BOARD EFFECTIVENESS: THE EVIDENCE FROM FIRM PERFORMANCE & RISK

SAGAR BHATTARAI
Master of Business Administration, Pokhara University, 2013

A Thesis
Submitted to the School of Graduate Studies
of the University of Lethbridge
in Partial Fulfillment of the
Requirements for the Degree

MASTER OF SCIENCE (M.SC.) IN MANAGEMENT

Faculty of Management
University of Lethbridge
LETHBRIDGE, ALBERTA, CANADA

BOARD EFFECTIVENESS: THE EVIDENCE FROM FIRM PERFORMANCE & RISK

SAGAR BHATTARAI

Date of Defence: August 4, 2016

Dr. Vishaal Baulkaran, Supervisor Thesis Examination Committee	Associate Professor	Ph.D.
Dr. Yutao Li, Supervisor Thesis Examination Committee	Associate Professor	Ph.D.
Dr. Ebenezer Asem, Co-Supervisor Thesis Examination Committee	Associate Professor	Ph.D.
Dr. Dr. Si Li, External Examiner Wilfrid Laurier University Waterloo, Canada	Associate Professor	Ph.D.
Dr. Shamsul Alam, Committee Chair Thesis Examination Committee	Professor	Ph.D.

Abstract

In this study I study the effect of board effectiveness, measured by Board Shareholder Confidence Index (BSCI) on firm performance and risk. I find that there is modest positive relationship between BSCI total scores and firm performance, which is similar to the earlier findings. More importantly, I show a strong relationship between board effectiveness ratings and firm risk. This relationship is tested using a panel regression, a two stage least square and simultaneous equation modelling. The findings are robust to all three econometric techniques. I further explore the relationship between individual sub-scores and find similar results in sub-score analyses. The relationship holds using multiple measures of risk and return, giving us a comprehensive picture of the hypothesized relationship.

Acknowledgements

I would like to express profound gratitude to my supervisor Dr. Vishaal Baulkaran for his immense support, suggestions and guidance throughout the period of my study. This master's thesis would not have been possible without his support.

I would further like to express my deep acknowledgment to Dr. Ebenezer Asem and Dr. Yutao Li for their constructive suggestions which have improved this research. I would also like to thank my external examiner Dr. Si Li for her valuable suggestions and comments.

In addition, I would also like to thanks Ms. Tammy Rogness for her help and support during my period of study.

Finally I would like to thank my family members and my classmate for their continuous encouragement that helped me to complete this thesis.

CONTENTS

List of tables

CHAPTER 1: INTRODUCTION

1.1 Background of study

Board effectiveness is a central theme in the overall corporate governance of firms. Board of director ineffectiveness has been blamed for numerous corporate scandals and failures such as massive earnings restatements, excessive CEO compensation, backdating of stock options, etc. (Agrawal & Chadha, 2005; Boyd, 1994; Collins, Gong, & Li, 2009). More recently, several papers argue that the characteristics of board played a significant role in the recent financial crisis (Erkens, Hung and Matos, 2012; Kirkpatrick, 2009; and Mehran, Morrison, and Shapiro, 2011). Board is one of the several governance mechanisms. Various governance ratings have been developed around the world to quantify the role of corporate governance and director effectiveness in reducing agency problems. The prior literature shows that firms with better governance tend to have higher firm value (e.g., Gompers et al. (2003), and Bebchuk et al. (2009)). However, there is little or no empirical research on board effectiveness ratings and its impact on firm risk.

In this context, this research investigates whether the board effectiveness ratings in Canada are good predictor of firm performance and level of firms' riskiness. There are several studies that examine overall corporate governance and firm performance (Bebchuk, Cohen, and Ferrell, 2009; Bhagat and Bolton, 2008; Core, Guay, and Rusticus, 2006; Gompers, Ishii, & Metrick, 2003). However, unlike the previous studies that focuses on a general governance ratings, this research aims at investigating the relationship between board effectiveness, using Board Shareholder Confidence Index (BSCI), and firm performance as well as firm risk. The BSCI, developed by Clarkson Centre for Business Ethics and Board Effectiveness, is one of the widely accepted benchmark for board

effectiveness in Canada. BSCI score is a freely available governance score in Canada, which makes it useful for individual investors who do not have access to proprietary ratings compiled by other rating agencies. Hence, this score is a relevant measure of market response toward governance of firms in Canada. Also, in Canada, corporate governance structures, implemented by public companies, tend to be voluntary in nature, whereas in USA most of the corporate governance structure are law-based. Thus, the study of corporate boards in Canada provides a unique insight into the role of effective board and the investors' perception towards it.

In this research, I study the effect of the BSCI composite score as well as sub-scores on firm performance and risk. Most of the previous studies have used only one measure of performance. In contrast, I use three different measures for performance (ROA, Tobin's Q and Stock Returns) and three different measures of risk (Beta, Total Risk and Idiosyncratic Risk). In addition in previous research, only a few studies have attempted to control for endogeneity. In this study, to address the endogeneity problems that may be caused by omitted variable bias or simultaneity, I use a two stage least square and a simultaneous equation model to control for potential endogeneity. Considering the evolving nature of BSCI index, I controlled for several voluntary governance practices which are now a part of the index (since 2011) but are not included in the earlier years for the index. Therefore, the findings from this research will add to the corporate governance literature by providing unique insight in effectiveness of board ratings in determining firms' performance and risk.

1.2 Overview of Corporate Governance

The Organization of Economic Co-operation and Development (OECD) (1999) defines Corporate Governance as a *"system by which business corporations are directed*

and controlled." With several corporate scandals recently coming to light, there have been many legal and regulatory reforms aimed at improving governance practices in corporations. The Sarbanes–Oxley Act of 2002 in the USA, Bill 198 in Canada, the Cadbury report of 2002 and Higgs report of 2003 in UK have all brought various reforms aimed at improving corporate governance. Other countries with developed security markets have adopted similar regulatory reforms.

Corporate governance is not only gaining value in regulatory framework; recent research shows that investors' decisions are increasingly based on firms' corporate governance records and are willing to pay a premium for shares of well-governed companies relative to shares of poorly governed companies with comparable financial results (Newby, 2001; Gompers et al., 2003; and Bebchuk et al., 2009). Similarly, a survey by the management consulting firm McKinsey & Company in 2002 shows that a majority of investors are prepared to pay a premium for companies exhibiting high governance standards (Global Investor Opinion, 2002).

1.3 Overview of Governance Ratings

Companies have always disclosed corporate governance mechanisms and processes in their filing with regulatory bodies as per regulatory requirements. However, it takes a considerable amount of time and effort to collect and analyze these disclosures. Hence, corporate governance scores are gaining momentum in financial markets because they simplifies this process. There are several governance ratings constructed globally, for example, MSCI ESG Ratings in USA[1], Deminor Corporate Governance ratings in Europe,

[1] GMI Ratings, formed by merger of Governance Metrics International, The Corporate Library and Audit Integrity, was acquired by MSCI on August 2014.

ACSI in Australia. In Canada, the rating is focused on a board of directors. The Globe and Mail ranks companies on S&P/TSX composite index using data from Clarkson Centre for Business Ethics and Board Effectiveness (CCBE). CCBE has also compiled its own ranking of boards since 2002, known as the Board Shareholder Confidence Index (BSCI) which is used in this research. Apart from these ratings, numerous other ratings are distributed privately by S&P, Moody's, E&Y, Fitch and other rating agencies to their proprietary clients.

CHAPTER 2: LITERATURE REVIEW

2.1 Agency Problem

The literature on corporate governance can be traced back to the discussion on agency problems by Jensen and Meckling (1976). They argue that separation of ownership and control in a firm can result in agency problems, which arise when managers make decisions that benefit themselves, at the expense of shareholders. Fama (1980) argues that with the competitive forces inside and outside the firm, a firm is forced to develop mechanisms to monitor the performance of the firm, thus reducing agency problems. Jensen (1986) argues that agency problems arise because managers invest excess cash flow in low investment projects. He provides evidence that oil companies in mid 1980s preferred investing their excess cash flows in expensive exploration projects rather than distributing the firm's profits to investors.

Furthermore, Shleifer and Vishny (1997) argue that legal protection and concentrated ownership are important ways of mitigating agency problems. One of the proposed methods of controlling agency problems is to link managerial compensation to the performance of company, which would give incentives for managers to maximize shareholder value (Holmstrom, 1979; Murphy, 1999). However, compensation alone cannot achieve good corporate governance (Frydman and Saks, 2010). In addition, Bebchuk and Fried (2004) argue that compensation is related to managers' ability to extract rent. Other research focuses on role of governance structure in the reduction of agency problems. These studies attempt to provide empirical evidence regarding the effectiveness of governance structures by measuring the effect of these governance structures on firm performance and risk. These papers are discussed below.

2.2 Corporate Governance and Performance

A better governance structure can impact firm performance in several ways. Firstly, with a better corporate governance structure in place, the appropriation of company resources by management is less likely. Therefore, with improved governance, efficient utilization of company resources can result in higher operating income and firm performance. Secondly, investors will be more confident to invest in companies with a good governance structure and will be more inclined to pay a premium for companies with a high governance standard (Global Investor Opinion, 2002).

There has been several studies to date that examine the relationship between corporate governance and firm performance. For example, Core, Holthausen, and Larcker (1999) find that firms with weaker governance structure[2] have higher agency problems which leads to higher rent extraction by managers in the form of compensation. They also find that board and ownership characteristics can predict future accounting performance more accurately than stock performance. In addition, they show that in firms with weaker governance, CEO compensation is higher due to greater agency problems.

In a study of Russian firms, Black (2001) finds a strong correlation between corporate governance behaviour and the market value of the firm. Black (2001) argues that in countries with weak regulatory governance reforms, the individual governance of firms has an important effect on their market value. This relationship between governance and firm value holds in cross-country analyses. For example, La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2002), in a cross-country analysis of 539 firms in 27 countries, find

[2] Core, Holthausen, and Larcker (1999) used set of board and ownership structure variables to proxy for governance structure of firm.

higher valuations of firms in countries with better shareholder protection. They also show that firms with higher cash flow ownership by controlling shareholders have higher valuations. Similarly, Gompers, Ishii, and Metrick (2003) find that firms with stronger shareholder rights have higher firm value, higher profit and higher sales growth. They also create their own governance index, and find that corporate governance is strongly correlated with stock returns, showing that firms in highest decile outperformed firms in lowest decile by 8.5%.

Baek, Kang, and Park (2004) also find that Korean firms with unaffiliated foreign investors and higher disclosure quality experienced smaller reduction in their share value during the 1997 Korean financial crisis. They argue that the change in firm value during financial crisis is a function of firm level differences in corporate governance structure. Similar results are reported by Black, Jang, and Kim (2006). They find that firms with a higher governance index have 40% higher share price. In addition, Durnev and Kim (2005) analysing firms across 27 countries, find that firms with higher governance and transparency rankings also have a higher stock market value. They determined that one standard deviation increase in the overall governance score is associated with an increase in a firms' market value by 9%.

Bebchuk, Cohen, and Ferrell (2009) proposed an entrenchment index. It consists of only 6 provisions among the 24 provisions used by Gompers, Ishii, and Metrick (2003), which limit shareholders' rights and protect companies from hostile takeover. Their research finds that an increase in the index is associated with significant reduction in firm value measured by Tobin's Q. This implies that as managers become entrenched, agency costs increase and firm value decreases.

Bhagat and Bolton (2008) find that corporate governance, as measured by G-index (Gompers et al. (2003) and E-index (Bebchuk et al. (2009), is positively related with current and future operating performance of the firm. However, they did not find a significant relationship between the governance measures and future stock market performance.

Yasser, Entebang, and Mansor (2011) examine the relationship between four corporate governance mechanisms (board size, board composition, CEO chairman duality and audit committee) with two measures of firm performance (ROE and profit margin) in the case of 30 listed Pakistani firms, and found a significant relationship between performance and three of the corporate governance mechanisms (board size, board composition and audit committee).

Black, De Carvalho, and Gorga (2012) examined the corporate governance in BRIK countries (Brazil, Russia, India and Korea) and found that the relationship between governance and market value of a firm is strongly influenced by country characteristics. Similary, Aggarwal, Erel, Stulz, and Williamson (2010) find that foreign firms invest less in internal governance mechanisms relative to comparable US firms. They find a negative relationship between this shortfall in goveranance investment whencompared to US firms, and the market value of the firm, as measured by Tobin's Q.

In general, the positive relationship between corporate governance and firm perforamance is well documented in literature. This relation between governance and firm performance has been tested in single country studies, as well as in cross-country analysis.

2.3 Corporate Governance and Risk

Recent studies that examine governance and risk show that with better governance, firms are indulging in riskier projects, since with better investor protection, managers have the authority to take higher risks (John, Litov, and Yeung, 2008). In addition, institutional investors are more confident in trading firms with better governance structure. Hence, shares of better-governed companies are traded more frequently, leading to frequent price fluctuation and higher idiosyncratic risk. In fact, Ferreira and Laux (2007) argue that better corporate governance increases the incentives for institutional investors to collect firm specific information and act upon it, thereby increasing idiosyncratic risk. Similarly, John et al. (2008) find that corporate risk taking is positively related to the quality of investor protection. They argue that in better governed firms, external stakeholders, such as creditors and labor groups, cannot pressure firms into taking lower risks, for the sole benefit of those external stakeholders.

In contrast, there are several studies which show that better governance leads to a decrease in firm risk. For example, Ashbaugh-Skaife, Collins, and LaFond (2006) find that credit ratings are negatively associated with the number of block-holders and CEO power, and positively related to takeover defenses, accrual quality, earnings timeliness, board independence, board stock ownership, and board expertise. Similarly, examining board-related voluntary governance practice, Baulkaran (2014) finds that firms with independent chairman, majority voting in director election, and detailed disclosure of voting have lower idiosyncratic risk.

In addition, Faccio, Marchica, and Mura (2011) find that firms controlled by diversified large shareholders undertake riskier investments than firms controlled by non-

diversified large shareholders. Also, Nguyen (2011) finds that family control and ownership concentration are associated with higher idiosyncratic risk, which explains the better performance of family-controlled firms[3]. Similarly, Anderson and Reeb (2003) find that firms with block ownership by founding family are associated with lower corporate diversification. Firms with family ownership employ lower leverage, however, all three measures of risk (total, systematic and unsystematic) are not significant between family and non-family firms. In general, the survey of literature on the relationship between corporate governance and firm risk provides mixed views on the subject.

2.4 Board of Directors

The board of directors is one of several governance mechanisms aimed at reducing agency problems.[4] Various aspects of boards such as board structure, board independence, and board size have been studied in great depth. There are several studies on board composition and firm performance. The consensus is that independent directors are better directors, since they are less prone to agency problems. In a survey by McKinsey & Company in 2002, 44% of investors identified independent board as a top governance reform priority (Global Investor Opinion, 2002). Academic research has also shown the advantage of having independent directors (Gordon, 2007; Ravina and Sapienza, 2010).

Based on the prior literature, the general view is that independent directors are beneficial to shareholder value. Gordon (2007) argues that independent directors are more

[3] Nguyen (2011) argues that market power makes large firms less prone to economy wide fluctuation. This decreases their systematic risk, and increases idiosyncratic risk. The competitive advantage of market power also results in higher firm performance. Thus, higher idiosyncratic risk is related to higher performance.

[4] Other governance mechanisms include ownership structure, executive compensation, market for corporate control, and legal and regulatory regimes.

valuable than insiders as they are less committed to management and its vision. Hence, the recent decades have seen an increase in the number of independent directors in large public firms. However, direct empirical evidence suggests that an independent board does not necessarily lead to better performance. For example, Bhagat and Black (2002) find that firms often add more independent directors after a period of low profitability. Their study finds no evidence that firms with independent boards perform better than other firms. Similarly, Hermalin and Weisbach (1991) found no significant relationship between board composition and performance. However, Hermalin and Weisbach (2001) present the endogenous nature of board structure, and argue that board composition is not related to corporate performance, while board size is negatively related to corporate performance. In addition, Adams, Hermalin, and Weisbach (2008) further emphasize a complex three way relationship between shareholders, boards, and top management.

On the other hand, Black, Jang, and Kim (2006) find that Korean firms with 50% outside directors have a 13% higher Tobin's Q. Similarly, Ravina and Sapienza (2010), using the level of inside information independent directors collected while serving on the board by comparing the market-adjusted returns associated with their trades to those associated with the executive officers' trades, they find that in well-governed firms, independent directors can earn substantial abnormal return, similar to the firm's executives, when they purchase their company stock. However, in poorly governed firms, executives' returns are almost 21% higher than independent directors' returns. Also, independent directors earn higher return when they are on audit committees, and when they make open market purchases of shares. Hence, they argue that in better-governed firms, independent directors are more informed.

In terms of the size of the board, several studies have shown that larger boards are less effective, due to director "free-riding" (Jensen, 1993; Lipton & Lorsch, 1992). On the other hand, small boards lack the necessary management capacity to function effectively in firms with multiple business segments. Hence, the suggested optimal board size should be around 6 to 8 members (Jensen, 1993; Lorsch and Young, 1990). Previous empirical evidence shows a negative relationship between board size and corporate performance (See Yermack (1996), and Eisenberg, Sundgren, and Wells (1998)).

There are several recent studies exploring the negative effects of board size. For example, Bennedsen, Kongsted, and Nielsen (2008) show that the effect of board size on performance is negative, and significant only for boards with greater than 6 directors. However, Coles, Daniel, and Naveen (2008) find that the relationship between firm size and firm valuation is U-shaped. They argue that either very small or very large boards are indeed optimal. In contrast, Beiner, Drobetz, Schmid, and Zimmermann (2004) did not find a significant relationship between board size and firm valuation, as measured by Tobin's Q, in a sample of publicly listed Swiss firms.

In terms of board structure, Mak and Li (2001) find that corporate ownership and board structure are related. They find that firms with higher managerial ownership have a lower proportion of outside directors. Furthermore, when a board has a high proportion of outside directors, it is more likely to be a small board.

The previous literature on boards of directors tend to focus on a one-dimensional aspect of the board. Very few studies look at director effectiveness from multiple dimensions. This study utilizes a rating index that combines several dimensions of the

board such as independence, ownership, structure, system and compensation in order to measure board effectiveness. Thus, it is possible that this index in more robust in capturing director effectiveness when compared to a single dimension such board independence or size.

2.5 Empirical evidence on Corporate Governance ratings

Increased concern toward corporate governance has given rise to various private and public governance ratings being developed. In general, a company board gets a higher rating if the firm has a majority of independent directors, the board size is small, it appoints a non-CEO board chairman, and has an explicit governance policy in place, as well as having other various governance practices. Among all the governance ratings, the most widely cited research regarding composite governance score is that of Gompers, Ishii, and Metrick (2003), commonly referred to as the GIM index. They used 24 provisions from the Investor Responsibility Research Center (IRRC) to form the GIM index. Empirical analysis of firms in the highest and lowest deciles show that firms in the lowest decile outperformed firms in highest decile by 8.5%. They also find evidence that firms with weak shareholder rights are less profitable.

Additionally, Brown and Caylor (2006) proposed the Gov-Score index which consists of 51 firm-specific provisions compiled from a dataset provided by Institutional Shareholder Services (ISS), and find that better-governed firms are relatively more profitable, more valuable, and payout more cash to their shareholders. Also, among all those 51 provisions, those related to executive and director compensation are highly associated with good performance.

In addition, Bhagat and Bolton (2008) examine the GIM and E-index and find that better governance is positively related to subsequent operating profit. However, none of the measures are related to future stock market performance. Similarly, Daines, Gow, and Larcker (2010) conduct a comprehensive study of the most widely used, commercially available ratings[5] to examine the relationship between ratings and outcomes of firms such as accounting restatement, shareholder litigation, operating performance, cost of debt, etc. They find that few of the ratings have a positive relationship with operating performance. However, the relationship seems modest. Also, they find that these ratings are not useful in predicting future accounting restatement, shareholder litigation or change in a firm's cost of debt.

Researchers around the globe find similar results regarding the dependability of corporate governance ratings. For example, Linden and Matolcsy (2004) conduct similar studies using Australian firms and find that companies that have large total assets usually have higher ratings. Also, when comparing profitability across different groups of corporate governance (high, medium, and low) there seems to be no statistical significance between governance and profitability. Bauer, Guenster, and Otten (2004) used Deminor Corporate Governance Ratings to analyse companies in Europe, and found a weak negative relationship between earnings and governance ratings. Similarly, Koehn and Ueng (2005) examined whether having higher corporate governance ratings will lead to the firm being more ethical, and whether the governance score will improve the earning quality of the firm. They show that corporate governance and earning quality are not related, and firms

[5] Ratings used in this research were from the Corporate Governance Quotient (CGQ) developed by Institutional Shareholder Services, Governance Metrics International (GMI) ratings, The Corporate Library (TCL) ratings and Audit Integrity Accounting and Governance Risk (AGR) ratings.

with higher corporate governance scores are less likely to be on the list of ethical firms. On the other hand, Kula and Baykut (2015) studied the effect of governance rating in the case of Turkey, and founds that higher governance rating results in an increased market value of the firm.

The mixed result of the relationship between corporate governance and firm performance has raised questions of whether ratings are effective in capturing the way a firm operates. Corporate governance ratings might not always reflect the actual state of corporate governance in a firm. While calculating governance ratings, rating agencies also rely on public information about the firm. With an increased focus on governance, a firm with poor governance structure might not only manipulate their financial statements, but also the public information used to calculate their governance ratings (Dechow, Sloan, and Sweeney, 1996). In addition, since there is no straightforward formula to measure the level of corporate governance, any ratings index is prone to errors when quantifying corporate governance structure into a score. The same company might be rated differently by different rating agencies because of differences in their ratings methodology. For example, Daines et al. (2010) find very little correlation among different ratings produced by various rating agencies. The strongest argument against corporate governance scores comes from Sonnenfeld (2004) where he argues that rating companies rely on myths rather than evidence in arriving at objective judgments.

2.6 Canadian Studies

Though there are several governance indexes around the world, in most cases, none of these composite governance ratings are freely available to the public, and all of providers sell their ratings to the client firms, as well as to the institutional and individual investors.

This makes it difficult to analyze the public's perception of a company based upon those governance ratings. However, in Canada, governance ratings are made publicly available; the Globe and Mail annually publishes the governance scores for TSX/S&P Index firms starting from 2002. This provides us with an appropriate environment to test whether any new information is communicated to investor by these governance ratings.

Another advantage of looking at Canadian firms is that, in Canada, corporate governance tends to be voluntary, especially compared to the USA, where most of the corporate governance reforms tends to be law-based. Firms listed on the Toronto Stock Exchange (TSX) are only encouraged to consider the guidelines when designing their own corporate governance system. They are required however, to disclose in the annual report or proxy circular, the level of their compliance with the suggested guidelines (Li and Broshko, 2006). Also, family ownership and private control is more prevalent Canadian firms. Thus, a study of corporate governance practices in Canada provides insight into board effectiveness and the investors' perception towards it, given that the ratings are publically available to all investors.

One of the earliest research regarding corporate governance score in Canada is Jog and Dutta (2005). They used the 2002 Goble and Mail governance index, and found no significant relationship between governance ratings and firm performance. Foerster and Huen (2004) conduct a similar study by using ratings from the Globe and Mail Governance index to investigate the performance of 270 Canadian publicly listed firms. Their study shows that the governance score is positively and significantly related to size. Also, firms cross-listed on NYSE have higher governance scores. Similar to Gompers et al. (2003),

they also divide stocks based on their governance score. They show that stocks with the highest governance scores outperform the rest by an average of almost 9%.

In addition, Klein, Shapiro, and Young (2005) find a positive relationship between firm performance, measured by Tobin's Q, and the Globe and Mail governance score. However, futher analysis of subcomponents shows that not all subcategories are important. They find that strong shareholder right, compensation policies that align managers' and shareholders' interest, and open and transparent disclosure mechanisms are highly valued by investors. One surprising finding is that board independence is negatively related to performance. This is driven primarily by family controlled firms. They argue that the importance of both board independence and composition on corporate governance depends on the ownership of the firm.

Beekes, Brown, and Chin (2007) analyze the BSCI scores for 2004 to determine if the governance of firms has any influence on speed of price discovery and disclosure of information by firms. They find that companies with higher BSCI score release more information, and relevant information is integrated into share price more rapidly.

Adjaoud, Zeghal, and Andaleeb (2007) used two different measures of performance and examined the relationship of those measures with the 2002 Globe and Mail governance score. The performance measures include traditional measures such as Return on Equity (ROE), Return on Investment (ROI), Market to Book Ratio (MB), and economic value measures such as Economic Value Added (EVA) and Market Value Added (MVA). They categorise firms by their governance score into three categories: best, average and lowest. They find that there is no significant difference between performance of best and lowest

categories when traditional performance measures are used. However, when performance is defined in terms of economic value measures, there is a statistically significant difference between higher and lower ranked firms. Their research supports the relationship between board quality and firm performance. In addition, Switzer and Cao (2011) used the BSCI index from 2002-2006 and analyse the relationship between firm performance measured by Economic Value Added (EVA) and BSCI score. They find that a higher BSCI score is associated with higher EVA, though there is a significant performance gap between poorly-governed and well-governed firms. Their findings support the argument that if the board and shareholders' interests are aligned, it improves company performance. They do not however, look at causality between performance and governance, and do not analyze firm risk.

Similarly, Gupta, Kennedy, and Weaver (2009) examined the relationship between the Globe and Mail index and financial and market performance for e time period from 2002 to 2005. They did not find any association between the composite index, and any sub-category of the corporate governance scores and various measures of firm performance such as Tobin's Q, ROA and Market to Book ratio. They argue that corporate governance is manifested in the market value of a firm over a much longer period and hence, suggest examining longer time series data. In contrast, Conheady, McIlkenny, Opong, and Pignatel (2014) examined the relationship between firms' BSCI composite index, its components and firm performance as measured by Tobin's Q, for 699 firms from 2003 to 2009. They show a positive association between performance and board effectiveness. Regarding the various subcomponents of the governance index, they find that board structure and independence are positively associated with the market performance of firm.

This research contributes to the literature in the following ways: firstly, most of the previous studies using governance ratings have examined only a short period of time (Adjaoud et al., 2007; Beekes et al., 2007; Foerster and Huen, 2004; Jog and Dutta, 2005; Klein et al., 2005). It is possible that these previous studies do not capture the true effect, since the effect of governance might be manifested in the market over a longer period of time and most of these previous studies have only analysed governance scores in a single year. Hence, this study proposes the analysis of longer time period, specifically from 2003-2010. Secondly, the previous research using Canadian governance ratings have used only Tobin's Q for measurement (Conheady et al., 2014; and Klein et al., 2005). I extend the research by using the accounting measure of performance (ROA) as well as annual stock return.

More importantly, despite the relationship between governance mechanisms and firm risk being documented in past research (Baulkaran, 2014; Beekes et al., 2007; Ferreira and Laux, 2007; John, Litov, and Yeung, 2008; Nguyen, 2011), most of the past Canadian studies did not examine the relationship between governance ratings or board effectiveness and firm risk (For example, Foerster and Huen, 2004; Gupta et al., 2009; Jog and Dutta, 2005; Klein et al., 2005; or Conheady et al., 2014). Hence, this research investigates the relationship of governance ratings with both performance and risk.

In addition, very few studies adequately account for potential endogeneity. None of the past Canadian studies, except Klein et al. (2005) and Conheady et al. (2014) attempted to control for endogeneity. Klein et al. (2005) controlled for endogeneity using dummy variable for firms listed on a U.S exchange and number of years listed in the TSX. However, their Hausman test rejected endogeneity. Conheady et al. (2014) controlled for

endogeneity using voting percentage as an instrument in the first stage of a two stage least squares. They argue that concentrated ownership reduces agency costs. However, a large percentage of TSX composite firms are dual class firms or family firms (Amoako-Adu, Smith, and Baulkaran, 2011). In these firms, voting power can exacerbate agency problems rather than minimize them. In addition, the share structure criteria in BSCI ratings already controls for the dual class structure of the firms in these ratings. Therefore, I believe that voting power is not an appropriate instrument to control for endogeneity in this setting. I explicitly account for potential endogeneity using two stage least square and simultaneous equation modeling techniques.

2.7 Hypothesis development

Earlier studies on the relationship between firm performance and corporate governance are inconclusive. Some studies in past suggests a link between governance and market performance (Bebchuk, Cohen, and Ferrell, 2009; Black, 2001; Black et al., 2006; Brown and Caylor, 2006; Gompers et al., 2003). However, other researchers have not been able to find a significant relationship (Adjaoud et al., 2007; Gupta et al., 2009; Jog and Dutta, 2005). Investor might not timely respond to the governance structure of firms. Also in complex environment of firm performance, which is affected by factors such as market structure, competition, political environment, demographic changes etc, real effect of governance on performance might be difficult to quantify. Hence, there is an ongoing debate about the relationship between governance and performance. In a firm with higher governance ratings, better management oversight will result in company resources being used for value maximizing projects, rather than a manager's pet project. This will result in higher operating performance of firms. Also, firms with higher governance ranking have

higher credit ratings (Ashbaugh-Skaife, Collins, and LaFond, 2006) making it easier for them to excess external financing at a lower cost. Hence, it is reasonable to assume that firms with better governance ratings will have better performance. Therefore, I propose the following hypothesis:

H1: There is a positive relationship between board effectiveness and firm performance.

Various studies have explored relationship between governance mechanisms and firm risk (Baulkaran, 2014; Ferreira and Laux, 2007; John et al., 2008; and Nguyen, 2011). However, the link between board effectiveness and firm risk has not been established in the literature. Hence, this study proposes exploration in this direction. Good corporate governance can reduce various kinds of risk associated with the firm, which might be of interest to investors. In a firm with higher governance ratings, better management oversight will be effective in reducing managers' risk-taking for their self-interest. In addition, better internal control mechanisms will limit the risk exposure of firms. Hence, I expect firms with better governance ratings to have lower risk, and propose following hypothesis:

H2: There is a negative relationship between board effectiveness and firm risk.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research Design

The relationship between board effectiveness and firm performance is tested using following panel regression with firm and year as fixed effects:

$$\mathbf{Performance_{i,t+1}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\ \mathbf{Board\ Effectivenes_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \qquad \textbf{(1)}$$

Three different measures of performance is utilised in this study. These include: Tobin's Q, Annual Stock Return and ROA. Board effectiveness is measured by using the BSCI score. Both the composite governance score and sub-scores are analysed separately. In terms of control variables, firm size, board size, growth, dividend yield, debt/total assets, R&D and advertising/total assets, are used following Agrawal and Knoeber (1996), Hermalin and Weisbach (1991) and Baulkaran (2014). In addition, I use various corporate governance practises voluntarily disclosed by Canadian firms, hereafter referred as voluntary disclosure practices, as control variables. These includes majority voting, individual director election, say on pay, disclosure of voting results. These voluntary disclosure practices variables have been shown to be related to firm risk and performance (Baulkaran, 2014)[6]. These measures are clearly important since they are part of the BSCI ratings since 2011[7]. My sample period for this analysis is from 2003-2010, since BSCI

[6] As of 12/31/2012, TSX requires the issuers to elect directors individually and to disclose the votes received for the election of each director (Baulkaran, 2014). Individual director election and detailed disclosure of voting policy are common voluntary best practice policies that has been emerging in recent years, post-Enron regulation changes. Firms with individual director election and detailed disclosure of voting results have higher firm performance (Baulkaran, 2014). Also, firms with independent chairman, majority voting and disclosure of voting results have lower idiosyncratic risk (Baulkaran, 2014).

[7] BSCI score underwent extensive changes in 2009, 2011 and 2013

rating have underwent many changes after 2010. Because voluntary disclosure practices are not part of BSCI during my sample period, I include these voluntary disclosure practices as control variable in the regression analysis.

I test hypothesis 2 using the following equation with firm and year fixed effects:

$$\mathbf{Risk_{i,t+1}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\mathbf{Board\ Effectiveness_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \boldsymbol{\varepsilon_{i,t}} \qquad (\mathbf{2}),$$

Risk is measured as beta, idiosyncratic risk and total risk. Market risk (beta) is estimated using a minimum 3 years and maximum 5 years of monthly returns. Idiosyncratic risk is the variance of residuals from the market model used to estimate beta. Total risk is defined as the standard deviation of monthly returns. All risk measures are at time t+1. Control variables used in eq. (2) are firm size, financial leverage, board size, percentage of independent directors, institutional ownership and managerial ownership following Wright, Ferris, Sarin, and Awasthi (1996), Anderson and Fraser (2000), Wang (2012) and Baulkaran (2014). In addition, I use voluntary disclosure practices, such as, individual director election, majority voting policy, say on pay and disclosure of voting policy as additional control variables.

I control for endogeneity using two stage least square and simultaneous equation models. First, two stage least square method is used to control for potential endogeneity[8].

The first stage equation is a panel regression to predict the value for board effectiveness score. The first stage regression is estimated as the following:

$$\textbf{Board Effectiveness}_{i,t} = \alpha + \sum_{i=1}^{n} \gamma_i \textbf{Controls}_{i,t} + \varepsilon_{i,t} \qquad (3),$$

The control variables are independent chairman, percentage of independent director, dummy variable for year 2009, institutional ownership, management ownership, asset growth, sales growth[9], dividend yield, leverage, majority voting, individual director election, say on pay, disclosure of voting results. Institutional investor's, such as CalPERS, are actively involved in improving corporate governance in a company, and thus play an important part in this relationship. Shleifer and Vishny (1986) indicate that institutional owners have a vested interest in controlling agency problem. Bushee and Noe (2000) show that firms with higher disclosure rankings have higher institutional ownership. Chung and Zhang (2011) show that institutional ownership increases with the increase in governance quality.

Also, increased managerial ownership is associated with reduction in agency costs (Jensen and Meckling, 1976). Ang, Cole, and Lin (2000) find that agency costs are negatively related to management ownership. In addition, leverage helps to decrease agency costs. Higher level of debt financing is associated with a higher the risk of bankruptcy, and therefore managers are less likely to shirk or undertake excessive risk (Grossman and Hart, 1982). Furthermore, dividend payout reduces the available funds that managers can use at their own discretion (Jensen, 1986), also reducing agency costs. Past

9 Asset growth and sales growth are both included in first stage. Correlation coefficient between them is 0.12.

research have shown that board size does matter for board effectiveness and have suggested board size to be around 6 to 8 (Jensen, 1993; Lorsch and Young, 1990). Other firm characteristics included in first stage are ROA, stock return, firm size. All these variables are uncorrelated with the residuals from the risk and performance regression estimation[10].

I use predicted values from the first stage panel regression in second stage regression for performance and risk in Eq. (1) and (2) to obtain the following:

$$\mathbf{Performance_{i,t+1}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\ \mathbf{Predicted\ Board\ Effectivenes_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \varepsilon_{\mathbf{i,t}} \quad (\mathbf{4})$$

$$\mathbf{Risk_{i,t+1}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\ \mathbf{Predicted\ Board\ Effectiveness_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \varepsilon_{\mathbf{i,t}} \quad (\mathbf{5})$$

It is possible that the contemporaneous risk affects contemporaneous performance and vice versa. Therefore, I jointly estimate risk and performance using simultaneous equation modelling for equations (6) and (7) below:

$$\mathbf{Performance_{i,t+1}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\ \mathbf{Board\ Effectiveness_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \mathbf{Risk_{i,t+1}} + \varepsilon_{\mathbf{i,t}} \quad (\mathbf{6})$$

$$\mathbf{Risk_{i,t+i}} = \boldsymbol{\alpha} + \boldsymbol{\beta}\mathbf{Board\ Effectiveness_{i,t}} + \sum_{\mathbf{i=1}}^{\mathbf{n}} \boldsymbol{\Upsilon_i}\mathbf{Controls_{i,t}} + \mathbf{Performance_{i,t+1}} + \varepsilon_{\mathbf{i,t}} \quad (\mathbf{7})$$

The measures of performance, risk and controls are similar to equations (1) and (2).

10 After performing panel regression for equaiton 1 and 2, the residuals were stored and corrleated with control variables for 1st stage equation.

3.2 Data Source

The majority of past research utilizes corporate governance ratings from the Globe and Mail, Report on Business as their measure of governance score (Adjaoud et al., 2007; Foerster and Huen, 2004; Gupta et al., 2009; and Klein et al., 2005). However, the Globe and Mail, Report on Business uses data from Clarkson Centre for Business Ethics and Board Effectiveness (CCBE) for their annual Board Games. Hence, this research uses governance data directly from CCBE. Board Shareholder Confidence Index (BSCI) is an annual ratings developed by CCBE to measure board effectiveness. This score is constructed in a manner that is similar to the spirit of the CalPERS approach[11], and measures factors affecting shareholders' confidence in the boards' abilities to fulfill their duties. Few of the past studies have used the BSCI scores (Conheady et al., 2014; Switzer and Cao, 2011).

A BSCI score is developed using 23 criteria which are separated in three sections: Individual Potential, Group Potential, and Board Decision Output. Individual potential focuses on the directors themselves and scores firms based on director independence, attendance at board or committee meetings and their motivation in the form of share ownership. Group potential focuses the board as a whole and scores board on characteristics of the board and meeting structure as well as the assessment and improvement of the board's collective skillset. Board decision output rates three major board decisions

[11] CalPERS, largest pension fund in U.S, is known for its shareholder activism. CalPERS implements its U.S. corporate governance initiatives and proxy voting responsibilities covering the following areas: Board Independence & Leadership; Board, Director, and CEO Evaluation; Executive and Director Compensation; Integrity of Financial Reporting; Risk Oversight; Corporate Responsibility and Shareowner Rights.

including CEO succession, Director Election and Compensation. All S&P/TSX Composite Index firms are initially assigned 100 points, and points were deducted based on the 23 different criteria. The final score ranges from 95 to 80 and the rating is from AAA+ to C. A detailed explanation of the 23 different criteria is included in appendix 1.

There are in total 225 publicly listed companies in Canada included in Corporate Governance (CG) ranking of 2010. This varies from time to time, since the S&P/TSX composite index is a floating index and the companies in the index changes every year.

BSCI ratings methodology is revised every few years to enhance the effectiveness of the ratings. During my study period, a major change in BSCI score occurred in 2009. The index contained five different sub-scores prior to 2009, whereas the index includes three additional sub-score criteria (meeting attendance, director election, CEO succession) from 2009 onwards. Also, the "output" sub-score is renamed as "compensation". To account for this, in robustness section analysis has been done for time period before the change. In addition, for the sub-score analysis, the newly added sub-scores since 2009 are excluded, since my sample ended in 2010.

All the accounting data for this research is obtained from Compustat, and stock price data is obtained from Canadian Financial Market Research. Corporate Governance and Ownership data is hand-collected from annual proxy circular retrieved from the SEDAR website.

3.3 Data Coding:

The data for this analysis includes panel data from 2003 to 2010. During this period, the methodology for scoring changed in 2009. Dummy variables are used to account for

the change in scoring methodology when analysing Total Score. BSCI assigns overall grades for individual firms in their ranking. Each company is ranked from AAA+ to C in descending order of corporate governance structure. In order to facilitate empirical analysis, those grades are converted into scores following Beekes et al. (2007). The table below presents the conversion scale.

BSCI Score	BSCI Grade	Board Effectiveness
100	AAA+	6
95-99	AAA	5
90-94	AA	4
75-89	A	3
50-74	B	2
<50	C	1

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Descriptive Statistics

In table 2, I report the descriptive statistics for all variables used in this analysis. After eliminating firms with incomplete data, the final sample contains 1,472 firm-year observations from 2003 to 2010, with the lowest number of firms in 2009 (145) and highest number of firms in 2010 (213). In Panel A, table 2, the summary statistics for board effectiveness total scores and sub-scores are reported. The board effectiveness score has a mean of 2.59 (median = 2.0, min=1, max=6). Among all subcategories, only CEO succession, director election and meeting attendance are sub-categories where some firms received a median score of 0. These three subcategory were added after 2009. Compensation, on average, has the highest sub-score (mean=4.05 and median=5). This implies that in most firms, CEO pay is important, and various activities such as option repricing, loans to directors, and dilution of shareholder return by issuing excessive options to directors are less practised, thus leading to higher sub-scores in compensation. Interestingly, compensation has the lowest standard deviation among all the sub-scores, showing that compensation policies across the majority of the firms are similar. Also, director independence (mean=3.81 and median=4) and stock ownership (mean=3.74 and median=4) scores are relatively high in my sample. This is indicative of a trend towards more independent boards, and a greater alignment of interest between directors and shareholders via stock ownership by directors. This in turn can reduce the traditional agency problems associated with separation of ownership and control. The meeting attendance sub-score has highest standard deviation (1.94) among all firms in my sample,

with a mean of 1.03 and a median score of 0. A detailed year-by-year analysis of sub-scores over the sample period is presented in Figure 1.

Firm characteristics are reported in Panel B, table 2. The average size of firm in my sample is $21.27bn, measured by total assets, with an average market capitalization of $6.53bn. The higher standard deviation among these firms shows the diversity in firm size included in S&P TSX Composite Index. In addition, firms in my sample spend, on average, $4.63m in advertising expense, $18.10m in R&D expense and $447.04m on capital expenditure (8% of total assets). The larger amount spent on R&D compared to advertising shows that innovation is key for success in large firms. Firms in my sample have a mean leverage ratio of 0.46 (median = 0.21), while, 17% of the firms in my sample are in regulated industries.

In term of dividend yield, firms in my sample have, on average, a dividend yield of 2% (median =1%). In addition, institutional ownership and management ownership are, on average, 9.8% and 8.4% in my sample, respectively. In terms of board size, the average board size in my sample is 10.24 directors (median = 10 directors). Firms with larger boards in my sample consist of a high number of financial firms, while firms with smaller boards in my sample mostly consist of energy and mining companies.

Voluntary governance mechanisms of firms included in the sample are presented in Panel C,. Majority voting, individual director election, and disclosure of voting results seem prevalent, with 36.2%, 22.6% and 38.2% of the firms in my sample having these governance policies in place, respectively. Only 3.6% of firms have say-on-pay. This is likely due to the fact that say-on-pay as a voluntary best practice started in 2007.

Firm risk and return characteristics are presented in Panel D, table 2. Firms in my sample have a mean beta of 1.04 (median = 0.907), total risk of 11.1% (median = 9.7%) and idiosyncratic risk of 0.2% (median = 0.3%). In terms of performance, firms in my sample have a mean Tobin's Q of 1.274 (median = 1.089), ROA of 11.1% (median = 11.6%) and an annual stock market return of 6.5 % (median = 3.2%). All of my performance and risk variables are measured at time *t+1*.

Figure 1 : Plot of average of governance sub-scores during the period 2003-2010

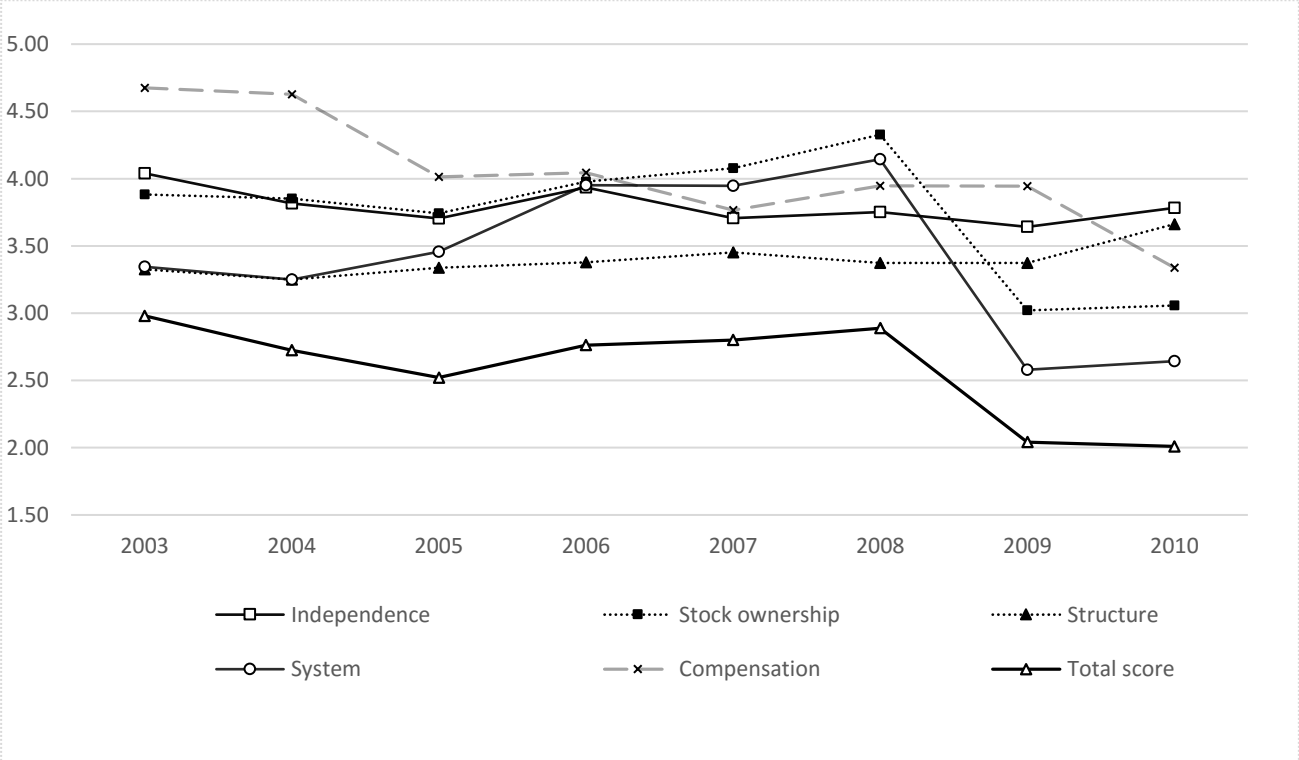

Figure 1 plots the yearly average of sub-scores during the 2003-2010 period. The total score, in general, has declined throughout the sample period except, for a period in between 2006-2008. The highest average total score is 2.98 in 2003 while the lowest is 2.01 in 2010. The total score has declined sharply from 2008 to 2009, which may be caused by

a change in scoring methodology in 2009. In general, the total board effectiveness ratings are, on average, declining in my sample throughout the time period.

Structure and independence sub-scores are fairly stable throughout the sample period. The structure sub-score is the lowest in 2004 at 3.25 and the highest in 2010 at 3.66. This may be because the criteria for calculating structure sub-score has been unchanged during the sample period. Similarly for independence, the lowest average score is 3.64 in 2009 and highest average score is 4.04 in 2003. Similar to structure, the criteria for the independence sub-score has been unchanged during the sample period. This implies that firms in the S&P/TSX Composite Index have had relatively independent boards since 2003. This is not surprising, since the Dey (1994) recommended board independence for Canadian-listed firms.

Most of the firms seems to score higher in the compensation sub-score during the earlier part of 2003-2010. During the first two years of the sample, the average compensation score is above 4.50. It remained relatively stable around 4 until 2009, and then decreased to 3.34 at the end of 2010. Furthermore, while examining the system sub-score, I observe a gradual increase from 3.34 in 2003 to 4.14 in 2008, followed by a rapid decline in 2009 and 2010. The rapid decline in scores during 2009 and 2010 can be attributed to the change in scoring methodology in 2009.

In addition, stock ownership has also seen a gradual increase during the earlier part of the sample period, and a rapid decline at the end. At the beginning of the sample period, average stock ownership score was 3.88 (2003), then increased to 4.33 by 2008, and then declined dramatically in 2009 and 2010. There are several reasons for the decline stock ownership and system sub-scores. Starting from 2009, various changes were made to the

board effectiveness score. Two new criteria for deductions were introduced for system and one for stock ownership. In 2009 there were also deductions for firms with no increase in director share ownership and hence, the ownership sub-scores are likely to be lower. Also, for system sub-scores, after 2009, additional points were deducted for "disclosure of director and board skill" as well as for "disclosure of continuing education process for directors". Hence, these changes resulted in a sharp decline in stock ownership and system sub-scores which caused the total score to decline in 2009.

Another interesting observation is that over the entire sample period, total score, as well as most sub-scores, have declined. Some part may be due to changes in sub-scores during this period, with new deductions being added in 2009.[12] Since the final score is obtained after deducting points for all the criteria, the addition of new criteria might have resulted in decrease in total governance scores. Hence, decline in governance scores might not necessarily mean decline in corporate governance standards. However, another explanation for this behaviour might be the "wearing off" effect of the all the regulatory reforms in 2002. Following Bill 198 and Sarbanes-Oxley Act of 2002, there has been an increased attention towards various aspect of boards, which may have motivated companies to avoid any activity which may project a poor board image. However, attention towards governance may also have shifted onto other aspect of boards, such as diversity, in the latter part of the sample and thus, the attention on board effectiveness may have declined.

[12] In order to address the issue of declining score due to change in methodology affecting the final results of regressions in subsequent sections, I re-do the regressions by dropping the scores after year of change, and find results identical to full sample. Detailed information is provided in robustness section.

4.2 Panel Regression

The results of panel regression of the BSCI score on firm performance using equation 1 is presented in Table 4. In column I, the results indicates that more effective boards lead to higher firm value, as measured by Tobin's Q (coeff = 0.033, t-stat=1.71), significant at the 10% level. This implies that firms with effective boards will have better management oversight, which in turn will reduce agency problems and thus, increase firm performance. This finding is similar to Klein et al. (2005) and Conheady et al. (2014). They show a positive relationship between Tobin's Q and board effectiveness. This relationship between Tobin's Q and board effectiveness score supports hypothesis 1.

In terms of control variables, firm size is negatively related to all measures of performance, but statistically significant for Tobin's Q and Annual returns. For example, it is statistically significant at the 1% level in column I (coeff = -0.169, t-stat =-7.06). This is quite surprising, as earlier theories on firm size and profitability (Hall and Weiss 1967), suggest larger firms tend to be more profitable. However, several studies report a similar negative relationship between firm size and performance (Agrawal and Knoeber, 1996; Baulkaran, 2014; and Evans, 1987). In addition, Hawawini, Subramanian, and Verdin (2003) show that profitability is more related to industry segment than firm size and hence, the composition of S&P TSX index might affect this relationship.

Capital expenditure has a positive relationship with firm performance (coeff = 1.219, t-stat =4.59). This relationship is significant at 1% for Tobin's Q in column I. Capital expenditure is a part of growth of companies, and increase in capital expenditure signals future growth which results in an increase in firm value. As well, the benefit from capital

expenditure is derived over a long period of time. Hence, a positive relationship between capital expenditure and firm performance is expected.

The regulation dummy variable has a negative relationship with firm performance (coeff = -0.205, t-stat = -1.93). Regulation of a firm limits the activities that it can carry out. Also, some of the company resources are consumed for compliance, rather than to produce output. This reduces the productivity of the company as well as performance.

Individual director election is positive and statistically significantly related to Tobin's Q in column I (coeff =0.152, t-stat =2.17). As well, disclosure of voting results is positively related to firm performance across all measure of performance, and is statistically significant at 10% and 1% in columns I and II (Tobin's Q and ROA). Disclosure of voting results and individual director election are added into the BSCI score since 2011, hence in my sample period this criteria is not a part of the total score. Therefore, these significant coefficients suggest that including them as control variables is effective in capturing the impact of board effectiveness scores on firm performance.

In column II, Table 4, there is a positive relationship between ROA and the total score. However, this relationship is not statistically significant (coeff = 0.003, t-stat = 1.12). Similar to the case of Tobin's Q, there is a positive relationship between the disclosure of voting results and performance, as measured by ROA, in column II (coeff = 0.022, t-stat = 3.17). Also, a negative relationship between the regulation dummy and performance is stronger in the case of ROA (coeff = -0.068, t-stat = -6.67), compared to Tobin's Q in column I.

Table 4, column III, reports the results for annual stock returns. Here, the relationship of measure of performance with total score is not significant (coeff= -0.000, t-stat = -0.03). Also, when using annual stock return as a measure of performance, the positive relationship between dividend yield and performance becomes significant in column III (coeff = 0.362, t-stat = 2.29). Similar to column I, a negative relationship between firm size and performance is also observed when performance is measured by annual stock return (coeff = -0.014, t-stat = -2.21).

Table 5 shows the result of panel regression of board effectiveness on firm risk. In column I, strong negative relationship between the total score and market risk, as measured by beta (coeff = -0.089, t-stat = -4.61) is seen. This shows that firms with effective directors have lower firm risks. With better directorial oversight, managers' discretion to choose excessively risky projects is limited. Directors monitor the firm and managers' risk taking behaviour and hence, we can observe a positive impact on firm risk. This result supports hypothesis 2.

Regarding the control variables, management ownership has a negative relationship with beta in column I (coeff= -0.549, t-stat = -3.35). With an increase in management ownership, managers' interests are aligned with that of shareholders. Hence, managers are less likely to undertake excessive risk, since they have a significant undiversified wealth at stake. This negative relationship between management ownership and risk has been supported by some earlier research (Baulkaran, 2014 and Chen, Steiner, and Whyte, 1998).

Board size has a negative relationship with beta (coeff =-0.521, t-stat = -4.04). Larger boards potentially have enough individuals to monitor the risk taking behaviour of senior executives more effectively. This negative relationship between board size and risk

has been well documented in past studies (Cheng, 2008; Sah and Stiglitz, 1986). Similar negative relationships can be seen when risk is measured as total risk and idiosyncratic risk in columns II and III. Hence, this finding is consistent across all measures. Also, the detailed disclosure of voting results have a negative relationship with beta in column I (coeff = -0.194, t-stat = -2.68).

In column II, the total score is negatively related total risk (coeff = -0.007, t-stat = -4.41) and statistically significant at the 1% level. Similar to beta in column I, disclosure of voting, management ownership and board size all are negatively related to risk.

In column III, firm specific risk (idiosyncratic risk) is used. The relationship between risk and total score is not statistically significant (coeff = 0.001, t-stat = 1.13). There is also a negative relationship between majority voting and idiosyncratic risk (coeff = -0.006, t-stat = -2.22).

In summary, I see the positive relationship between total score and performance, however, this relationship is statistically weak. A new and more interesting finding is a negative relationship between risk and total score. As well, various voluntary governance policy is significant and consistent with Baulkaran (2014). As explained earlier, these voluntary governance practices were not part of the board effectiveness score during my analysis period, but were added to the score in 2011. Hence, the use of these variables as further control in this analysis is important in gaining a more robust result when examining the relationship between risk and board effectiveness.

The results from panel regression support my hypothesis 1 and 2. However, to control for potential endogeneity that may influence the robustness of the results, I use two

econometric techniques in order to control for endogeneity: two stage least square and simultaneous equation modeling. Hence, I report the results of a two stage least square analysis below

4.3 Two stage least square

I estimate a two stage lease square model. The first stage is estimated using equation 3 to predict the value of the total score. The results of the first stage analysis are presented in Table 6. Independent chairman (coeff = 0.384, t-stat = 3.65) and percentage of independent directors (coeff = 2.172, t-stat =4.80) are both positive and significant. Institutional ownership is negatively related to the total score (coeff = -.620, t-stat = -1.91). Management ownership is also negatively related to the total score (coeff = -1.129, t-stat = -4.71). Firm size is positively related to the governance score (coeff= 0.168, t-stat =4.03). Growth is negatively related to total score (coeff = -0.228, t-stat = -3.59). The predicted value from the first stage regression is used in second stage regression for performance in equation 4.

The results of the second stage of two stage least square for performance are presented in Table 7. In column I, Table 7 the measure of performance is Tobin's Q. The coefficient for total score is not significant (coeff = -0.037, t-stat = -0.41). The control variables are similar to those reported in Table 4. In column II, the performance measure is ROA. Here also the relationship is not significant (coeff = -0.012, t-stat = -0.71). In contrast, in panel regression, this relationship is positive, but not significant. Therefore, it can be argued that controlling for endogeneity is important. Finally, in column III, I use annual stock return as measure of performance. Here the result is negative and significant (coeff = -0.076, t-stat = -1.76). This is contradictory to panel regression result.

The second stage regression results for the effect of predicted board effectiveness on firm risk from equation (7) are presented in Table 8. In Column I, the risk measure is beta. The results show that board effectiveness is negatively related to beta (coeff = -0.122, t-stat = -1.72). This relationship is statistically significant at the 10% level. Also, the negative relationship between management ownership, disclosure of voting results, and board size is reported in Column I. Column II shows a strong relationship between predicted total score and total risk (coeff = -0.010, t-stat = -1.99). All other control variables are similar to the panel regression. Column III reports the results for board effectiveness and idiosyncratic risk. The predicted total score is negatively and statistically related to the idiosyncratic risk (coeff = -0.005, t-stat = -2.24). This relationship is not observed in panel regression. Controlling for potential endogeneity, I show that all measures of risk are negatively affected by board effectiveness. This is consistent with my proposed hypothesis.

4.4 Simultaneous equation framework

It is possible that contemporaneous risk and returns are determined simultaneously. Therefore, I account for this in a simultaneous equation model using equations 6 and 7. The results of simultaneous equation model are presented in Tables 9-11.

In Table 9, ROA is jointly estimated with total risk and beta. In Columns I and III, the dependent variable is ROA. The relationship between the total score and ROA is not significant in Column I (coeff =-0.002, t-stat = -1.18), when controlling for contemporaneous total risk. In Column III, the relationship between ROA and total score is also not significant (coeff = -0.001, t-stat= -0.30), when controlling for contemporaneous beta as the measure of risk. These results are similar to the panel regression result. In Column II and IV, the dependent variable is total risk and beta, respectively. In Column II,

board effectiveness is negatively related to total risk (coeff =-0.007, t-stat =-6.30) when controlling for contemporaneous ROA. In Column IV, total score is negatively related to beta (coeff = -0.093, t-stat = -6.34) when controlling for contemporaneous ROA. The negative relationship between risk and board effectiveness is similar to the panel regression and the two stage least square. Hence, this negative relationship between board effectiveness and risk is robust to several different econometric methodologies.

In table 10, contemporaneous Tobin's Q is jointly estimated with contemporaneous total risk and contemporaneous beta. In Column I and III, the dependent variable is Tobin's Q. In Column I, total score is positively and statistically related to Tobin's Q (coeff = 0.046, t-stat = 2.90). The result from simultaneous equation model is statistically stronger than that of the panel regression. Hence, controlling for contemporaneous risk seems to be important in this setting. However, in Column III, the relationship between the total score and Tobin's Q, though positive, is not significant after controlling for contemporaneous beta as a risk measure. In Column II, the total score is negatively and statistically related to total risk (coeff = -0.007, t-stat = -6.68) when controlling for Tobin's Q. A similar negative relationship between beta and total score is reported in Column IV (coeff = -0.089, t-stat = -6.27) when controlling for contemporaneous Tobin's Q.

In general, using simultaneous equation modeling showed a positive relationship between various measures of performance, though they were not consistently significant. However, the negative relationship between total score and risk was consistent with both the panel regression and the two stage least square.

In summary, all the methods employed above support my hypothesis that there is a negative relationship between board effectiveness and risk. In terms of performance, the results should be interpreted with caution.

4.5 Panel regression for sub-scores

Given the above findings, I further explore the relationship between board effectiveness and performance as well as risk using the sub-scores which make up the total score for board effectiveness in the following section. I estimate equations 1 and 2 for each individual sub-score. Since my sample period is from 2003-2010, individual sub-score analysis of sub-scores added after 2009, namely, meeting attendance, director election and CEO succession, were excluded from sub-score analysis because of short time period. The results of the individual score panel regressions are reported in Tables 11-14.

In Tables 11 and 12, the results of individual sub-score analysis with firm performance, as measured by Tobin's Q and ROA are presented. A positive relationship between sub-scores and firm performance are reported in Tables 11 and 12. The only sub-score that is statistically related to performance is compensation. The compensation sub-score is positively related to Tobin's Q in Table 11, Column V (coeff = 0.041, t-stat = 2.18), and positively related to ROA in Table 12, Column V (coeff = 0.007, t-stat = 3.07). In general, the other sub-scores are positive, but not statistically significant. This is consistent with the weak relationship between board effectiveness and firm performance reported the panel regression, the two stage least square and the simultaneous equation analyses. In addition, the control variables are similar to those reported in the panel regression.

The sub-scores analyses for firm risk are reported in Tables 13 and 14. Several of the sub-scores are statistically significant and consistent with my expectations. In Table 13,

the measure of risk is beta. Board independence is negatively and statistically related to beta in Table 13, Column I (coeff = -0.059, t-stat = -3.18). Similarly, the system sub-score is statistically and negatively related to beta in Column IV (coeff = -0.053, t-stat = -2.90). Also, the compensation sub-score is negative and statistically significant at the 1% level (Column V- coeff = -0.129, t-stat = -5.27). The remaining sub-scores are negatively related to beta, but not statistically significant. The control variables are similar to those reported in the panel regression.

In Table 14, the risk measure is total risk (standard deviation of monthly returns). Several of the sub-scores are statistically significantly related to firm risk at the 1% level. Board independence is negatively related to total risk in column I (coeff = -0.004, t-stat = -2.75). This implies that more independent boards are effective in reducing firm risk. Also, board structure is negatively related to total risk in column III (coeff = -0.004, t-stat = -2.22). Similarly, system is negatively related to total risk in column IV (coeff = -0.004, t-stat = -2.72). In addition, compensation is negatively related to total risk in Column IV (coeff = -0.010, t-stat = -5.43). Stock ownership is negative, but not statistically significant. The control variables are similar to those reported in the panel regression.

Based on the sub-scores analyses, I show that several different components of the board effectiveness score affect firm risk. These components together increase the effectiveness of directors in controlling the riskiness for S&P/TSX Composite Index firms. In terms of performance, only one component of the index affects performance. This explains the weak relationship between firm performance and the total score reported above.

4.6 Robustness Check

Given that the scoring methodology for the BSCI ratings changed in 2009, I conducted robustness test by excluding 2009-2010 data. I estimate equations 1 and 2 for time period 2003-2008. The results, using a panel regression with fixed effects, are in tables 15 and 16. The total number of firm-year observations in the sample during this period is 1,120.

The results of panel regression of the BSCI score on firm performance during 2003-2008 is reported in Table 15. In column I, the total score is not significant, whereas in the original panel, regression it is marginally significant. The results differ from Conheady et al. (2014). One possible explanation for this is that the BSCI score in their proxing for the voluntary disclosure best practices governance policies. All other control variables are similar to panel regression results for 2003-2010 in Table 4.

In addition, in column II, the results are similar to panel regression for 2003-2010. In column III, board size is now positively related to annual stock return (coeff = 0.077, t-stat =1.68). Firm size, though negative, is not significant. All other variables exhibit similar results to panel regression. In general, the panel regression of BSCI score on firm performance during 2003-2008 shows similar results to those presented in table 4.

Table 16 shows the result of panel regression of BSCI score on firm risk during 2003-2008. In column I, total score is negatively related to beta (coeff = -0.079, t-stat = -3.95). Leverage is positively related to beta (coeff = 0.042, t-stat = 3.64) and firm size is negatively related to beta (coeff = -0.046, t-stat = -1.96). All other control variables are similar to panel regression results in Table 5. In column II, total score is negative related to total risk (coeff = -0.006, t-stat = -3.88). In column III, the relationship between total score

and idiosyncratic risk is not statistically significant. All these results are similar to panel regression of BSCI score on firm risk for 2003-2010, as shown in table 5.

In summary, the positive relationship between BSCI scores and firm performance is weaker during 2003-2008 period, compared to the full sample. However, the negative relationship between BSCI scores and firm risk for the 2003-2008 period is similar or stronger than the results for the full sample period. Most of the control variables used in this analysis exhibited a similar relationship between both time periods.

For an additional robustness check, I test if inclusion of financial firms in my sample has affected the result. Hence, I estimated equations 1 and 2, excluding financial firms from my sample. The total number of firm-year observations in sample during this period is 1,239. The results of panel regression of BSCI score on firm performance are presented in table 17. In column I, the total score is significant (coeff = .038, t-stat = 1.78) in the case of Tobin's Q, whereas in the case of ROA and annual stock return, the total score is not significant.

The results of panel regression of the BSCI score on firm performance for sample excluding financial firms are presented in table 18. In column I, the total score is negatively related to beta (coeff = -0.098, t-stat = -4.45). In column II, the total score is negatively related to total risk (coeff = -0.008, t-stat = -4.26).

These results are almost identical to the results reported in table 4 and 5. The inclusion of financial firms in my sample has not affected the relationship of BSCI scores with firm performance and risk.

Next, I try to replicate my analysis for the similar time period, following Conheady et al. (2014). Equations 1 and 2 are estimated for the 2003-2009 sample period. Also, I exclude financial firms from my sample, similar to the practices of Conheady et al. (2014). The total number of firm-year observations in the sample during this period is 1,074. In table 19, panel regression of the BSCI score on firm performance is reported. In column I, total score is not significant, whereas in my original analysis, it was marginally significant. This is similar to the result in table 15, though different from the result reported by Conheady et al. (2014).

Panel regression of BSCI scores on firm risk is reported in table 20. In column I, the total score is negatively related to beta (coeff = -0.09, t-stat = -4.04) and in column II, the total score is also negatively related to total risk (coeff =-0.007, t-stat = -4.05). This is similar to my original analysis.

The result for panel regression for the time period 2003-2009 is similar to my original analysis. However, it differs from Conheady et al. (2014), whose study uses similar time period. As described earlier, one possible explanation is that Conheady et al. (2014) did not include voluntary disclosure practices in their analysis. Several of these are director-related, such as individual director election. As reported in Baulkaran (2014), these variables are important in explaining firm performance and risk. Hence, they should be included as control variables. Also, several of these best practices have been a part of the BSCI index since 2011. Hence, I replicate Conheady et al. (2014) by excluding voluntary governance policy from the list of control variables and report the results in table 21.

In table 21, I report the results after excluding financial firms from sample and voluntary disclosure policy in control variables. In column I, the results for 2003-2010

period, as similar to my original analysis, are shown. Here, board effectiveness is positive and statistically significant (coeff = 0.048, t-stat = 2.13). In column II, the results for 2003-2009 period, the same sample period Conheady et al. (2014) studied, are reported. The board effectiveness ratings are positive and significantly related to Tobin's Q (coeff = 0.045, t-stat = 2.00). This is identical to the results in Conheady et al. (2014). Hence, the difference in my result can be attributed to the use of voluntary governance disclosure policy as control variables. Based on the results in table 21, it can be argued that Conheady et al. (2014) suffer from omitted variable bias. It is important to control for these voluntary best practice governance mechanisms, since a majority of these policies are related to director effectiveness, such as majority voting in director elections, disclosure of voting results and individual director election. These policies are positively related to firm performance (Baulkaran, 2014). Therefore, it is important to control for these in the research design, given that the BSCI index in 2011 incorporated these policies in measuring director effectiveness.

CHAPTER 5: CONCLUSION

This study aimed at providing empirical evidence of the impact of board effectiveness and firm performance, as well as firm risk. In general, relationship between board effectiveness and firm performance is positive, though weakly significant, unlike previous studies that report a strong relationship. Potential explanations include: prior studies used a shorter sample period or simply a cross-sectional analysis, and prior could be affected by endogeneity. In addition, Baulkaran (2014) provided evidence that several voluntary best practice governance mechanisms affect performance and risk. Hence, controlling for these are important in this setting. These voluntary best practices such as majority voting, individual director election and disclosure of election results no doubt serve as a mechanism for improving corporate governance and board effectiveness, since they are directly related to directors. It is possible that the BSCI index is capturing the effect of these voluntary best practices, and this could explain the stronger findings in the prior studies such as Conheady et al. (2014). In fact, after excluding these voluntary best practice as control variables, the results for Tobin's Q are identical to Conheady et al. (2014). The major contribution of the study is that board effectiveness seems to affect firm risk negatively as predicted, and this relationship is strong and statistically significant across several measures of risk. This is the first study to examine the relationship between board effectiveness and a firm's risk. Furthermore, I tested this relationship in two stage least square and simultaneous equation modeling to control for endogeneity, and the results are robust. Also, I conducted detailed analyses using the different components of the BSCI ratings for board effectiveness. Several different components are negatively related to firm risk, while only one component (compensation) of the BSCI index is statistically related to

firm performance. This explains the weak relationship between the total score and firm performance.

Since several voluntary governance practices became a part of the index in 2011 and appear to affect both performance and risk (Baulkaran, 2014), I believe that controlling for these in this analysis provides more robust findings. Controlling for these voluntary best practices, likely increases the robustness of board effectiveness and risk relationship as well as performance. I also exclude 2009-2010 in a robustness check, since the rating methodology changed in 2009. The results for firm risk is similar to the full sample. Hence, the scoring methodology did not influence the findings. Performance, on the other hand, is not significant for the 2003-2008 sample period, whereas it is significant at the 10% level for full sample.

BIBLIOGRAPHY

Adams, R., Hermalin, B., & Weisbach, M. (2008). The Role of Boards of Directors in Corporate Governance: A Conceptual Framework and Survey. *National Bureau of Economic Research Working Paper Series, No. 14486*.

Adjaoud, F., Zeghal, D., & Andaleeb, S. (2007). The effect of board's quality on performance: A study of Canadian firms. *Corporate Governance: An International Review, 15*(4), 623-635.

Aggarwal, R., Erel, I., Stulz, R., & Williamson, R. (2010). Differences in governance practices between US and foreign firms: Measurement, causes, and consequences. *Review of Financial Studies, 23*(3), 3131-3169.

Agrawal, A., & Chadha, S. (2005). Corporate governance and accounting scandals. *Journal of law and economics*, 48(2), 371-406.

Agrawal, A., & Knoeber, C. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of financial and quantitative analysis, 31*(03), 377-397.

Amoako-Adu, B., Smith, B. F., & Baulkaran, V. (2011). Unification of Dual Class Shares in Canada with Clinical Case on Magna International. *Canadian Investment Review,* 17-24

Anderson, R. C., & Fraser, D. R. (2000). Corporate control, bank risk taking, and the health of the banking industry. *Journal of Banking & Finance, 24*(8), 1383-1398.

Anderson, R. C., & Reeb, D. M. (2003). Founding-Family Ownership, Corporate Diversification, and Firm Leverage. *Journal of law and economics, 46*(2), 653-684.

Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *The Journal of Finance, 55*(1), 81-106.

Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of accounting and economics, 42*(1), 203-243.

Baek, J.-S., Kang, J.-K., & Park, K. S. (2004). Corporate governance and firm value: Evidence from the Korean financial crisis. *Journal of Financial Economics, 71*(2), 265-313.

Bauer, R., Guenster, N., & Otten, R. (2004). Empirical Evidence on Corporate Governance in Europe: The Effect on Stock Returns, Firm Value, and Performance (Digest Summary). *Journal of Asset Management, 5*(291-104).

Baulkaran, V. (2014). A Quiet Revolution in Corporate Governance: An Examination of Voluntary Best Practice Governance Policies. *International Review of Finance, 14*(3), 459-483.

Bebchuk, L., Cohen, A., & Ferrell, A. (2009). What matters in corporate governance? *Review of Financial Studies, 22*(2), 783-827.

Bebchuk, L., & Fried, J. (2004). Executive compensation as an agency problem. *Journal of Economics Perspectives, 117*(2).

Beekes, W., Brown, P. R., & Chin, G. (2007). Do better-governed firms make more informative disclosures? Canadian evidence. *Working Paper (May 2007)*.

Beiner, S., Drobetz, W., Schmid, F., & Zimmermann, H. (2004). Is board size an independent corporate governance mechanism? *Kyklos, 57*(3), 327-356.

Bennedsen, M., Kongsted, H. C., & Nielsen, K. M. (2008). The causal effect of board size in the performance of small and medium-sized firms. *Journal of Banking & Finance, 32*(6), 1098-1109.

Bhagat, S., & Black, B. (2002). The Non-Correlation between Board Independence and Long-Term Firm Performance"(2002). *Journal of Corporation Law, 27*(2).

Bhagat, S., & Bolton, B. (2008). Corporate governance and firm performance. *Journal of Corporate Finance, 14*(3), 257-273.

Black, B. (2001). The corporate governance behavior and market value of Russian firms. *Emerging Markets Review, 2*(2), 89-108.

Black, B., De Carvalho, A. G., & Gorga, E. (2012). What matters and for which firms for corporate governance in emerging markets? Evidence from Brazil (and other BRIK countries). *Journal of Corporate Finance, 18*(4), 934-952.

Black, B., Jang, H., & Kim, W. (2006). Does corporate governance predict firms' market values? Evidence from Korea. *Journal of Law, Economics, and Organization, 22*(2), 366-413.

Boyd, B. K. (1994). Board control and CEO compensation. *Strategic management journal*, 15(5), 335-344.

Bradley, N. (2004). Corporate governance scoring and the link between corporate governance and performance indicators: in search of the Holy Grail. *Corporate Governance: An International Review, 12*(1), 8-10.

Brown, L. D., & Caylor, M. L. (2006). Corporate governance and firm valuation. *Journal of Accounting and Public Policy, 25*(4), 409-434.

Bushee, B. J., & Noe, C. F. (2000). Corporate disclosure practices, institutional investors, and stock return volatility. *Journal of Accounting Research*, 171-202.

Chen, C. R., Steiner, T. L., & Whyte, A. M. (1998). Risk taking behavhiour and management ownership in depository institutions. *Journal of Financial Research, 21*(1), 1-16.

Cheng, S. (2008). Board size and the variability of corporate performance. *Journal of Financial Economics, 87*(1), 157-176.

Chung, K. H., & Zhang, H. (2011). Corporate governance and institutional ownership. *Journal of financial and quantitative analysis, 46*(01), 247-273.

Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics, 87*(2), 329-356.

Collins, D. W., Gong, G., & Li, H. (2009). Corporate governance and backdating of executive stock options. *Contemporary accounting research*, 26(2), 403-445.

Conheady, B., McIlkenny, P., Opong, K. K., & Pignatel, I. (2014). Board effectiveness and firm performance of Canadian listed firms. *The British Accounting Review*.

Core, J. E., Holthausen, R. W., & Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics, 51*(3), 371-406.

Core., J., guay, W., & Rusticus, T. (2006). Does Weak Governance Cause Weak Stock Returns? An Examination of Firm Operating Performance and Investors' Expectations. *The Journal of Finance, 61*(2), 655-687.

Daines, R. M., Gow, I. D., & Larcker, D. F. (2010). Rating the ratings: How good are commercial governance ratings? *Journal of Financial Economics, 98*(3), 439-461.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary accounting research, 13*(1), 1-36.

Dey, P. (1994). Where Were the Directors?: Guidelines for Improved Corporate Governance in Canada: Draft Report of the Toronto Stock Exchange Committee on Corporate Governance in Canada.

Durnev, A., & Kim, E. (2005). To steal or not to steal: Firm attributes, legal environment, and valuation. *The Journal of Finance, 60*(3), 1461-1493.

Eisenberg, T., Sundgren, S., & Wells, M. T. (1998). Larger board size and decreasing firm value in small firms. *Journal of Financial Economics, 48*(1), 35-54.

Erkens, D. H., Hung, M., & Matos, P. (2012). Corporate governance in the 2007–2008 financial crisis: Evidence from financial institutions worldwide. *Journal of Corporate Finance, 18*(2), 389-411.

Evans, D. S. (1987). The relationship between firm growth, size, and age: Estimates for 100 manufacturing industries. *The Journal of Industrial Economics*, 567-581.

Faccio, M., Marchica, M.-T., & Mura, R. (2011). Large shareholder diversification and corporate risk-taking. *Review of Financial Studies, 24*(11), 3601-3641.

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

Ferreira, M. A., & Laux, P. A. (2007). Corporate governance, idiosyncratic risk, and information flow. *The Journal of Finance, 62*(2), 951-989.

Foerster, S. R., & Huen, B. C. (2004). Does corporate governance matter to Canadian investors? *Canadian Investment Review, 17*(3), 19-23.

Frydman, C., & Saks, R. E. (2010). Executive compensation: A new view from a long-term perspective, 1936–2005. *Review of Financial Studies*, hhp120.

Global Investor Opinion. (2002). Retrieved from

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate Governance and Equity Prices. *The Quarterly Journal of Economics, 118*(1), 107-156.

Gordon, J. N. (2007). The Rise of Independent Directors in the United States, 1950-2005: Of Shareholder Value and Stock Market Prices. *Stanford Law Review, 59*(6), 1465-1568.

Grossman, S. J., & Hart, O. D. (1982). Corporate financial structure and managerial incentives *The economics of information and uncertainty* (pp. 107-140): University of Chicago Press.

Gupta, P. P., Kennedy, D. B., & Weaver, S. C. (2009). Corporate governance and firm value: Evidence from Canadian capital markets. *Corporate Ownership and Control, 6*(3), 293-307.

Hall, M., & Weiss, L. (1967). Firm size and profitability. *The Review of Economics and Statistics*, 319-331.

Hawawini, G., Subramanian, V., & Verdin, P. (2003). Is performance driven by industry- or firm-specific factors? A new look at the evidence. *Strategic management journal, 24*(1), 1-16.

Hermalin, B. E., & Weisbach, M. S. (1991). The effects of board composition and direct incentives on firm performance. *Financial management*, 101-112.

Hermalin, B. E., & Weisbach, M. S. (2001). Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature. *National Bureau of Economic Research Working Paper Series, No. 8161*.

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

Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *Corporate Finance, and Takeovers. American Economic Review, 76*(2).

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance, 48*(3), 831-880.

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

Jog, V. M., & Dutta, S. (2005). Corporate governance, performance and CEO pay. *Working Paper(Feburary 2004)*.

John, K., Litov, L., & Yeung, B. (2008). Corporate governance and risk-taking. *The Journal of Finance, 63*(4), 1679-1728.

Kirkpatrick, G. (2009). The corporate governance lessons from the financial crisis. *OECD Journal: Financial Market Trends*, *2009*(1), 61-87.

Klein, P., Shapiro, D., & Young, J. (2005). Corporate governance, family ownership and firm value: the Canadian evidence. *Corporate Governance: An International Review, 13*(6), 769-784.

Koehn, D., & Ueng, J. (2005). Evaluating the Evaluators: Should Investors Trust Corporate Governance Metrics Ratings? *Journal of Management & Governance, 9*(2), 111-128.

Kula, V., & Baykut, E. (2015). Does better corporate governance rating lead to higher market value?: An empirical investigation of BIST XKURY listed companies*:Electronic Journal of Vocational Colleges, 5*(6), 47-54.

Li, K., & Broshko, E. B. (2006). Corporate governance requirements in Canada and the United States: A legal and empirical comparison of the principles-based and rules-based approaches. *Sauder School of Business Working Paper*.

Linden, P., & Matolcsy, Z. (2004). Corporate Governance Scoring Systems: What Do They Tell Us? *Australian Accounting Review, 14*(32), 9-16.

Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *The business lawyer*, 59-77.

Lorsch, J., & Young, J. (1990). Pawns or potentates: The reality of America's corporate boards. *The Executive, 4*(4), 85-87.

Mak, Y. T., & Li, Y. (2001). Determinants of corporate ownership and board structure: evidence from Singapore. *Journal of Corporate Finance, 7*(3), 235-256.

Mehran, H., Morrison, A. D., & Shapiro, J. D. (2011). Corporate governance and banks: What have we learned from the financial crisis? *FRB of New York Staff Report*(502).

Murphy, K. J. (1999). Executive compensation. *Handbook of labor economics, 3*, 2485-2563.

Nguyen, P. (2011). Corporate governance and risk-taking: Evidence from Japanese firms. *Pacific-Basin Finance Journal, 19*(3), 278-297.

Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. (2002). Investor protection and corporate valuation. *The Journal of Finance, 57*(3), 1147-1170.

Ravina, E., & Sapienza, P. (2010). What do independent directors know? Evidence from their trading. *Review of Financial Studies, 23*(3), 962-1003.

Sah, R. K., & Stiglitz, J. E. (1986). The architecture of economic systems: Hierarchies and polyarchies. *American Economic Review, 76*(4).

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *The Journal of Political Economy, 94*(3), 461.

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

Sonnenfeld, J. (2004). Good governance and the misleading myths of bad metrics. *The Academy of Management Executive, 18*(1), 108-113.

Switzer, L. N., & Cao, Y. (2011). Shareholder interests vs board of director members' interests and company performance: A new look. *Review of Accounting and Finance, 10*(3), 228-245.

Wang, C.-J. (2012). Board size and firm risk-taking. *Review of Quantitative Finance and Accounting, 38*(4), 519-542.

Wright, P., Ferris, S. P., Sarin, A., & Awasthi, V. (1996). Impact of corporate insider, blockholder, and institutional equity ownership on firm risk taking. *Academy of Management Journal, 39*(2), 441-458.

Yasser, Q. R., Entebang, H. A., & Mansor, S. A. (2011). Corporate governance and firm performance in Pakistan: The case of Karachi Stock Exchange (KSE)-30. *Journal of economics and international finance, 3*(8), 482-491.

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

APPENDIX

BSCI rating criteria

1) Director independence
   - Independence: deduction is based upon percentage of independent board members.
   - Interlocks: deduction is made if more than one director interlock is present on a board.
   - Excessive board memberships: deduction for every director who is a member of more than five S&P/TSX composite index boards.
2) Stock ownership
   - Director stock ownership: deduction is made based upon average share ownership or ownership multiple in case where retainer is awarded, of the third of directors who have been directors for at least 3 years with the fewest holdings.
   - Director ownership increase: deduction is made for each director whose holdings do not increase up to a maximum of five directors.
3) Structure
   - CEO/chair split: deduction is made if CEO and chair positions are not separated.
   - Committee independence: deductions are made if a related director is a member of the audit, compensation or nominating committees.
   - Share structure: deductions in this area are graduated based upon dual class share structure.
4) Systems
   - Evaluation processes: deduction are made if there is no regular and formal evaluation processes for the board as a whole and for each of its individual directors.
   - Skills matrix: deduction is made if the individual skills of each director are not listed and if the skill set or requirements of the board as a whole are not disclosed.
   - Continuing education for directors: deduction are made if there is no disclosure of continuing education process.
5) Director attendance: deduction is made if a director standing for re-election failed to attend at least 75 % of board or individual committee meetings.
6) Compensation
   - Dilution: deduction is made if based upon percent of options issued and outstanding to the total outstanding shares.
   - Option re-pricing: deduction is made if a company has re-priced their options within the last three years.
   - CEO pay is related to performance: deduction made if there is no explicit link between CEO pay and company performance.
   - Evergreen option plan: deduction is made if there is evergreen option plan.

- Outstanding loans to directors or executives: deduction is made based upon outstanding loans to directors, its interest and if practice is still continuing.
- Director pensions: deduction is made if director receive pension.
- Option gains disclosed: deduction is made if no option gain disclosed.

7) Director elections (majority voting): deduction is made if there is no majority voting policy in place.
8) CEO succession
   - Succession plan disclosure: deduction is made in case of lack of formal succession plan.
   - New CEO hired externally: deduction made if new CEO is hired from unrelated company.

Table 1: Definition of variables used in study

Variables	Definition
Risk and Return Characteristics	
Tobin's Q	Calculated as (Market value of equity + Book value of debt) / Total Asset
ROA	Calculated as (Earnings before interest, tax, depreciation and amortization/ Total Asset)
Annual Stock Return	Yearly return of the stock
Total Risk	Standard deviation of monthly return over a minimum of 3 years to maximum of 5 years period
Beta	Estimated regressing monthly return on market return over a minimum of 3 years to maximum of 5 years period
Idiosyncratic Risk	Variance of the residual from market model used to estimate beta
Governance Variables	
Majority Voting	Equals to 1 if the firm had a majority voting policy and 0 otherwise
Independent Director Election	Equals to 1 if directors are elected individually and 0 otherwise
Say on Pay	Equals to 1 if firm allow a nonbinding vote on executive compensation and 0 if otherwise
Disclosure of Voting Results	Equals to 1 if the firm discloses voting results in annual meeting
Institutional Ownership	Percentage of shares owned by institutional investors
Management ownership	Percentage of shares owned by management
Board size	Natural log of number of directors
Dummy variable	Equals to 1 if year is 2009 -2010 and zero otherwise
Firm Characteristics	
Firm Size	Natural log of total asset
Sales Growth	Geometric growth in sales over a minimum of 3 years to maximum of 5 years period
Advertising and R&D ratio	Calculated as (advertising expense+ research and development expense)/ total asset
Capital expenditure ratio	Calculated as (capital expenditure)/ total asset
Leverage	Total Debt/Total Asset
Dividend Yield	Calculated as (cash + special dividend)/market value of equity
Regulation dummy	Equals to 1 for utilities and financial firms and 0 otherwise
Independent Director	Percent of independent directors on board

Table 2: Summary statistics of sample firms

This table gives the mean and standard deviation of 1473 firms in S&P TSX index during the time period from 2003 to 2010. Panel D risk and return characteristics is measure din time t+1 and all other variables are measured at time t.

Variable	Mean	Median	Standard Deviation	Min	Max
Panel A: Governance Score					
Total score	2.59	2.00	1.36	1.00	6.00
Independence	3.81	4.00	1.31	1.00	5.00
Stock ownership	3.74	4.00	1.47	1.00	5.00
Meeting attendance	1.03	0.00	1.94	0.00	5.00
Structure	3.40	4.00	1.49	1.00	5.00
Systems	3.40	3.00	1.41	1.00	5.00
Compensation	4.05	5.00	1.15	1.00	5.00
Director election	0.85	0.00	1.69	0.00	5.00
CEO succession	0.77	0.00	1.42	0.00	5.00
Panel B: Firm Characteristics					
Total asset ($ million)	21,269.52	2,625.70	73,139.08	25.42	726,206.00
Market capitalization ($ million)	6,538.70	2,182.53	10,591.28	42.69	77,568.47
Advertising expense ($ million)	4.63	0.00	46.13	0.00	1,100.00
R&D expense ($ million)	18.10	0.00	129.67	0.00	1,999.00
Capital expenditure ($ million)	447.04	117.24	1,001.27	0.00	9,031.00
Total Debt ($ million)	3,353.58	485.05	10,621.76	0.00	104,927.00
Advertising and R&D ratio	0.01	0.00	0.05	0.00	0.77
Capital expenditure ratio	0.08	0.05	0.08	0.00	0.65
Leverage	0.46	0.21	1.15	0.00	34.92
Firm size (log of total assets)	8.07	7.87	1.72	3.24	13.50
Regulation dummy	0.17	0.00	0.37	0.00	1.00
Dividend yield	0.02	0.01	0.04	0.00	1.05
Institutional ownership	0.098	0.000	0.151	0.000	0.903
Management ownership	0.084	0.000	0.175	0.000	0.909
Board size	10.24	10.000	3.030	4	23
Panel C: Voluntary Governance Mechanisms					
Majority voting	0.226	0.000	0.419	0.000	1.000
Individual director election	0.362	0.000	0.481	0.000	1.000
Say-on-pay	0.036	0.000	0.186	0.000	1.000
Disclosure of voting results	0.382	0.000	0.486	0.000	1.000
Panel D: Risk and Return Characteristics					
$Beta_{t+1}$	1.044	0.907	0.723	0.025	3.327
Total $Risk_{t+1}$	0.111	0.097	0.057	0.038	0.329
Idiosyncratic $Risk_{t+1}$	0.002	0.003	0.035	-0.140	0.187
Tobin's Q_{t+1}	1.274	1.089	0.807	0.217	3.372
ROA_{t+1}	0.111	0.116	0.138	-2.008	0.724
Annual $Return_{t+1}$	0.065	0.032	0.564	-0.983	7.735

Table 3: Correlation

Correlation Matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.00																						
2	-0.21	1.00																					
3	-0.24	0.64	1.00																				
4	0.14	-0.15	-0.13	1.00																			
5	-0.06	0.08	0.28	0.16	1.00																		
6	0.02	-0.10	-0.13	0.12	0.19	1.00																	
7	-0.02	0.10	0.12	0.04	0.17	0.07	1.00																
8	0.06	-0.23	-0.29	0.01	-0.14	0.13	0.00	1.00															
9	0.07	-0.15	-0.24	-0.03	-0.41	-0.12	0.09	0.48	1.00														
10	-0.10	0.01	0.03	-0.04	0.02	0.04	0.00	0.05	0.01	1.00													
11	-0.22	-0.15	-0.15	0.02	-0.02	0.00	-0.06	0.01	-0.03	-0.12	1.00												
12	0.25	-0.08	-0.05	0.34	0.01	-0.01	0.05	0.01	0.02	0.02	0.07	1.00											
13	0.17	-0.33	-0.46	0.00	-0.33	-0.07	-0.02	0.16	0.26	-0.04	0.17	0.08	1.00										
14	0.25	-0.24	-0.51	0.00	-0.53	-0.07	-0.04	0.14	0.44	-0.13	0.08	-0.06	0.64	1.00									
15	-0.03	0.17	0.25	-0.13	0.19	-0.24	0.00	-0.17	-0.12	0.01	-0.05	0.09	-0.10	-0.22	1.00								
16	-0.06	0.26	0.23	0.15	0.27	0.14	0.01	0.05	-0.19	-0.05	-0.07	0.06	-0.33	-0.29	-0.10	1.00							
17	-0.13	0.24	0.23	0.05	0.11	0.00	0.04	-0.15	-0.14	-0.05	-0.08	-0.02	-0.20	-0.16	0.03	0.19	1.00						
18	0.02	-0.13	-0.22	0.00	-0.12	0.04	0.04	0.14	0.16	0.05	0.00	-0.12	0.12	0.18	-0.08	-0.13	-0.09	1.00					
19	0.12	-0.27	-0.36	0.02	-0.40	-0.22	-0.03	-0.03	0.31	-0.11	0.02	-0.01	0.28	0.55	-0.10	-0.31	-0.13	0.18	1.00				
20	0.13	0.08	-0.07	-0.1	-0.09	-0.02	0	-0.01	0.04	-0.13	-0.2	-0.42	0.08	0.2	-0.07	-0.01	0.04	0.08	0.03	1			
21	0.18	0.04	-0.03	-0.09	-0.05	-0.09	-0.02	-0.03	0.06	-0.19	-0.21	-0.4	0.12	0.24	-0.03	-0.06	0.01	0.07	0.11	0.72	1		
22	0.07	-0.02	-0.07	-0.07	-0.09	-0.02	-0.06	-0.01	0.09	-0.1	-0.07	-0.34	0.12	0.23	-0.04	-0.07	-0.05	0.09	0.13	0.3	0.23	1	
23	0.18	-0.08	-0.26	0.01	-0.16	0.05	-0.04	0	0.08	-0.05	-0.09	-0.26	0.19	0.36	-0.11	-0.09	-0.06	0.14	0.23	0.36	0.35	0.2	1.00

1	Total score	7	Annual return	13	Board size	19	Regulation dummy
2	Beta	8	Leverage	14	Firm size	20	Majority voting
3	Total risk	9	Firm Leverage	15	Advertising and R&D ratio	21	Individual director election
4	Idiosyncratic risk	10	Institutional ownership	16	Capital expenditure ratio	22	Say-on-pay
5	Tobin's Q	11	Management ownership	17	Sales growth	23	Disclosure of voting results
6	ROA	12	Year 2009 dummy	18	Dividend yield		

Table 4: Panel regression of board effectiveness on firm performance

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q, ROA* and *Annual stock return.* The dependent variables *Tobin's Q, ROA* and *Annual stock return* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All the panel regressions include year and firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		(II) ROA		(III) Annual stock return	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	0.033	1.71*	0.003	1.12	-0.000	-0.03
Leverage	-0.214	-1.30	0.039	1.91*	0.030	0.66
Institutional ownership	-0.152	-0.92	-0.003	-0.15	-0.068	-1.41
Management ownership	0.239	1.23	0.011	0.56	-0.062	-1.68*
Board size	0.052	0.40	0.002	0.14	0.045	1.26
Firm size	-0.169	-7.06***	-0.003	-1.09	-0.014	-2.21**
Advertising and R&D ratio	0.786	2.59**	-0.133	-1.85*	-0.557	-4.31***
Capital expenditure ratio	1.219	4.59***	0.065	1.43	-0.174	-1.44
Sales growth	0.005	0.11	0.002	0.28	-0.007	-0.39
Dividend yield	0.146	0.38	0.144	1.60	0.362	2.29**
Regulation dummy	-0.205	-1.93*	-0.068	-6.67***	0.001	0.05
Majority voting	-0.103	-1.54	0.001	0.11	0.000	-0.02
Individual director election	0.152	2.17**	-0.014	-1.50	0.011	0.44
Say-on-pay	0.042	0.57	0.005	0.64	-0.038	-1.15
Disclosure of voting results	0.112	1.72*	0.022	3.17***	0.020	0.99
Intercept	2.296	8.87***	0.133	4.85***	0.100	1.45
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.3402*		*0.2276*		*0.2726*	
No of Obs.	*1,472*		*1,472*		*1,472*	

Table 5: Panel regression board effectiveness on firm risk

This panel regression examines whether the BSCI governance score affect the firm risk as measured by *Beta, Idiosyncratic risk* and *Total Risk.* The dependent variables Beta, *Total Risk* and *Idiosyncratic risk* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Total Risk		(III) Idiosyncratic Risk	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	-0.089	-4.61***	-0.007	-4.41***	0.001	1.13
Leverage	0.027	1.62	0.001	0.50	-0.005	-7.33***
Institutional ownership	-0.113	-0.78	-0.010	-0.80	-0.007	-1.25
Management ownership	-0.549	-3.35***	-0.037	-3.61***	0.000	-0.02
Board size	-0.521	-4.04***	-0.041	-4.46***	-0.002	-0.53
Firm size	-0.031	-1.41	-0.010	-6.00***	0.001	0.82
Majority voting	0.041	0.47	-0.009	-1.35	-0.006	-2.22**
Individual director election	0.090	1.08	0.020	2.72***	0.000	-0.12
Say-on-pay	0.039	0.45	0.012	1.79*	0.005	1.02
Disclosure of voting results	-0.194	-2.68***	-0.012	-2.33**	0.004	1.91*
Intercept	2.410	9.59***	0.317	17.11***	0.001	0.08
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2423*		*0.3539*		*0.183*	
No of Obs.	*1,472*		*1,472*		*1,472*	

Table 6: First stage regression of two stage least square

This table report the first stage of two stage least square regression. Here dependent variable *Total score* is predicted by using below mentioned variables. All the control variables are uncorrelated with the residuals from the performance and risk panel regression. All the variables used here, including *ROA* and *Annual stock return* are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively.

	Total Score	
	Estimates	t-stat
Independent chairman	0.384	3.65***
Dummy	-1.163	15.47***
% of independent director	2.172	4.80***
Advertising and R&D ratio	0.289	0.30
Capital expenditure ratio	-0.363	-0.67
Asset growth	-0.061	-4.79***
Leverage	-0.052	-1.44
Regulation dummy	-0.245	-1.59
Board size	-0.120	-0.60
Institutional ownership	-0.620	-1.91*
Management ownership	-1.129	-4.71***
Majority voting	0.171	1.14
Individual director election	0.170	1.13
Say-on-pay	0.271	1.79*
Disclosure of voting results	0.360	3.33***
Firm size	0.168	4.03***
Sales growth	-0.228	-3.59***
Dividend yield	0.457	0.76
Intercept	-0.084	-0.16**
Firm and year fixed effect	Yes	
Adjusted R^2	*0.3164*	
No of Observations	*1,472*	

Table 7: Second stage regression of board effectivness on firm performance

This table reports the second stage of two stage least square regression. The predicted total score from first stage is used to examine the effect of governance score in firm performance. The dependent variables *Tobin's Q, ROA* and *Annual stock return* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I)		(II)		(III)	
	Tobin's Q		ROA		Annual stock return	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
Predicted Total Score	-0.037	-0.41	-0.012	-0.71	-0.076	-1.76*
Leverage	-0.333	-1.62	0.054	1.64	-0.034	-0.42
Institutional ownership	-0.210	-1.00	-0.009	-0.31	-0.182	-2.22**
Management ownership	0.127	0.48	-0.030	-0.80	-0.200	-2.18**
Board size	0.006	0.04	-0.029	-1.18	0.024	0.40
Firm size	-0.195	-6.22***	0.003	0.56	-0.004	-0.29
Advertising and R&D ratio	1.170	2.50**	-1.123	-3.31***	-0.746	-3.91***
Capital expenditure ratio	1.389	4.03***	0.035	0.45	0.017	0.07
Sales growth	-0.012	-0.19	-0.004	-0.29	-0.015	-0.42
Dividend yield	0.142	0.28	0.210	1.18	0.524	1.19
Regulation dummy	-0.222	-1.72*	-0.087	-6.11***	-0.035	-0.97
Majority voting	-0.166	-1.93*	0.007	0.41	0.040	0.62
Individual director election	0.234	2.33**	-0.023	-0.90	0.036	0.79
Say-on-pay	0.102	1.03	0.009	0.56	0.002	0.04
Disclosure of voting results	0.128	1.56	0.039	3.03***	-0.003	-0.08
Intercept	2.867	7.57***	0.211	3.62***	0.324	2.44**
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.326*		*0.192*		*0.213*	
No of Observations	*1,472*		*1,472*		*1,472*	

Table 8: Second stage regression of board effectiveness on firm risk

This table reports the second stage of two stage least square regression. The predicted total score from first stage is used to examine the effect of governance score in firm risk. The dependent variables *Beta*, *Total Risk* and *Idiosyncratic risk* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Total Risk		(III) Idiosyncratic Risk	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
Predicted Total Score	-0.122	-1.72*	-0.010	-1.99**	-0.005	-2.24**
Leverage	-0.004	-0.33	0.001	0.73	-0.003	-4.66***
Institutional ownership	-0.069	-0.44	-0.011	-1.01	-0.008	-1.44
Management ownership	-0.545	-2.82***	-0.041	-3.33***	-0.007	-1.25
Board size	-0.440	-3.71***	-0.037	-4.45***	-0.002	-0.66
Firm size	-0.031	-1.38	-0.009	-5.39***	0.001	1.99**
Majority voting	0.062	0.70	-0.006	-0.96	-0.003	-1.22
Individual director election	0.100	1.33	0.018	2.92***	0.002	0.86
Say-on-pay	0.023	0.26	0.012	2.01**	0.005	1.30
Disclosure of voting results	-0.149	-2.08**	-0.011	-2.11**	0.006	2.97***
Intercept	2.308	9.21***	0.298	16.73***	0.010	1.51
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.238*		*0.376*		*0.265*	
No of Observations	*1,472*		*1,472*		*1,472*	

Table 9: Simulatneous equation framework 1

This table reports the joint estimation of risk and return on simultaneous equation framework, in which ROA and Total risk are jointly estimated in A and ROA and Beta are jointed estimated in B. The dependent variables *ROA*, *Beta*, and *Total Risk* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) ROA		(II) Total Risk		(III) ROA		(IV) Beta	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
ROA			-0.150	-9.04***			-1.166	-5.17***
Risk	-0.717	-16.22***			-0.030	-9.37***		
Total Score	-0.002	-1.18	-0.007	-6.30***	-0.001	-0.30	-0.093	-6.34***
Leverage	-0.019	-5.66***	-0.072	-8.60***	-0.020	-5.82***	-0.744	-6.64***
Institutional ownership	-0.004	-0.31	-0.003	-0.35	0.001	0.04	-0.036	-0.31
Management ownership	-0.021	-1.77*	-0.037	-4.66***	-0.011	-0.92	-0.562	-5.24***
Board size	-0.037	-4.10***	-0.062	-11.40***	-0.020	-2.21**	-0.611	-8.46***
Firm size	-0.001	-0.51	-0.005	-3.66***	0.003	1.44	0.014	0.80
Advertising and R&D ratio	-0.047	-0.86			-0.135	-2.73***		
Capital expenditure ratio	0.095	3.65***			0.091	3.42***		
Sales growth	0.005	1.30			0.003	0.67		
Dividend yield	0.108	1.99**			0.176	3.20***		
Regulation dummy	-0.083	-13.49***			-0.079	-12.81***		
Majority voting	-0.002	-0.36	-0.002	-0.47	0.002	0.24	0.081	1.34
Individual director election	-0.011	-1.85*	0.010	2.52**	-0.016	-2.69***	0.030	0.54
Say-on-pay	0.007	0.60	0.000	-0.01	0.006	0.51	-0.013	-0.13
Disclosure of voting results	0.013	2.85***	-0.014	-4.47***	0.018	3.90***	-0.170	-4.10***
Intercept	0.326	14.40***	0.359	29.77***	0.185	9.48***	2.622	16.44***
Adjusted R^2	0.285		0.362		0.232		0.255	
No of Observations	1,472		1,472		1,472		1,472	

Table 10: Simulatneous equation framework 2

This table reports the joint estimation of risk and return on simultaneous equation framework, in which Tobin's Q and Total risk are jointly estimated in A and Tobin's Q and Beta are jointed estimated in B. The dependent variables *Tobin's Q*, *Beta*, and *Total Risk* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q			(II) Total Risk			(III) Tobin's Q			(IV) Beta		
	Estimates	t-stat		Estimates	t-stat		Estimates	t-stat		Estimates	t-stat	
Tobin's Q				0.012	0.01					-0.062	-2.75	***
Risk	0.41	1.01					-0.188	-6.28	***			
Total Score	0.046	2.9	***	-0.007	-6.68	***	0.022	1.45		-0.089	-6.27	***
Leverage	-0.083	-0.08		-0.074	-8.91	***	-0.484	-4.01	***	-0.756	-6.97	***
Institutional ownership	-0.125	-1.01		-0.004	-0.42		-0.152	-1.24		-0.059	-0.51	
Management ownership	0.257	2.24	**	-0.041	-0.04		0.149	1.31		-0.561	-5.34	***
Board size	0.026	0.03		-0.042	-7.44	***	-0.076	-0.91		-0.549	-7.51	***
Firm size	-0.18	-10.35	***	-0.007	-5.37	***	-0.199	-11.84	***	-0.015	-0.91	
Advertising and R&D ratio	1.586	4.03	***				1.333	3.87	***			
Capital expenditure ratio	1.229	1.23					1.581	6.4	***			
Sales growth	0.026	0.72					0.021	0.58				
Dividend yield	0.117	0.22					-0.016	-0.03				
Regulation dummy	-0.319	-0.32					-0.256	-4.36	***			
Majority voting	-0.206	-3.18	***	-0.006	-0.01		-0.185	-2.88	***	0.036	0.61	
Individual director election	0.225	3.93	***	0.015	3.69	***	0.223	4.02	***	0.077	1.49	
Say-on-pay	0.099	0.1		0.005	0.7		0.072	0.68		0.016	0.16	
Disclosure of voting results	0.086	1.94	*	-0.015	-0.02		0.067	1.51		-0.217	-5.25	***
Intercept	2.402	2.4		0.291	23.28	***	3.061	17.29	***	2.603	15.94	***
Adjusted R^2	0.357			0.363			0.339			0.265		
No of Observations	1,472			1,472			1,472			1,472		

Table 11: Panel regression of firm subscore on Tobin's Q

This table reports the panel regression of eight governance sub-scores individually with firm performance as measured by Tobin's Q. The dependent variable Tobin's Q is measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm and year fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		(II) Tobin's Q		(III) Tobin's Q		(IV) Tobin's Q		(V) Tobin's Q	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
Independence	0.008	0.51								
Stock ownership			0.009	0.55						
Structure					0.019	1.20				
System							0.001	0.04		
Compensation									0.041	2.18**
Leverage	-0.206	-1.25	-0.205	-1.25	-0.209	-1.26	-0.206	-1.25	-0.219	-1.33
Institutional ownership	-0.177	-1.11	-0.170	-1.05	-0.166	-1.04	-0.178	-1.10	-0.167	-1.01
Management ownership	0.197	1.03	0.188	0.99	0.216	1.12	0.184	0.96	0.192	1.02
Board size	0.052	0.40	0.051	0.39	0.065	0.50	0.049	0.38	0.041	0.32
Firm size	-0.164	-6.84***	-0.166	-6.82***	-0.167	-7.04***	-0.164	-6.89***	-0.166	-7.07***
Advertising and R&D ratio	0.798	2.73***	0.810	2.77***	0.763	2.57**	0.800	2.75***	0.859	2.94***
Capital expenditure ratio	1.220	4.59***	1.198	4.43***	1.217	4.57***	1.210	4.50***	1.228	4.69***
Sales growth	-0.002	-0.04	-0.003	-0.07	-0.004	-0.10	-0.004	-0.10	0.003	0.08
Dividend yield	0.159	0.40	0.184	0.47	0.155	0.40	0.158	0.40	0.083	0.21
Regulation dummy	-0.208	-1.95	-0.209	-1.96*	-0.212	-2.00**	-0.210	-1.96*	-0.202	-1.92*
Majority voting policy	-0.094	-1.44	-0.095	-1.44	-0.097	-1.46	-0.095	-1.43	-0.111	-1.68*
Individual director election	0.162	2.32**	0.164	2.37	0.154	2.19**	0.164	2.37**	0.168	2.41**
Say on pay	0.057	0.74	0.056	0.72	0.048	0.63	0.059	0.76	0.048	0.63
Disclosure of voting results	0.123	1.90*	0.122	1.86*	0.117	1.78*	0.125	1.90*	0.123	1.86*
Intercept	2.325	9.09***	2.343	9.07***	2.289	8.50***	2.369	9.25***	2.206	8.65***
Adjusted R^2	0.337		0.337		0.338		0.337		0.341	
No of Observations	1,472		1,472		1,472		1,472		1,472	

Table 12: Panel regression of firm subscore on ROA

This table reports the panel regression of eight governance sub-scores individually with firm performance as measured by ROA. The dependent variable Tobin's Q is measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm and year fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) ROA		(II) ROA		(III) ROA		(IV) ROA		(V) ROA	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	T -stat	Estimates	t-stat
Independence	0.001	0.43								
Stock ownership			0.003	1.4						
Structure					0.000	0.07				
System							0.001	0.56		
Compensation									0.007	3.07***
Leverage	0.039	1.96*	0.040	2.0**	0.039	1.94*	0.039	1.91*	0.038	1.88*
Institutional ownership	-0.005	-0.24	-0.003	-0.1	-0.005	-0.24	-0.004	-0.23	-0.003	-0.14
Management ownership	0.008	0.41	0.008	0.4	0.007	0.35	0.007	0.39	0.008	0.42
Board size	0.002	0.14	0.002	0.1	0.002	0.12	0.001	0.07	0.000	-0.01
Firm size	-0.003	-0.94	-0.003	-1.1	-0.003	-0.97	-0.003	-1.01	-0.003	-1.07
Advertising and R&D ratio	-0.132	-1.87*	-0.128	-1.8*	-0.132	-1.86*	-0.131	-1.84*	-0.119	-1.65
Capital expenditure ratio	0.066	1.46	0.061	1.3	0.064	1.42	0.066	1.46	0.068	1.54
Sales growth	0.001	0.20	0.002	0.3	0.001	0.15	0.001	0.19	0.003	0.40
Dividend yield	0.145	1.60	0.154	1.7*	0.145	1.61	0.145	1.59	0.132	1.53
Regulation dummy	-0.069	-6.73***	-0.069	-6.7***	-0.069	-6.72***	-0.069	-6.69***	-0.067	-6.72***
Majority voting policy	0.002	0.19	0.002	0.2	0.002	0.18	0.001	0.15	-0.001	-0.12
Individual director election	-0.014	-1.41	-0.014	-1.4	-0.013	-1.38	-0.014	-1.42	-0.013	-1.34
Say on pay	0.007	0.77	0.006	0.7	0.007	0.79	0.006	0.74	0.005	0.55
Disclosure of voting results	0.022	3.39***	0.022	3.3***	0.023	3.33***	0.023	3.39***	0.022	3.37***
Intercept	0.134	4.66***	0.131	4.87***	0.139	4.73***	0.138	5.02***	0.110	3.84***
Adjusted R^2	0.226		0.228		0.226		0.226		0.238	
No of Observations	1,472		1,472		1,472		1,472		1,472	

Table 13: Panel regression of firm subscore on beta

This table reports the panel regression of eight governance sub-scores individually with firm risk as measured by beta. The dependent variable Tobin's Q is measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm and year fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Beta		(III) Beta		(IV) Beta		(V) Beta	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
Independence	-0.059	-3.18***								
Stock ownership			-0.015	-0.88						
Structure					-0.030	-1.43				
System							-0.053	-2.90***		
Compensation									-0.129	-5.27***
Leverage	0.031	1.89*	0.028	1.76*	0.029	1.82*	0.031	1.97**	0.028	1.50
Institutional ownership	-0.046	-0.31	-0.064	-0.44	-0.072	-0.48	-0.066	-0.45	-0.073	-0.51
Management ownership	-0.492	-3.12***	-0.408	-2.57**	-0.452	-2.69***	-0.428	-2.76***	-0.424	-2.69***
Board size	-0.532	-4.11***	-0.530	-4.10***	-0.549	-4.25***	-0.484	-3.91***	-0.489	-3.79***
Firm size	-0.050	-2.38**	-0.042	-1.96*	-0.040	-1.81*	-0.039	-1.83*	-0.037	-1.70*
Majority voting policy	0.018	0.20	0.017	0.18	0.018	0.20	0.034	0.37	0.072	0.81
Individual director election	0.076	0.90	0.059	0.69	0.076	0.92	0.071	0.84	0.038	0.46
Say on pay	0.002	0.02	0.002	0.02	0.012	0.14	0.013	0.15	0.019	0.22
Disclosure of voting results	-0.209	-2.79***	-0.223	-2.92***	-0.217	-2.97***	-0.221	-2.96***	-0.218	-2.87***
Intercept	2.543	9.24***	2.291	8.60***	2.364	9.58***	2.285	9.06***	2.707	9.51***
Adjusted R^2	0.232		0.222		0.225		0.229		0.256	
No of Observations	1,472		1,472		1,472		1,472		1,472	

Table 14: Panel regression of firm subscore on total risk

This table reports the panel regression of eight governance sub-scores individually with firm risk as measured by total risk. The dependent variable Tobin's Q is measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm and year fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Total Risk		(II) Total Risk		(III) Total Risk		(IV) Total Risk		(V) Total Risk	
	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat	Estimates	t-stat
Independence	-0.004	-2.75***								
Stock ownership			-0.001	-0.77						
Structure					-0.004	-2.22**				
System							-0.004	-2.72***		
Compensation									-0.010	-5.43***
Leverage	0.001	0.78	0.001	0.64	0.001	0.64	0.001	0.81	0.001	0.50
Institutional ownership	-0.005	-0.41	-0.006	-0.49	-0.007	-0.58	-0.006	-0.52	-0.008	-0.65
Management ownership	-0.033	-3.38***	-0.027	-2.65***	-0.032	-2.99***	-0.028	-2.91***	-0.028	-2.79***
Board size	-0.041	-4.42***	-0.041	-4.41***	-0.044	-4.59***	-0.038	-4.20***	-0.038	-4.19***
Firm size	-0.012	-6.76***	-0.011	-6.52***	-0.011	-6.23***	-0.011	-6.40***	-0.011	-6.67***
Majority voting policy	-0.011	-1.56	-0.011	-1.57	-0.011	-1.57	-0.010	-1.39	-0.007	-1.07
Individual director election	0.018	2.43**	0.017	2.26**	0.019	2.61***	0.018	2.38**	0.016	2.20**
Say on pay	0.008	1.28	0.009	1.34	0.010	1.55	0.010	1.50	0.010	1.53
Disclosure of voting results	-0.013	-2.50**	-0.014	-2.67***	-0.013	-2.56**	-0.014	-2.73***	-0.014	-2.65***
Intercept	0.325	15.50***	0.306	16.75***	0.318	15.98***	0.306	17.04***	0.338	17.18***
Adjusted R^2	0.343		0.334		0.341		0.340		0.364	
No of Observations	1,472		1,472		1,472		1,472		1,472	

Table 15: Panel regression of total governance score on firm performance for 2003-2008

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q, ROA* and *Annual stock return.* The dependent variables *Tobin's Q, ROA* and *Annual stock return* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All the panel regressions include year and firm fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		(II) ROA		(III) Annual stock return	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	0.026	1.40	0.002	0.92	-0.004	-0.69
Leverage	-0.199	-1.08	0.062	2.75***	-0.081	-1.51
Institutional ownership	-0.143	-0.79	-0.011	-0.51	-0.057	-1.03
Management ownership	0.265	1.32	0.007	0.34	-0.086	-2.03**
Board size	0.074	0.52	-0.003	-0.2	0.077	1.68*
Firm size	-0.164	-6.18***	-0.002	-0.63	-0.013	-1.65
Advertising and R&D ratio	0.812	2.62***	-0.141	-2.41**	-0.583	-4.59***
Capital expenditure ratio	1.215	4.45***	0.049	1.00	-0.098	-0.71
Sales growth	-0.013	-0.32	0.004	0.69	-0.006	-0.3
Dividend yield	-0.054	-0.16	0.162	1.40	0.394	3.2***
Regulation dummy	-0.225	-1.89*	-0.07	-6.18***	-0.018	-0.67
Majority voting	-0.059	-0.74	0.001	0.07	0.007	0.18
Individual director election	0.142	1.77*	-0.016	-1.48	0.025	0.84
Disclosure of voting results	0.185	2.65***	0.023	2.97***	0.026	1.09
Intercept	2.229	7.87***	0.133	4.32***	0.047	0.53
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.3501*		*0.2373*		*0.2806*	
No of Observations	1120		1120		1120	

Table 16: Panel regression of total governance score on firm risk for 2003-2008

This panel regression examines whether the BSCI governance score affect the firm risk as measured by *Beta, Idiosyncratic risk* and *Total Risk.* The dependent variables *Beta, Total Risk* and *Idiosyncratic risk* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level respectively. All the panel regressions include firm and year fixed effects and the standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Total Risk		(III) Idiosyncratic Risk	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	-0.079	-3.95***	-0.006	-3.88***	0.001	0.80
Leverage	0.042	3.64***	0.002	2.16**	-0.006	-6.23***
Institutional ownership	-0.193	-1.18	-0.016	-1.23	-0.005	-0.72
Management ownership	-0.484	-2.93***	-0.033	-3.05***	0.000	0.02
Board size	-0.525	-3.75***	-0.045	-4.11***	-0.008	-1.60
Firm size	-0.046	-1.96*	-0.011	-5.44***	0.002	1.68*
Majority voting	0.092	0.82	-0.005	-0.65	-0.005	-1.32
Individual director election	0.066	0.68	0.018	2.10**	0.000	-0.04
Disclosure of voting results	-0.179	-2.43**	-0.011	-1.93*	0.004	1.67*
Intercept	2.5	9.54***	0.329	15.82***	0.006	0.68
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2669*		*0.3802*		*0.1328*	
No of Observations	1120		1120		1120	

Table 17: Panel regression total score on return excluding financial firms

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q, ROA* and *Annual stock return*. Control variables and voluntary disclosure variables are as described for equation 1.The dependent variables are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. The standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		(II) ROA		(III) Annual stock return	
	Est.	t-statistics	Est.	t-statistics	Est.	t-statistics
Total Score	0.038	1.78*	0.001	0.51	0.000	0.05
Control variables	Yes		Yes		Yes	
Voluntary disclosure variables	Yes		Yes		Yes	
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2417*		*0.0996*		*0.2655*	
No of Observations	1239		1239		1239	

Table 18: Panel regression total score on risk excluding financial firms

This panel regression examines effect of BSCI score on firm risk as measured by *Beta, Total risk* and *Idiosyncratic risk.* Control variables and voluntary disclosure variable are as described for equation 2. The dependent variables are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. The standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Total Risk		(III) Idiosyncratic Risk	
	Est.	t-statistics	Est.	t-statistics	Est.	t-statistics
Total Score	-0.098	-4.45***	-0.008	-4.26***	0.001	1.25
Control variables	Yes		Yes		Yes	
Voluntary disclosure variables	Yes		Yes		Yes	
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2419*		*0.3203*		*0.2067*	
No of Observations	1239		1239		1239	

Table 19: Panel regression total score on return excluding financial firms for 2003-2009

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q, ROA* and *Annual stock return.* Control variables and voluntary disclosure variable are as described for equation 1. The dependent variables are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. The standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		II) ROA		(III) Annual stock return	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	0.034	1.59	0.001	0.47	-0.003	-0.41
Control variables	Yes		Yes		Yes	
Voluntary disclosure variables	Yes		Yes		Yes	
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2547*		*0.1023*		*0.2718*	
No of Observations	1074		1074		1074	

Table 20: Panel regression total score on return excluding financial firms for 2003-2009

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q, ROA* and *Annual stock return.* Control variables and voluntary disclosure variable are as described for equation 2. The dependent variables *Tobin's Q, ROA* and *Annual stock return* are measured at t+1 and all other variables are measured at time t. Detailed definitions of the variables are is in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All the panel regressions include year and firm fixed effects. The standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Beta		(II) Total Risk		(III) Idiosyncratic Risk	
	Estimates	t-statistics	Estimates	t-statistics	Estimates	t-statistics
Total Score	-0.09	-4.04***	-0.007	-4.05***	0.0001	1.08
Control variables	Yes		Yes		Yes	
Voluntary disclosure variables	Yes		Yes		Yes	
Firm and year fixed effect	Yes		Yes		Yes	
Adjusted R^2	*0.2523*		*0.33*		*0.2196*	
No of Observations	1074		1074		1074	

Table 21: Panel regression total score on Tobin's Q

This panel regression examines effect of BSCI score on firm performance as measured by *Tobin's Q.* Control variables and voluntary disclosure variable are as described for equation 1. *Tobin's Q* is measured at t+1 and all other variables are measured at time t. Detailed definitions of the variable are presented in Table 1. All variables used in this regression are winsorized at 1% and 99%. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. The standard errors are robust standard errors adjusting for firm-level clustering.

	(I) Tobin's Q		(II) Tobin's Q	
	Estimates	t-statistics	Estimates	t-statistics
Total Score	0.048	2.13**	0.045	2.00**
Control variables	Yes		Yes	
Voluntary disclosure variables	No		No	
Firm and year fixed effect	Yes		Yes	
Adjusted R^2	*0.2277*		*0.2397*	
No of Observations	1239		1074	