

# Risk management by US and Canadian financial firms during the financial crisis

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**Abstract** The objectives are to examine the impact of the 2008 financial crisis on enterprise risk management (ERM) disclosures in US and Canadian financial firms, and to compare risk management between these two financial sectors. ERM disclosures were examined through a content analysis of the 2007 and 2008 annual reports. The number of risk disclosures increased only slightly from 2007 to 2008. When the levels of risk exposure, risk consequences and risk management were examined, the only change was the reporting of higher risk consequences from 2007 to 2008 by US companies. Canadian companies reported higher levels of risk exposure and risk consequences only for liquidity risk. While there were similarities in the disclosure of risks in the financial category, the US financial sector firms disclosed higher levels of risk exposure but managed these risks more passively, whereas the Canadian firms reported higher levels of risk consequences and managed these risks more actively. Firms in the financial sector have not been inclined to disclose more information about their risk management strategies, despite the importance of risk management in their business model. This information asymmetry has potential for significant costs to investors and society in general. A study comparing the US and Canadian financial sectors has not been done previously. Given the origins of the financial crisis in the US and the relatively stable Canadian financial sector, this study is overdue.

**Keywords** Enterprise risk management · Financial sector · US · Canada · Financial crisis

## Introduction

The objectives of this paper are to examine the impact of the 2008 financial crisis on Enterprise Risk Management (ERM) disclosures in US and Canadian financial firms, and to compare risk management between these two financial sectors.

According to Mishkin (2010), the financial crisis broke in late 2008:

“The financial crisis of 2007–2009 can be divided into two distinct phases. The first, more limited, phase from August of 2007 to August of 2008 stemmed from losses in one, relatively small segment of the U.S. financial system—namely, subprime residential mortgages. Despite this disruption to financial markets, real GDP in the United States continued to rise into the second quarter of 2008, and forecasters were predicting only a mild recession.” (p. 1)

“In mid-September 2008, however, the financial crisis entered a far more virulent phase. In rapid succession, the investment bank Lehman Brothers entered bankruptcy on September 15, 2008, the insurance firm AIG collapsed on September 16, 2008; there was a run on the Reserve Primary Fund money market fund on the same day; and the highly publicized struggle to pass the Troubled Asset Relief Program (TARP) began.” (p. 1)

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The financial crisis highlighted the disastrous results when risks associated with business strategies are ignored or ineffectively managed. Coming out of the crisis, there have been calls for improvements in overall risk oversight with particular emphasis on strategic risk management (Beasley and Price 2010).

While our study goes back 10 years, our findings are relevant today. Important lessons have been learned from the financial crisis and these can help to mitigate a future crisis. Stock (2018) reports on the prediction of another global financial crisis (GFC) by an economist who predicted the earlier GFC. Caruana (2017) identified four potential risks that can drag us back into a financial crisis:

- (a) An upturn in inflation;
- (b) Maturation of bullish financial cycles;
- (c) Growth fueled solely by consumption rather than by investment; and
- (d) A wave of increased protectionism.

We are beginning to see the rise of the last risk under the current US administration with threats of tariffs and trade wars. Oliver (2018) reported recently on an on-line debate in the Financial Times on the issue of whether bank regulators should ease the rules to boost economic growth (deregulation) or simply apply the rules as they exist (regulation). The respondents opposed deregulation by more than three to one, arguing that deregulation could lead to another crash by emboldening risk-taking at the very large banks.

The current US administration is considering loosening some of the regulations to the Dodd-Frank Act of 2012. These financial reforms had been designed to protect the financial system from another collapse of the sort that occurred in 2008.

We are still learning from the world's greatest financial crisis in the modern era, the Great Depression of 1929–1934. John Kenneth Galbraith's "The Great Crash 1929" argued that the economy, on the verge of the Great Depression, was so fragile that it was just waiting for some event to cause the crisis (Wray 2011).

According to Stiglitz (2010), the problem before the beginning of the financial crisis in 2008 was that the banks were behaving badly but were not stopped by the regulators. They misallocated capital by providing billions of dollars to finance mortgages rather than investing in productive enterprises.

The crisis started with the collapse of the subprime mortgage market in early 2007 and at the end of a major housing boom. At this time, there was loose oversight, and a relaxation of normal standards of prudent lending (Bordo 2008). The rating agencies were criticized for continuing to give triple-A ratings to subprime securities, even as the underwriting deteriorated and the housing boom turned

into a bubble (McLean and Nocera 2010). Default rates on risky mortgage loans rose rapidly, while house prices dropped (Wray 2011).

The second problem was that, instead of managing risk, the banks created risk. Structured finance is often mentioned as the main cause of the financial crisis (Bordo 2008; Stiglitz 2010). Structured finance includes all advanced financial arrangements that serve to efficiently refinance and hedge any economic activity beyond the scope of conventional forms of traditional financial instruments (debt, bonds, equity) (Dionne 2009). Stiglitz (2010) indicated that before the financial crisis, the financial sector garnered 40% of all corporate profits in the USA. It was not making the economy more productive but less productive.

In this environment, some banks collapsed and surviving banks became even bigger and too big to fail. In Canada, the Office of the Superintendent of Financial Institutions (OSFI), the regulator, also has named the Big Six Banks (in Canada) as too big to fail (Greenwood 2013).

"Too big to fail" is a problem since it created one sided risks (Stiglitz 2010). When a too-big-to-fail bank takes big risks and wins, it walks away with big profits. However, if it takes big risks and loses, the taxpayer (through government bailouts) pick up the losses. This is reward without risk, and we save not only the depositors but also the bankers, shareholders and the bondholders.

### Enterprise risk management (ERM)

Balancing risk and reward has always been a challenge for companies. This has become more pronounced today against the background of the global economy. The risks that companies face are becoming more complex and interconnected. The global economy has increased both the interdependence of organizations and the interconnectedness of risks which often transcend boundaries and borders (Price Waterhouse Coopers 2009).

Companies are reassessing their strategies for responding to these challenges. Effective risk management has emerged as a key, if not the most important priority for companies (Protiviti 2007). Organizations that take risks and manage risks well are more likely to achieve or exceed their objectives (AICPA/CICA 1999; Lamm-Tennant and Lightfoot 2010).

Enterprise risk management (ERM) is a process that requires a firm's management to identify and assess the collective risks that affect firm value and to apply an enterprise-wide strategy to manage those risks in order to establish an effective risk management strategy (Beasley and Price 2010). The primary goal of risk management is to maximize shareholder value (CAS 2003; COSO 2004; Nocco and Stulz 2006; Beasley et al. 2008; Pagach and

Warr 2011). Risk management has evolved from a narrow view that focuses on evaluating risk from a “silo” perspective to a holistic all-encompassing view where all risks are viewed together within a coordinated and strategic framework (Lam 2006; Nocco and Stulz 2006).

Can risk management actually help to protect business? According to Sullivan (2012), this question has been asked regularly since the financial crisis. He claims that the companies that fared best in the downturn were those that had a clear, realistic understanding of their risks, had actually taken steps to address their key risks, and had defined clear roles, responsibilities and accountability for managing risk.

### Corporate governance and ERM

Companies need to align corporate governance with risk management (Sobel and Reding 2004). This means that directors, senior management, internal and external auditors and risk owners must work interdependently (Fabozzi and Drake 2009). The board of directors is traditionally not directly responsible for risk management. That is management’s job (IIA 2002; Sobel and Reding 2004; Price Waterhouse Coopers 2009). However, Caldwell (2012) holds the view that boards must take a more active and direct role in ERM, well beyond traditional oversight of typical management processes. In the Canadian financial sector, regulators are now going after boards, telling them that they need to oversee the material risks to a much greater degree than before (Shecter and Tedesco 2014).

### Regulation in the Canadian financial services sector

The federal and provincial governments in Canada share jurisdiction over the financial services sector. The federal government has the sole jurisdiction for banks under the Bank Act. A good guide to determine who regulates and supervises whom is to ascertain whether the company is federally or provincially incorporated.

The federal government provides prudential oversight through the Office of the Superintendent of Financial Institutions (OSFI). The OSFI is responsible for supervising federally regulated financial institutions, including the banks, federally incorporated insurance companies, trust and loan companies to ensure that they are in sound financial condition and in compliance with the laws that govern them. The provincially incorporated companies are regulated and supervised by the respective provincial governments. For federally regulated institutions, the OSFI assesses the risks inherent in a financial institution’s business activities and determines how effectively those risks are being managed (OSFI 2011). Canadian banks have not been severely affected by the global financial crisis of

2007–2008. There were no bailouts by the government. Why is this? Banks and other financial institutions are heavily regulated and controlled in Canada. Banks are required to submit detailed financial statements quarterly and annually to the OSFI who reviews these in an attempt to detect any undue risk before a solvency issue arises (Keefe and Sodhi 2011).

But this can change. According to Bloomberg News, Canada is among three economies in the world (China and Hong Kong being the others) most likely at risk of a banking crisis (Financial Post 2018). The Bank of International Settlements (BIS) reported that risks are growing in Canada because of its household debt levels. Credit cards are maxed out and there are higher debt levels in the wider economy.

### Regulation in the US financial services sector

Bank regulation in the USA is highly fragmented compared to other countries where there is one bank regulator. In the USA, banking is regulated at both the federal and state levels depending on the type of charter a banking organization has (Teslik 2008).

The Federal Reserve as the central banker is responsible for regulating the US monetary system as well as promoting stable prices and economic growth. The Department of the Treasury was originally created to manage government revenues, but it has evolved to encompass other duties. It recommends and influences fiscal policy, regulates US imports and exports, and collects all US revenues. The Office of the Comptroller of Currency (OCC) is the primary means through which the Treasury regulates US banks. It is responsible for chartering all US banks and also ensuring the stability of the banking system. The Office of Thrift Supervision (OTS) supervises federally chartered savings and loans associations known as “thrifts.” The Securities and Exchange Commission (SEC) oversees the US securities markets, enforces securities law and monitors exchanges for stocks, options and other securities. It also has enforcement authority for violators of securities law. The Federal Deposit Insurance Corporation (FDIC) insures holdings in checking and savings accounts at member banks guaranteeing up to \$100,000 per person per bank. The Commodities Futures Trading Commission (CFTC) regulates the derivatives clearing houses that bring together buyers and sellers of futures contracts. The National Credit Union Administration (NCUA) functions both like the FDIC and OCC. However, it regulates credit unions rather than banks. It is also responsible for chartering and supervising US credit unions.

## Recent studies of ERM in the financial sector

There are few studies that deal with the ERM implementation process and the benefits of ERM (Aabo et al. 2005; Beasley et al. 2005; Kleffner et al. 2003; Tellinghast-Towers Perrin 2004; Walker et al. 2002). More research in risk management and disclosure has been carried out in the USA with emphasis on financial risk disclosures (Venkatachalam 1996; Roulstone 1999; Linsmeier et al. 2002). In Canada, Thornton (1983) examined the theory and practice of contingency accounting. Risk information disclosures in Canadian annual reports were examined by Lajili and Zéghal (2005) and Dia and Zéghal (2008). Linsley and Shrivs (2000) and Kajuter (2001) have examined risk reporting and the disclosure environment in a comparative international setting. Beretta and Bozzolan (2004) proposed a framework for the analysis of risk communication and an index to measure the quality or risk disclosure.

Despite the precipitation of the financial crisis by the US financial sector, there have been few systematic studies of ERM in the financial sector during the 2008 crisis. Zeghal and El Aoun (2016) did find that the financial crisis affected the volume and the quality of ERM disclosures of top US banks; they also examined the effect of the characteristics of these banks on ERM disclosures. Maingot et al. (2014) found that the financial crisis did not have more than minor impacts on ERM in the Canadian financial sector. However, they noted that the Canadian financial sector was not severely affected by the crisis.

## Objectives

The objectives of this paper are to examine the impact of the 2008 financial crisis on Enterprise Risk Management (ERM) disclosures in US and Canadian financial firms, and to compare risk management between these two financial sectors.

Such a comparative study is particularly important to understand the degree to which ERM in the financial sector has responded to the financial crisis. Given the origins of the 2008 crisis in the US financial sector, a comparison with the Canadian financial sector is particularly revealing since the Canadian financial system was more stable and did not suffer the same crippling effects of the financial crisis.

Our general hypothesis is that the 2008 financial crisis had more of an effect on the US financial sector than on the Canadian financial sector.

This study is important for the investor and the consumer of annual reports to determine how much trust he or she can put in the annual reports when he or she is reading about the risks faced by various companies. There are

considerations that both regulators and policy-makers must take into account.

In both the USA and Canada, mandatory disclosure of risk reporting is required by the Financial Accounting Standards Board (FASB), the Securities and Exchange Commission (SEC), the New York Stock Exchange (NYSE), and the Chartered Professional Accountants, Canada (CPA Canada). However, risk disclosures in the Management Discussion and Analysis (MD&A) section of the annual reports are voluntary in both countries.

It is important to analyze information disclosure whether it is mandatory or voluntary. This is particularly true for information on the risks that firms face. For the financial sector in the USA and Canada, a comparative study is particularly important for the following reasons:

- (a) As discussed in the previous section, the regulatory regime governing the financial sector is different between the US and Canada,
- (b) The financial crisis arose in the USA and had major impacts there, while there were only minor impacts on the Canadian financial sector.

While a broader examination of annual reports before 2007 and after 2008 might be a richer study, the 2007–2008 window offers the most efficient look at the potential impact of the financial crisis. After 2008, the financial crisis broadened into an economic recession. Since we are primarily interested in the impact of the financial crisis, the 2007 and 2008 annual reports offered the most immediate portraits of risk management disclosure before and after the financial crisis broke.

## Methodology

The 2007 and 2008 annual reports of all 84 and all 34 financial corporations on the S&P 500 and the S&P TSX Composite Indices, respectively, were examined, particularly the Management's Discussion and Analysis (MD&A) and the Notes to the Financial Statements. Fifteen different types of risks were identified. These were grouped into three categories of risk:

- *Financial category* Foreign Exchange, Interest Rate, Credit, Market, Economic, and Liquidity
- *Business category* Political, Technology, Government Regulation, Weather, and Seasonality
- *Operational category* Environmental, Operational, Supplier, Natural Resource

Using content analysis, we identified instances where each type of risk was mentioned in the annual reports; this mode of analysis has been widely used in the accounting research literature, particularly for examining social and

environmental disclosures (Milne and Adler 1999; Zéghal and Ahmed 1990). The level of the risks disclosed was categorized in accordance with AICPA/CICA (1999) and are displayed in the tables that summarize the levels of risk exposure, risk consequences and risk management strategies.

## The US and Canadian financial sectors

Table 1 summarizes the total assets, total liabilities, net income, and market capitalizations of corporations in the financial sectors of the USA and Canada, as represented by financial firms on the S&P 500 and the S&P TSX Composite Index. While both the total assets and total liabilities grew from 2007 to 2008 in both countries, the net incomes and market capitalizations dropped markedly, following the advent of the 2008 financial crisis. The drop in the mean net income of the US financial sector is particularly dramatic (due mainly to AIG and Citigroup, whose net incomes went from \$15 to – \$43 billion and from \$19 to – \$20 billion, respectively, from 2007 to 2008); however, the change in the median net income is more in line with the changes in median and mean net income in the Canadian financial sector.

Table 1 also summarizes some key financial ratios—liabilities to assets, and return on equity. While the ratio of liabilities to assets changed only slightly, the return on equity dropped dramatically from 2007 to 2008.

Comparing the US and Canadian financial sectors as represented on the S&P 500 and the TSX Composite Index, it is clear that the US companies are much larger in size (as measured by total assets). Despite the size difference, the ratio of total liabilities to total assets is several times higher for the US compared to the Canadian financial sectors. This suggests that US financial firms are more highly leveraged than their Canadian counterparts.

## Results

In this section, we examine first the relative number or proportion of the financial sectors in the USA and Canada, respectively, that disclosed each of the fifteen types of risk, in 2007 and 2008. Second, for each type of risk disclosed, the levels of risk exposure, risk consequences and risk management strategies that were disclosed are summarized for each type of risk, separately for the two financial sectors in 2007 and 2008. Each section below begins with a discussion of the differences in the disclosures between

**Table 1** Financial characteristics of the US and Canadian financial sectors between 2007 and 2008

	2007			2008		
	Median	Mean	SD	Median	Mean	SD
<b>Total assets (billions of USD)</b>						
USA	62.3	224	438	65.8	231	460
Canada	14.1	100.5	159.8	15.1	115.9	190.6
<b>Total liabilities (billions of USD)</b>						
USA	54.6	205	411	52.7	210	425
Canada	2.8	15.1	27.2	2.9	17.1	30.7
<b>Net income (billions of USD)</b>						
USA	1.27	2.83	4.41	0.60	0.09	6.38
Canada	0.27	1.09	1.52	0.12	0.65	1.24
<b>Market capitalization (billions of USD)</b>						
USA	15.4	29.7	38.5	7.8	15.2	22.4
Canada	4.5	14.9	19.7	2.6	10.2	14.9
<b>Liabilities/assets (%)</b>						
USA	85.9	77.8	23.0	88.1	80.3	21.9
Canada	20.6	31.2	27.6	20.4	32.6	29.2
<b>Return on equity</b>						
USA	13.5	14.3	19.5	9.0	7.3	18.8
Canada	14.4	14.3	16.6	6.4	6.6	12.5

**Table 2** The proportion of US and Canadian financial firms disclosing risks during the 2008 financial crisis

Type of risk	Proportion of 84 US firms		Proportion of 34 Canadian firms	
	2007 (%)	2008 (%)	2007 (%)	2008 (%)
<b>Financial</b>				
Foreign exchange	76	76	94	94
Interest rate	96	99	100	100
Credit	94	95	91	94
Market	94	96	94	94
Economic	99	100	91	91
Liquidity	73	73	88	97
<b>Business</b>				
Political	74	75	3	3
Technology	46	49	6	6
Government regulation	98	99	82	82
Weather	86	85	0	0
Seasonality	11	11	0	0
<b>Operational</b>				
Environmental	38	39	62	62
Operational	87	88	82	82
Supplier	5	5	6	6
Natural resource	5	5	3	3

2007 and 2008 and follows with a summary of the similarities and differences between the disclosures in the US and Canadian financial sectors, respectively.

#### Types of risks disclosed by US and Canadian firms in 2007 and 2008

Table 2 summarizes the proportions of the 84 US financial firms and of the 34 Canadian financial firms, respectively, that disclosed each of fifteen different types of risk, in 2007 and 2008.

##### *Types of risks disclosed from 2007 to 2008*

Looking at the potential impacts of the financial crisis, the number of disclosures from both financial sectors increased only slightly from 2007 to 2008 (by the same 1.5% increase). On an absolute basis, the average number of disclosures increased from 27.08 to 27.48 for the US firms, spread over the fifteen types of risk, while the average number increased from 24.1 to 24.4 for the Canadian financial firms, spread over the same fifteen types of risk. However, the latter increase was due primarily to an increase in the reporting of liquidity risk from 88 to 97% of the 34 Canadian financial firms.

Since there are so few changes from 2007 to 2008 for either country, the discussion of the number of disclosures

in each country applies equally to each year, except for liquidity risk in Canada.

##### *Similarities in the types of risks disclosed between the USA and Canada*

The category of risks most often disclosed in both financial sectors were the various types of financial risk, in particular, interest rate, credit, market, and economic risks. These risks were reported by more than 90% of the companies in both countries. This is not at all surprising during a financial crisis, but the very high disclosure rate even before the full-blown crisis in 2008 perhaps reflects the warning signals in 2007. In addition, government regulation and operational risks were reported by over 80% of the financial firms in both countries (with virtually all US firms reporting government regulation risk in both 2007 and 2008).

Three types of risk (seasonality, supplier and natural resource risks) were hardly mentioned either by the US or by the Canadian financial firms.

##### *Differences in the types of risks disclosed between the USA and Canada*

While financial firms in both countries reported the financial risk category most often, foreign exchange and liquidity risks were reported more frequently in Canada than

in the USA, with liquidity risks being reported by 97% of the Canadian firms in 2008. While the US financial firms were so much more concerned about political, weather and technology risks, these types of risk were hardly mentioned by the Canadian financial firms.

### Disclosed levels of risk exposure

While the previous section highlighted the categories and types of risks disclosed by the financial sector in the USA and Canada, this section looks more closely at the disclosed levels of risk exposure.

#### Average levels of risk exposure

Table 3 summarizes the average levels of risk exposure as reported by US and Canadian financial firms, in 2007 and 2008. The “N/A” for some types of risk for Canadian firms indicates that fewer than three firms reported these types of risk. As a result, differences in the average level of risk exposure between the financial sectors of the two stock exchanges were calculated only for the remaining nine types of risk.

#### Changes in risk exposure from 2007 to 2008

There were hardly any differences in the level of risk exposure disclosures between 2007 and 2008, except for

liquidity risk for Canadian financial firms. This suggests that, with this one exception, the financial crisis generally did not have a noticeable effect on the level of risk exposure disclosures.

#### Similarities in risk exposure between the USA and Canada

The types of risk deemed to be “certain” or almost “certain” by both US and Canadian financial firms were interest rate, credit and operational risks. Any differences between the two jurisdictions for these three types of risk were statistically insignificant, except for the relatively small interest rate and credit risk exposure differences in 2007.

#### Differences in risk exposure between the USA and Canada

The US financial firms reported foreign exchange, market, economic, liquidity, and government regulation risks to be almost “certain”, compared to the Canadian firms which reported these risks as closer to the “probable” risk exposure level, with liquidity risks even lower at the “possible” level. In fact, even though the Canadian firms reported liquidity risks more often than their US counterparts, the difference in the level of risk exposure reported was the greatest among the nine types of risk. Differences between the USA and Canada in all these types of risk as well as in environmental risk were very highly statistically

**Table 3** Average levels of risk exposure in US and Canadian financial sectors during the 2008 financial crisis

Type of risk	USA		Canada		Difference (US-CD)		SE
	2007	2008	2007	2008	2007	2008	
<b>Financial</b>							
Foreign exchange	4.84	4.78	4.00	4.00	0.84	0.78	0.31
Interest rate	4.90	4.94	5.00	5.00	- 0.10	- 0.06	0.04
Credit	4.85	4.91	5.00	5.00	- 0.15	- 0.09	0.06
Market	5.00	4.98	4.34	4.31	0.66	0.67	0.13
Economic	4.88	4.98	4.45	4.45	0.43	0.53	0.14
Liquidity	4.97	5.00	2.97	3.31	2.00	1.69	0.11
<b>Business</b>							
Political	4.45	4.43	N/A	N/A			
Technology	4.46	4.39	N/A	N/A			
Government regulation	4.98	4.98	4.25	4.29	0.73	0.69	0.16
Weather	2.36	2.38	N/A	N/A			
Seasonality	4.44	4.44	N/A	N/A			
<b>Operational</b>							
Environmental	4.16	4.18	3.00	3.00	1.16	1.18	0.18
Operational	4.95	4.95	4.89	4.93	0.06	0.02	0.08
Supplier	4.25	4.25	N/A	N/A			
Natural resource	5.00	5.00	N/A	N/A			

Levels of risk exposure 1: rare; 2: improbable; 3: possible; 4: probable; 5: certain

significant. The estimated standard errors (SE) for the differences are notional, since the firms were not randomly selected, but they serve to determine which differences would have been statistically significant if they had been randomly selected.

Of the six types of risk reported by very few financial firms in Canada, the level of exposure for political, technology, seasonality, and supplier risks reported by the US firms was between probable and certain. However, natural resource risk exposure was reported to be certain, while weather risk was deemed to be closer to the improbable level of exposure.

### Disclosed levels of risk consequences

This section looks at the average levels of risk consequences as reported by US and Canadian financial firms, in 2007 and 2008, as displayed in Table 4. Again, comparisons between the two financial sectors were made only for the nine types of risk reported by substantial numbers of financial firms in the two countries.

#### *Changes in risk consequences from 2007 to 2008*

The US financial firms reported risk consequences higher in 2008 than in 2007 for interest rate, credit, economic, liquidity, government regulation, and supplier risks. These changes were very highly statistically significant since the

paired differences have a notional standard error of 0.06, if we were to treat the companies as if they had been randomly selected. However, the difference between 2007 and 2008 for foreign exchange risks was not statistically significant using this measure. Thus, while the number of risk disclosures increased slightly and the average level of risk exposure hardly changed from 2007 to 2008, the US financial firms were reporting higher average levels of risk consequences in 2008. In contrast, the Canadian financial firms did not show any increase in the average levels of risk consequences, except for liquidity risks.

#### *Similarities in risk consequences between the USA and Canada*

There were hardly any similarities between the levels of risk consequences reported by financial firms in the USA versus Canada. Only the reported levels of liquidity risk consequences were statistically not significantly different in the two countries and only for 2007.

#### *Differences in risk consequences between the USA and Canada*

Canadian financial firms reported higher levels of risk consequences than their US counterparts for foreign exchange, interest rate, credit, market, economic, government regulation, and operational risks. These differences

**Table 4** Average levels of risk consequences in the US and Canadian financial sectors during the 2008 financial crisis

Type of risk	USA		Canada		Difference (US-CD)		SE
	2007	2008	2007	2008	2007	2008	
<b>Financial</b>							
Foreign exchange	2.48	2.59	3.25	3.25	- 0.77	- 0.66	0.25
Interest rate	2.84	3.16	3.97	3.88	- 1.13	- 0.72	0.08
Credit	2.86	3.31	3.84	3.84	- 0.98	- 0.53	0.11
Market	3.05	3.05	3.94	3.94	- 0.89	- 0.89	0.07
Economic	3.13	3.92	4.00	4.00	- 0.87	- 0.08	0.04
Liquidity	2.90	3.49	2.76	2.91	0.14	0.58	0.13
<b>Business</b>							
Political	2.92	2.94	N/A	N/A			
Technology	2.97	3.00	N/A	N/A			
Government regulation	3.10	3.46	4.00	4.00	- 0.90	- 0.54	0.06
Weather	3.96	3.96	N/A	N/A			
Seasonality	2.11	2.11	N/A	N/A			
<b>Operational</b>							
Environmental	3.06	3.06	2.19	2.19	0.87	0.87	0.15
Operational	2.96	2.99	3.96	3.96	- 1.00	- 0.97	0.05
Supplier	3.00	3.25	N/A	N/A			
Natural resource	3.00	3.00	N/A	N/A			

Levels of risk consequence 1: insignificant; 2: minor; 3: moderate; 4: major; 5: catastrophic



were very highly statistically significantly non-zero if we were to treat the two groups as random samples. While we observed earlier that there were no statistically significant differences in the reported levels of liquidity risk consequences in 2007, the US financial firms reported statistically significantly higher liquidity risk consequences in 2008, and statistically significantly higher levels of risk consequences than their Canadian counterparts in environmental risk in both 2007 and 2008.

### Levels of total risk

Using the definition of total risk as the product of the level of risk exposure with the level of risk consequences as disclosed by each firm, Table 5 summarizes the average total risks as seen by the financial sectors in the USA and Canada. Since the level of risk exposure is coded on a scale from 1 (rare) to 5 (certain) and the level of risk consequence is coded on a similar scale (1 for insignificant to 5 for catastrophic), the total risk is measured on a scale from 1 (rare exposure level and insignificant consequences) to 25 (certain exposure level and catastrophic consequences). Table 5 shows that the average total risk ranges from just

below 10 to a high of almost 20 for US financial firms, and from below 7 to almost 20 for Canadian financial firms.

### Changes in total risk from 2007 to 2008

As discussed earlier, while the average level of risk exposure hardly changed from 2007 to 2008, the US financial firms were reporting statistically significantly higher average levels of risk consequences in 2008 compared to 2007, for interest rate, credit, economic, liquidity, government regulation, and supplier risks. Consequently, the average total risk increased from 2007 to 2008 for these same risks. In contrast, the Canadian financial firms did not show any increase in the average levels of risk exposure or in the average level of risk consequences and thus did not show any increases in average total risk, with the singular exception of liquidity risk.

### Similarities in total risk between the USA and Canada

The average total foreign exchange risk was higher in both 2007 and 2008 for the US financial firms, compared to their Canadian counterparts, but these differences were not statistically significant. There was also no difference between

**Table 5** Average total risk in the US and Canadian financial sectors during the 2008 financial crisis

Type of risk	USA		Canada		Difference (US-CD)		SE
	2007	2008	2007	2008	2007	2008	
<b>Financial</b>							
Foreign exchange	12.2	12.7	14.9	14.9	- 2.7	- 2.2	1.5
Interest rate	13.9	15.6	19.8	19.4	- 5.9	- 3.8	0.41
Credit	14.0	16.5	19.2	19.2	- 5.2	- 2.7	0.57
Market	15.2	15.2	17.1	17.0	- 1.9	- 1.8	0.62
Economic	15.3	19.5	17.8	17.8	- 2.5	1.7	0.61
Liquidity	14.4	17.5	8.0	9.4	6.4	11.1	0.63
<b>Business</b>							
Political	13.1	13.1	N/A	N/A			
Technology	13.3	13.1	N/A	N/A			
Government regulation	15.4	17.0	17.0	17.1	- 1.6	- 0.1	0.71
Weather	9.3	9.4	N/A	N/A			
Seasonality	9.1	9.1	N/A	N/A			
<b>Operational</b>							
Environmental	12.4	12.9	6.6	6.6	5.8	6.3	0.9
Operational	14.6	14.7	19.4	19.5	- 4.8	- 4.8	0.37
Supplier	12.8	14.0	N/A	N/A			
Natural resource	15	15	N/A	N/A			

Total risk is defined as the product of the level of risk exposure with the level of risk consequences, for each firm

the two countries for the average total government regulation risk in 2008.

#### *Differences in total risk between the USA and Canada*

US financial companies reported statistically significantly lower average total risk in interest rate, credit, market, economic, and operational risks in both 2007 and 2008, when compared to their Canadian counterparts. In addition, the average total government regulation risk was rated lower in the USA in 2007 only, with no difference in 2008 (as noted above). However, the US financial firms reported statistically significantly higher average total liquidity and environmental risks than their Canadian counterparts in both 2007 and 2008.

#### **Levels of risk management strategies**

As described in Zéghal and Faulkner (2006), companies respond to risks with one of the following management strategies:

- “Acceptance—Management can choose to accept the likelihood or impact of a given risk.
- Reduction—In this case management may take action to reduce the likelihood of risk or the impact of the risk.

Everyday business decisions do this on a more or less routine basis.

- Sharing (Transferring)—There are many risk-sharing schemes available to management whereby the likelihood or impact of risk can be shared or transferred. Insurance, pooling or hedging transactions are examples of such an approach to risk sharing.
- Avoidance—Management will avoid or reduce the activity that is giving rise to the risk. For example, the company may decline to move into a new market or close an existing plant.”

Table 6 summarizes the average levels of risk management as reported by US and Canadian financial sectors, in 2007 and 2008, based on coding the four risk management strategies on a scale from 1 (accept risk) to 4 (avoid risk). However, the calculation of the average coded value may not be the best way of summarizing the risk management strategies chosen by companies. The summaries of how the four risk strategies were distributed in 2007 and 2008 among US and Canadian financial companies in Tables 7 and 8, respectively, may be more informative. Again, comparisons between the two financial sectors were made only for the nine types of risk that were disclosed by more than just a few firms.

**Table 6** Average levels of risk management strategies in US and Canadian financial sectors during the 2008 financial crisis

Type of risk	USA		Canada		Difference (US-CD)		SE
	2007	2008	2007	2008	2007	2008	
<b>Financial</b>							
Foreign exchange	2.27	2.26	2.47	2.47	− 0.20	− 0.21	0.17
Interest rate	2.33	2.33	2.00	2.00	0.33	0.33	0.05
Credit	2.23	2.25	2.00	2.00	0.23	0.25	0.06
Market	1.91	1.88	2.19	2.19	− 0.28	− 0.31	0.11
Economic	1.07	1.11	2.13	2.10	− 1.06	− 0.99	0.08
Liquidity	2.04	2.04	2.03	2.00	0.01	0.04	0.07
<b>Business</b>							
Political	1.10	1.10	N/A	N/A			
Technology	1.90	1.85	N/A	N/A			
Government regulation	1.06	1.05	2.07	2.07	− 1.01	− 1.02	0.08
Weather	1.01	1.01	N/A	N/A			
Seasonality	1.00	1.00	N/A	N/A			
<b>Operational</b>							
Environmental	1.84	1.82	2.10	2.10	− 0.26	− 0.28	0.12
Operational	1.87	1.86	2.07	2.07	− 0.20	− 0.21	0.08
Supplier	1.25	1.25	N/A	N/A			
Natural resource	1.67	1.67	N/A	N/A			

Levels of risk management 1: accept risk; 2: reduce risk; 3: transfer risk; 4: avoid risk

**Table 7** Number of companies choosing different risk management strategies in the US financial sector during the 2008 financial crisis

Type of risk	2007				2008			
	Accept	Reduce	Transfer	Avoid	Accept	Reduce	Transfer	Avoid
<b>Financial</b>								
Foreign exchange	8	33	21	2	8	33.5	20.5	2
Interest rate	4	47.5	28	1.5	5	47.5	29	1.5
Credit	2	62	10	5	2	61.5	11	5.5
Market	7.5	71.5			9.5	71.5		
Economic	77	6			75	9		
Liquidity	6	50.5	0.5	4	6	50.5	0.5	4
<b>Business</b>								
Political	55.5	4.5		1	57.5	4.5		1
Technology	4	35			6	35		
Government regulation	77	5			78	4		
Weather	71	1			70	1		
Seasonality	9				9			
<b>Operational</b>								
Environmental	5	27			6	27		
Operational	10	63			11	63		
Supplier	3	1			3	1		
Natural resource	1	1.5	0.5		1	1.5	0.5	

When a firm reports a mixture of two strategies, each one is counted as 0.5

#### *Changes in risk management from 2007 to 2008*

Table 6 shows that US and Canadian financial firm disclosures showed very few changes in the average levels of risk management from 2007 to 2008. Tables 7 and 8 show very few changes in the risk management strategies from 2007 to 2008 in the USA and Canada, respectively. Again, this suggests that the financial crisis did not have much impact on how these financial firms managed enterprise risk. While the US financial sector reported more serious risk consequences in 2008 than in 2007, they did not change how they managed those risks.

#### *Similarities in risk management between the USA and Canada*

Table 6 does not show any statistically significant differences between the two countries in how their financial firms manage their foreign exchange and liquidity risks.

#### *Differences in risk management between the USA and Canada*

Despite the similarities noted above, the distribution of risk management strategies was different. For dealing with foreign exchange risk, the US firms used all four strategies,

with most split between “reduce risk” and “transfer risk”, whereas the majority of Canadian firms used the “reduce” strategy with a strong minority trying to “avoid” it. For liquidity risk, the US firms primarily tried to “reduce” it, with a small minority either “accepting” or “avoiding” it, whereas all the Canadian firms tried to “reduce” it.

Generally, the Canadian firms reported a much more activist management style in trying to reduce economic and government regulation risks compared to the US firms which accepted the same risks (Table 6 shows the very large negative differences in 2007 and 2008, while Tables 7 and 8 show how the US firms predominantly “accept” economic and government regulation risks while the Canadian firms predominantly try to “reduce” these risks).

However, in dealing with interest rate and credit risks, the US financial firms were slightly more likely to manage the risks by transferring them than by reducing them, compared to the Canadian firms (Table 6 shows the positive differences for 2007 and 2008, while Tables 7 and 8 show that Canadian firms all tried to reduce these risks while the US firms displayed a more varied set of strategies with a sizable minority trying to transfer these risks). The opposite was true for market, environmental and operational risks. Table 6 shows the negative differences for 2007 and 2008, while Tables 7 and 8 show virtually all of

**Table 8** Number of companies choosing different risk management strategies in the Canadian financial sector during the 2008 financial crisis

Type of risk	2007				2008			
	Accept	Reduce	Transfer	Avoid	Accept	Reduce	Transfer	Avoid
<b>Financial</b>								
Foreign exchange		24	1	7		24	1	7
Interest rate		34				34		
Credit		31				32		
Market		29		3		29		3
Economic		28	2	1		29	1	1
Liquidity		29	1			33		
<b>Business</b>								
Political								
Technology								
Government regulation		27		1		27		1
Weather								
Seasonality								
<b>Operational</b>								
Environmental		20		1		20		1
Operational		27		1		27		1
Supplier								
Natural resource								

the Canadian firms reporting a strategy of trying to reduce the risks and a majority of the US firms reporting a strategy of trying to reduce the risks with a minority reporting a strategy of accepting the risks.

### Summary of findings

The objectives of this paper were to examine the impact of the 2008 financial crisis on Enterprise Risk Management (ERM) disclosures in US and Canadian financial firms, and to compare risk management between these two financial sectors.

It was hypothesized that the global meltdown would have more of an effect on the risk disclosures of the US financial sector, since the crisis started in this sector of the US economy. Moreover, it was thought that there would be major differences in the risk profiles of financial firms between the two countries, since the financial crisis had a greater impact on US financial firms than on Canadian firms. This section summarizes the major findings discussed in the previous section.

### Number of risk disclosures

From 2007 to 2008, the increase in the number of risk disclosures was 1.5% for both the US and Canadian financial sectors. However, the increase for the Canadian financial sector was largely due to an increase in the

reporting of liquidity risk from 88 to 97% of the 34 firms. As expected, the types of risks cited by over 90% of the financial firms on both indices were interest rate, credit, market, and economic risks in the category of financial risk.

The risk of government regulation risk was cited by over 90% of the US firms, whereas over 90% of the Canadian firms cited foreign exchange risk in both years and liquidity risk in 2008 only. A relatively high proportion of the US financial firms disclosed political, weather and technology risks, compared to hardly a mention of these risks by the Canadian firms.

### Level of risk disclosures

In terms of the disclosed levels of risks, there was very little change from 2007 to 2008, in either the exposure to risk or the management of risk, for firms in both countries. However, while there was also little change reported in the level of risk consequences for Canadian firms, US financial firms disclosed higher levels of interest rate, credit, economic, liquidity, and government regulation risk consequences in 2008 compared to 2007. Except for liquidity risks, these risks were cited by well over 90% of the US firms.

In both the USA and Canada, interest rate, credit and operational risks were reported to be “certain” or almost “certain.” The US financial firms reported foreign exchange, market, economic, liquidity, and government

regulation risks to be almost “certain”, compared to the Canadian firms which reported these risks as closer to the “probable” risk exposure level, with liquidity risks even lower at the “possible” level.

In general, the Canadian firms, as compared to US firms, reported higher levels of risk consequences across the board (except for environmental risks). When the level of risk exposure was multiplied by the level of risk consequences to calculate total risk, the Canadian firms again reported higher average total risk across the board (except for environmental and liquidity risks). While the US firms reported being exposed to higher levels of risk exposure, they reported managing these risks more passively (except for interest rate and credit risks, where the opposite was true).

## Conclusions and implications

In both the US and Canadian financial sectors, there was only a minor increase in the number of disclosures from 2007 to 2008. The level of risk exposure and risk consequences and the type of risk management strategy also did not change, except that the US financial sector saw a small increase in the level of risk consequences and the Canadian financial sector saw a small increase in the level of liquidity risk exposure and liquidity risk consequences.

The banking crisis began in the USA and eventually led to the near failure and/or collapse of a number of financial institutions; on the other hand, the Canadian financial sector was much less affected due to the stronger regulatory regime. However, the relatively minor changes in both the number and level of disclosures in both financial sectors are not commensurate with the impacts of the 2008 financial crisis in the two countries.

In both countries, the types of risk most often cited were risks in the financial category. However, a major difference was that a very high proportion of US firms cited government regulation risk exposure, whereas a very high proportion of Canadian firms cited foreign exchange risk exposure.

Generally, while the US financial firms reported being exposed to higher levels of risk, they reported managing these risks more passively than the Canadian firms (except for interest rate and credit risks). On the other hand, the Canadian firms reported higher levels of risk consequences; this may explain why they were somewhat more proactive in managing these risks.

Overall, the results of our study did not show any significant effects of the financial crisis on risk management and risk disclosure by financial firms in either the USA or Canada. In both these countries, firms in the financial sector have not been inclined to disclose more information

about their risk strategies and risk management, despite the critical importance of risk management in their business model.

This could be motivated by a desire to reduce proprietary costs together with a prudent disclosure strategy following the financial crisis. It is our view that this information asymmetry may have potential for significant costs to investors and society in general. More research is needed to assess those costs in order to improve regulations and prevent future crises.

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