HOUSING RESEARCH

Research Insight

NOVEMBER 2022

An International Comparative Study of Catastrophe Risk Mitigation and Insurance

Around the world, climate change has resulted in the increased frequency and severity of extreme weather events and natural catastrophes. These disasters can have a significant impact on local economies and livelihoods and the health and well-being of residents. In addition, the amount of uninsured economic losses resulting from climate disasters have increased. Impacts on Canadian homeowners and renters can range from financial losses, forced relocations, injury, and death. The outcome of these events can be greater financial and housing precarity, particularly for households already experiencing vulnerability. Governments from all levels often support populations with emergency funds but the increased frequency and severity of events is putting pressures on public finances. Insurance programs can play a role to better protect people from these effects, incentivize better mitigation, and limit financial risks born by the government.

Insurance programs around the world

From 2000 to 2019, 7,438 disaster events were recorded worldwide by EM-DAT, one of the foremost international databases of such events.[1] In total, natural disasters worldwide claimed approximately 1.23 million lives, an average of 60,000 per year, and affected a total of 4 billion people (many by more than one disaster). Additionally, disasters led to $US 2.97 trillion in economic losses worldwide over the same period.

[1] EM-DAT. The international Disaster Database. www.emdat.be

Canada

CMHC SCHL

About CMHC Data, Research and Analysis

CMHC exists to make housing affordable for everyone in Canada. To achieve our goal that everyone in Canada has a home that they can afford and then meets their needs, our data, research and analysis efforts will primarily focus on, but are not limited to:

- investments required for households in core housing need;
- market housing demand, supply gaps and affordability imbalances;
- racism and discrimination as a barrier to housing;
- the effects of climate change on housing;
- effectiveness of current housing policies and potential future policies; and
- working with Indigenous groups to understand their distinct housing needs.

As a trusted source of housing information, CMHC provides unbiased housing-related data, research and market information to help close knowledge gaps and deepen understanding of complex housing issues to inform future policy decisions.

Sign Up

Get the latest findings directly in your inbox

SUBSCRIBE

cmhc.ca/researchnewsletter

As a result, globally there is increased interest and momentum for insurance-based solutions to help mitigate disaster and catastrophic impacts and risks of climate change. This is an emerging area of interest for the Government of Canada and the Canada Mortgage and Housing Corporation (CMHC). This Insight summarizes the results of an international comparative study of catastrophe risk mitigation and insurance commissioned to Deloitte. The summary of the final report by Deloitte:

- Assesses the structure, economic impacts, and risk mitigation strategies for catastrophe risk insurance pools based on three case studies on pools from the United Kingdom, France, and Japan. Each of the three pools chosen provide coverage for specific natural disasters most applicable to Canada, such as floods and earthquakes; and,
- Highlights key findings and features to consider when developing a catastrophe risk insurance pool in Canada.

Flood Re (UK)

Launched in April 2016, Flood Re is a reinsurance scheme that gives insurance companies the ability to provide affordable flood insurance in high-risk areas. Flood Re provides flood coverage for an estimated 2% of properties for whom obtaining insurance coverage? was problematic.

Flood Re's goal is to ease the transition to full risk-based pricing of insurance over the course of 20 to 25 years. By the end of that transition period, gradual increases in premiums and improved risk mitigation will aim to make it possible for private insurers to offer risk-based coverage.

Role of government:

Flood Re is designated as a public body, which makes reporting to Parliament and oversight by the Secretary of State mandatory. However, the government has no role in the scheme's day-to-day management (the fund is owned and managed by the private insurance industry). In addition to the oversight function mentioned above, the government's role also includes:

- Public investments in flood risk mitigation and development of policies to help manage flood risk; and,
- While the scheme is funded and managed by the private sector, losses from extreme flooding will be the responsibility of the government.

Strengths:

- Pool expands flood coverage options for homes at high risk of flooding. Previously, the insurance market for these homes was characterized by high premium rates or risks deemed uninsurable for many households, especially those previously flooded.
- Except in the case of extreme flooding, the government has no direct financial liability as claims are handled by the private insurance industry.

Weaknesses:

- Flood Re is a temporary plan to ease the transition to a risk-based pricing regime by 2039. As a consequence:
  - If the government is not able to reduce the overall level of risk over the course of time that Flood Re is operational, the government and insurers will once again have to tackle affordability in the context of a mandatory insurance regime; and,
  - If the transition toward risk-based pricing is successful, flood insurance will still be unaffordable except for a small number of homeowners. Some form of support will need to continue beyond 2039.
- Premiums are not reflective of the risk exposure due to the scheme's affordability measures. Accordingly, governments and individuals may forgo necessary mitigation simply because there is a financial management scheme in place.

CCR Nat Cat (France)

The French natural disaster compensation scheme ("Nat Cat") is a public-private collaboration between the Caisse Centrale de Réassurance ("CCR"), a public-sector reinsurer in France, and private insurers.

Insurers generally transfer 50% of their natural peril risk to the CCR Nat Cat by paying CCR 50% of their natural disaster premiums. This 50% transfer is meant to decrease the risk of adverse selection, as it ensures that the insurer's incentives are aligned with CCR Nat Cat. Under this arrangement, the reinsurer undertakes to pay the same proportion of losses.

Compensation under the CCR Nat Cat scheme requires three conditions:

1. The declaration of a natural disaster by interministerial decree;
2. Deductible threshold met by policymakers (i.e. The amount of money policyholders must pay out-of-pocket for losses before compensation); and,
3. Damaged property must be covered by a property damage insurance policy.

Role of government:

- The government must declare state of natural catastrophe before private insurers can compensate policyholders;
- The government sets the natural disaster premium rates which is paid by policyholders and uniformly priced;
- The government provides state guarantee to cover excess claims over €4.8 billion; and,
- The government establishes natural disaster prevention and mitigation plans.

Strengths:

- The multi-peril scheme provides diverse insurance coverage against all perils declared by the government as a natural catastrophe.
- Risk pooling through automatic enrollment of natural catastrophe insurance within property insurance policies supports the accessibility and affordability of the scheme.
- Disaster risk mitigation incentivized by varying deductibles based on a municipality's risk mitigation strategies and the Barnier Fund (the principal instrument for co-funding disaster risk prevention measures), which is financed by insurance premiums.

Weaknesses:

- The unlimited state guarantee provided to the CCR Nat Cat and the relatively low reinsurance prices may result in adverse risk selection in reinsurance;
- The risk mitigation burden is shifted to municipalities, rather than individuals. Although this incentivizes better planning by municipalities, this may also incentivize policyholder risk-taking behaviour; and,
- Centralized determination of covered risk and heavy involvement of central government reduces the flexibility of the scheme in terms of coverage.

Japan Earthquake Insurance (Japan)

Japan is a country prone to frequent earthquakes, but traditionally, earthquake insurance was deemed too difficult to provide given the unpredictability and severity of the event. After many major earthquakes, the Japan Earthquake Insurance (JER) was established in 1966.

JER is offered as an optional addition to fire insurance, which covers buildings for residential use and/or personal property. As such, it is a prerequisite to carry fire insurance in order to carry JER. The earthquake risk for residential buildings and assets is partly shared by the JER, government, and the private sector. The JER is jointly owned by ten private insurers.

In terms of insurance coverage, the amount insured is within a range of 30-50% of the amount of insurance provided by the policyholder's fire insurance, limited to a maximum of 50 million yen (approximately $659K CAD) for a building and 10 million yen (approximately $132K CAD) for personal property.

Role of government:

- The JER cedes the majority of earthquake insurance liability to the federal government, under a retrocession agreement.
- The government's earmarked Special Account for Earthquake Reinsurance receives and manages reinsurance premiums, separately from the general fund budget.

Strengths:

- Sustainable insurance schemes have withstood several major earthquakes due to sound management of policy limits and conservative reinsurance coverage.
- Financial incentives are offered to invest in disaster risk mitigation:
  - Risk-based insurance premiums make policyholders aware of the underlying cost of risks with respect to building zones and types of construction.
  - There are discounts on premium rates offered to policyholders who invest in risk reduction.

Weaknesses:

- Partial insurance coverage may not meet the needs of the insured and may leave the policyholder at risk of significant out-of-pocket expense. While there may be a growing demand for higher coverage, such an increase in coverage would need to be carefully evaluated to maintain the financial sustainability of the system.
- Current risk reserves are not sufficient to cover the maximum liability. As such, the case of a major disaster would require immediate government budget appropriation or reallocation.
- This scheme has relatively low insurance penetration as typically associated with voluntary schemes.
- Differences in Japan's cultural and societal characteristics (i.e.. Law abiding, homogenous) can reduce the applicability of this scheme in other jurisdictions.

Key Findings Relevant to Canada

Property insurance is an important component of the housing finance system, and its health is tied to the health of the entire system. Having a well-designed property insurance system impacts achieving affordable and climate compatible and resilient housing. The impacts also extend to providing stability to the housing finance system when catastrophic events occur. The following six features were identified by industry subject matter experts consulted as the most crucial elements to consider when developing a catastrophe risk insurance pool in Canada.

Role of government and private sector

A major consideration for any risk insurance pool is the level of collaboration between the government and private sector. Typically, across the pools analyzed, the private sector provides insurance while the government develops supportive public policies that help mitigate natural disaster risk. The government may also develop partnerships with private reinsurance companies to lessen financial losses in years with significant climate events and to preserve capital.

Administrative ease

In terms of scheme design, a major consideration is the administrative ease associated with claims processing and other day-to-day management. Relevant factors may include contracting requirements, automatic processing capabilities, level of bureaucracy and associated decision-making timelines. Experience suggests that private insurers can process claims more rapidly, and that new technologies such as robotic processing and Artificial Intelligence have a role to play.

Risk exposure

Catastrophe risk insurance pools can discourage development in disaster-prone areas through pricing signals. For example, risk-based insurance premiums make policyholders aware of the underlying cost of risks associated with certain building zones and types of construction. Monitoring performance indicators such as natural disaster mapping and climate change data can also ensure that the risk exposure of the scheme is declining.

Funding mitigation

Insurance premiums collected within a catastrophe risk insurance pool can also serve as a source of funding for government disaster risk mitigation investments. Additionally, premium and/or deductible discounts associated with resiliency measures can encourage greater uptake of disaster mitigation investment among policyholders.

Take-up rates

High take-up rates are key to ensuring the effectiveness of the pool. Insurance companies typically use the Law of Large Numbers to determine appropriate and stable premium rates. Typically, as the number of policyholders increases, the probability of an outlier event impacting the financial stability of the pool will decrease. If the pool has low take-up rates, the Law of Large Numbers is not as applicable, and risks are borne by individuals and governments.

Risk pooling

Without intervention, only high-risk property owners are incentivized to insure. This increases premiums, making them unaffordable. With risk pooling, both low and high risks are insured, making average premiums more affordable. Risk pooling mechanisms can include automatic enrolment of natural catastrophe insurance within property insurance policies (but enrolment need not be mandatory; opt-outs could be allowed under certain conditions).

Full Report

Research Report: An international comparative study of catastrophic risk mitigation and insurance, **2021**

https://assets.cmhc-schl.gc.ca/sf/project/archive/research_6/20221017001researchcoveraninternationalcomparativestudyofcatastrophicriskmitigationandinsurance.pdf

Project Managers

Babak Mahmoudi Ayough and Rachel Shan
Housing Policy and Research
Canada Mortgage and Housing Corporation

CMHC helps Canadians meet their housing needs

Canada Mortgage and Housing Corporation (CMHC) has been helping Canadians meet their housing needs for more than 70 years. As Canada's authority on housing, we contribute to the stability of the housing market and financial system, provide support for Canadians in housing need, and offer unbiased housing research and advice to Canadian governments, consumers and the housing industry. Prudent risk management, strong corporate governance and transparency are cornerstones of our operations.

For more information, visit our website **cmhc.ca** or follow us on Twitter, LinkedIn, Facebook, Instagram and YouTube.

You can also reach us by phone at 1-800-668-2642 or by fax at **1-800-245-9274**.

Outside Canada call **613-748-2003** or fax to **613-748-2016**.

Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities. If you wish to obtain this publication in alternative formats, call **1-800-668-2642**.

70003 20221017-002A