ANALYSIS OF THE EFFECT OF CORPORATE GOVERNANCE ATTRIBUTES ON RISK MANAGEMENT PRACTICES

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Abstract

Despite recent increased risk research attention being focussed on the Canadian and international scene, there are few research studies that specifically address the relation between corporate governance systems and risk management practices. This paper examines the relation between corporate governance systems and enterprise risk management. More specifically, we analyze how corporate governance attributes and particularly board characteristics can affect risk management practices in the context of Canadian listed companies. Using a content analysis approach, the level of exposure to risk in terms of likelihood, the consequences of such risk and the strategies for managing that risk were identified for each type of risk. The results reveal that corporate governance attributes related to board's structure, directors' characteristics and the board's operating process play a significant and important role in establishing an integrative risk management approach. The results show that directors' characteristics and the board's process significantly determine the quality of risk management through the level of risk-taking in decisions, especially in terms of financial risks.

Keywords: Board Structure, Directors' Characteristics, Board Process, Risk Management Practices, Financial Risk

1. INTRODUCTION

Recently, increasing research attention has been directed to risk management driven by increased complexities in the business world and with the objective of promoting transparency and improving disclosure quality. From a defensive attitude towards risk, considering it as a situation to be reduced or avoided, companies have come increasingly to recognise the opportunistic side and the value-creating potential of risk (Nocco and Stulz, 2006; Lamm-Tennant and Lightfoot, 2010). The risk oversight function of the board of directors, as a central corporate governance mechanism, has never been more critical and challenging than it is today. The risks that companies face are becoming more complex, interconnected and potentially devastating than ever before (Maingot et al., 2012).

Firms are reassessing their strategies for responding to these challenges. Risk management has emerged as a key success factor and a priority for companies (Protiviti, 2007; Grove and Clouse, 2016). Firms that take and manage risks well are more likely to achieve and even exceed their objectives (Lamm-Tennant and Lightfoot, 2010). Effective risk management not only helps companies avoid costly financial distress and sustain investment programmes, but also improves company-wide decision making. Emphasis has been given to the important role boards have in managing risks. The corporate governance system and particularly the board of directors plays a central role in reducing information asymmetry, planning and managing most of the strategies and risks and consequently promoting the increase of firm value. Nevertheless, the ability of the board to successfully achieve its goals depends largely on its attributes (Gouiaa and Zéghal, 2009). Boards of directors have responsibility for determining an appropriate level of risk appetite in order to achieve their objectives.

Risk management practices could be based on either a compartmentalized and decentralized approach or an integrated approach. The first, which is the traditional approach to risk management, focuses on managing the risks of different parts and functions of the business, ignoring the consequences for the value of the business (Manab et al., 2010). The second approach, or Integrated Risk

Management (IRM), encompasses all risks in a strategic and coordinated framework (Nocco and Stulz, 2006). Using this approach, management can manage uncertainty and assess how risks and opportunities in a company can create, destroy or preserve the value of the business (Fabozzi and Drake, 2009; Maingot et al., 2012; Mensah and Gottwald, 2016). Despite recent increased risk research on the Canadian and international scene, there are few research studies that specifically address the relation between corporate governance systems and risk management practices. This paper examines the relation between corporate governance systems and enterprise risk management. More specifically, we analyze how corporate governance attributes, and particularly board characteristics, can affect risk management practices in the context of Canadian listed companies. This study is based on a content analysis methodology and aims to provide a clear understanding of the relationship and impact of corporate governance attributes on risk management practices in Canadian companies.

As information about risk management is important to analysts, investors, and other firm stakeholders, the findings of this research may therefore be pertinent to new corporate governance regulation regarding the importance of the role played by internal governance mechanisms in improving risk management. Consequently, corporate governance codes could articulate the responsibility of boards for effective risk management. This study sets out to understand the attributes through which boards may exercise responsibilities for risk management. Specifically, our research seeks to identify optimal board structure and characteristics that are important for ensuring effective practices in risk management.

This article is organized as follows. The second section presents the theoretical framework of our research and the hypotheses to be tested. Methodological aspects are the subject of the third section while the fourth section is devoted to the presentation and analysis of results. In the final section, we review the main results and contributions of this study.

2. THEORETICAL BACKGROUND AND RESEARCH HYPOTHESES

2.1. Board of directors and risk management

In the wake of several large corporations' failure and the recent financial crisis, boards of directors, as guardians of shareholder value, play an increasingly important role in risk management. Boards are responsible for the identification, the evaluation and the mitigation of all types of risks (economic risk, operational risk, market risk and liquidity risk). These recent events have led to a variety of changes in regulations and listing rules leading to a stricter interpretation of the fiduciary responsibilities of directors and the issuance of best practice governance standards. These standards have resulted in growing expectations for boards of directors. Boards must exercise greater oversight of their organization's risk management processes (Gupta and Leech, 2014).

Boards that fail to meet these monitoring and control requirements leave their businesses vulnerable to significant risk management failures (McNulty et al., 2013). Results from recent research have shown that board effectiveness is treated as a key function of the ability and willingness of independent directors to foster senior executive accountability (Hillman et al., 2008; Adams, 2012; Gupta and Leech, 2014).

External pressure on the board is based on the foundation of the agency theory that claims stronger control over risk management strategies and activities will lead to substantial improvements in risk management and will lead to more informed decision-making (Ittner and Keusch, 2015). Thus, board structure and director characteristics, which are critical to board effectiveness, could help explain some aspects of business risk-taking, such as economic risk, financial risk and business risk. It is expected that the effectiveness with which boards exercise their risk management function may vary depending on the differences in board structure, director characteristics and operating process of the board (Geeta and Prasanna, 2016). The structure of the board is related to the size of the board, its composition and its committees. Directors' characteristics include experience, compensation and financial expertise. Finally, the board's operating process refers to the frequency and attendance of directors at board and committee meetings.

2.2. Board structure

- **Board size**: the size of the board plays an important role in the ability of directors to control executives and oversee the accounting and financial process (Pearce and Zahra, 1992; Eisenberg et al., 1998). The effectiveness of the board's oversight increases with its size because of the possibility of distributing the workload to a larger number of observers (Klein, 2002). In addition, large boards allow for better monitoring and are more effective at controlling by providing greater expertise (Adams and Mehran, 2004). If larger boards are more efficient controllers of the accounting and financial process, information users should benefit through more effective risk management.
- **Directors' independence:** the role of the board of directors is to provide independent and effective control of management. The effectiveness of this control largely depends on the percentage of independent directors on the board (Andres et al., 2005; Armstrong et al., 2014; Reguera-Alvarado and Bravo, 2017). Greater representation of independent directors on the board enhances the level of control and allows the board to more effectively perform its strategic functions (Coles et al., 2001). Through control and oversight activities, independent directors can reduce excessive risk taking by executives in strategic and operational decisions. These arguments lead us to predict a negative relationship between the percentage of independent directors on the board and excessive risk taking by managers.
- **Other board structure characteristics**: Characteristics related to the duality or separation of CEO and chairman of the board and to audit and risk management committees may also play an important role in the effectiveness of the board of directors to manage business risks.

The CEO duality: The duality of functions of CEO and board chairman leads to a concentration of power that opens the way for individuals to serve their own interests (Tuggle et al., 2010). Since effective business management requires adequate commitment by the board and management to achieve objectives that are in the best interest of the company and its shareholders (Pugliese et al., 2009), the duality of functions is highly controversial. In fact, the duality can adversely affect the board's oversight function, thereby reducing its ability to detect management incompetence and corruption. This duality, which can undermine the possibility of preventing corruption, can, therefore, hinder the prevention of corporate disasters (Krause et al., 2014). Based on these arguments, it is anticipated that boards that choose a structure that separates the roles of CEO and chairman would achieve their risk management mandate more effectively and, consequently, would be less likely to engage in excessive risk taking.

Audit and Risk Management Committees: the effectiveness of a board of directors can be enhanced by setting up board committees, such as an audit committee, or a compensation and nomination committee (Raghunandan and Rama, 2007; Ittner and Keusch, 2015). The audit committee and risk management committee in some cases can have a particularly significant impact on the level of risk to which companies are exposed (McNulty et al., 2013). This is due to one of the primary responsibilities of the audit committee, which is to monitor the integrity of financial statements, review internal controls, and the internal audit and risk management systems of the organization, in accordance with Regulation 52-110 respecting the audit committee. The audit/risk management committee has a special role, acting independently of the executive committee to ensure that the interests of shareholders and other stakeholders are protected, by ensuring effective risk management and compliant and transparent financial reporting. This form of governance calls for important functions of audit committees with responsibility for risk management, or an independent risk management committee, with responsibilities defined as monitoring, identification, evaluation, review and management of risks to which the company may be exposed (COSO, 2004). Thus, boards of directors that have a risk management committee, or an audit committee identified as the bearer of risk management responsibility, are expected to be the most effective in terms of managing risks.

Hypothesis 1: Corporate risk taking is lower when the board structure is characterized by a large board of directors, a high percentage of independent directors, a separation of the functions of Chief Executive Officer and Chairman of the Board and the existence of an independent Audit or Risk Management Committee.

In addition to the size of the board, its independence and its structure, specific characteristics of directors may also affect the performance of boards of directors in fulfilling their roles and duties, including enterprise risk management (Gouiaa and Zéghal, 2009; McNulty et al., 2013; Geeta and Prasanna, 2016).

2.3. Directors' characteristics

- **Directors' Experience**: Administrators with long-term tenure on the board of directors accumulate greater experience and expertise (Vafeas, 2003; McDonald et al., 2008; Reguera-Alvarado and Bravo, 2017). A long-term mandate increases the quality and effectiveness of the board in the performance of its duties as the mandate term is associated with greater experience, commitment and knowledge of the organization and its business environment. According to Anderson et al. (2004), effective supervision is an acquired skill, which implies that boards of directors made up of more experienced directors can provide greater oversight. Considering the above, boards of directors who opt for longer directorships would be less likely to take excessive risks.
- **Directors' Compensation**: Director compensation may also affect risk management practices. The remuneration can be in the form of money (fixed and/or variable compensation) and in the form of shares or stock options. According to agency theory, the percentage of capital held by independent directors can be an incentive to exercise effective management control as well as the accounting and financial reporting process (Jensen and Meckling, 1976; Beasley, 1996). Independent shareholder directors are more responsive and efficient and provide clearer management that meets the requirements of creditors and investors (Cremers and Nair, 2005; Chen et al., 2009). As a result, we expect a higher level of compensation in equity or stock options for independent directors to improve the risk management process by reducing risky decision-making.

  In addition, some studies have shown that attractive levels of financial compensation for independent directors might encourage them to exercise their supervisory function more effectively (Becher et al., 2005; Adjaoud et al., 2007; Deutsch et al., 2011). According to McNulty et al. (2013), the relative remuneration in terms of the ratio between executive remuneration and independent directors' remuneration can affect the extent of the risks to which directors are prepared to expose their business. In order to recruit the most skilled and experienced non-executives, who may be more willing to act independently and competently in controlling excessive risk-taking by executives, a higher level of remuneration is required. This implies that the higher the relative pay between independent directors and executives (close pay levels), the lower the risk taking for the company. As a result, we expect more effective risk management when the financial compensation of the independent directors is closer to the compensation granted to the executive directors. This should promote lower risk taking.
- **Financial Expertise**: Risk management relies heavily on the skills, experience and expertise that directors possess (Ittner and Keusch, 2015). Among the broad range of skills that directors can possess, financial literacy is a skill and expertise essential to any board of directors, and especially to any audit and risk management committee (Chhaochharia and Grinstein, 2007; Minton et al., 2014). Therefore, boards with a higher percentage of independent directors with financial expertise are expected to

manage business risks more effectively by making less risky decisions.

Hypothesis 2: Characteristics of directors related to experience (board directors' average tenure), to the ownership percentage of independent directors, to the relative compensation of independent directors (average of independent directors compensation versus average executive compensation) and to the financial expertise of independent directors positively affect risk management practices through less risky decision-making.

2.4. Board processes

Meeting frequency and attendance level: The frequency of the board's activities indicates the level of diligence and the level of vigilance exercised by the directors (Ghosh et al., 2010). Improved quality of board oversight of managers and financial reporting process, high frequency of board meetings and high attendance rate of directors should lead to improved quality of risk management. This should, therefore, lead to the reduction of risk levels and related costs incurred by shareholders. When a board of directors and its committees meet more often, this is seen as evidence of a management structure that effectively performs its functions and this reduces the risk of manipulation and discretionary adjustments of the disclosed accounting information (Coles et al., 2008).

Hypothesis 3: Risk taking is lower when board processes are characterized by high frequency of board meetings and a high attendance rate of independent directors.

3. RESEARCH METHODOLOGY

3.1. Sample description and data

To test our hypotheses, we analyze the 2012 and 2013 annual reports of the Canadian companies listed on the TSX Composite index. The composite index accounts for about 70% of the total capitalisation of all companies on the TSE. Companies with missing observations and outliers (on the basis of 1st and 99th percentiles) were excluded, as were companies belonging to the financial industries as they are exposed to different types of risk and to liquidity considerations. This treatment is also justified by the fact that the restriction to non-financial firms increases the homogeneity of the sample and improves the robustness and comparability of our findings. In addition, the governance system of financial institutions is very specific and differs from that of non-financial firms (Macey and O'Hara, 2003; Gouiaa and Zéghal, 2009). After matching the data from the different sources the final sample consisted of 324 observations corresponding to 162 non-financial companies listed on the TSX composite index in both 2012 and 2013.

Data for this study were collected from different databases. On the one hand, accounting and financial data were extracted from the Research Insight database. On the other hand, data regarding board characteristics and risks were collected from the S&P Capital IQ's Compustat-ExecuComp database, and manually from the 2012 and 2013 annual reports of the companies. These reports have been downloaded from the System for Electronic Document Analysis and Retrieval (SEDAR) online database.

This paper examines the relation between corporate governance systems and enterprise risk management. More specifically, we analyze how corporate governance attributes, and particularly board characteristics, can affect risk management practices in the context of Canadian listed companies. In assessing risk management practices, the types of risks to which companies may be exposed must first be identified. Although there is no consensus on the grouping of different types of risk (Collier, 2009), Lajili and Zéghal (2005) have identified fourteen different types of risk that can be grouped into three main categories (Maingot et al., 2012):

- Financial risks: risks of fluctuations in the exchange rate, the interest rate, credit risk (default risk of customers and non-recovery of receivables), market risk (risk of increased competition or loss of important customers), economic risks (risks of economic recession, decrease of purchasing power, economic or financial crisis).
- Business risks: regulatory risk (changes in laws and regulations, tax law, cut in government aid and loans), political risks (risk associated with transactions with the international environment), technological risk (rapid technological change, IT security), climate risk (extreme, unexpected and unfavorable weather conditions), seasonal risk (geographical diversification, weather).
- Operational risks: environmental risk (environmental incidents, new environmental laws and regulations, environmental activists), operational risks (unionization, technical failures and accidents, human errors, insufficient resources), supply risk (supplier relationships and bargaining power, dependence), risks related to natural resources (insufficient nature reserves, regulations limiting exploitation and extraction).

Operational risks are unique to and can be managed within each company. Business risks, on the other hand, are somewhat outside the company's direct control. Financial risks are sometimes considered part of business risks but are generally not outside the company's control, given the opportunities to manage these types of risks through the financial markets (Maingot et al., 2012).

Using a content analysis approach, the level of exposure to risk in terms of likelihood, the consequences of such risk and the strategies for managing that risk were identified for each type of risk (AICPA/CICA; 1999; Milne and Addler, 1999; Cerbioni and Parbonetti, 2007; Beattie and Thomson, 2007; Dobler et al., 2012). Empirical hypotheses were tested using multiple regression models. Specifically, measures related to board structure, director characteristics, and the board's operating process, along with a variety of control variables such as size, profitability, growth opportunities, and industry, are compiled in four regression models to analyze their effect on the measures of the financial, operational and business risk management indices as well as on a global risk management index. In addition, given the opportunities for companies and boards to manage financial risks, a complementary analysis deepens this analysis by examining the effect of the

governance attributes studied on the level of risk taking through three financial risk indicators.

3.2. Measures of risk management practices

Two measures of risk management practices were used in this study. A first measure summarizes risk management into an index by risk category (financial, operational and business) and a global index. A second measure consists of financial risk indicators, to assess companies' financial risk-taking policies, based on changes in cash and cash equivalents, changes in net cash flow, and working capital (McNulty et al., 2013).

3.2.1. Risk management index

The first measure is used to assess, for each risk category, the level of exposure of the company, the possible consequences and how it is managed. Table 1 presents a classification and coding grid of risk exposure levels, consequence levels and risk management strategies. The assessment of exposure levels, consequences and risk management strategy is based on the assessment of risk types by category based on the methodology of content analysis of the annual reports of the firms studied.

Table 1. Categorisation and coding of risks

Risk exposure	*Code*	*Risk consequence*	*Code*	*Risk management*	*Code*
Rare	1	Insignificant	1	Accept risk	1
Improbable	2	Minor	2	Reduce risk	0.75
Possible	3	Moderate	3	Transfer risk	0.25
robable	4	Major	4	Avoid risk	0.1
Certain	5	Catastrophic	5		

Adapted from Cerbioni and Parbonetti, 2007; Beattie and Thomson, 2007; Dobler et al., 2012.

*Risk Management Index (RMI) per risk category = Av. Risk exposure * Av. Risk consequence * Av. Risk management code*

By risk category (business, operational and financial), a sub-RMI index is calculated in accordance with the above equation, ranging from 0.1 to 25. In addition, a global risk management index per enterprise is calculated. This is the sum of three sub-indexes per category and varies from 0.3 to 75, to assess overall risk management by company. The lower the value of the risk management index, the better the quality of the overall risk management; and the higher the value of global RMI, the less effective is the risk management approach and the higher the risk exposure.

3.2.2. Proxies of financial risk

Financial risk measures refer to the level of liquidity of the company as well as its current financial reserves (its ability to react to unforeseen events). By industry, the financial policy of a company is considered low risk if it has a fairly high level of liquidity, through fairly large current financial reserves maintained during the period studied. Corporate policies characterized by low liquidity levels and difficulties in finding new sources of financing are treated as high risk. Inspired by McNulty et al. (2013), three liquidity measures were used as inverted references to the level of risk-taking:

- Change in cash and cash equivalents (**ΔCE**): Change in cash and cash equivalents to total assets.
- Change in net cash (**ΔNC**): The change in cash and cash equivalents, net of current liabilities and current portion of long-term debt to total assets.
- Change in financial slack (**ΔFS**): Corrected working capital is the sum of cash and cash equivalents, marketable securities, 70% of accounts receivable, 50% of inventories, less accounts payable, divided by the net balance of fixed assets (Cleary 1999; McNulty et al., 2013).

These three indicators are inverse measures of the level of risk-taking. Thus, the higher the value of the variation, the better the quality of risk management.

3.2.3. Measures of explanatory variables

The explanatory variables are related to the structural characteristics of the board of directors, the characteristics of the directors and the board's operating process. In addition to governance attributes, the effect of the industry, growth opportunities, size and profitability of the business is controlled. Table 2 below summarizes the measures of all these explanatory and control variables.

Table 2. Measures of board attributes and Control variables

Variables	*Description*
BRD_SIZE	**Board size:** Number of directors comprising the board of directors
DUAL	**Duality or separation of CEO and Chairman functions**: Dummy variable that takes the value 1 when the CEO is also the Chairman of the board (duality) and the value 0 otherwise (separation of functions).
BRD_IND	**Board Independence**: Percentage of independent directors on the Board.
FIN_ MOTIV	**Financial motivations of independent directors:** percentage of shares and stock-options in total remuneration of non-executive.
BRD_TEN	**Board Tenure:** Average operating years of directors in the board.
RD_FREQ	**Meeting frequency of the board: Number of meeting of the board of directors annually.**

Variables	*Description*
RISK_COM	**Risk committee:** Dummy variable that takes the value 1 when there is a separate risk committee or an audit committee identified as the bearer of the risk management responsibility and the value 0 otherwise.
FIN_EXP	**Financial Expertise:** Percentage of non-executives who are financially literate
DIR_COMP	**Director Compensation:** Average remuneration of executive directors divided by the average remuneration of non-executive directors
DIR_ATT	**Attendance at Board Meetings:** Participation rate of independent directors at board meetings.
FRM_SIZE	**Firm size**: Logarithm of the book value of total assets.
ROA	**Return on Assets:** Earnings before Interest and Taxes / Total Assets.
MB	**Market to Book**: Growth opportunities measured by the ratio: Market value of equity / book value of equity
IND	**Industry:** measured by four dichotomous variables for the 4 main industries: IND1 (Energy), IND2 (Materials), IND3 (Manufacturing) and IND4 (Services). Each variable takes the value 1 if the firm belongs to the specific industry and 0 otherwise.

4. RESULTS ANALYSIS

4.1. Descriptive statistics

The results presented in Table 3 indicate that the average board size is approximately 8 directors and ranges from 5 to 16 directors. A review of board composition reveals that, on average, 71% of directors are independent in accordance with National Instrument 52-110. These results also show that boards of directors of Canadian companies meet at least 5 times a year, up to 16 times a year, with an average of 8 meetings per year and an attendance rate of 71%. The results also reveal that directors fulfill an average mandate of 7.95 years.

The results of the descriptive statistics show that the average remuneration of the independent directors represents approximately 5.5% of the average remuneration of the executive directors. These results also show that the remuneration of the independent directors consists of an average of 22% of shares or stock options. Moreover, more than half of the companies surveyed (58%) opt for a structure separating the functions of senior management and board chairmanship and only 14% have an independent risk management committee.

Table 3. Sample characteristics

	Mean	*St. dev.*	*Min*	*Max*
Board Characteristics				
BRD_SIZE	8.354	2.546	5.000	16.000
BRD_IND	0.705	0.188	0.241	0.923
BRD_TEN	7.946	4.532	1.205	18.439
FIN_EXP	0.214	0.169	0.091	0.750
DIR_COMP	0.054	0.036	0.034	0.319
FIN_ MOTIV	0.218	0.127	0.019	0.689
BRD_FREQ	7.845	2.474	5.000	16.000
DIR_ATT	0.709	0.211	0.620	0.950
Control Variables				
ROA	0.029	0.081	-0.293	0.401
MB	2.298	1.975	-5.637	17.807
FRM_SIZE	8.287	1.757	1.464	11.246
Risk Management Measures				
RMI_FR	4.843	2.795	1.173	17.467
RMI_BR	12.043	5.746	3.128	20.104
RMI_OR	6.508	4.073	2.069	19.153
GRMI	23.394	7.058	7.944	48.715
ΔCE	0.004	0.061	-0.299	0.431
ΔNC	-0.008	0.081	-0.407	0.267
ΔFS	0.006	0.085	-0.289	0.561

RMI_FR is the financial risk management index, **RMI_BR** is the business risk management index, **RMI_OR** is the operational risk management index, **GRMI** is the golbal risk management index, **ΔCE** is the variation cash and cash equivalents divided by total assets, **ΔNC** is the change in net cash from current liabilities divided by total assets, **ΔFS** is the change in the adjusted fund divided by net fixed assets (financial slack).

Given the highly financial nature of the annual reports, the content analysis of these reports on the risks and the way they are managed shows that the companies studied provide more information in the area of financial risks than other types of risks, with the exception of market risks. Descriptive statistics show that the financial risk management index is on average the lowest (4.843) compared to operational risk management indices (6.508) and business risks (12.043). This indicates, therefore, better financial and operational risk management in comparison to business risk management. This result shows that companies opt for more effective risk management practices whenever the risks are partly under their control and can therefore be managed, particularly with respect to financial and operational risks.

On average, the value of cash and cash equivalents of the companies surveyed increased by 0.4%, net cash decreased by 0.8% and financial slack increased by 0.6%. These three indicators show, on average, relatively small fluctuations in total assets,

which could be a sign of good financial risk management.

4.2. Analysis of the effect of governance variables on risk management indices

The results of the regression model analyzing the effect of the board structure, board characteristics and board operating process on the risk management indices, shown in Table 4, show satisfactory explanatory power with statistically significant coefficients, especially for financial and operational risk indices. These models indicate that 23% of the change in the financial risk management index, 6% of the variation in the business risk management index and 17% of the variation in the operational risk management index are explained by the characteristics of the directors, the structure and the operating process of the board of directors, controlling the effect of the industry, the size and the profitability of the companies.

The results of the first regression model show that the size and independence of the board of directors, as well as the existence of an independent risk management committee, have a negative and significant impact on the financial risk management index. This shows that larger, independent boards with an independent risk management committee are more able to manage the financial risks to their organizations. This result thus confirms the first research hypothesis. In addition, three of the four characteristics of the directors studied have a negative and significant effect on the financial risk management index, which shows that directors with financial expertise who are well remunerated and motivated manage the financial risks more effectively. This result confirms the second hypothesis. For the variables related to the board's operating process, the results found show that boards that meet more regularly manage better the financial risks to which the company is exposed, partially confirming the third research hypothesis.

The results of the second regression model, analyzing the effect of the three groups of governance variables on business risk management, show that only the level of relative remuneration of independent directors and the frequency of board meetings have a negative and significant effect on the business risk management index. This result indicates that boards that meet more frequently and directors who are paid at levels closer to executive levels are more effective in managing business risks.

The results of the regression model that analyzes the effect of the governance attributes on operational risk management show that only certain variables related to board structure and director characteristics significantly affect the quality of operational risk management. In fact, these results show that independent boards of directors, which have an independent risk management committee and whose independent directors are experienced and motivated by a greater participation in the capital, more effectively manage the operational risks of their organizations.

Table 4. Regression results _ Risk Management Indices

	RMI_FR *Coefficient (t-statistic)*	**RMI_BR** *Coefficient (t-statistic)*	**RMI_OR** *Coefficient (t-statistic)*	**GRMI** *Coefficient (t-statistic)*
BRD_SIZE	-0.12** (0.04)	0.08 (0.36)	-0.11 (0.13)	-0.21* (0.09)
BRD_IND	-0.18* (0.07)	-0.13 (0.42)	-0.07* (0.06)	-0.12 (0.17)
DUAL	0.05 (0.31)	0.10 (0.56)	0.03 (0.61)	0.08 (0.24)
RISK_COM	-0.16** (0.03)	-0.07 (0.29)	-0.14* (0.09)	-0.20* (0.05)
BRD_TEN	-0.11 (0.27)	-0.08 (0.34)	-0.07* (0.08)	-0.13 (0.15)
FIN_EXP	-0.27** (0.03)	-0.12 (0.29)	-0.15 (0.26)	-0.21 (0.15)
DIR_COMP	-0.16* (0.08)	-0.21* (0.06)	-0.19 (0.41)	-0.13* (0.07)
FIN_MOTIV	-0.41* (0.10)	-0.05 (0.68)	-0.18** (0.02)	-0.26* (0.09)
BRD_FREQ	-0.09* (0.08)	-0.14* (0.07)	-0.02 (0.31)	-0.07* (0.08)
DIR_ATT	-0.21 (0.16)	0.06 (0.35)	-0.09 (0.11)	-0.10 (0.34)
ROA	-0.01 (0.24)	-0.13 (0.60)	-0.02 (0.44)	-0.11 (0.23)
MB	-0.03 (0.15)	0.41 (0.42)	-0.38 (0.15)	-0.27 (0.29)
FRM_SIZE	-0.24* (0.10)	-0.10 (0.12)	-0.08* (0.08)	-0.19** (0.04)
Intercept	0.09 (0.37)	0.04 (0.51)	0.16 (0.13)	0.12 (0.29)
IND	Yes	Yes	Yes	Yes
R-Squared (Adj.)	0.23	0.06	0.17	0.11

*Notes: ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively.*
Independent variables are defined in the section "Research Methodology".

The analysis of the effect of the three groups of governance attributes on the overall risk management index (GRMI) generally confirms the three research hypotheses. The analysis of the results reveals a negative and significant effect of the size of the board of directors and the existence of an independent risk management committee on the overall risk management index.There is, therefore, a positive effect on the quality of the management of all risks, which confirms the first hypothesis. In addition, the results show that the characteristics of the directors allow for better risk management overall. It should be noted that the financial motivation of the independent directors (percentage of shares and stock options in the total compensation of the independent directors) and the level of their average remuneration compared to that of the executive directors are variables that positively and significantly affect the quality of integrated risk management. This result thus confirms the second hypothesis. Finally, we find that boards that meet more frequently manage more effectively the risks to which their companies are exposed.

4.3. Analysis of the effect of governance attributes on financial risk indicators

The analysis of the results of the regression models, presented in Table 5, examining the effect of board characteristics on financial risk-taking levels, shows satisfactory explanatory powers. The adjusted R2 values indicate that 22% of the change in cash, 11% of the change in net cash and 18% of the change in financial slack are explained by the structure of the board of directors, the characteristics of its administrators and its operating process, in addition to variables whose effect has been controlled.

The results of this complementary analysis thus corroborate the results found in the financial risk management index. Overall, the variables related to the structure of the board of directors show a positive and significant effect on the quality of financial risk management through less risky decision-making. Findings indicate that larger boards, with more independent directors and an independent risk management committee, better manage financial risks by providing a higher level of liquidity. This result confirms the first research hypothesis.

The results of the three regression models examining the effect of the directors' characteristics on the level of financial risk-taking confirm the second hypothesis. These results show that independent directors with financial expertise who are financially motivated by remuneration closer to that of executives and a greater shareholding in the company better manage financial risks through higher liquidity levels. The results found indicate a positive and significant effect of the frequency of board meetings and the participation rate of the directors on the change in cash flow and the change in financial slack, respectively. This analysis shows the importance of the process of operating boards of directors at the level of financial risk taking and, therefore, on the quality of risk management.

Table 5. Regression results _ Financial Risk Measures

	ΔCE *Coefficient (t-statistic)*	**ΔNC** *Coefficient (t-statistic)*	**ΔFS** *Coefficient (t-statistic)*
BRD_SIZE	0.12** (0.03)	0.03 (0.19)	0.09* (0.07)
BRD_IND	0.07* (0.06)	0.06** (0.02)	0.04* (0.08)
DUAL	-0.02 (0.48)	-0.12 (0.19)	-0.05 (0.34)
RISK_COM	0.02** (0.03)	0.45 (0.21)	0.28* (0.09)
BRD_TEN	0.15 (0.30)	0.21 (0.19)	0.17 (0.26)
FIN_EXP	0.27** (0.02)	0.08** (0.02)	0.10** (0.05)
DIR_COMP	0.31* (0.08)	0.23* (0.09)	0.16** (0.05)
FIN_MOTIV	0.10** (0.05)	0.07* (0.08)	0.19** (0.02)
BRD_FREQ	0.04** (0.05)	0.07 (0.17)	0.12 (0.18)
DIR_ATT	0.20 (0.31)	0.04 (0.29)	0.11* (0.06)
ROA	-0.12 (0.76)	-0.09 (0.33)	-0.18 (0.27)
MB	0.23 (0.13)	0.01 (0.39)	0.31 (0.18)
FRM_SIZE	0.18** (0.05)	0.09* (0.07)	0.12* (0.09)
Intercept	0.03 (0.29)	0.10 (0.43)	0.05 (0.39)
IND	Yes	Yes	Yes
R-Squared (Adj.)	0.22	0.11	0.18
*Notes: ***, **, * indicate significance at the 1%, 5%, and 10% level, respectively. Independent variables are defined in the section "Research Methodology".*			

The set of regression models analyzed thus confirms the importance of the role played by boards of directors in managing the risks that companies face. The results found show that the governance attributes related to board's structure, the characteristics of the directors and the board's operating process significantly determine the quality of risk management through the level of risk-taking in decisions, especially in terms of financial risks. These results reveal that directors' characteristics and board process play a significant and important role in establishing an integrative risk management approach that allows reducing the financial risk.

5. SUMMARY AND CONCLUSION

The board of directors plays a central and essential role in the management of business risks, particularly in the management of controllable risks (financial and operational). The results of this study validate the importance of the impact of the individual measures of the characteristics of the board of directors, in particular the board structure and the characteristics of the directors that owards go towards determining the level of risk-taking and in the quality of enterprise risk management. The stronger the characteristics of a board, the better the quality of risk management and the lower the level of risk taking.

The results contribute to enriching the accounting and financial literature by showing the importance of the board's characteristics, as the main governance mechanism, in determining risk management practices. This study identifies the structural, managerial and operational characteristics that can play a significant role in ensuring effective risk management practices. The more efficient the majority of board characteristics, the better the quality of risk management and the lower the level of risk taking.

This study reveals that companies are encouraged to strengthen the attributes of their boards of directors in order to maximize efficiency in the performance of their duties and to ensure more effective risk management that allows them to take advantage of the opportunities that arise, by controlling the associated risks.

As information about enterprise risk management is important to analysts, investors, and other stakeholders, these findings may therefore be pertinent to support new corporate governance regulation regarding the importance of the role played by internal corporate governance mechanisms in improving risk management. Corporate governance regulations, codes and financial market authorities could restructure the responsibility of boards of directors for more effective risk management.

In addition, if Canadian companies seek to improve the quality of risk management they face in this difficult economic and financial situation, they must control their corporate governance system in general, and their boards of directors in a particular way. They must optimize the characteristics of their boards of directors in terms of the board's structure, directors' characteristics, directors' attendance and meetings frequency.

This research incorporates the main features of the board, but not all. To this end, future research can widen and deepen this research framework by incorporating other board characteristics to better understand the determinants of the efficiency of this central governance mechanism and its implications for risk management practices. In addition, it would be interesting to integrate the influence of differences in institutional environments in explaining risk management practices through international comparison.

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