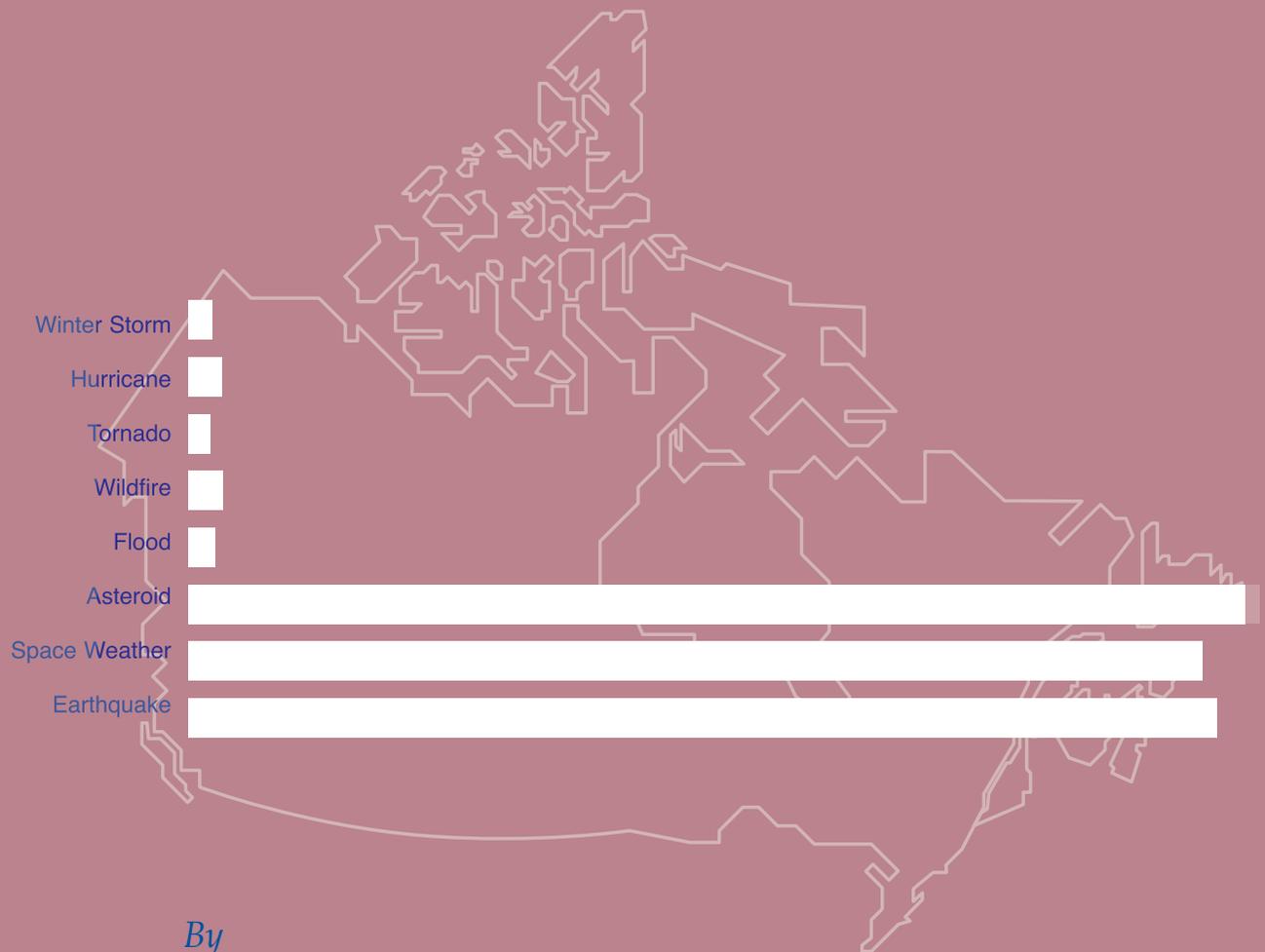


# Why insurers fail

Natural disasters and catastrophes



By

**Grant Kelly**

**Peter Stodolak**

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# **PACICC's mission and principles**

## **Mission Statement**

The mission of the Property and Casualty Insurance Compensation Corporation is to protect eligible policyholders from undue financial loss in the event that a member insurer becomes insolvent. We work to minimize the costs of insurer insolvencies and seek to maintain a high level of consumer and business confidence in Canada's property and casualty insurance industry through the financial protection we provide to policyholders.

## **Principles**

- In the unlikely event that an insurance company becomes insolvent, policyholders should be protected from undue financial loss through prompt payment of covered claims.
- Financial preparedness is fundamental to PACICC's successful management support of insurance company liquidations, requiring both adequate financial capacity and prudently managed compensation funds.
- Good corporate governance, well-informed stakeholders and cost-effective delivery of member services are foundations for success.
- Frequent and open consultations with members, regulators, liquidators and other stakeholders will strengthen PACICC's performance.
- In-depth P&C insurance industry knowledge – based on applied research and analysis – is essential for effective monitoring of insolvency risk.

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PACICC is responsible for the observations and conclusions of the study and for any errors or omissions.

## Executive summary

Insurance is an essential tool used by homeowners and businesses to manage the risk of sudden and accidental loss from a broad range of perils including natural hazards. Natural disasters represent a significant risk for insurance companies. Over the past 60 years, two insurance companies in Canada were overwhelmed, in part, by disaster damage claims and were wound up by insurance regulators. This paper explores the solvency risk for Canada's insurers from natural hazards with a special focus on large disasters and catastrophes.

Canada experiences thousands of natural hazards each year. Flood, earthquakes, wildfire, intense rainfall, winter storms, hurricanes, tornados, lightning, hail, avalanches, and landslides are some of the perils. A few hazards result in loss of life, injuries and damage to property. In industrial countries, like Canada, about 40 percent of disaster damage to property is covered by insurance, including most of the damage to homes and businesses. However, a significant portion of the damage is not insured, including most of the damage to public infrastructure and flood damage to homes.



Canada's insurance system works very well for most natural disasters. Insurance is the business of managing risk. The experience in Canada and elsewhere around the globe shows that natural disasters have not been a solvency risk for most insurance companies. Insurers have developed techniques to manage the solvency risk of natural disasters and these tools have proven to be very effective. Indeed, with current practices, insurance companies in Canada appear well prepared financially and operationally to pay up to \$15 billion in insured losses from a single disaster event - losses 10 times greater than anything Canadians have yet experienced.

However, Canada's insurance system has not been tested by larger disasters. PACICC estimates that catastrophes resulting in damage claims of \$15 billion to \$25 billion, may overwhelm some insurance companies, and could cause some insurers to fail. Nevertheless, with some adjustments to established industry-funding mechanisms like Property and Casualty Insurance Compensation Corporation (PACICC), systems are in place to fully respond to policyholders.

A catastrophic loss, with insurance claims in excess of \$30 billion, however, has the potential to overwhelm Canada's insurance industry. Recent international experience warns about the special risks associated with major catastrophes. While unlikely to occur, these catastrophes have the potential to overwhelm the insurance industry and represent a special challenge for all stakeholders.

Fortunately, there are few perils in Canada with the potential to result in more than \$30 billion in insurance damage claims, and these hazards are very unlikely to occur. Some potential catastrophes in Canada that could exceed the capacity of Canada's insurance industry include:

- a catastrophic earthquake in Vancouver or Montreal
- an asteroid strike on a major urban centre
- extreme space weather event.

These events could result in insurance damage claims in excess of \$30 billion and perhaps greater than \$100 billion. The resulting insurance damage claims would overwhelm Canada's insurance industry. Some insurers would fail immediately and others would become insolvent when confronted by their responsibility to help pay claims against failed insurers. Canadian citizens would be confronted by the failure of an essential element used to manage the risk of operating a vehicle, running a business or owning a home. PACICC supports the insurance industry, through the Insurance Bureau of Canada, working with the appropriate public officials to establish a national disaster risk financing plan for managing the financial risks associated with large natural disasters and catastrophes.

# Introduction

“*Why insurers fail*” is a series of reports by PACICC seeking to share lessons learned from past insolvencies of insurance companies. These reports seek to benefit insurance consumers by promoting better management of solvency risk by insurance companies, regulators and other stakeholders. This report focuses on the solvency risk for insurers from natural disasters.

## **Solvency risk for insurers from natural disasters**

Since 1950, two insurance companies failed in Canada as a result of natural disasters. The insurance industry could be confronted in the future by a disaster much larger than all past events.

There are several examples where a natural disaster caused insurers to fail in other countries. Some of these failures occurred in modern, well-functioning markets. For example:

- In 1906, an earthquake struck San Francisco. About 3,000 people died, 80 percent of San Francisco was destroyed and 12 insurance companies were declared insolvent.<sup>1</sup>
- In 1992, Hurricane Andrew made landfall in Homestead, Florida as a Category 5 storm. More than 730,000 houses and buildings were damaged or destroyed and nine insurance companies were declared insolvent.
- In 2011, Christchurch, New Zealand experienced a powerful earthquake that killed 185 people, severely damaged the city and caused two insurance companies to become insolvent.

This paper explores the risk that insurance companies in Canada could fail in the future as a result of a natural disaster. A particular focus of this paper is on large disasters and catastrophes. Throughout this paper, the term ‘large disaster’ is used to describe an event with insured losses greater than 1 percent of Gross Domestic Product (GDP), which is approximately \$20 billion for Canada. A ‘catastrophe’ means a disaster with insured losses greater than 1.5 percent of the country’s GDP: for Canada this would be claims in excess of \$30 billion.

## **Research examining past insolvencies and catastrophic losses**

Solvency risk associated with large disasters and catastrophes justifies a closer look at existing research on past insolvencies. There is a large body of research that seeks to explain why insurers fail. PACICC is a primary source of information about insurance solvency risk in Canada, and there are several important studies assessing solvency risk in the United States, Europe and Asia. These studies consistently find that few insurance companies have failed as a result of natural disasters.

A.M. Best maintains a database of more than 1,000 insurance companies that have failed in the United States since 1969. The most common reasons for insolvency were deficient loss reserves and inadequate pricing, or rapid growth. These factors accounted for the majority of financial impairments. Natural disasters were the seventh most common reason for an insurer in the United States to fail, accounting for 7 percent of insolvencies.

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<sup>1</sup> Winchester, Simon, *A Crack in the Edge of the World*, Harper Perennial, 2005, p.324.

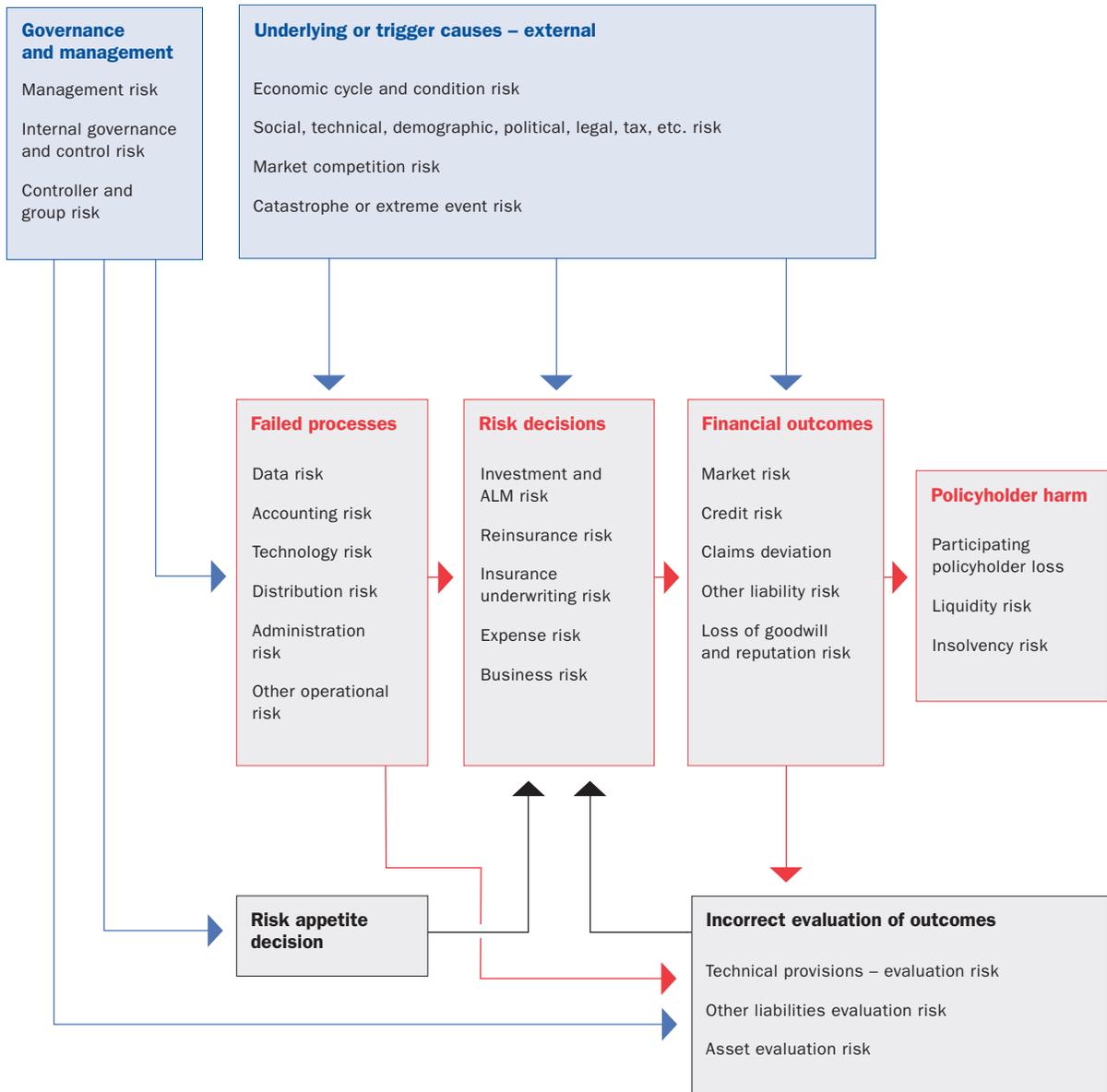
The Financial Services Authority (FSA) in United Kingdom assessed 270 insurance companies that failed in the European Union since 1969. Many factors were identified as primary or contributing factors resulting in insurance insolvency, with natural hazards found to have made a very small contribution.

The European research emphasizes that failures in the insurance industry are typically complex problems linking together inadequacies in addressing many risks. One event, like a natural disaster, may be seen as the ultimate cause of insolvency, but Sharma (2002) and others found that there are frequently many contributing factors.

McDonnell (2002) and the EU (2002) developed a risk map that illustrates the sources of risk (failed processes, risk decisions, external factors, management) and the links between them. The process of mapping and analyzing the data allowed a broader understanding of why a particular institution was wound-up.

The research that seeks to identify the causes of past insolvencies describes catastrophic risks as a trigger event that could cause a company with poor underwriting performance, weak internal controls or failed processes to become insolvent. This literature suggests that it is rare for insurers to fail due to natural disasters.

**Figure 1. Insolvency Risk map**



## **Catastrophic losses caused two Canadian insurers to become insolvent**

This risk map is consistent with the experience in Canada. PACCIC examined every insurer that has involuntarily exited the Canadian insurance marketplace since 1950. Of these 35 companies, a natural disaster was a primary cause in just two cases.

### **National General Insurance Company – closed in 1952**

National General Insurance Company was a federally regulated insurer that opened in July 1948. The company had initial capital of \$330,000 (approximately \$3.5 million in 2012 dollars). Its business plan focused on providing fire insurance in the province of Manitoba. In 1950, the Red River climbed to its highest level since 1861, resulting in major flooding from April to June. The Federal Insurance Commissioner reported that the company “suffered a succession of underwriting losses which were aggravated by the Winnipeg flood in 1950.”<sup>2</sup> On December 1, 1950, the company decided to discontinue new business and placed existing policies with other insurers. The company was closed by the federal Department of Insurance in 1952.

### **Mennonite Mutual Hail Insurance Company – closed in 1984**

Mennonite Mutual Hail Insurance Company provided hail insurance in western Canada for almost 100 years. The company reported volatile underwriting results and losses over the 10 years prior to being closed in 1984. Every other year, the company reported a spike in its loss ratio. Following the jump in the loss ratio, premiums grew rapidly. Losses resulting from major hailstorms in Manitoba in 1978 and Alberta in 1981 resulted in a reduction in capital and the company was unable to recover. Manitoba’s insurance superintendent closed the company in 1984.

There are other cases where the financial health of a Canadian insurance company was seriously impaired following a natural disaster. These firms chose to sell or merge their operations with other insurers. These companies are not included in this analysis because they were not declared insolvent by regulators.

There are two main reasons why natural disasters do not cause regular insolvencies:

- 1) Canadian insurers have a great deal of experience managing high-frequency, low-impact events such as extreme weather.
- 2) A robust regulatory system.

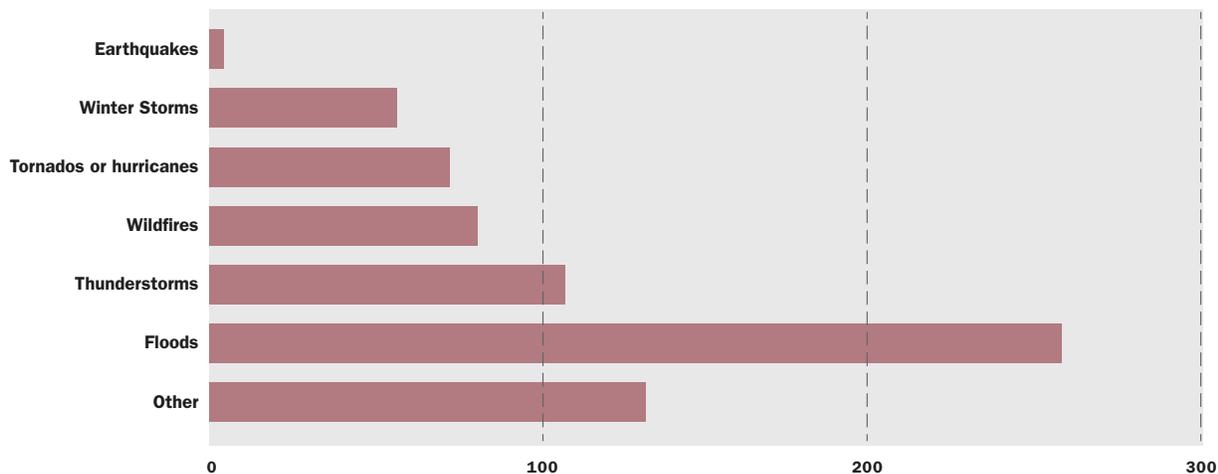
.....  
<sup>2</sup> Report of Federal Insurance Commissioner, 1952, p.xxix.

## Natural disasters occur regularly in Canada

Severe weather is common in Canada. Indeed, Environment Canada issues more than 10,000 severe weather warnings across Canada each year.<sup>3</sup> The Government of Canada’s Disaster Database identifies 785 natural disasters that have occurred since 1950, with an average of more than a dozen new events added each year. Fortunately for Canadians, approximately 40 percent of the loss and damage experienced by homeowners and businesses is covered by insurance.

Each year insurers help Canadians recover from large natural disasters.

**Figure 2. Natural disasters occur regularly across Canada**



Canadian disaster database, number of events in Canada from 1950 to 2012.

Source: PACICC, with data from The Canadian Disaster Data Base.

**Table 1. Most costly natural disasters in Canadian insurance history**

Date	Event	Insured losses Not adjusted for inflation
1998 January	Icestorm, Ontario, Quebec, New Brunswick	\$1,295,000,000
2011 May 14 to 17	Wild fire, Slave Lake, Alberta	\$700,000,000
2005 August 19	Wind and rainstorm, Toronto, Ontario	\$590,000,000
2010 July 12 and 13	Wind and thunderstorm, Calgary and other areas in southern Alberta	\$500,000,000
2009 August 1 to 3	Wind storm, Alberta	\$355,000,000
1991 September 7	Hailstorm, Calgary, Alberta	\$342,745,000
2005 June 6 to 8 and 17 to 19	Flooding, Alberta	\$300,000,000
2011 November 27 and 28	Wind and rainstorm, Alberta	\$225,000,000
1996 July 19 and 20	Flooding, Saguenay, Quebec	\$207,159,000
1987 July 31	Tornado, Edmonton, Alberta	\$148,377,000

Source: PACICC based on data from IBC and PCS Canada

<sup>3</sup> [http://www.oag-bvg.gc.ca/internet/english/parl\\_cesd\\_200812\\_02\\_e\\_31819.html](http://www.oag-bvg.gc.ca/internet/english/parl_cesd_200812_02_e_31819.html)

Table 1 shows that some of the events have resulted in billions of dollars of disaster damage claims paid by insurers to consumers. While costly, no insurer failed as a result of these natural disasters.

A key aspect of the risk management framework used by insurers is prudent capital management. Canada's insurers presently hold \$40 billion in capital to support their business. Over the past several decades there has been a trend of insurers holding more capital relative to the size of the Canadian insurance market. In 1975, for example, an average P&C insurer held 50 cents in capital for every dollar of insurance they wrote. Today this ratio has doubled to \$1 of capital for every \$1 in insurance premiums. As a consequence, the capital base supporting the financial capacity of Canada's insurance industry to pay claims has never been stronger.

An increase in reinsurance coverage represents a second measure that has improved the insurance sector's management of solvency risk. Insurers' concern about the solvency risk associated with natural disasters – coupled with rising regulatory demands – have contributed to a 15-year trend of increasing industry attention to catastrophe reinsurance coverage. Disaster damage claims have been rising but there has also been a significant increase in the funds available to Canada's insurers to pay disaster claims as measured in terms of capital in place and reinsurance coverage.

## Insurers manage natural disasters risk well

In recent years, severe weather damage claims have emerged as the largest cost for property insurance companies, exceeding damage from fire. Despite the high and rising cost of disaster damage, insurance companies across Canada remain well capitalized and financially sound. Insurers have adapted pricing, refined the coverage offered and developed tools to anticipate future costs. In particular, some tools insurers use to mitigate the solvency risk of natural disasters include:

- Managing geographic risks by carefully deciding which consumers to insure. For example, insurers avoid covering every home on a single street if they are concerned about concentration of damage following a hailstorm, tornado or extreme rainfall event.
- Using computer models to assess their potential exposure to a severe earthquake for more than a decade. Recently, models have been developed to help insurers better manage the risks associated with severe weather events, including hurricanes and summer storms.
- Applying an explicit “cat load” when setting the price of homeowners’ insurance policies to consider claims settlement costs resulting from natural disasters.
- Diversifying catastrophic risk through the purchase of reinsurance.

Insurers use catastrophic models to calculate their probable maximum loss (PML) by modelling the impact of thousands of earthquakes. In these models, a smaller earthquake has a higher probability of occurring each year. Larger, more expensive earthquakes occur less often. The PML is the average loss that the model expects each year.

The potential severity and likelihood of a natural disaster in these models is defined by return period<sup>4</sup>. The worst-case storm or earthquake that occurs once every 100 years is bigger, and results in much more damage than a storm that occurs every 10 years.

Risk Management Solutions (RMS), the largest modeling company in the world, estimated the return period for modeled earthquakes and severe storms damage in Canada. RMS anticipates that it will be relatively common for Canadians to experience severe convective storms resulting in insured losses of \$250 million, while a worst-case (the 10,000-year return period event) severe convective storm would result in \$6.7 billion in insurance damage claims.

In contrast, RMS anticipates that damaging earthquakes will remain uncommon but have the potential to result in extensive loss and damage. A worst-case earthquake in Western Canada could result in \$95 billion in insurance damage claims, and in Eastern Canada a worst-case loss event could result in much larger damage claims. That is to say, catastrophe models predict that most natural disasters that Canada will experience will be severe weather events, but these should not be a solvency threat for well managed insurers. However, the risk of a catastrophic earthquake represents a special challenge for Canadians and the insurance industry.

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<sup>4</sup> A **return period**, also known as a **recurrence interval**, is an estimate of the interval of time between events like an earthquake, or flood of a certain intensity or size. The less frequent the event, the larger the potential impact. For example, a 1-in-1000 year earthquake will be much more powerful than a 1-in-250 year earthquake.

Several international agencies have confirmed the importance of the insurance sector in supporting the recovery. For example, in November 2012, Finance Ministers from Canada and the other G20 nations adopted the “Methodological Framework for Disaster Risk Assessment and Risk Financing” developed by the Organisation for Economic Co-operation and Development (OECD). Canada signed this international agreement to help finance government ministries and other authorities develop effective disaster risk management that builds on strengthened risk assessment and risk financing. A well-functioning insurance industry is a key component of the OECD framework:

*“Reliance may be placed on risk financing and risk transfer markets to manage the risks to private assets, with governments working to facilitate the operation of these markets and encouraging, where such markets are weakly developed, the development of tools and arrangements designed to protect financially vulnerable populations and sectors of the economy. For this reliance to be well-founded, the availability, adequacy and efficiency of private markets need to be evaluated. This assessment needs to be focused on identifying market failures, which may consider such factors as the insurability of disaster risks, the extent of asymmetric information and adverse incentives, consumer behaviour, and market features and structure.”<sup>5</sup>*

In December 2012, a report from the Bank for International Settlements further highlighted the importance of a well-functioning insurance industry following a natural catastrophe. “Unmitigated Disasters: New Evidence of the Macroeconomic Costs of Natural Catastrophes” reports on the impact of natural disasters in 203 countries over a period of 52 years. The presence of a healthy insurance industry was the most important factor that determined the speed of recovery after disaster strikes. Following a period of only two or three years, well-insured catastrophes could be inconsequential or even positive to the national economy.

The 2010 report by the World Bank entitled “Natural Hazards, UnNatural Disasters” also identifies the essential role of insurance in helping society to manage the financial risks of natural disasters.

Insurance transfers risk to those willing to bear it. It clearly increases a person’s choices and thus well-being.<sup>6</sup>

.....  
<sup>5</sup> <http://www.oecd.org/finance/insurance/G20disasterriskmanagement.pdf>, p. 49  
<sup>6</sup> <http://www.gfdrr.org/sites/gfdrr.org/files/nhud/files/NHUD-Overview.pdf>, p. 18

## Canada's regulatory system

A robust regulatory system represents the second reason why Canadian insurers have effectively managed solvency risk. Canada's regulatory framework recognizes the solvency risk associated with natural disasters. During the 1990s, the companies that provide Canada's home, auto and business insurance worked with their prudential regulator, the Office of the Superintendent of Financial Institutions (OSFI) to build earthquake risks into the supervisory system. The goal of this system is to ensure that insurers have the money to pay legitimate claims resulting from a major urban earthquake. OSFI, Quebec and British Columbia updated the guidelines on earthquake risk in 2013 to take into account emerging knowledge and best practices.

The key components of the regulatory framework for insurers are:

- 1) Risk-based minimum capital tests called Minimum Capital Test (MCT) and Branch Adequacy of Asset Test (BAAT)
- 2) Dynamic Capital Adequacy Test
- 3) Stress testing
- 4) Earthquake Sound Practices Exposure Guideline B-9

Of these, the most relevant for this paper is OSFI Guideline B-9. This document sets out sound practices for the management and measurement of earthquake exposures. The policy objective of the Guideline is to improve the safety and soundness of Canada's financial services sector by increasing the insurance industry's capacity to handle a large earthquake. The Guideline places responsibility for managing earthquake risk on insurers by holding Boards of Directors responsible for reporting their readiness to OSFI.

Insurers must annually estimate their PML arising from a major earthquake using models. Although all federally regulated insurers and reinsurers are encouraged to comply with the Guideline, only those with earthquake exposures in the British Columbia and Quebec markets are required by OSFI to do so.

Companies must demonstrate to OSFI that they have financial resources to pay the estimated claims resulting from an earthquake from the following sources:

- 1) Up to 10 percent of the company's capital
- 2) Reinsurance
- 3) Dedicated earthquake reserves.

These reports must be presented to the company's Board of Directors or Chief Agent annually.

Each year, this test gets more rigorous as regulators make the required earthquake more powerful with the goal of moving toward preparedness for a 500-year return period event. In 1998, regulators required insurers to report preparedness for a 250-year earthquake. Each year, regulators increase the benchmark slightly with the goal of having insurers ready for a 500-year earthquake by 2025. In 2013, insurers must prove that they have enough capital and reinsurance to pay for claims resulting from a 400-year earthquake.

Together, these tools require that the management and owners of insurance companies operating in Canada monitor and report their catastrophic risks.

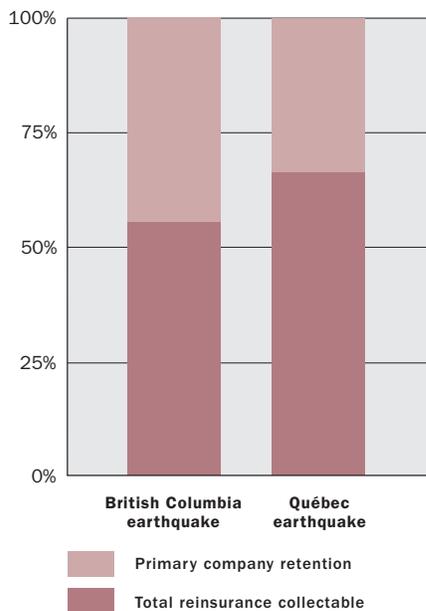
### OSFI's 2012 stress testing

In addition to the annual requirements of Guideline B-9, OSFI conducts stress tests on Canadian insurers every year. In 2012, OSFI required that insurers model the impact that four earthquakes would have on the financial health of their companies.

At its November 2012 Risk Management Seminar, OSFI presented findings from its earthquake stress tests. Some highlights are:

- 44 percent of homeowners' insurance policyholders and 65 percent of commercial policyholders in British Columbia purchase earthquake coverage. In Quebec, just 4 percent of homeowners and 43 percent of commercial policyholders purchase earthquake insurance.
- A large Montreal earthquake could result in total economic losses equivalent to 9 percent of Canada's 2011 gross domestic product (GDP). More than 40 percent of the insurers would fail the MCT, before management action, and more than 5 percent would report negative capital scores (meaning their MCT or BAAT scores would be less than zero).<sup>7</sup>

**Figure 3. Reinsurance will pay more than 50% of expected earthquake claims**



Source: OSFI

A large subduction earthquake in B.C. would cause economic damage equivalent to 5 percent of Canada's 2011 GDP, and would result in approximately \$30 billion in insured losses. More than half of the insurers would fail the regulatory minimum capital test (MCT or BAAT of less than 150 percent) before management action. And 40 percent of these insurers would report negative capital scores (MCT or BAAT of less than zero).

<sup>7</sup> The MCT or BAAT score measures the insurance company's available assets compared to assets required by regulators. The minimum score allowed by Canadian regulators is 150 percent. A score below 100 percent means that the insurer would not be able to pay all the liabilities it owes to creditors even if they sold every available asset.

## The role of reinsurance

Reinsurance is an important tool that Canadian insurers use to reduce their solvency risk. Following a major natural disaster, reinsurers are expected to provide the majority of the funds that insurers will use to pay claims by Canadians. OSFI's Reinsurance Guideline states, every insurer must develop a Reinsurance Risk Management Plan and should perform a sufficient level of due diligence on its reinsurance counterparties on an on going basis to ensure that the insurer is aware of its counterparty risk and is able to assess and manage such risk."<sup>8</sup> The Guideline also states that insurers should not rely on rating agencies, reinsurance brokers or other reputable agents or intermediaries to undertake this analysis on behalf of the company.

The analysis and design of reinsurance programs differs between insurers, although there are common factors such as the use of credit ratings. For instance, a subsidiary of a global insurer may set its own standards for assessing reinsurers, while a national or regional insurer may rely more on a reinsurance broker in making assessments. Table 2 illustrates how catastrophic excess and loss programs are typically structured. Ratings are taken into consideration by primary insurers

**Table 2. Example reinsurance program – Property catastrophe reinsurer participation**

Company	Authorized	MCT/ BAAT	S&P	AMBest	Catastrophe excess and loss				
					First layer	Second layer	Third layer	Fourth layer	Fifth layer
					\$25,000,000 excess of \$15,000,000	\$60,000,000 excess of \$40,000,000	\$100,000,000 excess of \$100,000,000	\$200,000,000 excess of \$200,000,000	\$150,000,000 excess of \$400,000,000
A	No	n/a	AA-	NR-5	4.00%	2.00%	2.00%		1.00%
B	Yes	279%	A pi	A u	2.00%	3.00%	1.50%	2.00%	0.50%
C	No	n/a	n/a	A-				2.50%	7.50%
D	Yes	450%	A	A	8.00%	4.00%	6.00%	4.50%	2.50%
E	Yes	369%	AA-	A	12.00%	10.00%	10.00%	7.50%	3.00%
F	No	n/a	A	A	7.00%	6.00%	5.00%	8.00%	4.20%
G	Yes	219%	AAA	A+		5.00%	5.00%	5.00%	5.00%
H	Yes	1212%	AA	A++	7.50%	7.50%	7.50%	5.00%	3.50%
I	Yes	189%	A-	A+	7.00%	4.00%			
J	Yes	288%	AA-	A+	3.00%	2.50%	4.00%	4.00%	5.00%
K	Yes	278%	A-	A		3.00%	3.00%	1.00%	
L	Yes	207%	AA- neg	Au	2.00%	1.50%	1.50%	1.50%	1.80%
M	No	n/a	NR	A+		2.50%	2.00%	2.00%	0.50%
N	Yes	2200%	AA-	A				7.00%	4.00%
O	No	n/a	A-	A-	5.00%	6.00%	6.00%	5.00%	2.00%
P	Yes	275%	A+	A+	3.00%	2.50%	1.50%	1.00%	0.60%
Q	Yes	261%	A-	A					7.50%
R	Yes	178%	AA-	A+	7.00%		2.50%	1.00%	1.00%
S	Yes	452%	A-	B++	8.50%	8.00%	10.00%	8.00%	10.00%
T	Yes	242%	A neg	A+u	3.00%	3.00%			
U	Yes	230%	AA-	A+		3.00%	3.50%	4.00%	8.55%
V	No	n/a	AA-	A+u	4.00%	4.50%	4.00%	3.00%	1.00%
X	Yes	n/a	A	A	17.00%	15.00%	20.00%	20.50%	23.85%
Z	Yes	214%	A+	NR-5		7.00%	5.00%	7.00%	7.00%
<b>Total</b>					<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

\*Data used in this table are illustrative, not actual figures.

Source: PACICC.

<sup>8</sup> [http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/guidelines/sound/guidelines/B3\\_e.pdf](http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/guidelines/sound/guidelines/B3_e.pdf)

along with other information such as regulatory capital scores. For a large insurer, as depicted in Table 2 a number of different reinsurers may participate in each layer. Hence, diversification is built into a program. If a company wishes to have a reinsurer in its program that does not pass all the company's criteria, the standard practice is for the reinsurance broker to have the company sign off on the particular reinsurer.

## The role of PACICC

PACICC's mission is to ensure that Canadian insurance policyholders do not experience undue financial hardship in the unlikely event that a member insurer fails. The cost of settling claims against a failed insurance company is paid by PACICC through assessments charged to member insurance companies. Insurance legislation requires companies operating in Canada to be PACICC members, unless they are members of a farm mutual guarantee organization or operate exclusively in providing specialty lines of insurance coverage not covered by PACICC, like mortgage insurance, marine or aviation.

PACICC has no role in responding to a natural disaster unless a member insurer fails and is closed by its regulator. If an insurer does fail as a result of a natural disaster, the court will appoint a liquidator to manage the wind-up of the company. PACICC will support the liquidator as they settle the estate of the insolvent insurer, including the settling of valid claims by consumers and refunding unearned premiums. Liquidators are also responsible for settling employment contracts and pension plans, exiting leases and other contracts. Settling the estate of an insurance company is a complicated and expensive process that takes years and sometimes decades.

PACICC's payments to policyholders of a failed insurer ensure the timely return of unearned premiums and the settlement of claims, within established limits. This process has been in place for almost 25 years and has successfully responded to the needs of policyholders of a dozen failed insurance companies without imposing undue hardship on the insurance industry.

PACICC's protection extends to consumers of insurers that may fail as a result of a natural disaster, or as a result of subsequent events. It is possible that an insurance company could survive a natural disaster, but be forced into insolvency because of its responsibility, through PACICC, to pay part of the cost of claims made against failed insurers.

For the policyholders of these companies PACICC would pay:

- Up to \$300,000 per homeowners' policy
- Up to \$250,000 per auto and commercial insurance policy
- Up to \$700 of unearned premiums.

When an insurance company enters into liquidation – whether it is an insolvent insurance company or a solvent subsidiary of a distressed foreign parent company – normally the assets of the estate are frozen by the Court until the liquidator has had an opportunity to assess the claims against the insurer's estate. For more than 20 years, PACICC has paid the eligible claims of policyholders with a failed insurer, and has been granted priority to later reclaim from the estate a portion of the costs it incurs. The costs ultimately incurred by PACICC members reflect both the shortfall in the estate of the insolvent insurer and the delay of 10 years or more between when it makes its payments and subsequently recovery of funds from the estate. PACICC therefore supports both:

- the financial shortfall, and
- the liquidity of the insurer in wind-up.

PACICC's Memorandum of Operation sets out three steps that PACICC will take when a member insurer experiences an involuntary wind-up:

- I. "the board of directors shall estimate an amount (the "Total Assessment") which reflects the maximum exposure of the Corporation anticipated by the board of directors in respect to the Insolvency of a particular Member."
- II. "the board shall then allocate the Total Assessment among each of the Participating Jurisdictions in which the insolvent Insurer was writing policies." And
- III. "The Corporation shall levy assessments on each Member which is licensed... in a Contributing Participating Jurisdiction.

The Court-appointed liquidator provides the Board with a detailed analysis of the estate as a basis for determining the Total Assessment. The assessment timeframe is partly determined by the circumstances of the failed insurer. In the case of Markham General, it took 10 months before the Board assessed members, whereas this information was available at the time of the wind-up of Reliance Canada.

PACICC staff has developed and tested the organization's capacity to model the expected assessment requirements, and this information will be provided to the Board immediately when a wind-up is declared. The challenge for the Board involves determining "maximum exposure" given considerable uncertainty about assets in place and claims liabilities. Staff assumes that the Board will seek evidence about the expected shortfall in the estate under a plausible scenario with adverse claims development and possible challenges in realizing asset values; combined with an assessment of cash flow and liquidity issues to estimate the funds that PACICC will need from member insurers to ensure timely payment of eligible claims. This step requires rigorous analysis but is unlikely to be contentious.

Further, PACICC's Memorandum of Operation limits the total annual amount that the corporation can require of insurers in any single year. PACICC assessments are limited to 1.5 percent of covered direct premium written by an insurer in the prior year. The member is responsible for paying the full assessment, however, it is only required to pay this portion annually. If a member is at this maximum and another insolvency occurred, the cost of the new insolvency would be added to future payments. There is no limit on the number of years that an insurer may be required to pay PACICC's maximum assessment.

# Potential catastrophes in Canada

Canada’s insurers have successfully responded to hundreds of natural disasters. Fortunately Canadians, and the insurance industry, have never experienced a very large disaster resulting in catastrophic loss and damage. PACICC’s consultation with the science community confirms that there are relatively few perils that could bring catastrophic damage. This paper will assess the potential of these perils as an insolvency risk. While these are very unlikely to occur, they would have severe adverse impacts on Canada – the potential to overwhelm the capacity of Canada’s insurance industry.

## **A catastrophic earthquake in Vancouver or Montreal**

The risk of a very strong earthquake occurring is “high” in Vancouver and “moderate” in Montreal. On the other hand, vulnerability to earthquake damage is moderate in Vancouver and high in Montreal, particularly in terms of the number of older, high-value buildings and infrastructure – built before modern seismic engineering knowledge became available.

RMS estimates that a M7.5 event centred near Montreal could potentially result in insurance damage claims that exceed \$100 billion. A magnitude 9.0 subduction event west of Victoria could result in insurance damage claims of \$20 billion to \$30 billion. And a worst-case Western Canada earthquake could result in modeled insurance claims of \$95 billion.

Crustal earthquakes under urban areas result in extensive damage to buildings and infrastructure. This includes destruction due to strong shaking and the potential for extensive fire damage. Older structures are the most vulnerable. A large subduction event results in less shake and fire damage because it is located some distance from major urban areas, but damage will extend over a larger area and there is the additional risk of damage to coastal communities from a tsunami. The tsunami exposure of insurance companies is not well known.

## **An asteroid striking Toronto or another urban centre**

Meteoroids are small particles or fragments of comets or asteroids, typically less than a metre wide. An estimated 15,000 tonnes of meteoroids impact the Earth’s atmosphere each year. While much of this material incinerates in the form of meteors, pieces of larger meteoroids (>10cm dia.) may survive to impact the earth surface. Property insurance covers the risk of damage from falling objects including responding to damage claims from meteorites.

Asteroids are large rocky bodies with a diameter exceeding 30 metres. Comets are of similar size, and are composed of ice mixed with rock. In 1908, a small asteroid or comet exploded over Siberia blowing down 80 million trees over an area of 2,000 square kilometers. There is a 5 to 10 percent chance over the next 50 years that the planet will experience another asteroid or comet strike like the 1908 event. Almost 70 percent of the planet is covered by oceans so the asteroid or comet is most likely to strike water and result in a tsunami damaging coastal communities. If the asteroid or comet were to strike land and directly strike a city, the devastation would be beyond anything previously experienced. A RMS model of a small asteroid strike or explosion, like the 1908 event, in New York City resulted in an estimate of more than \$1 trillion in damage.<sup>9</sup>

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<sup>9</sup> [https://support.rms.com/publications/1908\\_tunguska\\_event.pdf](https://support.rms.com/publications/1908_tunguska_event.pdf)

The value of insured property in Toronto and the other large areas is several hundred billion dollars. While an asteroid striking a city is very unlikely to occur, it would result in uninsured damage claims that would exceed insurers ability to pay.

### **Extreme space weather**

In 1989 a geomagnetic storm tripped the circuit breakers on Hydro-Quebec's power grid, resulting in a blackout that lasted for 12 hours, affected five million people and resulted in more than \$2 billion in damage. Some satellites lost control for several hours and short-wave radio signals were disrupted. Solar storms can also disrupt communications satellites, weather monitoring, and electrical transmission lines and damage pipelines, spacecraft, and require the redirection of air travel to avoid the increased risk of radiation in polar regions.

Society has grown increasingly dependent on sensitive electrical equipment. Research to understand and help manage the risks associated with the next solar superstorm, like the 1859 Carrington event<sup>10</sup>, has been under way for about a decade, but the implications for society and potential impact on the insurance industry is only emerging. The impact of an extreme space weather event on the Canadian insurance industry is unknown, but there is some risk that it could result in several tens of billions of dollars of claims, potentially exceeding the industry's financial capacity.

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<sup>10</sup> On September 1, 1859, amateur astronomer Richard Carrington observed what he described as "two patches of intensely bright and white light" erupting from the Sunspots. Five minutes later the fireballs vanished, but within hours their impact would be felt across the globe. That night, telegraph communications around the world began to fail; there were reports of sparks showering from telegraph machines, shocking operators and setting papers ablaze. Records indicate the Carrington Event was nearly twice as big as any other solar flare in at least the past 500 years. If anything even close to that event occurs in a modern society, hundreds of satellites in orbit will be at risk, not to mention power grids on Earth.

## Modeling solvency risk for insurers

The remainder of this paper will define three levels of catastrophe risk in Canada:

- 1) The size of catastrophe that causes one insurer to fail;
- 2) The size of catastrophe that causes multiple insurers to become insolvent;
- 3) The size of catastrophe that overwhelms Canada's insurance industry.

PACICC modeled hypothetical losses resulting from major earthquakes for British Columbia and Quebec, and the impact on Canada's insurers. For consistency it also modeled earthquakes similar in size to those that OSFI included in its 2012 stress tests. The breakdown of total losses by line was estimated by averaging insured losses in past catastrophic events in the United States, Japan and Canada. Due to PACICC's rule in determining assessments, it was necessary to break down insured claims paid by type of policy. The following breakdown was used:

**Table 3. Modeled catastrophic losses by line of business**

<b>((\$000)</b>								<b>Total insured losses</b>
<b>Automobile</b>		<b>Personal property</b>		<b>Commercial property</b>		<b>Liability</b>		
\$ 500,000	+	\$ 1,750,000	+	\$ 1,750,000	+	\$1,000,000	=	<b>\$ 5 billion</b>
\$1,000,000	+	\$ 3,500,000		\$ 3,500,000	+	\$2,000,000	=	<b>\$10 billion</b>
\$2,000,000	+	\$ 5,000,000	+	\$ 5,000,000	+	\$3,000,000	=	<b>\$15 billion</b>
\$3,000,000	+	\$ 6,500,000	+	\$ 6,500,000	+	\$4,000,000	=	<b>\$20 billion</b>
\$4,000,000	+	\$ 8,000,000	+	\$ 8,000,000	+	\$5,000,000	=	<b>\$25 billion</b>
\$4,000,000	+	\$10,000,000	+	\$10,000,000	+	\$6,000,000	=	<b>\$30 billion</b>

Earthquake claims were assigned to insurers operating in the province according to market share for each line of insurance.

Measuring the size of a natural disaster by the dollar value of damage allows PACICC to overcome the uncertainty within the models. For example, the models estimate the "average" earthquake that will occur in a given time period. As a guarantee fund, PACICC must be concerned about a worse-than-average earthquake. Large earthquakes can result in broken gas lines causing fires. Fire-following the earthquake has proven difficult to model. The models do not estimate business interruption claims or damage from tsunamis. By using a dollar figure, PACICC avoids these uncertainties.

It is likely that PACICC would not pay all insurance claims. A natural disaster would likely result in a large number of claims that surpasses its policy limits. Normally, PACICC would pay up to its policy limits with the remainder resolved in the courts from the estate of the failed insurer. However, PACICC is unable to estimate the number of claims or average claim size that would result from an earthquake. This analysis assumes that PACICC pays all possible claims against insurers that fail.

There is no publicly available information on reinsurance limits purchased by Canada’s P&C insurers. Reinsurance purchase estimates were based on information collected by PACICC in confidence from reinsurance experts. In its stress test results, OSFI reported that the total reinsurance available to pay catastrophe claims in British Columbia was \$18 billion. In Quebec, OSFI reported \$16 billion in reinsurance available.

### Impact on insurer solvency

PACICC’s model estimates the financial resources that a Canadian insurer could use to pay claims resulting from an earthquake. Cash available by a company is the sum of three numbers:

- Earthquake reserves, if any, reported on financial statements;
- Estimated catastrophic reinsurance limits; and
- Capital in excess of a 100 percent score on Minimum Capital Test (MCT) or Branch Asset Adequacy Test (BAAT).

PACICC modeled catastrophic risk at the following levels:

- **\$15 to \$20 billion** – Modeling undertaken by PACICC indicates that Canada’s insurers can fully respond up to a \$15 billion disaster shock with little or no impact on the solvency of well-run, healthy insurance companies. The shift in insurance regulation from a 400-year regional event to a 500-year national event is expected to increase this threshold to \$20 billion over the next decade.
- **\$25 to \$30 billion** – The insurance industry appears to have sufficient financial capacity to respond to a large natural disaster generating insurance claims of \$25 billion. Several otherwise

**Table 4. PACICC modeling of potential failures due to catastrophes**

Number of insurers failing  Amount	Current industry capital and reinsurance		Expected industry capital and reinsurance in ten years	
	Insolvent due to catastrophe	Insolvent due to PACICC assessment	Insolvent due to catastrophe	Insolvent due to PACICC assessment
\$ 5 billion	0	0	0	0
\$10 billion	1	0	0	0
\$15 billion	3	0	2	0
\$20 billion	7	1	5	1
\$25 billion	10	1	7	1
\$30 billion	21	All insurers in Canada	9	2
\$35 billion	25	All insurers in Canada	19	All insurers in Canada
\$40 billion	44	All insurers in Canada	42	All insurers in Canada
\$45 billion	52	All insurers in Canada	49	All insurers in Canada
\$50 billion	60	All insurers in Canada	57	All insurers in Canada

healthy insurance companies are expected to fail and PACICC would need to establish an emergency response capacity because it has never been required to respond to multiple member insolvencies. With regulatory changes this threshold will increase to \$30 billion over the next decade.

- **Greater than \$30 billion** – A catastrophic loss of this size would exceed the existing capacity of Canada’s insurance industry, and would exceed PACICC’s ability to address the needs of policyholders. This trigger is the point when a PACICC assessment results in an otherwise healthy insurer failing regulatory solvency tests that was not exposed to the initial catastrophe.

According to OSFI’s industry stress test, insurers reported reinsurance available of \$18 billion in 2012. However, such reinsurance was not spread evenly across the industry. Some insurers buy more reinsurance, while others buy closer to the regulatory minimum. OSFI’s \$18 billion was used as PACICC’s base case. We also re-ran the model assuming that insurers purchased an additional \$5 billion in reinsurance or accumulated capital in response to OSFI’s 2012 proposal to strengthen Guideline B-9 by moving from a 400-year regional earthquake exposure to a 500-year national earthquake exposure.

PACICC analysis suggests, under its base case (assuming \$18 billion in reinsurance available), the first insurer fails the regulatory solvency test when catastrophic claims exceeded \$10 billion. Once catastrophic claims reach \$15 billion, three insurers fail. At \$20 billion, seven insurers fail. At \$25 billion, 10 insurers fail the solvency tests. When losses reach \$30 billion, PACICC estimates that 30 insurers would report MCT/BAAT scores below 100 percent.

In 10 years, if insurers accumulate an additional \$5 billion in capital or purchase more reinsurance cover, then no insurer fails following a \$10 billion event. At \$15 billion, two insurers fail. At \$20 billion, five insurers fail the solvency tests. Once claims reach \$25 billion, seven insurers fail. When losses reach \$30 billion, nine insurers fail the regulators’ solvency tests. At \$35 billion, 19 insurers fail report MCT/BAAT scores below 100 percent.

### **Impact of resulting PACICC assessments**

For the purposes of this paper, the total assessment levied on surviving insurers by PACICC for any insolvent insurer was estimated to be the total of:

- Unpaid claims on insurer’s balance sheet as of December 31, 2011
- 70 percent of unearned premiums; and,
- Net retention of claims arising from the catastrophe.

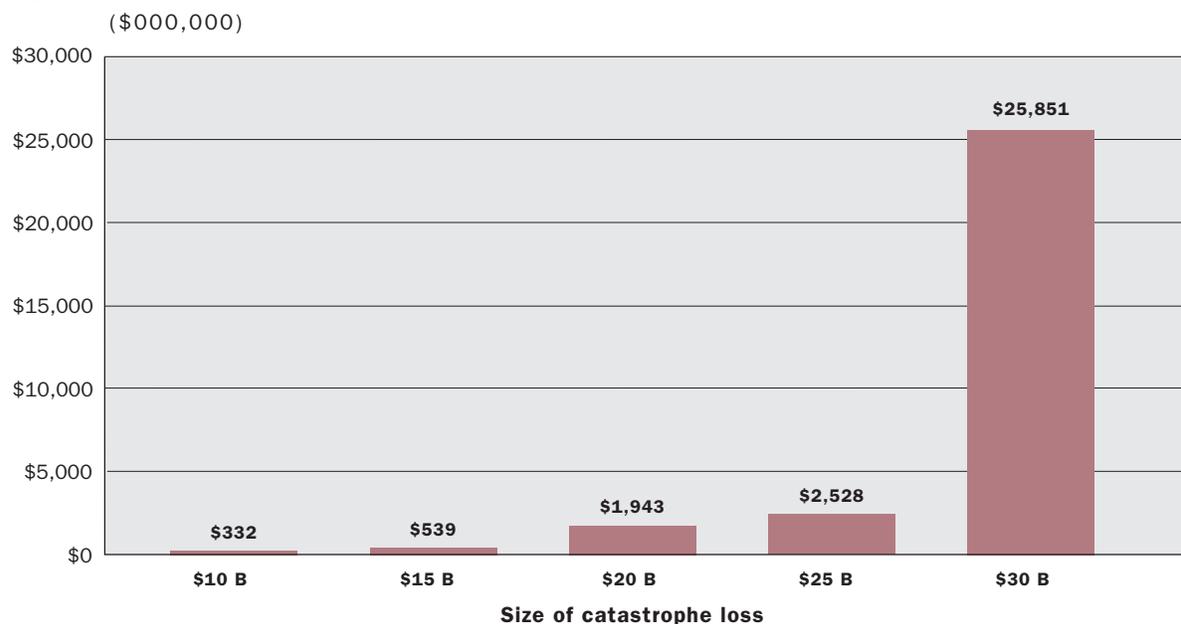
PACICC assumes that all reinsurance owing to the insolvent insurer is collected and that this reinsurance is available to pay claims. In this case, PACICC’s obligation would be the net retention amount. This assumption requires that the insolvency clauses required by OSFI’s Guideline B-3 are credible. An insolvency clause is part of the reinsurance treaty that states how the contract will be treated if either the primary insurer or the reinsurer becomes insolvent. For the purposes of this analysis, PACICC assumes that reinsurers will pay their contractual obligations if the primary

insurer becomes insolvent. Experience, however, warns that reinsurance recovery for insolvent insurers can be more contentious and requires more time to resolve than for other insurers.

The PACICC assessment was allocated to the surviving insurers that participated in the same markets as the failed insurer, based on market share, by line. For example, if the insolvent insurer only sold personal property insurance in B.C., then PACICC would assess the cost of the insolvency to the remaining companies that sold this product in B.C.. If they also sold insurance in Alberta, PACICC would assess the costs to insurers in both Alberta and B.C. based on the share of premiums in each market.

For a \$10 billion catastrophe, PACICC's assessment on insurers would be \$332 million. This rises to \$1.9 billion when a catastrophe rises to \$20 billion. This is 9.7% of the total cost of the catastrophe.

**Figure 4. Estimated PACICC assessment**



Source: PACICC

In PACICC's simulation of a \$10 billion event, only one insurer would be shut down by regulators for failing the regulatory capital test. The resulting assessment to its members would be larger than any assessment that PACICC has ever levied on its membership. Under this scenario, PACICC member insurers would still be able to fully meet their assessment obligations.

In this model, PACICC begins to experience liquidity problems once catastrophic losses reach \$15 billion. In this case, the estimated industry assessment would be approximately \$540 million. This assessment would pay the claims outstanding for three failed insurers and reimburse premiums paid in advance by policyholders. This would result in a number of insurers being billed in excess of the 1.5 percent of their Direct Written Premiums annual assessments limits. PACICC would receive 91 percent of estimated required assessments to settle covered claims within three years. Policyholders should not experience delays in securing payment from PACICC. The remaining assessment would take more time. PACICC estimates it would take another 10 years to collect from all members.

PACICC’s ability to raise funds necessary to pay claims resulting from a major catastrophe would become an issue for a major disaster that caused insured losses greater than \$20 billion. In this case, PACICC’s estimated assessment on the remaining insurers would be approximately \$2 billion with current mechanisms. PACICC could expect to collect 77 percent of the required funds within three years. PACICC will need to explore the creation of an emergency funding mechanism to ensure timely payment of policyholders. At this level of insured losses, PACICC’s assessment will likely cause an insurer that was already weakened by the catastrophe to become insolvent.

PACICC’s model suggests that multiple large insurers become insolvent at \$30 billion. In the case of a \$30 billion event it is estimated that PACICC assessments on surviving member insurers could approach \$25 billion. This assessment is so large that every PACICC member across Canada would

fail the regulatory solvency tests. When losses reached \$30 billion, PACICC’s assessments become the delivery mechanism that threatens the solvency of its member insurers. In economic literature, this is called the risk of contagion.

With the 1.5 percent of DWP limit, it would take the average PACICC member 38 years to pay the full

**Table 5. Share of estimated required PACICC assessment collected**

Years following catastrophe	\$30 B	\$25 B	\$20 B	\$15 B
1	3.8%	25.7%	31.9%	74.6%
3	11.3%	64.4%	77.4%	91.1%
5	18.2%	88.1%	94.2%	93.8%
10	34.4%	97.1%	97.5%	97.6%
25	73.3%	99.5%	100.0%	100.0%
50	99.8%	100.0%	100.0%	100.0%
75	99.9%	100.0%	100.0%	100.0%

assessment. The insurance industry and PACICC would be unable to raise the funds required to cover the industry’s obligations to insurance policyholders from a \$30 billion catastrophe. The sheer size of the required assessment would produce a contagion effect that takes down otherwise healthy, well-capitalized insurance companies.

### Impact of PACICC assessment on member insurers

The accounting impact of PACICC’s assessment on insurers is governed by the guidance in International Accounting Standard 37, *Provisions, Contingent Liabilities and Contingent Assets*. This Standard outlines the accounting treatment for provisions (liabilities of uncertain timing or amount), together with contingent assets (possible assets) and contingent liabilities (possible obligations and present obligations that are not probable or not reliably measurable). An entity must recognize a provision if, and only if:

- a present obligation (legal or constructive) has arisen as a result of a past event (Insurers are required to be members of good standing in PACICC under provincial insurance legislation),
- payment is probable (there will be claims following a large catastrophic loss); and
- the amount can be estimated reliably (PACICC will provide an invoice with a specific amount).<sup>11</sup>

<sup>11</sup> <http://www.iasplus.com/en/standards/standard36>, [IAS 37.14].

An obligating event is an event that creates a legal or constructive obligation and, therefore, results in an entity having no realistic alternative but to settle the obligation. [IAS 37.10] A PACICC assessment would meet these criteria and insurers that survived the earthquake would be required to recognize the full liability on their balance sheet when presented with a PACICC assessment.

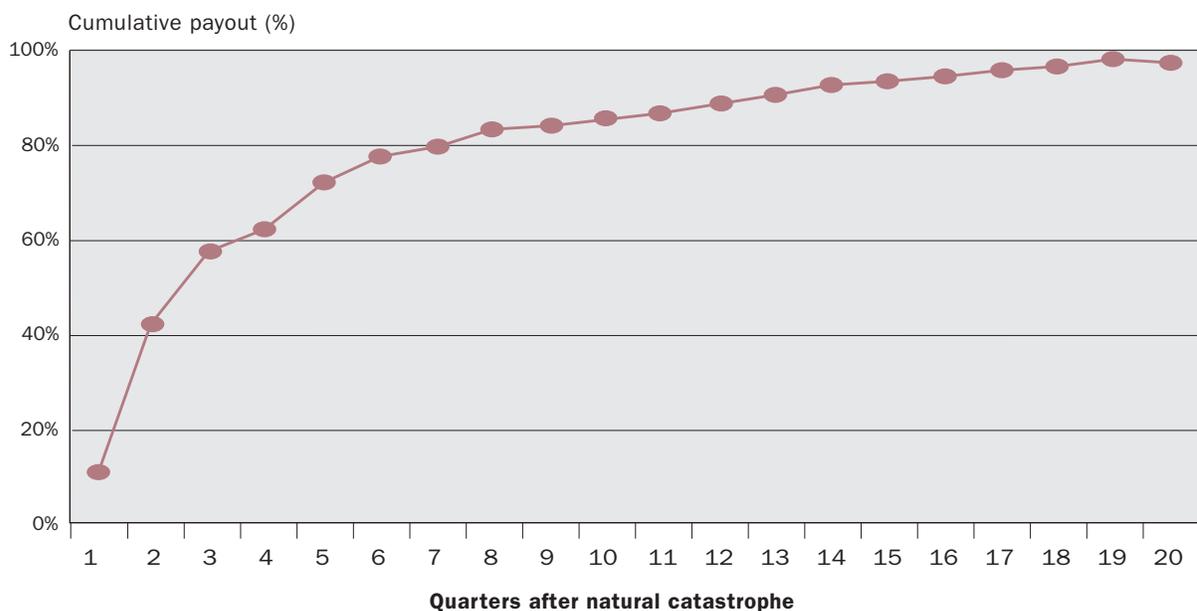
Seven insurers are expected to have their MCT/BAAT scores fall below 100 percent before management action based on PACICC’s simulation of the impact of an earthquake creating \$20 billion in claims. If seven companies fail at once, and the remaining insurers are significantly weakened by the earthquake, it is possible that PACICC’s assessments could force other insurers into wind-up.

The impact becomes even more dramatic for an earthquake with insured losses of \$30 billion. In this case, 30 insurers fail due to the earthquake. PACICC assessments cause the MCT/BAAT score to fall below 100 percent for an additional 75 insurers. When these 75 insurers fail, PACICC assessment would drive all remaining insurers into insolvency. The insurance industry does not have the funds in place to cope with a catastrophe causing claims in excess of \$30 billion.

### Impact on Canadian insurance policyholders

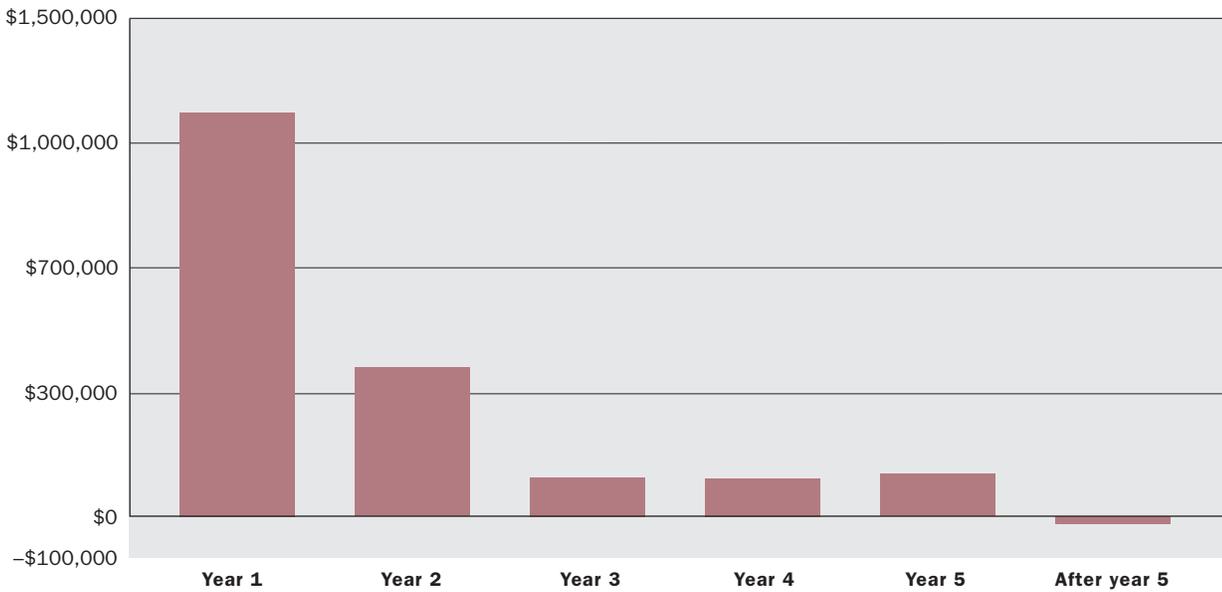
To understand the impact on consumers, we must consider the normal timing of claims payment following a natural disaster. The best source of data is from the Reinsurance Association of America (RAA). According to RAA, it is normal for approximately 60 percent of claims to be settled within the first year following a major catastrophe. This rises to 80 percent by the end of year two and 90 percent of expected claims being paid to consumers by the end of year three.

**Figure 5. Insurance payout profile**



Source: Reinsurance Association of America.

**Figure 6. Estimated PACICC claims and unearned premiums refunds payable (\$000)**



Source: PACICC

With current mechanisms, PACICC would face significant liquidity problems meeting its obligations for a catastrophe resulting in insured losses greater than \$20 billion. For an event with insured losses greater than \$30 billion, it is unlikely that PACICC would be able use its existing assessment mechanisms to settle claims.

For a \$30 billion event, PACICC would collect only 11 percent of the total assessment in the first year. Over the first 5 years, PACICC would, under its existing assessment model, fall short by approximately \$22.5 billion. At this level, PACICC would not have funds that would be sufficient to ensure the timely payment of consumer claims. It would take 38 years before more than 90 percent of the total assessment would be collected. It would take more than 50 years for PACICC to collect the total estimated assessment. For catastrophic losses greater than \$30 billion, it does not appear that PACICC could fund the timely settlement of claims for policyholders.

### **In summary**

For natural disasters where total insured losses are below \$15 billion, PACICC expects its member insurers can fully respond with little or no impact on the solvency of well-run, healthy insurance companies.

For large disasters, with total insured losses between \$15 billion and \$25 billion, three to 10 otherwise healthy insurance companies are likely to experience significant financial impairment. PACICC has never been required to respond to multiple member insolvencies. Thorough planning and perhaps a new emergency assessment tool will be needed to ensure that claims can be paid in a timely manner.

### Figure 7. PACICC's estimated catastrophic loss capacity

Billions of insured losses



Source: PACICC

Catastrophes with insured losses exceeding \$30 billion would overwhelm the existing capacity of Canada's insurance industry, and exceed PACICC's ability to address the needs of policyholders. PACICC was simply not designed to protect insurance consumers from this level of catastrophic loss.

## Lessons learned

A review of the Canadian and international experience with natural hazards shows that insurance companies are skilled in managing the risk of insolvency from natural disasters. Few insurance companies have failed despite many disaster events over many decades. Nevertheless, this review does warn about the potential adverse impact of large disasters or catastrophes. These low probability, but high consequence events present a special challenge. Eight lessons from this review include:

- 1.** Insurers have demonstrated their skill in effectively managing the disaster risks that have been present in Canada over the past 200 years. Only two insurance companies failed in Canada over the past 60 years because they were overwhelmed by disaster claims, and both of these companies were vulnerable due to other issues that left them weakened. Over this period, insurers paid billions of dollars in damage claims to help Canadian homeowners and businesses recover after disaster strikes.
- 2.** Nevertheless, it is inevitable that a large disaster will eventually strike – an event many times larger than anything experienced to date in Canada. Some potential catastrophes that may overwhelm the financial capacity of Canada’s insurance industry include; a large earthquake near Vancouver or Montreal; an asteroid strike on a major urban centre like Toronto; or a severe space weather event. These hazards are unlikely, but if they strike, they could result in insurance damage claims in excess of \$30 billion and perhaps greater than \$100 billion.
- 3.** PACICC protects consumers when regulators close an insurer that has failed. Fortunately, since it was established almost 25 years ago, PACICC has never faced a shock that resulted in several insurers failing at the same time. The organization is presently working to ensure its preparedness and financial capacity to respond to a major disaster. PACICC may seek to establish an emergency mechanism, like other some guarantee funds, to ensure that it has the capacity to pay consumer claims when a major disaster strikes.
- 4.** The solvency risk from natural disasters is a concern that insurers and insurance regulators have identified. Efforts to improve awareness and management of this risk have been underway for 20 years. In particular, OSFI Guideline B-9 (adopted by British Columbia, Quebec and Ontario) allows regulators to assess how insurers manage this risk. In 2012, OSFI put forward a proposal to strengthen this Guideline, including the idea that the current 400-year return period minimum for a regional risk will increase over the next decade to a 500-year national risk. This would build on the progress achieved over the past 15 years and further increase the industry’s financial capacity to deal with large natural disasters. PACICC supports a timely transition to a 500-year national minimum.

- 5.** The majority of funds that insurers will use to pay claims from a large natural disaster will come from reinsurance. Information about the reinsurance arrangements of insurers is reported to regulators but is not presently part of the financial information disclosed. Given the importance of reinsurance to assisting Canada recover from a natural disaster, PACICC believes that regulators should release more information about the reinsurance arrangements of individual insurers. Beyond increased disclosure, regulators or another interested stakeholders like PACICC should prepare an annual report based upon current filing information to estimate the evolving capacity of the insurance industry to pay disaster claims. OSFI's 2012 stress testing study is an example of regulatory leadership, disclosing information about the financial capacity of the insurance industry to respond to large disasters.
- 6.** Canada's property and casualty insurers appear to have the financial capacity to fully respond to natural hazards that result in insurance damage claims of up to \$15 billion. This is an event that is 10 times larger than any natural disaster experienced in Canada's history. This capacity is expected to grow to exceed \$20 billion over the next decade with reform in minimum regulatory requirements. There should be little need, if any, for PACICC to support insurers' response to a disaster resulting in insurance claims of \$15 billion given the low the risk of an insurer failing.
- 7.** There appears to be sufficient resources within the industry to respond to catastrophes resulting in insured losses between \$15 billion and \$25 billion, and expected to grow to over the next decade to \$20 billion to \$30 billion with regulatory reform. However, some insurers are likely to fail with such a large disaster. PACICC needs to complete its current work to ensure its preparedness and capacity to respond. This may involve establishing an emergency response capacity for large disasters to ensure the timely payment of claims by consumers, while minimizing the risk that PACICC contributes to the failure of solvent insurance companies.
- 8.** A catastrophic natural disaster resulting in insurance damage claims in excess of \$30 billion would overwhelm Canada's insurance industry. Some insurers would fail immediately and others would become insolvent when confronted by their responsibility to help pay claims against failed insurers. Canadian citizens would be confronted by the failure of an essential element used to manage the risk of operating a vehicle, running a business or owning a home. PACICC supports the insurance industry, through the Insurance Bureau of Canada, working with the appropriate public officials to establish a national disaster risk financing plan for managing the financial risks associated with large natural disasters and catastrophes.

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