The Accounting Review 90*(4): 1265-1306.

Altman, E. I. 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance 23*(4): 589-609.

Amiram, D., A. M. Bauer, and M. M. Frank. 2017. Tax Avoidance at Public Corporations Driven by Shareholder Demand: Evidence from Changes in Shareholder Dividend Tax Policy. Darden Business School Working Paper No. 2111467. Available at SSRN: https://doi.org/10.2139/ssrn.2111467

Babenko, I., and Y. Tserlukevich. 2009. Analyzing the tax benefits from employee stock options. *The Journal of Finance 64*(4): 1797-1825.

Bebchuk, L. A., K.M. Cremers, and U.C. Peyer. 2011. The CEO pay slice. *Journal of Financial Economics 102*(1): 199-221.

Bebchuk, L. A., and J.M. Fried. 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives* 17 (3): 71-92.

Bebchuk, L. A., and J.M. Fried. 2005. Pay without performance: Overview of the issues. *Journal of Corporate Finance* 17 (4): 8-23.

Bebchuk, L. A., J. M. Fried, and D. I. Walker. 2002. Managerial Power and Rent Extraction in the Design of Executive Compensation. *University of Chicago Law Review* 69(3): 751-846.

Belsley, D. A., E. Kuh, and R.E. Welsch. 1980. Regression diagnostics: Identifying influential data and sources of collinearity. New York, NY: Wiley.

Bird, A. 2018. Taxation and executive compensation: Evidence from stock options. *Journal of Financial Economics* 127(2): 285-302.

Blouin, J. L., and M.E. Carter. 2010. The economics of restricted stock and the section 83 (b) election (February 2010). Available at SSRN: https://ssrn.com/abstract=1561923

Blouin, J., J. E. Core, and W. Guay. 2010. Have the tax benefits of debt been overestimated?. *Journal of Financial Economics 98*(2): 195-213.

Bova, F., K. Kolev, J.K. Thomas, and X. F. Zhang. 2014. Non-executive employee ownership and corporate risk. *The Accounting Review 90*(1): 115-145.

Boyle, P. P., R. Jha, S. Kennedy, and W. Tian. 2011. Stock and option proportions in executive compensation. *The Quarterly Journal of Finance 1*(01): 169-203.

Byrd, J. W. and K. A. Hickman. 1992. Do outside directors monitor managers?: Evidence from tender offer bids. *Journal of financial Economics 32*(2): 195-221.

Carter, M. E., L.J. Lynch, and I. Tuna. 2007. The role of accounting in the design of CEO equity compensation. *The Accounting Review 82*(2): 327-357.

Chen, C. R., T. L. Steiner, and A.M. Whyte. 2006. Does stock option-based executive compensation induce risk-taking? An analysis of the banking industry. *Journal of Banking & Finance 30*(3): 915-945.

Colquhoun, N., S. Sweatman, and S. Murtha. 2012. Executive Compensation – Current and Deferred Remuneration Strategies. *2012 British Columbia Tax Conference*, (Toronto: Canadian Tax Foundation, 2012), 6: 1-29

Cook, R. D. 2000. Detection of influential observation in linear regression. *Technometrics* 42 (1): 65-68.

Core, J. E. and W. R. Guay. 1999. The use of equity grants to manage optimal equity incentive levels. *Journal of Accounting and Economics 28*(2): 151-184.

Crosbie, I., E. Roth, R. Juneja, and B. Bloom. 2015 (Oct 29). Will tax treatment for Canadian stock options change. *Retrieved from* https://www.dwpv.com/en/Resources/Publications/2015/Will-Tax-Treatment-for-Canadian-Stock-Options-Change

Davidson, R., and J.G. MacKinnon. 1993. *Estimation and Inference in Econometrics*. New York, NY: Oxford University Press.

Desai, M. A., and D. Dharmapala. 2006. Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics 79*(1): 145-179.

Desai, M. A., and D. Dharmapala. 2009. Corporate tax avoidance and firm value. *The Review of Economics and Statistics 91*(3): 537-546.

Desai, M. A., A. Dyck, and L. Zingales. 2007. Theft and taxes. *Journal of financial economics*, *84*(3): 591-623.

Devers, C. E., R.M. Wiseman, and R.M. Holmes. 2007. The effects of endowment and loss aversion in managerial stock option valuation. *Academy of Management Journal 50*(1): 191-208.

Draper, N., and J. John. 1981. Influential Observations and Outliers in Regression. *Technometrics* 23(1): 21-26.

Dyreng, S. D., M. Hanlon, and E.L. Maydew. 2010. The effects of executives on corporate tax avoidance. *The Accounting Review 85*(4): 1163-1189.

Fama, E. 1980. Agency Problems and the Theory of the Firm. *Journal of Political Economy* 88(2): 288-307.

Feltham, G. A., and M.G. Wu. 2001. Incentive efficiency of stock versus options. *Review of Accounting studies 6*(1): 7-28.

Ferreira, M. A., and P. Matos. 2008. The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics 88*(3): 499-533.

Ferri, F., and T. Sandino. 2009. The impact of shareholder activism on financial reporting and compensation: The case of employee stock options expensing. *The Accounting Review 84*(2): 433-466.

Financial Accounting Standards Board (FASB). 2004. *Share-Based Payment*. Statement of Financial Accounting Standards No. 123(R). Norwalk, CT: FASB.

Financial Stability Forum. 2009. *FSF principles for sound compensation practices.* Retrieved from http://www.fsb.org/wp-content/uploads/r_0904b.pdf

Frydman, C., and D. Jenter. 2010. CEO compensation. *National Bureau of Economic Research* (No. w16585).

Frydman, C., and R. S. Molloy. 2011. Does tax policy affect executive compensation? Evidence from postwar tax reforms. *Journal of Public Economics 95*(11): 1425-1437.

García-Ramos, R., and M. García-Olalla. 2011. Board characteristics and firm performance in public founder-and nonfounder-led family businesses. *Journal of Family Business Strategy 2*(4): 220-231.

Geddes, G. J. 2009. Executive Pay Packages: Compensation Planning in Light of Increased Scrutiny, Report of Proceedings of Sixty-First Tax Conference, 2009 Conference Report (Toronto: Canadian Tax Foundation 2010), 31:1-25. *Gowling Lafleur Henderson LLP. Retrieved from* https://www.gowlings.com/knowledgeCentre/publicationPDFs/Executive%20Pay%20Packages%20Compensation%20Planning.pdf on June 13, 2015.

Geddes, G. J. 2010. Cross-border Executive Compensation. *Gowling Lafleur Henderson LLP. Retrieved from* http://www.gowlings.com/knowledgeCentre/publicationPDFs/20100824_2010%20Cross-Boarder%20Comp.pdf on November 23, 2014.

Gerakos, J. 2010. CEO pensions: disclosure, managerial power, and optimal contracting (August 1, 2010). Pension Research Council Working Paper No. WP2007-5. Available at SSRN: https://ssrn.com/abstract=982180

Gillan, S. L., and L.T. Starks. 2000. Corporate governance proposals and shareholder activism: The role of institutional investors. *Journal of Financial Economics*, *57*(2): 275-305.

Gorry, A., K. A. Hassett, R.G. Hubbard, and A. Mathur. 2017. The response of deferred executive compensation to changes in tax rates. *Journal of Public Economics 151*: 28-40.

Graham, J. R. 1996. Proxies for the corporate marginal tax rate. *Journal of Financial Economics 42*(2): 187-221.

Graham, J. R., and Mills, L. F. 2008. Using tax return data to simulate corporate marginal tax rates. *Journal of Accounting and Economics 46*(2): 366-388.

Guay, W. 1999. The sensitivity of CEO wealth to equity risk: An analysis of the magnitude and determinants. *Journal of Financial Economics* 53: 43–71.

Hall, B. J., and J. B. Liebman. 2000. The taxation of executive compensation. *Tax Policy and the Economy 14:* 1-44. MIT Press.

Hall, B. J., and K. J. Murphy. 2002. Stock options for undiversified executives. *Journal of Accounting and Economics 33*(1): 3-42.

Hartzell, J. C., and L. T. Starks. 2003. Institutional investors and executive compensation. *Journal of Finance* 58 (6): 2351–2374.

Hermanson, D. R., J. G. Tompkins, R. Veliyath, and Z. S. Ye. 2012. The Compensation Committee Process. *Contemporary Accounting Research 29*(3): 666-709.

Hodge, F. D., S. Rajgopal, and T. Shevlin. 2009. Do managers value stock options and restricted stock consistent with economic theory?. *Contemporary Accounting Research 26*(3), 899-932.

Jensen, M. C., and W. H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics 3*(4): 305-360.

Kadan, O., and J.M. Swinkels. 2008. Stocks or options? Moral hazard, firm viability, and the design of compensation contracts. *Review of Financial Studies 21*(1): 451-482.

Klassen, K. J., and A. Mawani. 2000. The Impact of Financial and Tax Reporting Incentives on Option Grants to Canadian CEOs*. *Contemporary Accounting Research 17*(2): 227-262.

Lambert, R. A., and D. F. Larcker. 2004. Stock options, restricted stock, and incentives. Available at SSRN: http://ssrn.com/abstract=527822

Lee, J. Y. 2010. Stock Option Plans and Other Equity-Based Incentives. *Osler, Hoskin & Harcourt LLP*. Retrieved from http://www.cba.org/cba/cle/PDF/Lee_Julie_Paper.pdf

Liberal Party of Canada (Liberal Party 2015). A New Plan for a Strong Middle Class. Retrieved from https://www.liberal.ca/files/2015/10/New-plan-for-a-strong-middle-class.pdf

Marquaridt, D. W. 1970. Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. *Technometrics*, *12*(3), 591-612.

Marron, D. B. (October 4, 2017). How Should Tax Reform Treat Employee Stock and Options? The Urban Institute, October 2017. Available at SSRN: https://ssrn.com/abstract=3058954

Matsunaga, S. R. 1995. The effects of financial reporting costs on the use of employee stock options. *The Accounting Review* 70 (1): 1–26.

Matsunaga, S., T. Shevlin, and D. Shores. 1992. Disqualifying dispositions of incentive stock options: Tax benefits versus financial reporting costs. *Journal of Accounting Research* 37-68.

Mawani, A. 2003. Cancellation of Executive Stock Options: Tax and Accounting Income Considerations. *Contemporary Accounting Research 20*(3): 495-517.

May, D. 1995. Do manager motives influence firm risk reduction strategies? *Journal of Finance* 50: 1291– 1308.

Murphy, K. J. 1985. Corporate performance and managerial remuneration. *Journal of Accounting and Economics* 7 (April): 11-42

Murphy, K. J. 2002. Explaining executive compensation: Managerial power versus the perceived cost of stock options. *The University of Chicago Law Review* 847-869.

Murphy, K. J. 2012. Executive compensation: Where we are, and how we got there. *Handbook of the Economics of Finance. Elsevier Science North Holland*.

Oyer, P., and S. Schaefer. 2005. Why do some firms give stock options to all employees?: An empirical examination of alternative theories. *Journal of Financial Economics 76*(1): 99-133.

Plesko, G. A. 2003. An evaluation of alternative measures of corporate tax rates. *Journal of Accounting and Economics 35*(2): 201-226.

Rajgopal, S., and T. Shevlin. 2002. Empirical evidence on the relation between stock option compensation and risk taking. *Journal of Accounting and Economics 33*(2): 145-171.

Scholes, M. and M. Wolfson. 1992. Taxes and Business Strategy: A Planning Approach. Englewood Cliffs, NJ: Prentice Hall.

Scholes, M. S., M. A. Wolfson, M. Erickson, M. Hanlon, E. L. Maydew, and T. Shevlin. 2015. Taxes and Business Strategy: A Planning Approach, 5th Edition. Prentice-Hall, Inc., Upper Saddle River, NJ.

Scotti, M. 2017. Liberals Offer No Timeline on Closing Controversial Stock-Option Tax Loophole. Global News 8 October 2017. Retrieved from globalnews.ca/news/3787605/liberals-tax-changes-stock-option-loophole/

Shackelford, D. A., and T. Shevlin. 2001. Empirical tax research in accounting. *Journal of Accounting and Economics 31*(1): 321-387.

Shevlin, T. 1990. Estimating corporate marginal tax rates with asymmetric tax treatment of gains and losses. *Journal of the American Taxation Association* 11(2): 51-67.

Shleifer, A., and R. W. Vishny. 1997. A survey of corporate governance. *The Journal of Finance* 52 (2):737–783.

Smith, M. P. 1996. Shareholder activism by institutional investors: Evidence from CalPERS. *The Journal of Finance 51*(1): 227-252.

Smith, C. W., and R. L. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics* 32: 263-292.

Spalt, O. G. 2013. Probability weighting and employee stock options. *Journal of Financial and Quantitative analysis*, *48*(4), 1085-1118.

Spizzirri, A. and M. Fullbrook. 2013. The Impact of Family Control on the Share Price Performance of Large Canadian Publicly-Listed Firms (1998-2012). Retrieved from http://www.rotman.utoronto.ca/FacultyAndResearch/ResearchCentres/ClarksonCentreforBoardEffectiveness/Family-Firm-Performance-Study-June-2013

Stikeman Elliott LLP. 2014**.** Executive Compensation Guide for Canadian Officers and Directors (2nd Edition). Retrieved from http://www.stikeman.com/fr/pdf/ExecCompGuide.pdf on January 14, 2015

Sun, L., and M. Widdicks. 2016. Why do employees like to be paid with Options?: A multi-period prospect theory approach. *Journal of Corporate Finance*, *38*, 106-125.

Tedds, L. 2015 (March 30). Repealing the Employee Stock Option Deduction and Unanswered Questions. Retrieved from https://deadfortaxreasons.wordpress.com/2015/03/30/repealing-the-employee-stock-option-deduction-and-unanswered-questions/

Van Essen, M., J. Otten, and E. J. Carberry. 2012. Assessing managerial power theory: A meta-analytic approach to understanding the determinants of CEO compensation. *Journal of Management*

Woodrow Wilson Action Committee (WWAC). n.d. *Fixed Effects Models.* Retrieved from https://www.princeton.edu/wwac/academic-review/stata/effects/

Yermack, D. 1995. Do corporations award CEO stock options effectively? *Journal of Financial Economics 39*(2): 237-269.

Yermack, D. 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics 40*(2): 185-211.

Appendix A

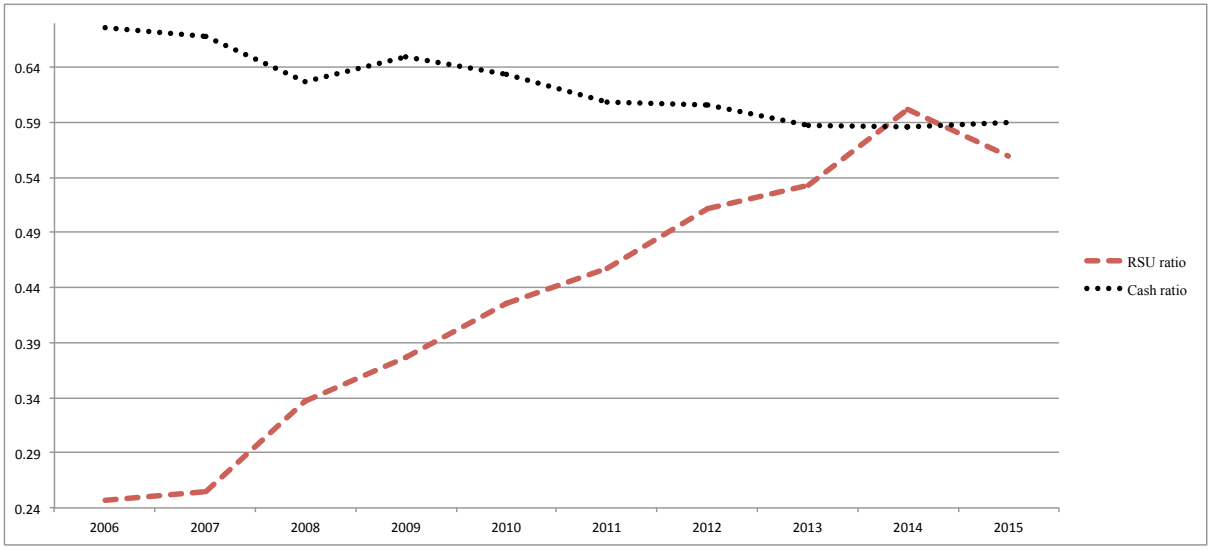
Figures

Figure 1 Classification of Employment-Related Equity Grants Based on Their Tax Consequences

		At the Employee Level	
		100% taxable on employment income	**50% taxable on employment income or "One-half deduction"**
At the Employer Level	**Tax-deductible**	**Tax-deductible grants**[47] **(Group I)** • RSUs or PSUs with cash or repurchased share payout **(25% of total annual compensation)** • Option cancellation with cash payout [48] • SARs with cash payout **(1% of total annual compensation)**;[49] **[26% of total annual compensation]**	
	Non tax-deductible	**Non tax-deductible grants**[50] **(Group III)** • Restricted shares • RSUs or PSUs with newly issued or treasury share payout **[2% of total annual compensation]**	**Option grants (Group II)** • At-the-money stock options (**20.5% of total annual compensation)** • SARs with share payout (no observations) **[20.5% of total annual compensation]**

[47] Salary and annual incentives (bonuses) are typically cash compensation and are corporate tax deductible. The cash amount is included in the employee's taxable income at the grant date.
[48] I do not expect firms grant options expecting employees' option cancellation prior to exercise date. Therefore, the tax consequence of a realized outcome is irrelevant.
[49] Tandem Stock Appreciation Rights (TSARs) account for 1% of total annual compensation, which I do not include in this classification.
[50] In a technical interpretation released by the Canada Revenue Agency (CRA) in 2017, the CRA indicates that it will not deny a corporate tax deduction on the cost of these share-based compensation plans if the employer does not have a legal obligation to issue shares to the employee (see Canada Revenue Agency, Document no 2015-0060941I7, "Share Based Deferred Compensation – Section 7" released on 7 April 2017)

Figure 2 Change in Canadian Executive Compensation Structure During the Sample Period



This figure shows that cash portion of executive compensation, represented by cash compensation divided by total compensation ("Cash ratio"), decreases from approximately 68% between 2006-2007 to approximately 59% of the total compensation later in the sample period (2014-2015). The use of tax-deductible RSUs, computed as RSU grants divided by total equity compensation ("RSU ratio"), increases from 25% during the 2006-2007 period to above 55% of the total equity compensation later in the sample period.

Figure 3 Corporate and Top Marginal Personal Tax Rate Changes Between 2000-2015

This figure illustrates the unique Canadian setting in which corporate statutory tax rate varies across time, using Ontario province as an example. The corporate tax rate in the U.S. does not change during this period.

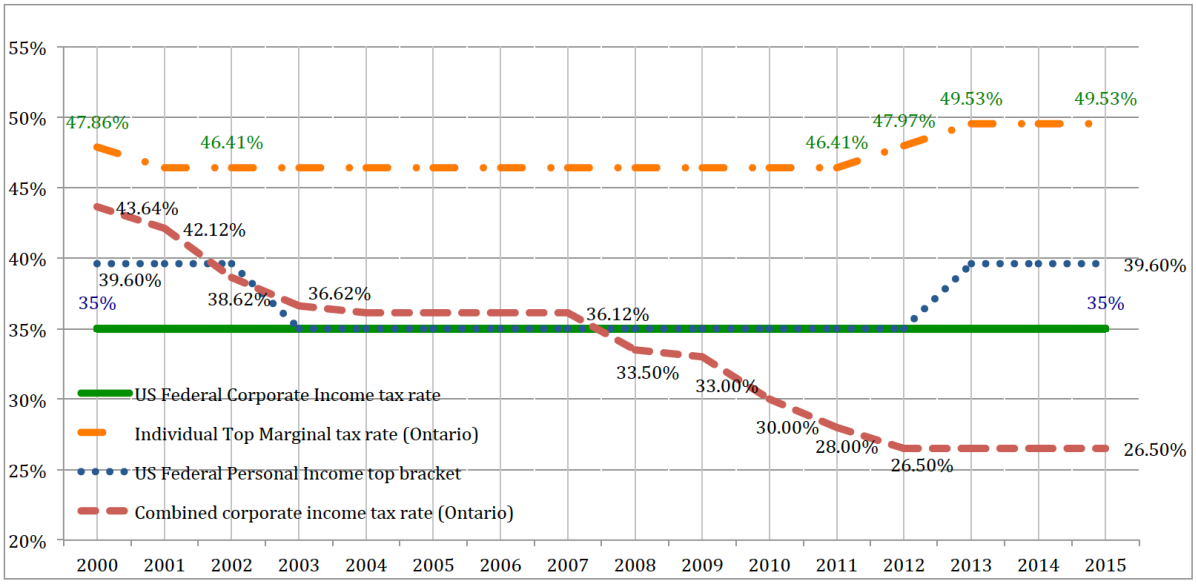


Figure 4 Algorithm to Compute Future Tax Loss Carryforwards (An example)

This figure illustrates how tax loss carryforward for vesting years are computed for the scenario when tax loss carryforward for year t-1 is zero and taxable income for the year t-2, t-1, and t are negative where year t is grant year, the year of interest.

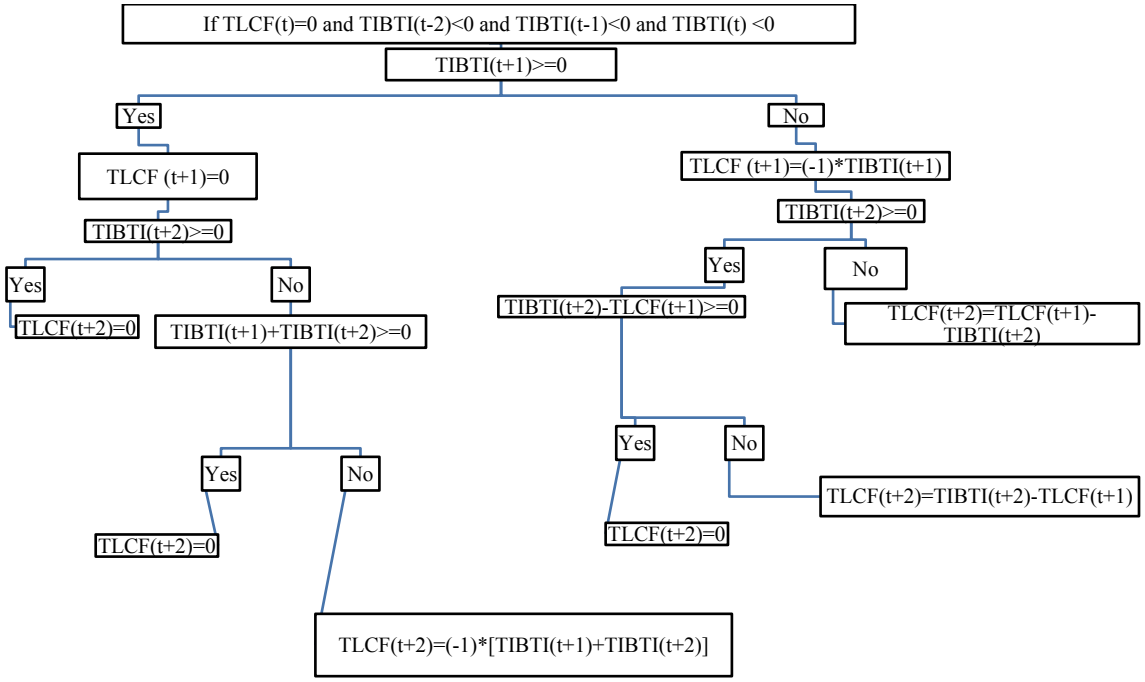
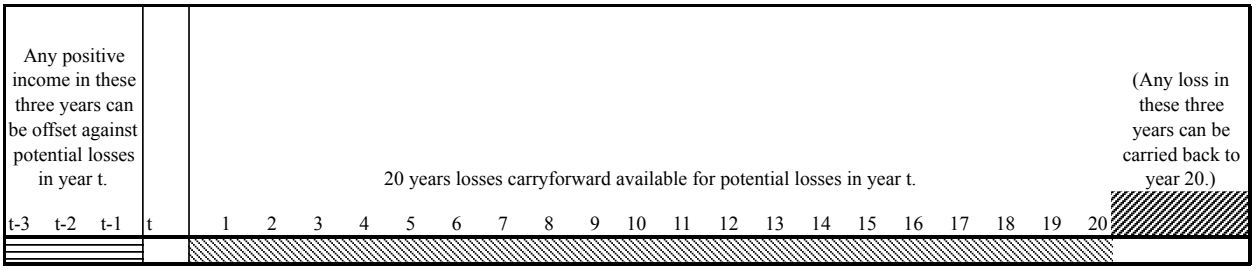


Figure 5 Illustration of Data Requirement to Simulate Corporate Marginal Tax Rate in Canada

This figure explains data requirement to simulate ex ante corporate marginal tax rate in Canada. (a) demonstrates why 23 years of simulated future corporate taxable income are necessary to compute at grant year; (b) demonstrates why 26 years of simulated future corporate taxable income are necessary to compute at vesting year.

(a) This figure explains why 23 years of simulated future corporate taxable income are necessary to compute grant year corporate marginal tax rate in Canada.



(b) This figure explains why 26 years of simulated future corporate taxable income are necessary to compute vesting year corporate marginal tax rate in Canada.

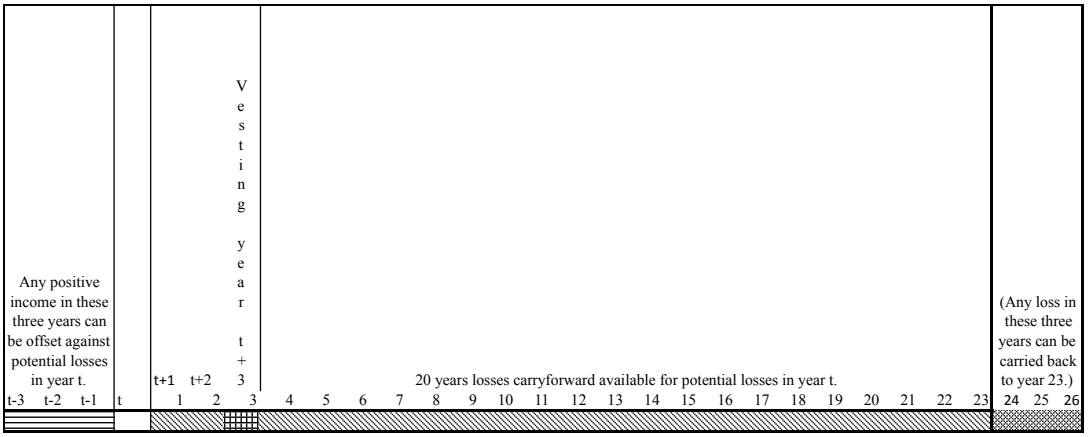
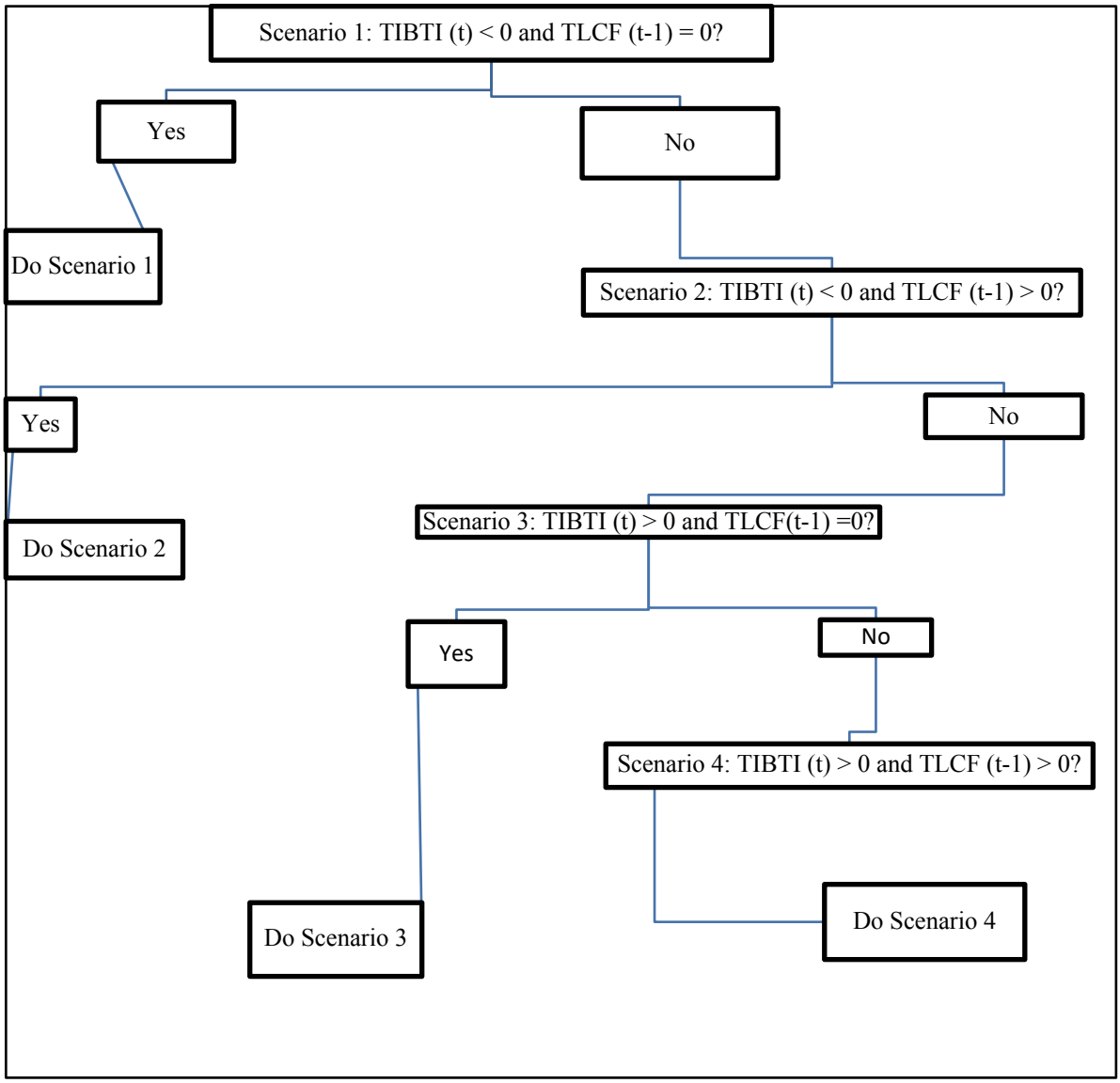


Figure 6 How Corporate Marginal Tax Rate is Computed

This figure illustrates how corporate marginal tax rate is computed based on the existing literature. (a) is the main program, which summarizes four possible combinations of corporate taxable income before taxes and interest and tax loss carryforward. (b)--(e) illustrate how corporate marginal tax rates are computed under four possible scenarios previously stated. Algorithm is adapted by applying Shevlin (1990).

(a) Main Program

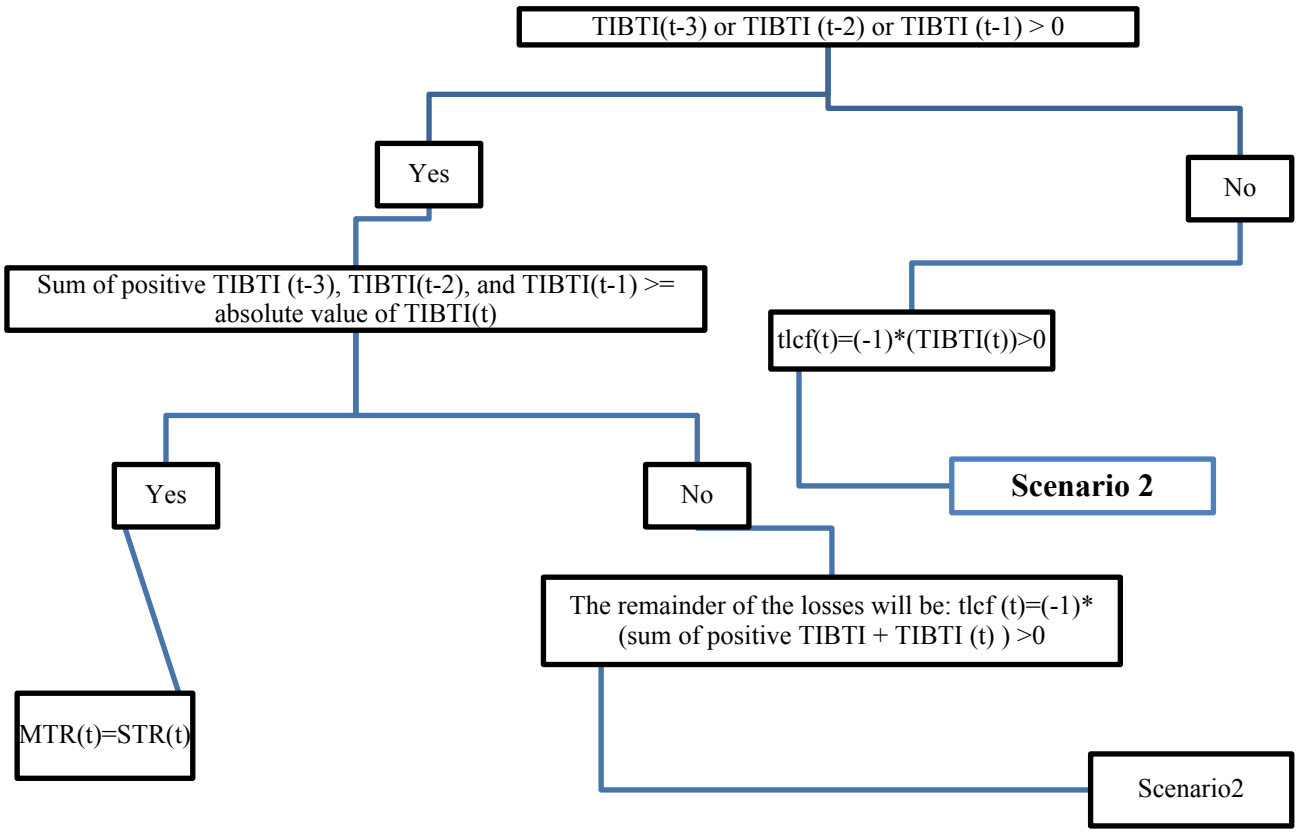


TIBTI (t) = Corporate taxable income before tax and interest at year t;

TLCF(t-1) = tax loss carryforward at the end of year t-1

Figure 6 (continued)

(b) Scenario 1: TIBTI (t) < 0 and TLCF (t-1) = 0



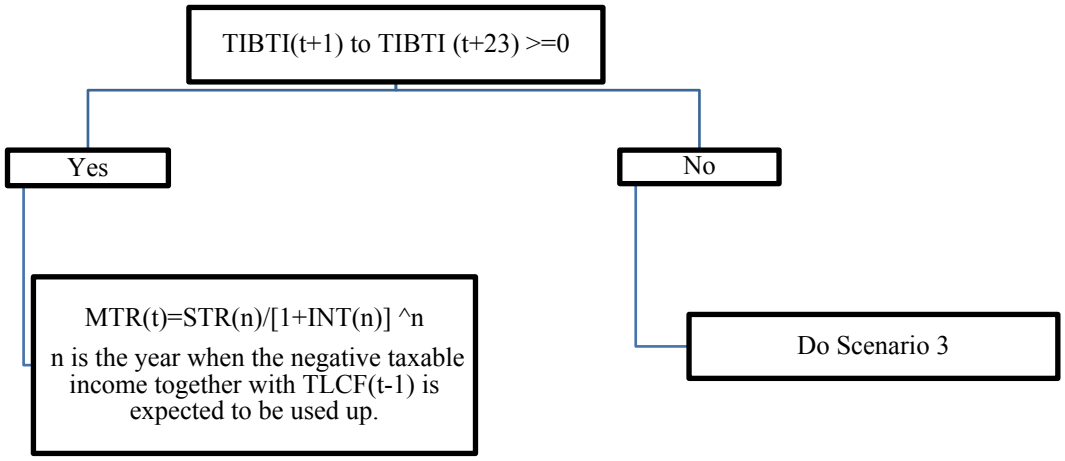
Note:

TIBTI (t) = Corporate taxable income before tax and interest at year t; TLCF(t-1) = tax loss carryforward at year t-1

MTR (t) = simulated corporate marginal tax rate at year t; STR (t) = expected statutory tax rate at year t

Figure 6 (Continued)

(c) Scenario 2: TIBTI (t) < 0 and TLCF (t-1) > 0



Note:

TIBTI (t) = Corporate taxable income before tax and interest at year t

TLCF (t-1) = tax loss carryforward at the end of year t-1

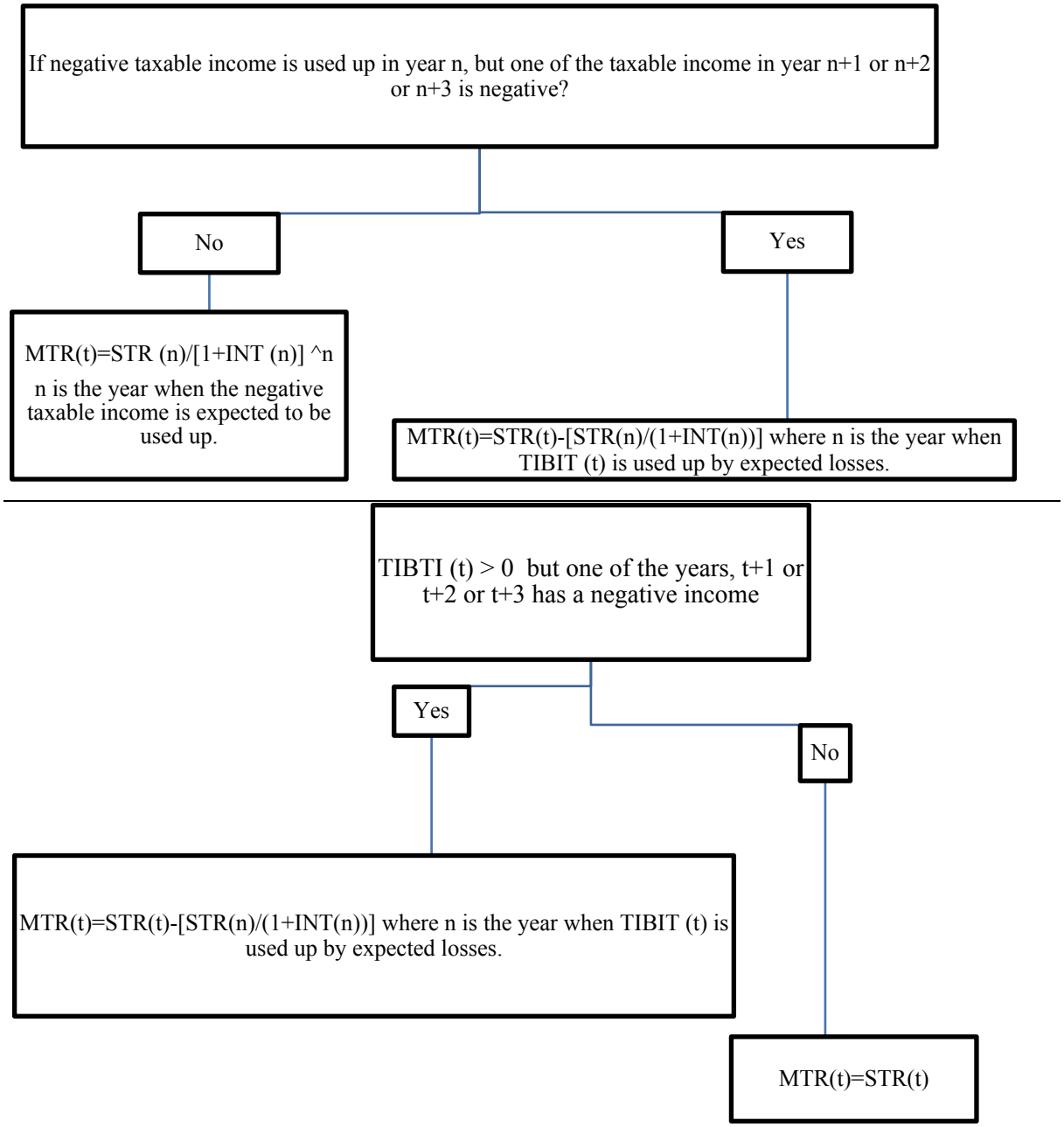
MTR (t) = simulated corporate marginal tax rate at year t

STR (t) = expected statutory tax rate at year t

INT (t) = interest rate at year t, which is the discount rate used to compute the present value of the tax payable

Figure 6 (Continued)

(d) Scenario 3: TIBTI (t) > 0 and TLCF (t-1) = 0

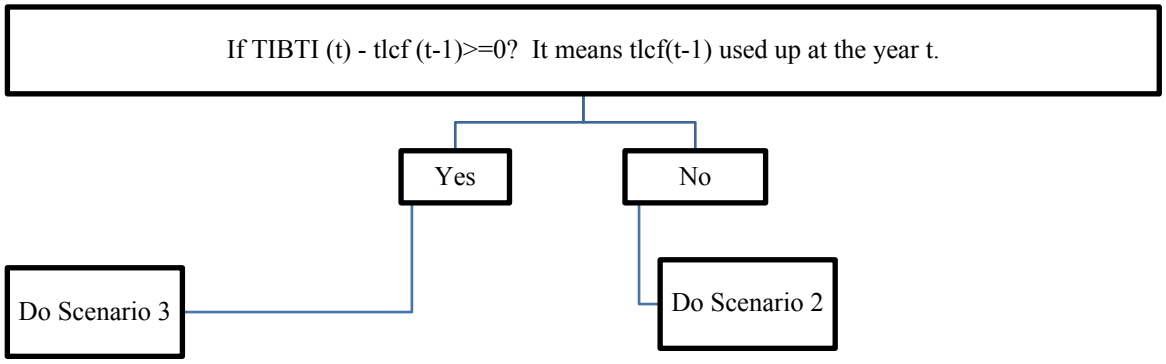


Note:

TIBTI (t) = Corporate taxable income before tax and interest at year t
TLCF (t-1) = tax loss carryforward at the end of year t-1
MTR (t) = simulated corporate marginal tax rate at year t
STR (t) = expected statutory tax rate at year t
INT (t) = interest rate at year t, which is the discount rate used to compute the present value of the tax payable

Figure 6 (Continued)

(e) Scenario 4: TIBTI (t) > 0 and TLCF (t-1) > 0



Note:

TIBTI (t) = Corporate taxable income before tax and interest at year t

TLCF (t-1) = tax loss carryforward at the end of year t-1

MTR (t) = simulated corporate marginal tax rate at year t

STR (t) = expected statutory tax rate at year t

INT (t) = interest rate at year t, which is the discount rate used to compute the present value of the tax payable

Appendix B
A Simplified Tax Incentive Model

To explain corporate tax incentives to use the corporate tax-deductible RSUs, I present the following algebraic model. I assume t_c as the expected corporate marginal tax rate at the vesting year; t_p as the top marginal personal tax rate at the vesting year. The stock price at the exercise or vesting date is P. The exercise price is X, and the number of stock option units is N. I also assume that the expected payout on an RSU grant is the same as the expected payout on a stock option grant, i.e., $P = N * (P - X)$.

I estimate the vesting date value of after-tax cost to the employer and after-tax value to the employee of various equity-based grants in the U.S. and Canada by applying respective tax policies. The second (third) column of Table B.1 presents the after-tax cost to the employer and after-tax value to the employee of the most prevalently used equity-based grants in the U.S. (Canada).

Table B.1 Comparing After-tax Costs of Various Equity Grants Across U.S. and Canadian Tax Regimes

Panel A: RSUs with payout in cash or repurchased shares (GROUP I)

	U.S. (1)	CANADA (1)
After-tax cost to the employer	$P * (1 - t_c)$	$P * (1 - t_c)$
After-tax value to the employee	$P * (1 - t_p)$	$P * (1 - t_p)$

Panel B: Stock options (GROUP II)

	U.S. (2)	CANADA (2)
After-tax cost to the employer	$N * (P - X) * (1 - t_c)$	$N * (P - X)$
After-tax value to the employee	$N * (P - X) * (1 - t_p)$	$N * (P - X) * (1 - 0.5t_p)$

Panel C: Restricted shares/RSUs with payout in newly issued or treasury shares (GROUP III)

	U.S. (3)	CANADA (3)
After-tax cost to the employer	$P * (1 - t_c)$	P
After-tax value to the employee	$P * (1 - t_p)$	$P * (1 - t_p)$

From the employer's perspective, on the exercise date (assuming the exercise date is the same as the vesting date), firms will prefer tax-deductible RSUs over employee tax-favoured stock options in Canada if:

$$\frac{max\ (N * (P - X), 0)(1 - 0.5\mathrm{t}_p)}{max(N * (P - X),0)} < \frac{\mathrm{P} * \ (1 - \mathrm{t}_p)}{\mathrm{P} * (1 - \mathrm{t}_c)}$$

(Inequality 1)

The left-hand side of the inequality $\frac{max\ (N*(P-X),0)(1-0.5\mathrm{t}_p)}{max(N*(P-X),0)}$ represents the ratio of the after-tax value of the stock options to the employee to the after-tax cost of the stock options to the employer. The right-hand side of the inequality $\frac{\mathrm{P}*\ (1-\mathrm{t}_p)}{\mathrm{P}*(1-\mathrm{t}_c)}$ represents the ratio of the after-tax value of the RSUs to the employee to the after-tax cost of RSUs to the employer. The above inequality can be simplified into

$$t_c > \frac{0.5\mathrm{t}_p}{1 - 0.5\ \mathrm{t}_p}$$

(Inequality 2)

Therefore, if $t_c > \frac{0.5\mathrm{t}_p}{1-0.5\mathrm{t}_p}$, the employer will prefer tax-deductible RSUs. The employee will be indifferent between the employee tax-favoured stock options and corporate tax-deductible RSUs if the expected after-tax value of employee tax-favoured stock options is the same as that of corporate tax-deductible RSUs.

Based on Inequality (2), it can also be observed that the employer's and employee's choices depend on their marginal tax rates. Since the personal marginal tax rate of highly paid executives is typically in the top tax bracket and does not change much, the choice between RSUs and stock options depends on the corporate marginal tax rate at the vesting or exercise date. It can be concluded that Canadian firms that are expecting corporate marginal tax rate above 32.89% will prefer corporate tax-deductible RSUs.

To demonstrate how tax policies and individual and corporate marginal tax rates affect the after-tax cost to the employer, I present the after-tax cost of various equity-based instruments at various corporate marginal tax rates, applying current tax policies in the U.S. and Canada. As explained in Chapter 2 of this study, the U.S. tax policies on various equity-based instruments are similar, whereas current Canadian tax policies on two main equity-based components vastly differ.

Table B.2 presents the after-tax costs of various equity-based instruments in Canada at the expected corporate marginal tax rates 0%, 10%, 20%, 30% and 36.1%, holding the after-tax value to the employee constant at $100 and the expected personal marginal tax rate at 49.5% (the highest combined federal and provincial personal tax rate in Ontario).

Appendix B (continued)

The after-tax cost of tax-deductible RSUs (see Panel A, Table B.2) increases with decreasing corporate marginal tax rates under the Canadian tax regime, i.e., $127 at 36.1% to $198 at 0%. However, the after-tax cost of other equity grants does not change with the corporate marginal tax rate because these instruments are not tax-deductible at the employer level. Furthermore, the after-tax cost of corporate tax-deductible RSUs is lower than the after-tax cost of employee tax-favoured stock options when a firm is expecting a high corporate marginal tax rate, i.e., $127 vs. $133 at the corporate marginal tax rate 36.1%.

In summary, firms expecting a high corporate marginal tax rate prefer corporate tax-deductible RSUs to employee tax-favoured stock options.

Table B.2 After-tax costs of Various Equity Grants in Canada

Panel A: RSUs with payout in cash or repurchased shares (GROUP I)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	0.0%	10.0%	20.0%	30.0%	36.1%
Expected Personal Marginal Tax Rate	49.5%	49.5%	49.5%	49.5%	49.5%
After-tax cost to the employer	$198	$178	$159	$139	$127
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$98**	**$78**	**$59**	**$39**	**$27**

Panel B: Stock options (GROUP II)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	0.0%	10.0%	20.0%	30.0%	36.1%
Expected Personal Marginal Tax Rate	49.5%	49.5%	49.5%	49.5%	49.5%
After-tax cost to the employer	$133	$133	$133	$133	$133
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$33**	**$33**	**$33**	**$33**	**$33**

Panel C: Restricted shares/ RSUs with payout in newly issued or treasury shares (GROUP III)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	0.0%	10.0%	20.0%	30.0%	36.1%
Expected Personal Marginal Tax Rate	49.5%	49.5%	49.5%	49.5%	49.5%
After-tax cost to the employer	$198	$198	$198	$198	$198
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$98**	**$98**	**$98**	**$98**	**$98**

Appendix B (continued)

Table A.3 presents the after-tax costs of various equity-based instruments in the U.S. at the expected corporate marginal tax rates 0%, 10%, 20%, 30% and 35%, holding the after-tax value to the employee constant at $100 and the expected personal marginal tax rate at 39.6%. The after-tax cost of equity-based instruments increases from $108 to $166 when corporate marginal tax rate decreases from 35% to 0%. As a result of similar tax treatments among all equity-based instruments, i.e., the compensation expense related to any equity grants is tax-deductible at the employer level, and the payout from any equity grants is taxed at the employee level when these equity grants vest, the after-tax costs to the employer does not change across equity grants.

In summary, since the after-tax cost of equity grants does not change across equity grants, firms may be indifferent on the choice of equity types.

Table B.3 After-tax Costs of Various Equity Grants in the U.S (A Numerical Example)

Panel A: RSUs with payout in cash or repurchased shares (GROUP I)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	**0%**	**10%**	**20%**	**30%**	**35%**
Expected Personal Marginal Tax Rate	**39.5%**	**39.5%**	**39.5%**	**39.5%**	**39.5%**
After-tax cost to the employer	$166	$149	$132	$116	$108
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$66**	**$49**	**$32**	**$16**	**$8**

Panel B: Stock options (GROUP II)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	**0%**	**10%**	**20%**	**30%**	**35%**
Expected Personal Marginal Tax Rate	**39.5%**	**39.5%**	**39.5%**	**39.5%**	**39.5%**
After-tax cost to the employer	$166	$149	$132	$116	$108
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$66**	**$49**	**$32**	**$16**	**$8**

Panel C: Restricted shares/ RSUs with payout in newly issued or treasury shares (GROUP III)

	(1)	(2)	(3)	(4)	(5)
Expected Corporate Marginal Tax Rate	**0%**	**10%**	**20%**	**30%**	**35%**
Expected Personal Marginal Tax Rate	**39.5%**	**39.5%**	**39.5%**	**39.5%**	**39.5%**
After-tax cost to the employer	$166	$149	$132	$116	$108
After-tax value to the employee constant	$100	$100	$100	$100	$100
Joint tax to the government at vesting	**$66**	**$49**	**$32**	**$16**	**$8**

Summary and conclusions

The after-tax costs of equity grants differ because of differential tax treatments at the employer and employee levels in Canada. Firms expecting a higher corporate marginal tax rate at the vesting year have the opportunity to lower the after-tax compensation cost by using corporate tax deductible RSUs. Thus, I posit that the proportion of the corporate tax-deductible RSUs in executive equity-based compensation increases with increasing corporate marginal tax rate among Canadian firms.

Appendix C
Procedure to Simulate a Stream of Future Corporate Taxable Income Using a Non-Parametric Model

The following is the outline of the procedure that I used to simulate future taxable income. This procedure is a modified version of the procedure used in the study of Blouin et al. (2010).

Step 1:

The first step computes corporate taxable income $TIBTI_t$ described in section 5.3.1 and the *Average total assets* of each Canadian firm available on COMPUSTAT at year t,[51] where

$$TIBTI = PI + INT - DTE + PT\_EX\_DIS + SPI$$

and

$$Average\ total\ assets\ at\ year\ t = [Beginning\ of\ the\ year\ total\ assets + End\ of\ the\ year\ total\ assets]/2$$

The variable descriptions are as follows.

PI= Pretax income, COMPUSTAT item PI, which is operating and non-operating income before provisions for income taxes and minority interest;

INT= financial statement interest expense (COMPUSTAT item *XINT*) plus the interest portion of rental payments, one-third of total rental payment *XRENT* as suggested in Mills and Graham (2008);

DTE= Deferred income taxes (COMPUSTAT item *TXDI*) divided by combined federal and provincial statutory tax rate;

PT_EX_DIS= Pretax extraordinary items and discontinued operations, which is (COMPUSTAT item *XIDO) divided by (1-* combined federal and provincial statutory tax rate)*;*

SPI = Special items which is COMPUSTAT item *SPI.*

Step 2:

I compute ROA_t, which is defined as $TIBIT_t$ divided by *Average total assets at year t* computed in Step 1. Observations that belonged to financial firms are dropped as none of my sample firms are from financial institutions. Observations with missing ROA_t and *Average total assets* at year t are eliminated. I rank observations based on *ROA (t-2), which is TIBTI (t-2)/Average total assets (t-2).* Next, I group the negative *ROA (t-2)* and the positive *ROA (t-2)* separately, and each group is further divided into several groups with an equal number of firms in each group. To have the same number of firms in each group, positive *ROA (t-2)* firms are further divided into four groups, and negative

[51] The subscript `t' is suppressed in the following equation.

Appendix C (continued)

ROA (t-2) are further divided into three to six groups, depending on the number of negative ROA(t-2) firms each year. Within each group, firms are ranked based on *Average total assets (t-2) and* further divided into five groups, resulting a total of 35 performance-size groups.

Step 3:

Compute *ΔROA (t-1)=ROA (t-1) - ROA (t-2)*

Compute *Assets growth (t-1)= Average total assets (t-1)/Average total assets (t-2)*

Step 4:

Use TIBTI and average total assets of sample firms at year *t* (i.e., for the period 2005-2015), draw a random firm (j) from the group, which was ranked based on *TIBTI (t-2)/Average total assets (t-2)* and *Average total assets (t-2)*, that matches the sample firm's *TIBTI (t)* and *Average total assets (t)*.

Step 5:

Using the random firm's (firm *j*'s) *ΔROA (t-1) and Assets growth (t-1),* I estimate $\widehat{TIBTI\,(t+1)}_\iota$ as follows.

$$\widehat{TIBTI\,(t+1)} = \widehat{ROA(t+1)}_\iota * Average\ \widehat{total\ assets}(t+1)_\iota$$

where

$$\widehat{ROA(t+1)}_\iota = ROA\ (t)_i + \Delta ROA\ (t-1)_j$$

$$Average\ \widehat{total\ assets}(t+1)_\iota = Average\ total\ assets\ (t)_i * Assets\ growth\ (t-1)_j$$

Step 6:

Using $\widehat{\text{ROA}(t+1)}_\iota$ and $\widehat{\text{Average total assets}}\ (t+1)_\iota$, I repeat Step 5 and estimate $\widehat{ROA(t+2)}_\iota$, $\widehat{Average\ total\ assets}\ (t+2)_\iota$ and $\widehat{TIBTI\,(t+2)}$.

Step 7:

Using $\widehat{ROA(t+2)}_\iota$, $\widehat{Average\ total\ assets}\ (t+2)_\iota$, I repeat Step 5 and 6 to estimate $\widehat{TIBTI\,(t+3)}$.

To account for the distribution as well as the mean of future corporate taxable income, I repeat the estimation step (Step 5 to Step 7) 50 times. This simulation is similar to the Monte Carlo experiment.

Appendix D
Variable Descriptions

Variable	Description
Dependent variables	
$\boldsymbol{RSU\ ratio_{i,j,t}}$	A proxy to measure executive <u>*equity*</u> compensation mix, which is defined as: $$\frac{RSU\_grant_{i,j,t}}{RSU\ grant_{i,j,t} + Option\ grant_{i,j,t}}$$ where: $RSU\_grant_{i,j,t}$ = Grant date value of tax deductible share-based grants, which include RSUs or PSUs with cash or repurchased share payout, granted to executive i of firm j at grant year t; $Option\ grant_{i,j,t}$ = Black-Scholes grant date value of employee tax-favoured at-the-money stock option granted to executive i of firm j at grant year t;
$\boldsymbol{Cash\ ratio_{i,j,t}}$	A proxy to measure executive <u>*total*</u> compensation mix, which is defined as: $$\frac{Cash\ compensation_{i,j,t}}{Total\ compensation_{i,j,t}}$$ where: $Cash\ compensation_{i,j,t}$ = Grant date value of total cash compensation, which includes annual salary and bonus, granted to executive i of firm j at grant year t; $Total\ compensation_{i,j,t}$ = Grant date value of total compensation, which includes both total cash compensation and equity compensation, granted to executive i of firm j at grant year t;
Independent variables	
<u>Corporate tax planning proxies</u>	
Proxy 1 (MTR_V)	Expected corporate marginal tax rate at vesting year. MTR_V is defined as the present value of the change in taxes payable in the present and future for a dollar increase in corporate taxable income at the vesting year. I estimated MTR_V using a non-parametric corporate taxable income model following Blouin et al. 2010. I followed their method by writing an iterative computer program. First, I simulated the future corporate taxable income using the nonparametric model developed by Blouin et al. 2010. Next, I computed the corporate marginal tax rate using the method described in Shevlin (1990). (Source: used COMPUSTAT data for simulation)
TOP_TAX	An indicator variable assigned 1 if MTR_V, defined as above, is in the top quintile, and zero otherwise.
LOW_TAX	An indicator variable assigned 1 if MTR_V, defined as above, is in the bottom quintile and zero otherwise.

Continued on next page-

Appendix D

Variable Descriptions (Continued)

Variable	Description
Independent variables (continued)	
Corporate tax planning proxies	
Proxy 2 (Corporate tax status at vesting year: HIGH_TAX_V and LOW_TAX_V)	Dichotomous measures [52] of corporate tax status applied in Klassen and Mawani (2000) using modified measures of estimated corporate taxable income suggested by Blouin et al. (2010) and Mills and Graham (2008) as follows: $TIBTI = PI + INT - DTE + PT\_EX\_DIS + SPI$ where: TIBTI = Corporate taxable income before taxes and interest *PI* = Pretax income, COMPUSTAT item PI, which is operating and non-operating income before provisions for income taxes and minority interest at grant year; *INT* = financial statement interest expense (COMPUSTAT item *XINT*) plus the interest portion of rental payments, one-third of total rental payment *XRENT* as suggested in Mills and Graham (2008) at grant year; *DTE* = Deferred income taxes (COMPUSTAT item *TXDI*) divided by combined federal and provincial statutory tax rate at grant year; *PT_EX_DIS* = Pretax extraordinary items and discontinued operations, which is (COMPUSTAT item *XIDO) divided by (1-* combined federal and provincial statutory tax rate) at grant year*;* *SPI* = Special items which is COMPUSTAT item *SPI* at grant year.
HIGH_TAX_V	An indicator variable *one* for observations with no tax loss carry forward (tlcf) and estimated positive corporate taxable income (TIBTI as defined above) for three consecutive years following the grant year, and zero otherwise.
LOW_TAX_V	An indicator variable *one* for observations with positive tax loss carry forward and/or estimated negative corporate taxable income (TIBTI as defined above) for three consecutive years following the grant year, and zero otherwise.

Continued on next page-

[52] Prior literature uses trichotomous measures, i.e., high, moderate, and low tax statuses. I combine the moderate tax status group with the low tax status group because low tax group consists a small number of observations. This combination results in dichotomous measures of corporate tax status (HIGH_TAX_V and LOW_TAX_V), instead of trichotomous measures.

Appendix D

Variable Descriptions (Continued)

Variable	Description
Independent variables (continued)	
Managerial Power proxy	
POWER	A component of Managerial Power, a factor variable created from principal component analysis of the board-related variables, *BOARD SIZE, INSIDERS, OWNERSHIP CONCENTRATION and INSTITUTIONAL OWNERSHIP*.
BOARD SIZE	Natural logarithmic function of the number of directors (Source: Hand-collected from Management circulars)
INSIDERS	The proportion of insiders as board members (Source: Hand-collected from Management circulars)
OWNERSHIP CONCENTRATION	The proportion of firm shares owned by the largest shareholders (Source: FACTSET via WRDS)
INSTITIONAL OWNERSHIP	The proportion of institutional ownership (Source: FACTSET via WRDS)
EXECUTIVE PAY SLICE (EPS)	A component of managerial power proxy, which is the proportion of the total compensation paid to the top five executives that goes to an executive (Source: Constructed from hand-collected compensation data)
Control Variables	
CASH_CONSTR	Cash constraint, measured as the average over year t-2, t-1, and t of [(Common and preferred dividends (DVC+DVP) – cash flow from investing (INVCF) – cash flow from operations (OANCF))/ total assets (AT)] for firm j (Core and Guay 1999; Carter et al. 2007). (Source: COMPUSTAT)
RISK_PREF	Executive wealth in terms of stocks and options holding at the grant date. (Source: Manual data collection for Canadian executives from management circulars)
DIV_PAYOUT	The dividend payout, computed as the average of dividends per share divided by price per dividend over the period t-2, t-1, and t (Carter et al. 2007). Source: COMPUSTAT

Continued on next page-

Appendix D

Variable Descriptions (Continued)

Variable	Description
EARN_VOL	Earnings volatility, measured as the variance of ROA (Carter et al. 2007). Source: COMPUSTAT
STOCK_VOL	Stock volatility (Boyle et al. 2011), measured as the standard deviation of unadjusted daily returns over the 12 months following the grant year, $t + 1$. Source: CFMRC
Z-SCORE	Bankruptcy risk as defined in Altman (1968) and applied in Kadan and Swinkels (2008). It is measured as follows: $Z = 1.2\ WC + 1.4R + 3.3\ PI + 0.6\ MKT + 1.0\ S$ where: WC is net working capital. R is retained earnings. PI is pretax income. MKT is market value of equity. S is sales. All right-hand-side variables, except market value of equity, are scaled by total assets. Market value of equity is scaled by total liabilities. Observations with the negative Z-score are to be eliminated. (Source: COMPUSTAT)
LN_ASSET	Natural log of total assets (AT) for firm j at the end of year t. Source: COMPUSTAT
BOOK_MKT	Book value of equity/market value of equity at the end of year t for firm j (Feltham and Wu 2001). Source: COMPUSTAT
RET	Stock performance, measured as cumulative monthly stock returns at grant year t for firm j (Murphy 1985) (Source: CFMRC)
INDUSTRY	Industry fixed effects, using industry dummies as defined in COMPUSTAT variable (ggroup)

Continued on next page-

Appendix D

Variable Descriptions (Continued)

Variable	Description
TIBTI	Grant year corporate taxable income before taxes and interests computed as follows: $$TIBTI = PI + INT - DTE + PT\_EX\_DIS + SPI$$ where: *PI*= Pretax income, COMPUSTAT item PI, which is operating and non-operating income before provisions for income taxes and minority interest at grant year; *INT*= financial statement interest expense (COMPUSTAT item *XINT*) plus the interest portion of rental payments, one-third of total rental payment *XRENT* as suggested in Mills and Graham (2008) at grant year; *DTE*= Deferred income taxes (COMPUSTAT item *TXDI*) divided by combined federal and provincial statutory tax rate[53] at grant year; *PT_EX_DIS*= Pretax extraordinary items and discontinued operations, which is (COMPUSTAT item *XIDO) divided by (1*- combined federal and provincial statutory tax rate[54]) at grant year*;* *SPI* = Special items which is COMPUSTAT item *SPI* at grant year.
TLCF	Tax loss carryforward
HIGH_TAX_G	High tax paying status at grant date; an indicator variable equals to 1 if the firm has positive corporate taxable income (TIBTI>0) and no non-capital loss carryforwards (TLCF=0) in the three years prior to the grant year, and zero otherwise.
LOW_TAX_G	Low tax paying status at grant date; an indicator variable equals to 1 if the firm has negative corporate taxable income (TIBTI<=0) and positive non-capital loss carryforwards (TLCF>0) in the three years prior to the grant year, and zero otherwise.
MOD_TAX_G	Moderate tax paying status at grant date; an indicator variable equals to 1 if the firm has negative corporate taxable income (TIBTI<=0) or zero non-capital loss carryforwards (TLCF>0) in the three years prior to the grant year, and zero otherwise.

[53] The location of the head office found in COMPUSTAT is used to determine the relevant provincial tax rate following Klassen et al. (2004).
[54] Same as above footnote.

Appendix E
Tables

TABLE 1 Sample Selection

Panel A: Summary of Sample Selection Procedure

	Number of Firms
At firm level,	
Largest Canadian firms traded on Toronto stock exchange (September 18, 2016)	247
Restricted to:	
Non-financial Canadian firms	197
Executive compensation data availability using proxy statements available on SEDAR filing system	143
	# of Executive-years
At executive-year level,	
Top executive-level compensation data collected for the period 2005-2015	7,509
Less: Observations with fewer than five top executives' annual compensation data	(514)
Less: Missing Cash Constraint proxy	(95)
Less: Missing Dividend Payout proxy	(35)
Less: Missing Earnings Volatility	(175)
Less: Missing Stock volatility	(55)
Less: Missing Stock performance	(815)
Less: Missing Bankruptcy risk proxies	(210)
Less: Missing Book to Market ratio	(10)
Top five executive-level compensation data with available annual COMPUSTAT and CFMRC data (138 unique firms) (See Summary statistics in Table 2, Panel A.)	5,600
Data screening to test hypotheses:	
Less: Firms that grant non tax-deductible shares in some years (13 firms)	(345)
Less: Observations in which the compensation package does not include both tax-deductible RSUs and employee tax-favoured options	(1,030)
Less: Missing main explanatory variables	(45)
Total observations before removing influential observations (128 unique firms)	4,180
Less: Influential observations identified using Cook's D (4/N-k-1)	(197)
Total observations used in testing the hypotheses (127 unique firms for the period 2006-2015) (See Summary statistics in Table 2, Panel B.)	3,983
Restricted to non-family run firms only (111 unique firms)	3,474

Continued on next page:

TABLE 1 (continued)

Panel B: Distribution of Observations Across Sample Period

	Initial data		Top five executives' data		Full sample		Non-family firm sample	
Year	# of obs.	%	# of obs.	%	# of obs.	%	# of obs.	%
2005	631	8.4	0	0.0	0	0.0	0	0.0
2006	653	8.8	455	8.1	242	6.1	213	6.1
2007	655	8.7	470	8.4	280	7.0	244	7.0
2008	678	9.0	520	9.3	316	7.9	264	7.6
2009	691	9.2	570	10.2	361	9.1	312	9.0
2010	694	9.3	590	10.5	397	10.0	340	9.8
2011	702	9.3	530	9.5	423	10.6	367	10.6
2012	706	9.4	625	11.2	494	12.4	440	12.7
2013	702	9.3	625	11.2	515	12.9	454	13.1
2014	703	9.4	640	11.4	516	13.0	458	13.2
2015	694	9.2	575	10.3	439	11.0	382	11.0
Total	7,509	100.0	5,600	100.0	3,983	100.0	3,474	100.0
# of firms	143		138		127		111	
# of executives	1,705		1,447		1,160		1,037	

Continued on next page:

TABLE 1 (continued)

Panel C: Industry Distribution

	Initial Data (N=7,509)		Top five executives' data (N=5,600)		Full sample (N=3,983)		Non-Family firm sample (N=3,474)	
Industry	# of firms	%	# of firms	%	# of firms	%	# of firms	%
Material Extraction	39	29.4	39	28.3	35	26.9	33	29.7
Energy sector (Oil & gas)	31	21.7	30	21.7	29	24.4	28	25.2
Manufacturing of Capital Goods	11	7.7	11	8.0	11	9.2	10	9.0
Utilities	9	7.0	10	7.2	8	5.0	7	6.3
Food & Staples Retailers	7	4.9	7	5.1	7	5.9	4	3.6
Cable & Satellites, Broadcasting, and Entertainment	6	4.2	6	4.3	6	5.0	4	3.6
Software & Services	6	4.2	6	4.3	5	2.5	5	4.5
Commercial & Professional Services	5	3.5	4	2.9	3	4.2	2	1.8
Transportation	5	3.5	5	3.6	5	4.2	5	4.5
Telecommunication Services	4	2.8	4	2.9	4	3.4	3	2.7
Technology Hardware & Equipment	3	2.1	3	2.2	3	1.7	3	2.7
Automobiles & Components Manufacturers	2	1.4	2	1.4	2	1.7	1	0.9
Consumer Durables & Apparel	2	1.4	2	1.4	2	0.8	2	1.8
Consumer Services	2	1.4	2	1.4	2	1.7	2	1.8
Retailing	2	1.4	2	1.4	2	1.7	1	0.9
Food, Beverage & Tobacco	2	1.4	2	1.4	2	1.7	0	0.0
Pharmaceuticals, Biotechnology & Life Sciences	2	1.4	2	1.4	1	0.0	1	0.9
Health Care Equipment & Services	1	0.7	1	0.7	0	0.0	0	0.0
Total	143	100	138	100	127	100	111	100

TABLE 2 Summary Statistics of Dependent Variables ($ amounts in millions)

Panel A: Initial Sample

Variable	N	Mean	Std. dev.	Median	P25	P75	Min.	Max.
Salary	5600	0.472	0.306	0.397	0.285	0.561	0.000	6.039
Bonus	5600	0.480	0.781	0.263	0.126	0.527	0.000	11.200
(1) Cash compensation (Salary + Bonus)	5600	0.953	0.999	0.663	0.438	1.082	0.000	12.700
(2) Share appreciation rights value(SARs)	5600	0.010	0.104	0.000	0.000	0.000	0.000	3.023
(3) Tax-deductible RSU/PSU value	5600	0.465	1.505	0.040	0.000	0.469	0.000	84.800
(4) Non tax-deductible RSU value	5600	0.033	0.245	0.000	0.000	0.000	0.000	6.624
(5) Employee tax-favoured Options	5600	0.384	0.860	0.114	0.000	0.406	0.000	22.000
(6) Tandem SARs value (TSARs)	5600	0.017	0.179	0.000	0.000	0.000	0.000	5.010
Total annual compensation (Sum of item 1-6)	5600	1.885	2.332	1.211	0.691	2.226	0.000	85.800
Dependent variable – Ratios								
Cash Ratio	5600	0.641	0.262	0.625	0.071	0.445	0.882	1.000
RSU Ratio	4473	0.450	0.390	0.500	0.000	0.754	0.000	1.000

Panel B: Full Sample for Hypotheses Testing

Variable	N	Mean	Std. dev.	Median	P25	P75	Min.	Max.
Salary	3983	0.492	0.307	0.416	0.305	0.581	0.000	6.039
Bonus	3983	0.463	0.633	0.286	0.147	0.538	0.000	9.786
(2) Cash compensation (Salary + Bonus)	3983	0.954	0.865	0.710	0.472	1.100	0.000	10.700
(2) Share appreciation rights value (SARs)	3983	0.002	0.030	0.000	0.000	0.000	0.000	1.000
(3) Tax-deductible RSU/PSU value	3983	0.577	1.696	0.197	0.000	0.637	0.000	84.800
(4) Non tax-deductible RSU value	3983	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(5) Employee tax-favoured Options	3983	0.501	0.937	0.231	0.053	0.559	0.000	22.000
(6) Tandem SARs value (TSARs)	3983	0.024	0.211	0.000	0.000	0.000	0.000	5.010
Total annual compensation (Sum of item 1-6)	3983	2.115	2.527	1.375	0.821	2.539	0.118	85.800
Dependent variable – Ratios								
Cash Ratio	3983	0.543	0.191	0.539	0.414	0.686	0.000	0.995
RSU Ratio	3983	0.436	0.379	0.500	0.000	0.750	0.000	1.000

Continued on next page:

TABLE 2 (continued)

Panel C: Non-family Owned Firm Subsample

Variable	N	Mean	Std. dev	Median	P25	P75	Min.	Max.
Salary	3474	0.470	0.294	0.400	0.296	0.547	0.000	6.039
Bonus	3474	0.417	0.549	0.265	0.141	0.499	0.000	9.786
(3) Cash compensation (Salary + Bonus)	3474	0.886	0.770	0.670	0.455	1.038	0.000	10.700
(2) Share appreciation rights value (SARs)	3474	0.003	0.030	0.000	0.000	0.000	0.000	1.000
(3) Tax-deductible RSU/PSU value	3474	0.576	1.774	0.201	0.000	0.625	0.000	84.800
(4) Non tax-deductible RSU value	3474	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(5) Employee tax-favoured Options	3474	0.492	0.958	0.220	0.046	0.536	0.000	22.000
(6) Tandem SARs value (TSARs)	3474	0.016	0.166	0.000	0.000	0.000	0.000	4.297
Total annual compensation (Sum of item 1-6)	3474	2.024	2.526	1.328	0.800	2.419	0.118	85.800
Dependent variable – Ratios								
Cash Ratio	3474	0.535	0.189	0.533	0.408	0.669	0.000	0.995
RSU Ratio	3474	0.447	0.383	0.500	0.000	0.750	0.000	1.000

Table 2: Panel A presents summary statistics of executive compensation components of 5,600 executive-year observations for the period 2006-2015 (138 unique firms); Panel B presents summary statistics of executive compensation components of 3,983 executive-year observations (119 unique firms) used in hypotheses testing; Panel C presents summary statistics of executive compensation components of 3,474 executive-year observations for non-family firms used in hypotheses testing.

Salary is the total salary of the executive for the grant year.

Bonus is the total bonus of the executive for the grant year.

Cash compensation is the total of salary and bonus paid to the executive for the grant year.

Share appreciation rights value is the total value of SARs granted to the executive for the grant year.

Tax-deductible RSU/PSU value is the total value of restricted share units (RSUs) and performance share units (PSUs), which are to be satisfied at maturity date with cash payment or shares repurchased in the market, granted to the executive for the grant year.

Non tax-deductible RSU value is the total value of RSUs, PSUs and restricted shares, which are to be satisfied at the maturity date with treasury shares or new shares, and outright shares granted to the executive for the grant year.

Employee tax-favoured option value is the total disclosed Black-Scholes value of employee tax-favoured stock options granted to the executive for the year. If the compensation table does not disclose the option value, the option value is computed using the Black-Scholes method. The input parameters disclosed in annual reports are used.

Tandem SARs value is the total value of tandem share appreciation rights (TSARs) granted to the executive for the grant year. TSARs are the stock option grants attached with share appreciation rights, which are redeemable either as options or in cash for the value of share appreciation at the maturity date.

Total annual compensation is the total value of cash compensation, share appreciation rights, tax-deductible RSU/PSU, non-tax-deductible RSUs, employee tax-favoured options, TSARs granted to the executive for the year.

Cash Ratio is the proportion of total cash compensation (item 1) to the total annual compensation granted to the executive.

RSU Ratio is the proportion of the value of tax-deductible RSU grants to the sum of the value of tax deductible RSUs and employee tax-favoured options granted to the executive for the year.

TABLE 3 Summary Statistics of Independent Variables Used in Hypothesis testing

PANEL A: Full Sample for Hypotheses Testing

Variable	N	Mean	Std. dev.	Median	P25	P75	Min.	Max.
High Corporate Tax Status (HMTR_V=1)	1558							
Low Corporate Tax Status (HMTR_V=0)	2425							
Corporate Marginal tax rate (At Grant Year, t)	3983	0.18	0.07	0.17	0.13	0.22	0.00	0.38
Corporate Marginal tax rate (At year t +1)	3983	0.18	0.05	0.18	0.15	0.21	0.08	0.34
Corporate Marginal tax rate (At year t +2)	3983	0.19	0.04	0.18	0.16	0.21	0.09	0.31
Corporate Marginal tax rate (At year t +3)	3983	0.19	0.04	0.19	0.16	0.21	0.09	0.31
Top corporate tax status (TOP_TAX=1)	694							
Low corporate tax status (TOP_TAX=0)	3289							
Managerial Power	3983	– 0.09	1.00	0.02	– 0.79	0.68	– 3.51	1.67
LN (Board size)	3983	2.27	0.29	2.30	2.08	2.48	1.10	2.89
% of insiders	3983	0.23	0.12	0.20	0.11	0.33	0.00	0.57
Institutional ownership	3983	0.40	0.29	0.36	0.15	0.64	0.00	1.00
% of large ownership	3983	0.09	0.11	0.06	0.00	0.15	0.00	0.59
High Managerial Power (HIGH_POWER=1)	693							
Low Managerial Power (HIGH_POWER=0)	3290							
Executive pay slice (EPS)	3983	0.20	0.12	0.16	0.13	0.24	0.02	0.89
High Executive pay slice (High_EPS=1)	694							
Low Executive pay slice (High_EPS=0)	2780							
Cash constraint	3983	0.02	0.08	0.01	– 0.02	0.05	– 0.35	0.48
Dividend payout	3983	0.02	0.02	0.02	0.00	0.03	0.00	0.15
Earnings volatility	3983	0.01	0.02	0.00	0.00	0.01	0.00	0.22
Stock volatility	3983	0.03	0.03	0.02	0.01	0.03	0.01	0.45
Bankruptcy risk	3983	6.35	21.84	3.11	1.97	5.20	0.06	469.06
LN (Assets)	3983	8.20	1.42	8.12	7.22	9.29	3.41	11.35
Performance (RET)	3983	0.17	0.50	0.11	– 0.09	0.32	– 0.88	6.44
Book to market ratio	3983	0.62	0.53	0.50	0.34	0.73	0.00	7.41
Idiosyncratic risk	3145	1.19	0.90	1.12	0.54	1.76	– 0.84	4.25
CEO = 1	770							
CFO = 1	762							
OTHER EXECUTIVES = 1	2451							
Shareholder Activism = 1	194							
Shareholder Activism = 0	3789							

TABLE 3 (continued)

PANEL B: Non-Family Owned Firm Subsample

Variable	N	Mean	Std. dev.	Median	P25	P75	Min.	Max.
High Corporate Tax Status (HMTR_V=1)	1265							
Low Corporate Tax Status (HMTR_V=0)	2209							
Corporate Marginal tax rate (At Grant Year, t)	3474	0.17	0.07	0.17	0.13	0.21	0.00	0.38
Corporate Marginal tax rate (At year t +1)	3474	0.18	0.05	0.17	0.14	0.21	0.08	0.34
Corporate Marginal tax rate (At year t +2)	3474	0.19	0.04	0.18	0.16	0.21	0.09	0.31
Corporate Marginal tax rate (At year t +3)	3474	0.19	0.04	0.19	0.16	0.21	0.09	0.31
Top corporate tax status (TOP_TAX=1)	694							
Low corporate tax status (TOP_TAX=0)	2780							
Managerial Power	3474	–0.21	0.99	–0.12	–0.90	0.55	–3.51	1.67
LN (Board size)	3474	2.23	0.27	2.20	2.08	2.40	1.10	2.77
% of insiders	3474	0.21	0.12	0.18	0.11	0.29	0.00	0.57
Institutional ownership	3474	0.41	0.30	0.37	0.16	0.67	0.00	1.00
% of large ownership	3474	0.10	0.11	0.07	0.00	0.16	0.00	0.59
High Managerial Power (HIGH_POWER=1)	695							
Low Managerial Power (HIGH_POWER=0)	2780							
Executive pay slice (EPS)	3474	0.20	0.11	0.16	0.13	0.23	0.02	0.89
High Executive pay slice (High_EPS=1)	694							
Low Executive pay slice (High_EPS=0)	2780							
Cash constraint	3474	0.03	0.08	0.02	–0.02	0.05	–0.22	0.48
Dividend payout	3474	0.02	0.02	0.01	0.00	0.04	0.00	0.15
Earnings volatility	3474	0.01	0.02	0.00	0.00	0.01	0.00	0.22
Stock volatility	3474	0.03	0.03	0.02	0.01	0.03	0.01	0.45
Bankruptcy risk	3474	6.67	23.3	3.17	1.97	5.22	0.06	469.06
LN (Assets)	3474	8.12	1.44	8.04	7.16	9.19	3.41	11.35
Performance (RET)	3474	0.16	0.46	0.11	–0.09	0.32	–0.88	3.68
Book to market ratio	3474	0.62	0.51	0.49	0.35	0.72	0.00	7.41
Idiosyncratic risk	2742	1.22	0.92	1.13	0.57	1.83	-0.84	4.25
CEO = 1	677							
CFO = 1	675							
OTHER EXECUTIVES = 1	2122							
Shareholder Activism = 1	170							
Shareholder Activism = 0	3304							

Table 3 presents summary statistics and statistical distribution of independent and control variables used in testing hypotheses. Panel A presents full sample and Panel B presents non-family firms only subsample. See Appendix D for variable descriptions.

TABLE 4 Pearson Correlation Matrix

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	RSU ratio	1.000						
(2)	Cash Ratio	–0.141*	1.000					
(3)	Corporate Marginal tax rate (At Grant Year)	–0.079*	–0.032*	1.000				
(4)	Corporate Marginal tax rate (At vesting year, t +3)	–0.071*	0.008	0.653*	1.000			
(5)	Managerial Power	–0.051*	0.154*	–0.034*	0.030	1.000		
(6)	Executive Pay Slice	0.000	–0.237*	–0.004	–0.005	0.004	1.000	
(7)	Cash constraint	–0.032*	–0.121*	–0.058*	–0.120*	–0.026	0.006	1.000
(8)	Dividend payout	0.348*	0.072*	–0.051*	–0.031	0.210*	0.000	0.066*
(9)	Earnings volatility	–0.102*	0.006	–0.054*	–0.070*	–0.102*	0.002	0.009
(10)	Stock Volatility	–0.136*	0.020	0.093*	0.056*	0.076*	–0.009	0.066*
(11)	Bankruptcy risk	–0.110*	–0.003	–0.024	–0.050*	–0.028	0.000	0.144*
(12)	LN (Assets)	0.250*	–0.309*	0.198*	0.200*	0.039*	–0.008	–0.054*
(13)	Performance (RET)	–0.058*	0.009	0.042*	0.105*	0.004	–0.001	–0.082*
(14)	Book to market ratio	–0.027	–0.025	–0.133*	–0.171*	–0.011	0.004	0.004

	Variables	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1)	RSU ratio							
(2)	Cash Ratio							
(3)	Corporate Marginal tax rate (At Grant Year)							
(4)	Corporate Marginal tax rate (At vesting year, t +3)							
(5)	Managerial Power							
(6)	Executive Pay Slice							
(7)	Cash constraint							
(8)	Dividend payout	1.000						
(9)	Earnings volatility	– 0.152*	1.000					
(10)	Stock Volatility	– 0.167*	0.048*	1.000				
(11)	Bankruptcy risk	– 0.114*	0.040*	0.023	1.000			
(12)	LN (Assets)	0.130*	– 0.213*	– 0.105*	– 0.270*	1.000		
(13)	Performance (RET)	– 0.079*	0.090*	– 0.012	0.008	– 0.074*	1.000	
(14)	Book to market ratio	– 0.052*	0.068*	0.250*	– 0.116*	0.030	– 0.217*	1.000

This table reports Pearson's correlation matrix among explanatory and explained variables used in testing hypotheses. Correlations with p-value less than 0.05 are indicated with stars. See Appendix D for variable descriptions.

TABLE 5 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses

	Full sample (n=3,983)		Non Family firm sample (n=3474)	
	HIGH_TAX_V=1	LOW_TAX_V=1	HIGH_TAX_V=1	LOW_TAX_V=1
N	1558	2425	1265	2209
Mean	0.458	0.422	0.467	0.436
Median	0.500	0.500	0.500	0.500
Standard Deviation	0.377	0.380	0.383	0.383
Minimum	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000
75th Percentile	0.750	0.750	0.767	0.750
Maximum	1.000	1.000	1.000	1.000

Table 5 presents the summary statistics of RSU ratio across high corporate tax and low corporate tax statuses for the full sample as well as for non-family firm subsample. See Appendix B for variable descriptions.

TABLE 6 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power Using an OLS Model

$$\text{RSU\_ratio}_{i,j,t} = \beta_0 + \beta_1 \text{Corporate Tax Planning Proxy}_{i,j,t+3} + \beta_2 \text{Managerial Power}_{i,j,t-1} + \beta_3 \text{Corporate Tax Planning Proxy}_{i,j,t+3} * \text{Managerial Power}_{i,j,t-1} + \sum_{i=4}^{n} \beta_i \text{ Controls} + \varepsilon_{i,j,t}$$

		Full sample		Non-family owned firm subsample	
Dependent variable: RSU ratio		Coefficient	t-stats	Coefficient	t-stats
Intercept		– 0.363***	[– 8.12]	– 0.368***	[– 7.39]
HIGH_TAX_V	+	+ 0.055***	[+ 2.70]	+ 0.054***	[+ 2.38]
Managerial Power (POWER)	–	– 0.056***	[– 8.01]	– 0.045***	[– 6.22]
HIGH_TAX_V*POWER	–	+ 0.020**	[+ 1.84]	+ 0.021**	[+ 1.78]
Executive Pay Slice (EPS)	–	+ 0.048	[+ 0.89]	+ 0.053	[+ 0.91]
HIGH_TAX_V*EPS	–	– 0.067	[– 0.78]	– 0.058	[– 0.61]
Cash Constraint	–	+ 0.044	[+ 0.63]	– 0.013	[– 0.16]
Dividend Payout	+	+ 5.590***	[+ 21.50]	+ 5.159***	[+18.74]
Earnings Volatility	?	– 0.428*	[– 1.61]	– 0.141	[– 0.48]
Stock Volatility	–	– 0.199	[– 1.13]	– 0.145	[– 0.72]
Bankruptcy Risk	+	– 0.001**	[– 2.15]	– 0.000**	[– 1.89]
Natural Log (Assets)	+	+ 0.048***	[11.81]	+ 0.052***	[+11.72]
Stock Performance	+	– 0.020**	[– 1.81]	– 0.029***	[– 2.15]
Book to Market Ratio	–	– 0.029***	[– 2.70]	– 0.036***	[– 2.99]
Year controls		Yes		Yes	
Industry control		Yes		Yes	
Firm fixed effects		No		No	
Number of observations		3983		3474	
R-Squared		0.359		0.363	
Adjusted R-squared		0.353		0.356	
Root mean square error		0.305		0.308	

***, **, * Indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Columns (1)–(2) contain the results of OLS regression model. The t-statistics shown in brackets are based on OLS standard errors. The dependent variable RSU ratio measure is defined as [Tax Deductible RSU grants /(Tax Deductible RSU grants + Employee Tax-favoured Stock Option grants]. The expected corporate tax status at vesting year detailed in Section 5 is used as a corporate tax planning proxy. This proxy measures the change in RSU ratio for the change in corporate tax status from low to high. The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. This proxy measures the change in RSU ratio for a change in managerial power. The sample consists of 3,983 (3474) executive-year observations from 2006 to 2015 for full sample (non-family firms). The control variables for this model are described in Appendix D. Coefficients on 15 industry indicator variables and 9-year indicator variables are not shown.

TABLE 7 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power Using a Firm Fixed Effects Model

$$\text{RSU\_ratio}_{i,j,t} = \beta_0 + \beta_1 \text{Corporate Tax Planning Proxy}_{i,j,t+3} + \beta_2 \text{Managerial Power}_{i,j,t-1} + \beta_3 \text{Corporate Tax Planning Proxy}_{i,j,t+3} * \text{Managerial Power}_{i,j,t-1} + \sum_{i=4}^{n} \beta_i \text{ Controls} + \varepsilon_{i,j,t}$$

		Full Sample		Non-family run firm subsample	
Dependent variable: RSU ratio		Coefficient	t-stats	Coefficient	t-stats
Intercept		– 0.156*	[– 1.63]	– 0.147*	[– 1.52]
HIGH_TAX_V	+	+ 0.043***	[+ 2.65]	+ 0.012	[+ 0.68]
Managerial Power (POWER)	–	– 0.036***	[– 5.32]	– 0.030***	[– 4.38]
HIGH_TAX_V*POWER	–	– 0.010	[– 1.04]	– 0.021***	[– 2.02]
Executive Pay Slice (EPS)	–	+ 0.049*	[+ 1.30]	+ 0.048	[+ 1.23]
HIGH_TAX_V*EPS	–	– 0.049	[– 0.83]	–0.019	[– 0.29]
Cash Constraint	–	– 0.063	[– 0.90]	– 0.120*	[– 1.58]
Dividend Payout	+	+ 3.019***	[+ 8.50]	+ 2.664***	[+ 7.19]
Earnings Volatility	?	– 2.125***	[– 5.99]	– 2.532***	[– 6.67]
Stock Volatility	–	– 0.048	[– 0.30]	– 0.097	[– 0.57]
Bankruptcy Risk	+	+ 0.000*	[– 1.39]	+ 0.000*	[– 1.55]
Natural Log (Assets)	+	+ 0.019*	[+ 1.46]	+ 0.019*	[+ 1.43]
Stock Performance	+	– 0.036***	[– 4.41]	– 0.048***	[– 4.96]
Book to Market Ratio	–	– 0.040***	[– 4.48]	– 0.034***	[–3.48]
Year controls		Yes		Yes	
Industry control		Yes		Yes	
Firm fixed effects		Yes		Yes	
Number of observations		3983		3474	
R-Squared		0.705		0.720	
Adjusted R-squared		0.694		0.709	
Root mean square error		0.210		0.207	

***, **, * Indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Columns (1)–(2) contain the results of a firm fixed effects model over 2006-2015. The t-statistics shown in brackets are based on bootstrap standard errors, one tailed when sign of the coefficient is predicted, and two-tailed otherwise. The dependent variable RSU ratio measure is defined as [Tax Deductible RSU grants /(Tax Deductible RSU grants + Employee Tax-favoured Stock Option grants]. The expected corporate tax status at vesting year detailed in Section 5 is used as a corporate tax planning proxy. This proxy measures the change in RSU ratio for the change in corporate tax status from low to high. The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. This proxy measures the change in RSU ratio for a change in managerial power. The sample consists of 3,983 (3474) executive-year observations from 2006 to 2015 for full sample (non-family firms). The control variables for this model are described in Appendix D. Coefficients on 15 industry indicator variables and 9-year indicator variables are not shown.

TABLE 8 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses and Managerial Power Levels for a Non-Family Firm Subsample

(n=3,474)

	TOP_TAX	LOW_TAX	HIGH_POWER	LOW_POWER	HIGH_EPS	LOW_EPS
N	694	2780	693	2781	694	2780
Mean	0.359	0.469	0.457	0.445	0.474	0.441
Median	0.407	0.500	0.500	0.500	0.500	0.500
Standard Deviation	0.357	0.387	0.416	0.375	0.384	0.383
Minimum	0.000	0.000	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000	0.000	0.000
75th Percentile	0.617	0.760	1.000	0.750	0.755	0.750
Maximum	1.000	1.000	1.000	1.000	1.000	1.000

Table 8 presents the summary statistics of RSU ratio across high tax and low tax statuses, high power and low power, and high EPS and low EPS. The expected corporate marginal tax rate at vesting year (MTR_V) detailed in Section 5 is used as a corporate tax planning proxy. I reclassify TOP_TAX =1 if MTR_V is in the top quintile and zero otherwise.

The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. HIGH_POWER=1 if POWER is in the top quintile and zero otherwise. The HIGH_POWER proxy measures the change in RSU ratio for a change in managerial power from low to high.

HIGH_EPS represents an indicator variable. I classify HIGH_EPS=1 if Executive Pay Slice is in the top quintile and zero otherwise.

TABLE 9 The Relation Between Executive Equity Compensation Structure and Corporate Tax Status and Managerial Power After Reclassifying Expected Corporate Marginal Tax Rate and Managerial Power Variables as Indicator Variables

$$\text{RSU\_ratio}_{i,j,t} = \beta_0 + \beta_1 \text{TOP\_TAX}_{i,j,t+3} + \beta_3 \text{HIGH\_POWER}_{i,j,t-1} + \beta_4 \text{TOP\_TAX}_{i,j,t+3} * \text{HIGH\_POWER}_{i,j,t-1} + \sum_{i=6}^{n} \beta_i \text{ Controls} + \varepsilon_{i,j,t}$$

Equation (2)

		Non-family run firm subsample	
Dependent variable: RSU ratio		Coefficient	t-stats
Intercept		–0.171**	[–1.78]
TOP_TAX	+	+0.007	[+0.43]
HIGH_POWER	–	–0.020*	[–1.28]
TOP_TAX*HIGH_POWER	–	–0.081***	[–3.24]
HIGH_EPS	–	+0.020**	[+1.95]
TOP_TAX*HIGH_EPS	–	–0.004	[–0.19]
Cash Constraint	–	–0.132**	[–1.73]
Dividend Payout	+	+2.544***	[+6.80]
Earnings Volatility	?	–2.800***	[–7.35]
Stock Volatility	–	–0.055	[–0.32]
Bankruptcy Risk	+	–0.000**	[–1.82]
Natural Log (Assets)	+	+0.028***	[+2.13]
Stock Performance	+	–0.049***	[–5.10]
Book to Market Ratio	–	–0.037***	[–3.79]
Year controls		Yes	
Industry control		Yes	
Firm fixed effects		Yes	
Executive fixed effects		No	
Number of observations		3474	
R-Squared		0.718	
Adjusted R-squared		0.707	
Root mean square error		0.208	

Continued on next page:

TABLE 9 (Continued)

***, **, * Indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Columns (1) contains the results of a fixed effects model. The t-statistics shown in brackets are based on bootstrap standard errors. The dependent variable RSU ratio measure is defined as [Tax Deductible RSU grants /(Tax Deductible RSU grants + Employee Tax-favoured Stock Option grants]. The sample consists of 3474 executive-year observations from 2006 to 2015 for non-family firms.
The control variables for this model are described in Appendix D.
Coefficients on 15 industry indicator variables and 9-year indicator variables are not shown.
Main explanatory variables are defined as follows.

The expected corporate marginal tax rate at vesting year (MTR_V) detailed in Section 5.3 is used as a corporate tax planning proxy. I reclassify TOP_TAX =1 if MTR_V is in the top quintile and zero otherwise. The TOP_TAX proxy measures the change in RSU ratio for the change in corporate tax status from low to high.

The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. HIGH_POWER=1 if POWER is in the top quintile and zero otherwise. The HIGH_POWER proxy measures the change in RSU ratio for a change in managerial power from low to high.

HIGH_EPS represents an indicator variable. I classify HIGH_EPS=1 if Executive Pay Slice is in the top quintile and zero otherwise.

TABLE 10 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statuses and Managerial Power Levels for Non-Family Firm CEO, CFO and Other Executive Subsamples

Panel A: CEO subsample (n=677)

	TOP_TAX	LOW_TAX	HIGH_POWER	LOW_POWER	HIGH_EPS	LOW_EPS
N	137	540	131	546	83	594
Mean	0.368	0.487	0.491	0.456	0.307	0.485
Median	0.387	0.500	0.526	0.500	0.000	0.500
Standard Deviation	0.366	0.388	0.417	0.379	0.426	0.376
Minimum	0.000	0.000	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000	0.000	0.000
75th Percentile	0.652	0.773	1.000	0.750	0.667	0.753
Maximum	1.000	1.000	1.000	1.000	1.000	1.000

Panel B: CFO subsample (n=675)

	TOP_TAX	LOW_TAX	HIGH_POWER	LOW_POWER	HIGH_EPS	LOW_EPS
N	136	539	125	550	16	659
Mean	0.331	0.468	0.435	0.441	0.207	0.446
Median	0.364	0.500	0.464	0.500	0.000	0.500
Standard Deviation	0.345	0.383	0.402	0.374	0.284	0.379
Minimum	0.000	0.000	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000	0.000	0.000
75th Percentile	0.600	0.753	0.758	0.750	0.500	0.750
Maximum	1.000	1.000	1.000	1.000	0.813	1.000

Panel C: Other Executive subsample (n=2126)

	TOP_TAX	LOW_TAX	HIGH_POWER	LOW_POWER	HIGH_EPS	LOW_EPS
N	421	1705	437	1689	85	2041
Mean	0.365	0.464	0.454	0.442	0.446	0.444
Median	0.427	0.500	0.479	0.500	0.500	0.500
Standard Deviation	0.359	0.387	0.420	0.374	0.437	0.382
Minimum	0.000	0.000	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000	0.000	0.000
75th Percentile	0.632	0.763	1.000	0.750	1.000	0.750
Maximum	1.000	1.000	1.000	1.000	1.000	1.000

Table 10 presents the summary statistics of RSU ratio across different groups of executives, i.e., CEOs, CFOs and Other executives. The comparisons are made based on high tax and low tax statuses, high power and low power, and high EPS and low EPS. The expected corporate marginal tax rate at vesting year (MTR_V) detailed in Section 5.3 is used as a corporate tax planning proxy. I reclassify TOP_TAX =1 if MTR_V is in the top quintile and zero otherwise.

The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. HIGH_POWER=1 if POWER is in the top quintile and zero otherwise. The HIGH_POWER proxy measures the change in RSU ratio for a change in managerial power from low to high.

HIGH_EPS represents an indicator variable. I classify HIGH_EPS=1 if Executive Pay Slice is in the top quintile and zero otherwise.

TABLE 11 The Relation Between Executive Equity Compensation Structure and Corporate Tax Planning and Managerial Power Using a Subsample of CEOs, CFOs and Other Executives

$$\text{RSU\_ratio}_{i,j,t} = \beta_0 + \beta_1 \text{TOP\_TAX}_{i,j,t+3} + \beta_3 \text{HIGH\_POWER}_{i,j,t-1} + \beta_4 \text{TOP\_TAX}_{i,j,t+3} * \text{HIGH\_POWER}_{i,j,t-1} + \sum_{i=6}^{n} \beta_i \text{ Controls} + \varepsilon_{i,j,t}$$

Equation (2)

		CEOs		CFOs		Others	
Dependent variable: RSU ratio		Coef.	t-stats	Coef.	t-stats	Coef.	t-stats
Intercept		– 0.356	[– 1.46]	– 0.303	[– 1.33]	+ 0.001	[+0.01]
TOP_TAX	+	– 0.057	[– 0.65]	+ 0.002	[+0.05]	+ 0.014	[+0.77]
HIGH_POWER	–	– 0.004	[– 0.11]	– 0.040	[– 1.12]	– 0.020	[– 1.04]
TOP_TAX*HIGH_POWER	–	– 0.082*	[– 1.33]	– 0.098**	[– 1.65]	– 0.070***	[– 2.25]
HIGH_EPS	–	– 0.052	[– 1.18]	– 0.069	[– 0.95]	+ 0.089***	[+3.41]
TOP_TAX*HIGH_EPS	–	+ 0.039	[+ 0.46]	– 0.086	[– 0.57]	+ 0.015	[+0.22]
Cash Constraint	–	– 0.268*	[– 1.39]	– 0.145	[– 0.81]	– 0.072	[– 0.75]
Dividend Payout	+	+ 2.907***	[+ 3.07]	+ 2.902***	[+3.44]	+ 2.241***	[+4.74]
Earnings Volatility	?	– 2.622***	[– 2.57]	– 2.482***	[– 2.63]	– 2.987***	[– 6.42]
Stock Volatility	–	+ 0.158	[+ 0.34]	– 0.463	[– 1.07]	– 0.006	[– 0.03]
Bankruptcy Risk	+	– 0.001	[– 0.89]	+ 0.000	[– 0.75]	+ 0.000*	[– 1.32]
Natural Log (Assets)	+	+ 0.061**	[+ 1.82]	+ 0.035	[+1.14]	+ 0.005	[+0.32]
Stock Performance	+	– 0.038*	[– 1.52]	– 0.054**	[– 2.36]	– 0.052***	[– 4.29]
Book to Market Ratio	–	– 0.027	[– 1.12]	– 0.016	[– 0.64]	– 0.043***	[– 3.52]
Year controls		Yes		Yes		Yes	
Industry control		Yes		Yes		Yes	
Firm fixed effects		Yes		Yes		Yes	
Number of observations		677		675		2126	
R-Squared		0.717		0.753		0.736	
Adjusted R-squared		0.650		0.695		0.719	
Root mean square error		0.228		0.209		0.203	

***, **, * Indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Columns (1)–(3) contain the results of a firm fixed effects model. The t-statistics shown in brackets are based on bootstrap standard errors. The dependent variable RSU ratio measure is defined as [Tax Deductible RSU grants /(Tax Deductible RSU grants + Employee Tax-favoured Stock Option grants]. The expected corporate tax status at vesting year detailed in Section 5.3 is used as a corporate tax planning proxy. This proxy measures the change in RSU ratio for the change in corporate tax status from low to high. The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. This proxy measures the change in RSU ratio for a change in managerial power. The sample consists of 677 (675) (2126) executive-year observations from 2006 to 2015 for CEOs only sample (CFOs only sample) (other executives) from non-family firms. The control variables for this model are described in Appendix D. Coefficients on 15 industry indicator variables and 9-year indicator variables are not shown.

TABLE 12 Executive Equity Compensation Structure (RSU Ratio) Across Corporate Tax Statues and Managerial Power Levels for a Reduced Non-Family Firm Subsample

(n=2,712)

	TOP_TAX	LOW_TAX	HIGH_POWER	LOW_POWER	HIGH_EPS	LOW_EPS
N	434	2278	552	2160	542	2170
Mean	0.435	0.512	0.528	0.492	0.524	0.494
Median	0.496	0.521	0.633	0.500	0.548	0.505
Standard Deviation	0.356	0.382	0.410	0.370	0.377	0.379
Minimum	0.000	0.000	0.000	0.000	0.000	0.000
25th Percentile	0.000	0.000	0.000	0.000	0.000	0.000
75th Percentile	0.749	0.828	1.000	0.754	0.825	0.775
Maximum	1.000	1.000	1.000	1.000	1.000	1.000

Table 12 presents the summary statistics of RSU ratio of non-family firms executives. The comparisons are made based on high tax and low tax statuses, high power and low power, and high EPS and low EPS. The expected corporate marginal tax rate at vesting year (MTR_V) detailed in Section 5.3 is used as a corporate tax planning proxy. I reclassify TOP_TAX =1 if MTR_V is in the top quintile and zero otherwise.

The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. HIGH_POWER=1 if POWER is in the top quintile and zero otherwise. The HIGH_POWER proxy measures the change in RSU ratio for a change in managerial power from low to high.

HIGH_EPS represents an indicator variable. I classify HIGH_EPS=1 if Executive Pay Slice is in the top quintile and zero otherwise.

TABLE 13 The Relation Between Executive Equity Compensation Structure and Corporate Tax Planning and Managerial Power After Controlling for Idiosyncratic Risk and Shareholder Activism

$$\text{RSU\_ratio}_{i,j,t} = \beta_0 + \beta_1 \text{TOP\_TAX}_{i,j,t+3} + \beta_3 \text{HIGH\_POWER}_{i,j,t-1} + \beta_4 \text{TOP\_TAX}_{i,j,t+3} * \text{HIGH\_POWER}_{i,j,t-1} + \sum_{i=6}^{n} \beta_i \text{ Controls} + \varepsilon_{i,j,t}$$

Equation (2)

		Controlling for Idiosyncratic risk		With Shareholder Activism	
Dependent variable: RSU ratio		Coefficient	t-stats	Coefficient	t-stats
Intercept		+ 0.413***	[+3.09]	+ 0.402***	[+3.01]
TOP_TAX	+	+ 0.001	[+0.07]	+ 0.003	[+0.15]
HIGH_POWER	–	– 0.052***	[– 2.97]	– 0.052***	[– 2.96]
TOP_TAX*HIGH_POWER	–	– 0.057**	[– 1.92]	– 0.056**	[– 1.89]
HIGH_EPS	–	+ 0.016*	[+1.54]	+ 0.016*	[+1.53]
TOP_TAX*HIGH_EPS	–	+ 0.001	[+0.04]	+ 0.001	[+0.04]
Cash Constraint	–	– 0.378***	[– 3.72]	– 0.375***	[– 3.69]
Dividend Payout	+	+ 3.274***	[+8.18]	+ 3.316***	[+8.28]
Earnings Volatility	?	– 4.644***	[– 7.07]	– 4.610***	[– 7.02]
Stock Volatility	–	– 1.706***	[– 6.38]	– 1.637***	[– 6.08]
Bankruptcy Risk	+	+ 0.000	[– 0.39]	+ 0.000	[– 0.36]
Natural Log (Assets)	+	– 0.021*	[– 1.29]	– 0.021	[– 1.24]
Stock Performance	+	– 0.058***	[– 5.40]	– 0.058***	[– 5.38]
Book to Market Ratio	–	– 0.051***	[– 3.25]	– 0.052***	[– 3.30]
Idiosyncratic Risk	+	+ 0.024**	[+1.75]	+ 0.024**	[+1.80]
Shareholder Activism	+			+ 0.043**	[+2.01]
Year controls		Yes		Yes	
Industry control		Yes		Yes	
Firm fixed effects		Yes		Yes	
Number of observations		2712		2712	
R-Squared		0.737		0.737	
Adjusted R-squared		0.725		0.725	
Root mean square error		0.199		0.199	

***, **, * Indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. Columns (1)–(2) contain the results of a firm fixed effects model over 2006-2015. The t-statistics shown in brackets are based on bootstrap standard errors, one tailed when sign of the coefficient is predicted, and two-tailed otherwise. The dependent variable RSU ratio measure is defined as [Tax Deductible RSU grants /(Tax Deductible RSU grants + Employee Tax-favoured Stock Option grants]. The expected corporate tax status at vesting year detailed in Chapter 5 is used as a corporate tax planning proxy. This proxy measures the change in RSU ratio for the change in corporate tax status from low to high. The managerial power proxy is measured as a principal component analysis of the board-related variables and executive pay slice described in Section 5.4. This proxy measures the change in RSU ratio for a change in managerial power. The sample consists of 2,712 executive-year observations from 2006 to 2015 for non-family firms. The control variables for this model are described in Appendix D. Coefficients on 15 industry indicator variables and 9-year indicator variables are not shown.