



# Property Insurance Affordability:

Challenges and  
Potential Solutions

RESEARCH PAPER

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## Executive summary

Australia is one of the most sophisticated countries in the world in terms of risk pricing for natural perils. This reflects a significant evolution in pricing sophistication in recent years enabled by new technologies to measure risk and geocoded property location.

The transition to address level rating has resulted in some properties seeing price dislocation (sometimes upwards, sometimes downwards) reflecting granular measurement of risk. Given the variation in natural peril risks across households, this means the annual insurance premium for home insurance can vary from less than \$1,000 for many households to more than \$5,000 or \$10,000 for a small proportion in the riskiest areas.

Unfortunately, some homes in the highest risk areas tend to be in lower socio-economic groups; understandably they may not buy insurance and we have many examples of this when bushfires, floods or cyclones occur and people are not insured or are underinsured. Currently we lack a clear and widely accepted measure of affordability, which is necessary to target relief to those who need it. Public policy makers are looking to better understand affordability problems and potential solutions, as reflected in the Australian Competition and Consumer Commission (ACCC) Inquiry process which is about to report to Government.

Building codes to date have not fully considered property protection, community resilience and a changing climate, instead focusing on life safety and the current view of risk. Land use policies have not always fully considered today's view of risk, much less that of future states reflecting climate change. This, combined with insufficient economic signals for mitigation from postcode level insurance pricing in the past, has led to many properties experiencing a 'mitigation gap', where buildings have not been constructed to reflect today's understanding of risk or that which may arise in the future over their design lifetimes.

A key part of addressing the affordability pressures created by mitigation gaps and economic challenges involves increased mitigation and revisions to building codes; this will take many years and sustained funding. Current effort is nowhere near enough to address the issue rapidly.

Beyond mitigation and revisions to building codes, there are other things that can be done, such as reducing the impact of government taxes; those alone will not fix affordability but will reduce the extent of the problem. It is also important for homeowners to understand the natural perils risk at the time of purchasing a new property since insurance costs may represent a significant component of the cost of home ownership.

Some commentators argue for allowing economic forces to address the issue over time, but the level of consumer dislocation involved with this approach may not be acceptable. For example, mapping a sample of 15,000 quotes from a Finity supplied national buildings quote dataset shows 12 per cent of postcodes have medium to high affordability pressure across the country. In population terms, this equates to 7 per cent of Australia's population – the difference driven primarily due to the remote and regional nature of many of these communities. While these figures are illustrative only (with the key limitation being new quotes may inaccurately reflect actual premiums paid), they strongly suggest insurance affordability is an important contemporary issue.

There is a compelling public policy case for examining various ways of cross-subsidising some premiums for those experiencing extreme premium stress; if properly structured, such arrangements can provide some support to the people most affected while still providing economic incentives for good behaviour.

Arguments for targeted policies to reduce premium stress include increasing the take up of insurance, creating funds for research and mitigation, reducing government expenditures on post-event recovery, reducing intangible costs (such as mental health impact) in the event of loss from the 'peace of mind' that insurance can provide, and increasing overall economic activity by enabling development.

Climate change is an important factor to consider, as additional mitigation gaps will arise in some locations across Australia, leading to new pockets of affordability pressure for the foreseeable future. This implies that any solutions developed to address current stresses concentrated in Northern Australia should be robust enough to address similar issues which may arise in other parts of the country in coming years.

While the Institute strongly supports cost-effective mitigation, it is generally agnostic towards which other methods should be adopted to address the affordability problem. The Institute suggests certain guiding principles which can help identify the best other method/s.

- Creating proper incentives for mitigation to lower overall losses over time is fundamentally important.
- Generally, well-functioning competitive private insurance markets which limit government intervention are desirable in an economy such as Australia's.
- All else being equal, we believe robust private markets and risk-based pricing support long term public policy goals.
- As conditions change over time, we believe any solution framework needs periodic review.
- Temporary and targeted government intervention can be useful to manage affordability issues until mitigation and other measures address the issue.

We also recognise that targeted government intervention can serve important public policy objectives; sometimes these objectives do not align for all stakeholders – private insurers, developers, real estate agents, local councils or other stakeholders. This paper is designed to provide a framework for identifying paths to a solution and to identify tools which will enable better analysis of possible policies.

We have identified several design features which should be part of any framework to address affordability:

- the ability to target more vulnerable consumers most impacted by insurance affordability and the risks these consumers are exposed to;
- the sending of economic signals to consumers as to their underlying risk through pricing and other means; and
- the identification of what changes in behaviour are being encouraged, if any, in the short, medium and long term; and what cost that may have for the communities and governments.

We have identified certain areas requiring additional work:

- developing an affordability measure;
- selecting the right mix of policy measures to relieve affordability problems, support loss mitigation, and maintain a robust private market where possible; and
- agreeing on the general public policy principles of a solution, such as:
  - How much economic pain on a consumer/household is acceptable?
  - How much exposure can the government afford to mitigate such pain?
  - Should losses be pre-funded or post-funded, and in what proportion?

Ultimately, public policy decisions on which specific method or combination of methods is the most effective solution to address affordability issues must consider:

- what is the method's effect on the behaviour of all stakeholders to understand and mitigate risk;
- how does the method shift cost between various subsets of the population;
- is there any intergenerational impact if today's costs are pushed into the future; and
- what strategy exists for government to reduce its intervention in the market over time.

Almost every method to address affordability involves some distribution of cost across space and/or time to reduce affordability pressure for some subsets of the population today. Mitigation investments involve diversion of government resources or taxes today in order to generate benefits to certain communities in the future. Other non-pool methods such as community rating lead to cross-subsidies from policyholders with low risk properties to those with high risk properties. Pool methods are usually funded in part by levies or funding from outside the premium base of policyholders of high-risk properties, and so forth.

Public policy makers should identify and implement a mix of methods which yield the largest long-term benefit relative to their cost and level of disruption. Clearly, pre-funding mitigation, implementing forward-looking building codes and examining land use policies must be key parts of any sustainable strategy to improve affordability without excessive and unsustainable cross-subsidies. The overall goal should be to improve the risk profile of the population to maximise insurability of properties and minimise the need, in the long-term, for ongoing government intervention to promote resilient communities. In short, we need to future-proof Australia in a cost-effective manner to make affordable insurance available to as many people as possible.



# 1. Introduction

Affordability of home insurance is a very real issue in Australia. As reported through the ACCC's Northern Australia Insurance Inquiry process, on any number of measures affordability is a greater concern in Northern Australia than elsewhere. The likely economic consequences of recent events, particularly the widespread bushfires of the 2019/20 summer and COVID-19 pandemic, have further highlighted the importance of ensuring affordable insurance is readily available across Australia and major policy types.

This Research Paper has been prepared against that backdrop. It is intended to assist public policy makers and other stakeholders as they deliberate the response to the ACCC's report and conditions more generally. Although the analysis in this Paper is focused on home insurance, as that has been the focus of the ACCC Inquiry process, the principles and potential solutions can easily be extended to other general insurance policy types.

This Paper is structured as follows.

- **Section 2** discusses the issue of how to measure affordability, considering both the cost of insurance and consumers' ability to pay. It discusses protection gaps and presents an approach for measuring affordability pressures, followed by ideas for further research.
- **Section 3** discusses non-pool methods of addressing affordability. These include mitigation as well as product design and pricing, tax-free catastrophe reserves and direct subsidies.
- **Section 4** discusses pools and their broad design features. A survey of global pool designs, including thoughts on pros/cons of various approaches, is presented to outline the variety of structures available to use as models.
- **Section 5** discusses the success factors and design features of various methods that stakeholders, and particularly government, can take to alleviate affordability pressures. An approach to identifying optimal solutions is offered, with a framework for understanding design features that are available to public policy makers to vary along four dimensions: product features; pricing and funding; operations and the market; and maintenance, monitoring and exit. The importance of both an intervention and exit strategy for government is discussed. The case for increased pre-funding of mitigation and adaptation measures is also made, arguing that doing so lowers overall government spending in the long term.

## 2. Affordability measurement

### 2.1 Background

Insurance affordability pressure in different communities can be driven by natural hazard risk (impacting insurance premiums), economic factors (impacting individuals' ability to pay or absorb changes in risk), or by a combination of both. This issue is currently difficult to measure as insurance costs are not included in 'housing costs' measured by the Australian Bureau of Statistics (ABS).

Data driven insights into postcodes or regions of insurance affordability pressure can identify those Australian communities to prioritise appropriate solutions which address the natural perils risk, income available to pay for insurance, or both. Understanding those Australian communities for which affordability is the greatest problem can enable the development of solutions through collaboration between all stakeholders, including but not limited to the insurance industry (including reinsurance), all levels of government, regulators, home builders, mortgage providers and customer advocacy experts.

Affordability pressure is more than a 'business challenge' for insurers to solve. When housing affordability and cost of living pressures increase, property owners may choose to allow their policies to lapse or consider purchasing less insurance than required to restore their property after a loss event. This gives rise to what is considered a 'Protection Gap', property owners without sufficient insurance protection to recover well from loss events.

Protection gaps are a concern for individuals, communities, governments (taxpayers) and charitable organisations as they are called upon to bridge the gap through restoration and recovery of both property and livelihoods. It is also an issue for the sustainability of the insurance and reinsurance industries and their ability to pool risk.

Often it is the case that locations at greatest risk of natural hazards are populated by those with lower incomes and existing housing cost stress. However, a consumer's level of risk exposure does not necessarily correlate with their ability to afford insurance. For example, high income earners that choose to live in wind exposed coastal properties or flood exposed river frontage may be able to afford, and are willing to pay, a higher insurance premium.

The social concern arises where higher premiums occur in communities where there is less flexibility to absorb higher costs – for example, areas where homes are of poor resilience in peril affected areas and/or where income levels are low. This may arise where a location proves to have higher than expected risk after purchase, such as a discovery that a home has a greater than a 1 in 100-year flood risk after an updated flood study. Over time, climate change is expected to have a similar effect.

As insurance affordability pressure relates to a complex interaction of income level, economic circumstances, exposure to natural perils, land use planning and building codes in place at the time of build, the problem is not a challenge for insurers to solve alone.

Collectively across a community, insurance premiums can signal regions that can benefit from infrastructure or higher planning and building standards to reduce the risk of perils like flood or bushfire. Infrastructure such as dams and levees can materially reduce the level of natural perils risk to a community and reduce premiums. The flood levees in Roma are a good example of this (see Section 5.4.2). While Infrastructure solutions play an important role in building a more resilient built environment, they are not the only solution.

An appropriate measure of insurance affordability will consider natural hazard risk, insurance premiums, and wider economic and cost of living pressures in consumer decision making. Unfortunately, the measurement of housing affordability stress<sup>1</sup> in Australia does not include insurance premiums as is done in some overseas jurisdictions, such as in the USA.

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1 <https://www.ahuri.edu.au/policy/ahuri-briefs/3040-indicator>

A more holistic measure of housing affordability in Australia could consider the inclusion of insurance costs alongside the ABS housing costs measure. Were the next ABS survey or census to include insurance costs, it could also assist in measuring the protection gap over time.

## 2.2 Understanding insurance affordability pressure

The core drivers that typically influence insurance affordability pressure are:

- the cost of the insurance premium;
- the change in the annual premium cost on renewal;
- the annual cost of insurance related taxes;
- the income of the household; and
- the perceived value of the insurance.

## 2.3 The insurance premium

As the actuarial understanding of natural perils risk and the resilience or otherwise of properties has advanced to a granular locations level with increasing sophistication, insurance pricing has become an important risk signal to a homeowner. Less sophisticated pricing can enable cross-subsidisation and poor risk signalling to homeowners. With more sophisticated and granular pricing, two homes in the same street of a cyclone prone location can, for example, have very different premiums. A materially lower premium can be charged for the home built to modern building standards with a secure roof and design features to prevent water ingress, relative to one that is not.

Risk intelligence can enable insurers to reward customers that mitigate their risk, though this is not done in all cases. It can also result in riskier properties having higher premiums. High premiums alone are not unaffordable – for example, high income earners that choose to live in wind exposed coastal properties or flood exposed river frontage may be able to afford and are willing to pay a higher insurance premium.

## 2.4 Premium increases

Customers may experience sharp increases in premiums where natural perils events or scientific studies trigger a review of an insurer or reinsurer's view of the natural perils risk for a region.

Many households manage to a budget that can tolerate some premium increases depending on wider housing costs (such as mortgage or utility costs) and personal financial resiliency. Assuming all other factors remain steady, there will be a threshold over which an increase in premium results in premium affordability pressures. One way to measure this threshold is by linking to income levels of residents by area.

When the natural perils cost base has increased for an insurer, it can generally either pass on the full cost, not offer insurance or moderate the level of annual increases to premiums to reduce the risk of policy lapse. This latter practice is known as 'capping' and over the short term can minimise the number of customers reducing cover due to affordability pressure. However, over the longer term this can dilute the risk-based pricing signal. The withdrawal of insurance coverage from higher perils risk locations has been reported to have occurred in Northern Australia, particularly for strata.

## 2.5 Insurance related taxes and levies

The combination of taxes, duties and parafiscal charges can comprise between 9-31 per cent of a customer's total retail premium at point of sale, depending on the customers' State or Territory<sup>2</sup>. These amounts are charged proportionally, compounding the cost of insurance for customers with higher insurance risk premiums. In Australia, the main premium taxes affecting general insurance are Goods and Services Tax (GST) at 10 per cent and stamp duty, currently at 9-11 per cent depending on State (except for the Australian Capital Territory, which currently has no stamp duty on general insurance policies)<sup>3</sup>. In addition to these taxes, New South Wales (NSW) charges an Emergency Services Levy of 21 per cent to policyholders.

While comparison to overseas countries is challenging, given differences in types of taxes charged, at a high level Australian premium taxes appear to be higher than many developed countries based on several international comparisons

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<sup>2</sup> This was calculated within Suncorp

<sup>3</sup> Various state government sources. For example, for Northern Territory see: [https://treasury.nt.gov.au/\\_\\_data/assets/pdf\\_file/0003/481062/I-GEN-001.pdf](https://treasury.nt.gov.au/__data/assets/pdf_file/0003/481062/I-GEN-001.pdf)

compiled over the last decade<sup>4</sup>. There may be good reasons for differences in premium tax rates (such as greater reliance on the corporate tax rate for revenue from general insurers), but the result is that the policyholder bears a greater proportional tax burden.

An insurance affordability measure should include the cost of taxes, duties and parafiscal charges as they are a material and compulsory cost. The most practical way to account for this is to use retail premium at point of sale.

## 2.6 Income of the household and housing costs

Household income is a critical consideration in understanding affordability pressures as noted in section 2.3. The average number of weeks needed to pay for the annual cost of home insurance is a metric previously considered by Andrews and Lau (2018). The Australian average home insurance premium then was equivalent to 0.8 weeks of average weekly earnings<sup>5</sup>. To assist with deepening the understanding of affordability pressure by location, a more granular measure could consider calculating this for specific parts of Australia (including Northern Australia) and how this measure compares for home only, home and contents and strata insurance

One limitation of using Average Weekly Earnings (AWE) is that it does not account for other sources of income such as retirement and investment income. Building on the Andrews and Lau approach as well as existing measures of housing affordability developed through the Australian Housing and Urban Research Institute (AHURI), we have considered the impact of household disposable income on consumers' ability to absorb housing affordability pressure (Section 2.8 and Appendix A).

There is also a limitation in looking at aggregated statistics state or nationwide. For example, when considering housing costs and incomes on a nationwide average basis, there are no affordability pressures. Yet, when the ABS 2017-2018 Survey of Income and Housing<sup>6</sup> considered low income earners as a segment, there is housing affordability stress as there are many cases where housing costs<sup>7</sup> (which exclude insurance) are greater than 30 per cent of gross income<sup>8</sup>.

In the low-income group, 40 per cent of homeowners with a mortgage spend more than 30 per cent of their gross income, before considering insurance costs. 57 per cent of renters also face housing costs in excess of 30 per cent before considering insurance costs. Home insurance premium affordability shows similar patterns, with certain subgroups showing greater than average stress.

In the case of insurance, there is a greater likelihood of differences at a granular level because insurance premiums, unlike mortgage interest rates, vary significantly by location. Thus, insurance premiums could show similar issues to those of the ABS findings on household costs, but with a more complex interaction of income, location and level of property mitigation.

## 2.7 The perceived value of the insurance

Some part of the protection gap is due to homeowners perceiving insurance to provide insufficient value and/or an assumption that in the event of a loss government will provide assistance<sup>9</sup>.

Where a policyholder has a strong understanding of the risk of property damage and financial loss, the perceived value of insurance is likely to be greater. In many cases, the policyholder's understanding of risk and how the insurance policy responds are low but can improve after a natural disaster or claim. Insurers often see increased take up of insurance after severe natural perils, such as following the 2011 floods. Similarly, when those who have underestimated risk perceive risk is greater, they may try to purchase insurance, as was seen during the 2019/20 bushfire season. Insurers sometimes implement coverage embargoes to avoid homeowners attempting to buy cover as bushfires, for example, approach their property.

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4 For example, see:

(1) [https://www.pwc.com/sg/en/international-comparison-of-insurance-taxation-2011/assets/2011\\_central\\_cluster\\_comparison\\_of\\_international\\_insurance\\_taxation\\_one.pdf](https://www.pwc.com/sg/en/international-comparison-of-insurance-taxation-2011/assets/2011_central_cluster_comparison_of_international_insurance_taxation_one.pdf)

(2) [https://www.ey.com/Publication/vwLUAssets/EY-global-insurance-premium-tax-newsletter-issue-2/\\$FILE/EY-global-insurance-premium-tax-newsletter.pdf](https://www.ey.com/Publication/vwLUAssets/EY-global-insurance-premium-tax-newsletter-issue-2/$FILE/EY-global-insurance-premium-tax-newsletter.pdf)

(3) <https://www.airmic.com/news/guest-stories/overview-insurance-premium-taxation-across-europe>

5 <https://www.actuaries.asn.au/Library/Events/CAT/2018/CAT2018TimAndrewsPresentation.pdf>

6 <https://www.abs.gov.au/ausstats/abs@.nsf/mf/6553.0>

7 Housing costs defined simply as "the sum of rent payments; rate payments (water and general); and mortgage or unsecured loan payments (if the initial purpose of the loan was primarily to buy, add, or alter the occupied dwelling)". This definition excludes insurance costs, body corporate fees, repairs, maintenance and any rent assistance provided by the Australian Government.

8 The ABS measures housing affordability by a 30/40 rule whereby a lower income household is defined as within the lowest 40% of the income distribution and where they spend 30% or more of their gross income on housing costs (excluding insurance) can be considered 'housing stress'. This is a measure typically considered for home renters.

9 <https://www.insurancecouncil.com.au/assets/report/the%20non%20insured%20-%20report.pdf>

It is important for homeowners to understand the natural perils risk at the time of purchasing a new property since insurance costs may represent a significant component of the cost of home ownership. This is particularly important because it is not uncommon for high risk homes to be more affordable to buy. Lenders are also increasing their understanding of insured and uninsured natural hazard risk. They are expected to increase their engagement with customers as part of their responsible lending obligations, including the impact of climate change.

There are many dimensions of home insurance cover, often with quite different levels of coverage available for a dimension. Consumers may not value or understand important features or dimensions of an insurance product, which can lead to the issue of ‘false affordability’ – where a consumer believes they are receiving a comparable product, but at a lower price – increasing the risk of unintentional underinsurance.

One example is coastal storm surge coverage, not always offered as a standard policy feature and sometimes reflecting restrictive conditions. Another example is removal of debris. This product feature supports the removal of damaged property such as charred wood after a fire prior to reinstating a damaged home. There are different limits available for this dimension of cover, and this can be insufficient in relation to properties with damaged asbestos. A policy with no/zero limit or a low limit for this dimension is expected to have a lower price and may be incorrectly considered comparable to an alternative policy with better coverage on this dimension. Consumer education and simpler product disclosures are important tools to address this.

The perceived value of insurance is a measure that is expected to be correlated with the understanding of risk, the annual premium level, insurance industry reputation, successive premium increases and the level of household income.

While the perceived value of insurance is noted as a key element, it is not considered in the development of an affordability measure in this paper as it is difficult to quantify and requires research into consumer behaviour.

## 2.8 Proposed measures of insurance affordability pressure

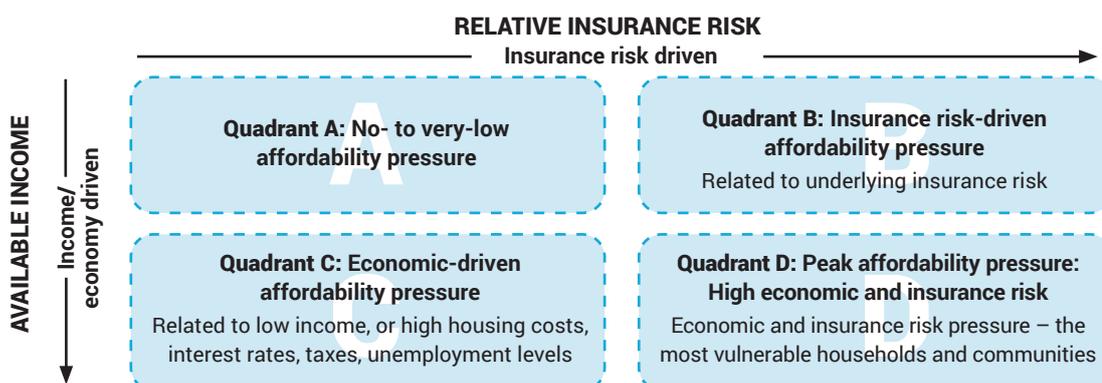
As noted in preceding sections, existing approaches to measure insurance affordability have typically focused on natural hazard risk and insurance premiums in isolation and have not connected insurance affordability pressure to wider economic and cost of living pressures in consumer decision making.

For this paper we have developed an approach to isolate the potential drivers of insurance affordability pressure in communities and enable monitoring over time (Figure 1). The approach is presented as illustrative and additional research is required to identify a robust measure for use in public policy decision making. It consists of three measures.

- **‘Available income’:** This measure combines existing metrics used by the ABS and researchers in assessing housing affordability pressure. It calculates household disposable income after tax (ABS Median Household Disposable Income) minus housing costs not including insurance (ABS Housing costs). ‘Low available income’ is defined as being in the bottom 40th percentile in line with existing approaches by the ABS and AHURI.
- **‘Relative insurance risk’:** This measure is a function of retail premiums at the point of sale, relative to the sum insured.
- **‘Affordability Pressure’:** This is a measure of the weeks of available income required to cover the retail premium. High pressure: 6+ weeks; Medium pressure: 4-6 weeks; Low pressure: 2-4 weeks; No pressure: 0-2 weeks.

Across these measures, a plot enables quadrants to be established.

Figure 1: Quadrants demonstrating affordability pressure

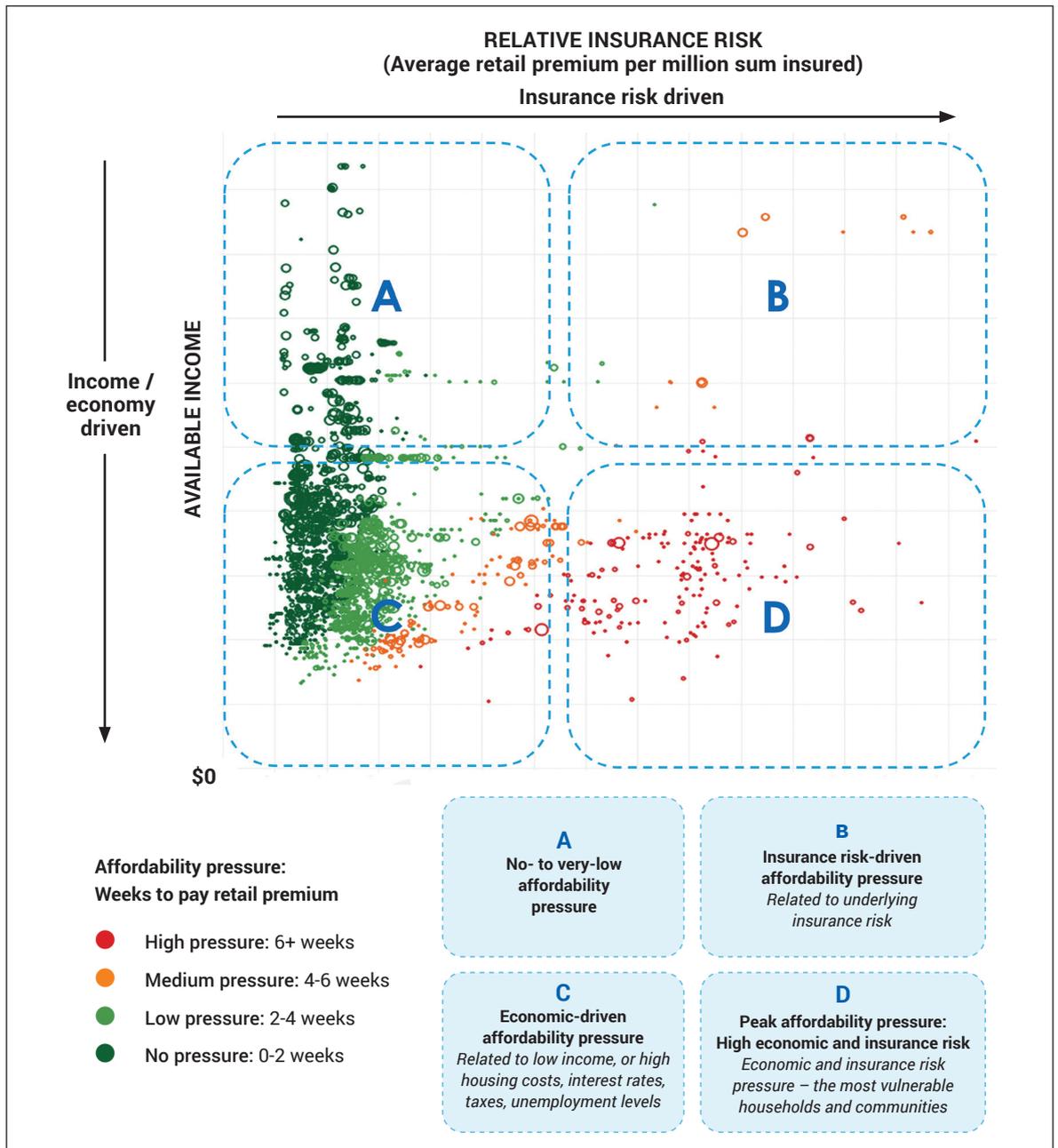


The objective of this approach is to assess how sensitive different communities (e.g. Local Government Area (LGA) or postcode level) may be to high insurance risk and costs relative to other housing costs, as opposed to calculating just housing costs including insurance.

## 2.9 Affordability Measurement Framework illustrated by postcode

To illustrate the Affordability Measurement Framework we mapped a sample of 15,000 quotes from a Finity supplied national buildings quote dataset to consider the affordability of home insurance by postcode. This showed that on average 88 per cent of postcodes can obtain affordable insurance quotes. However, 12 per cent of postcodes have medium to high affordability pressure across the country. In population terms, this equates to 7 per cent of Australia's population – the difference driven primarily due to the remote and regional nature of these communities.

Figure 2: Insurance affordability pressure (illustrative example)



The above plot of affordability pressure is colour coded with larger circles representing postcodes with larger accumulated sums insured from the sample.

The high affordability pressure postcodes are spread across three quadrants and larger circles could be targeted for prioritisation. The detailed data behind this could be further interrogated to help decision makers understand the relevant natural peril risks and affordability drivers in these locations.

The chart can be interpreted as in these examples.

- Broome is in Quadrant B where there is low affordability pressure – note this can be higher or lower within a postcode, as these are averages across the postcode – but high insurance risk, in this instance due to exposure to cyclone.
- Bundaberg is in Quadrant C and has economic driven pressure; however, it is nudging towards D and parts of Bundaberg are known to have material flood risk.
- Greater Geraldton is in Quadrant D. Although halfway down the Western Australia (WA) coastline, there is material cyclone risk and economic driven affordability pressure.

Additional information on the proposed framework for measuring affordability pressure can be found in Appendix A.

## 2.10 Limitations

One limitation of the approach is that it may be difficult to isolate granular differences between households within a postcode, or even at street level given the limitations of the ABS datasets.

A further limitation in terms of affordability pressure is the impact of other living costs not factored in the ABS dataset, such as groceries, childcare, healthcare or other insurances.

Further research on the prevalence and impact of insurance affordability pressure on underinsurance could also be pursued, as well as potential correlations with non-insurance rates in some communities or populations.

Regions with the greatest protection gap demonstrate the greatest affordability pressure and this is not explicitly captured in this framework.

Having an industry-wide data collection of in-force policies, potentially including statistics around lapse from the industry rather than switching between insurers, would assist in identifying peak affordability locations.

## 2.11 Other applications of the framework

This framework can be applied to different insurance products (e.g. Strata, contents and motor) and different elements of insurance product pricing (e.g. removing taxes).

Where analysis is repeated over time, improvements and deteriorations can be understood. Affordability pressure could improve in response to undertaking solutions detailed in subsequent sections of this paper. Equally, it could deteriorate as the economic and financial resilience of Australians is tested as we progress through the COVID-19 pandemic.

## 2.12 Insurer specific measures

It is difficult for individual insurers to assess the affordability pressure of their customers as they do not have insights into whether a customer lapses out of the insurance market or renews a policy with another insurer.

Collection of data on several aspects could be considered to help identify affordability trends, including the proportion of:

- policies with premium renewal increases above 15/20 per cent or an appropriate threshold that may indicate household budget pressure;
- policies with premium renewal increases capped (refer section 2.4) by insurers to remain below 15/20 per cent or an appropriate threshold that may indicate a delay in longer-term strong upward pressure on premiums;
- claims settled by cash settlement;
- high claims excesses or a large proportion written off or paid by instalments;
- claims withdrawn due to high excess;
- premium instalments on hold due to financial hardship; and
- proportion of policies with coverage opt out options such as flood.

## 3. Non-pool methods for affordability

### 3.1 Overview

Significant focus in the subject of addressing insurance affordability is given to insurance pools, the merits and design issues of which are discussed in Section 4. This section will consider a range of methods outside insurance pools which can be used to address affordability. This section describes each method and, where relevant, provides examples of where it has been used globally. These methods require support from various levels of government and/or private insurance companies.

The non-pool methods have been grouped into four broad categories.

1. **Mitigation**
2. **Insurance Product and Premium Design**
3. **Reducing Taxes and Other Costs**
4. **Direct Intervention**

### 3.2 Risk mitigation

#### 3.2.1 *Private and government risk mitigation*

The ACCC's Northern Australia Insurance Inquiry reports and many of the submissions made to the ACCC support risk mitigation as the most cost-effective solution to address insurance affordability in the long-term. This includes submissions from the Actuaries Institute, Insurance Council of Australia and Australian Prudential Regulation Authority (APRA).

The Institute strongly supports a greater focus on funding on adaptation measures that improve the resilience of individuals, businesses and the community to better withstand or avoid natural perils, rather than post-funding disaster relief and recovery. Currently, the balance of funding is heavily weighted towards post-funding. There is widespread evidence that the return on investment from considered pre-funding can be many times greater than the return on post-funding.

Risk mitigation can include the following.

#### ► **Community level infrastructure funded by governments**

The construction of a flood levee in Roma is an example of community risk mitigation. Allianz Australia was recently quoted saying that some Roma policyholders have achieved up to a 90 per cent reduction in their premium as a result. This example also highlights the partnership role that insurers can play with councils.

#### ► **Land use planning**

Land use planning includes local councils incorporating natural perils risk in their zoning process, for example by not allowing building development on land exposed to high levels of flood risk. Ideally this would be done consistently across all levels of government. The Institute encourages these processes to be dynamic to reflect the continually improved understanding of localised risks due to:

- improved technology, including advances in catastrophe modelling;
- higher resolution data at an address level; and

- learnings from recent events, such as the Queensland Floods, Cyclone Yasi or the 2019/20 bushfires.

Furthermore, as the understanding of risks improves and the suitability of land to specific uses changes, consideration needs to be given to equitable transition processes. The relocation of Grantham in Queensland (albeit a small town), is a useful case study where this impacted a whole town.

Land use planning should also be forward looking, as conditions are not expected to remain static in decades to come due to climate change.

### ► **Stronger building standards**

The Institute notes these standards have traditionally been set with regard to protection of life, yet this may be below community expectations of what is appropriate, especially when the high cost of intangible losses (including, mental health, domestic violence and alcohol abuse) is considered. The summer 2019/20 devastating bushfire season was the most recent illustration of this. Furthermore, the implications of a changing climate for building standards is also significant – for example, the expected southerly shift in cyclones will at some point warrant a change in building standards for newly exposed areas. The expected long life for housing and other structures highlights the importance of building standards having a forward-looking approach.

### ► **Household level retrofitting works on existing properties**

There are widespread examples of successful retrofit efforts, including the Queensland Reconstruction Authority financing of roof upgrades, window protection and strengthening of doors for cyclone risk. The generally higher cost of retrofitting compared to strengthening buildings during construction further underscores the importance of timely change to building standards.

## **3.2.2 Mitigation gaps**

An important concept is the notion of ‘mitigation gaps’, which is a term describing a situation where either the level or understanding of risk changes over time in a way that leaves a building inadequately protected against the level of risk it will face during its design lifetime. A building constructed at a given point in time with a 50 or 100 year design life may have been fully ‘fit for purpose’ at the time of construction but inadequately protected when conditions change. This can lead to either large increases in the cost of insurance coverage or a need for expensive retrofit, or both, with consequent affordability pressure.

The existence of mitigation gaps is a partial explanation for the onset of affordability pressure in Northern Australia, and the concept helps explain why it is not necessarily a property owner’s ‘fault’ if an older structure is not constructed to today’s understanding of risk. Since mitigation gaps can be caused by factors out of the control of a property owner, such as improved address level risk assessment technology or a changing climate, there is some public policy rationale for social solutions to affordability issues triggered by emerging mitigation gaps.

Minimising foreseeable mitigation gaps should be a goal of public policy. This is why building standards should take account of likely future conditions and the stresses those structures should be able to withstand, including from natural perils, over that long life. Recognising that protection against future costs generates long term benefits with short term cost, it is essential that cost-benefit analyses take a multidecadal view.

## **3.2.3 Multi-year policy with links to risk mitigation**

In Australia, insurance policies are generally one year in duration. Insurers are not obliged to renew coverage and, equally, policyholders may switch at any time. These factors do not encourage policyholders and insurers to collectively work towards long-term goals.

To the extent that risk mitigation represents a costly but ultimately valuable exercise that cannot be funded within a one-year time horizon, it makes sense to extend the period of insurance so that the insurance policy can embed a risk mitigation implementation plan and the sharing of its costs and benefits. This can also be supported by governments to make the mitigation work economically viable.

With a progressively greater understanding of the suite of risk mitigation measures that can be undertaken at different levels (e.g. householder or community levels) and cost/benefit over different time horizons, we believe greater research into how to embed mitigation into insurance product design would be worthwhile.

### **3.3 Insurance product and premium design**

#### **3.3.1 Community rating**

Community rating requires insurers to charge the same premium to customers with different risk characteristics. In contrast to free (i.e. unrestricted) risk rating by insurers, this rating option inherently creates cross-subsidies within the insured population.

Partial community rating has been in existence for many years within Australia's statutory schemes (i.e. where insurance is compulsory). In such schemes, the scheme designer makes value judgements on which risk factors can be rated and which cannot. Through careful selection of these factors and placing limits to which such factors can be used, a system of cross-subsidies can be created, thus alleviating affordability concerns for select policyholders while increasing costs for others. In the case of Northern Australia affordability issues, value judgements would also need to extend to which natural perils are worthy of cross-subsidisation (for example, only cyclone risk is cross-subsidised).

Where the level of cross-subsidy within the system becomes significant, the sustainability of the scheme could become challenging if the scheme is not compulsory. Optional schemes run the risk of insurers refusing to underwrite high risk customers, and lower risk individuals may become reluctant to purchase coverage at a price above that reflecting their risk. Even compulsory schemes require strong regulations to prevent insurers from being able to manipulate their portfolios towards preferred risks.

Acute sustainability issues for certain insurers could still exist even if the overall scheme is financially sustainable, due to the possibility of a maldistribution of high risks among insurers all required to charge a community rate, as discussed in the next subsection.

#### **3.3.2 Risk equalisation**

Risk equalisation is a mechanism that equalises the risk profile of insurers. It typically sits alongside community rating, such that any sustainability issues for individual insurers caused by community ratings' cross-subsidies are addressed. This occurs through a redistribution of funds from those insurers with higher risk portfolios to those insurers with lower risk portfolios. A significant design challenge of risk equalisation mechanisms is how to maintain incentives for insurers to act competitively, given it is known to them that their profits are capped and survival is guaranteed. There are also costs to administer the scheme, which can ultimately fall back into insurance premiums.

Risk equalisation exists in Australia's private health insurance market and was recently introduced in NSW Compulsory Third Party (CTP) insurance. It also exists in the US and many European health insurance markets.

#### **3.3.3 Base level compulsory product**

In Australia, options for basic cover already exist and these are offered readily in the private market. However, non-insurance for lower income groups remains a significant issue. The view of Good Shepherd Microfinance (Australia's largest not for profit microfinance provider) is that the real barrier for such groups is affordability, which includes consideration of premium amount, payment method and frequency. While some Australian insurers have trialled speciality insurance products targeted to this group, this method continues to be worthy of greater research, as it directly targets the issue of affordability. Research is required to find a model that is both affordable and can increase coverage. Examples of insurance policy design to promote affordability include changing excesses (also known as deductibles), different sum insured amounts and insuring only specific items.

In Switzerland, a basic home insurance policy is mandatory. This covers fire and some natural perils. This sits alongside a more comprehensive non-mandatory product.

The primary benefit of such products is providing an affordable alternative to full cover policies to help people recover after an event, reducing the need for government grants. When implementing these, however, it is important that purchasers clearly understand the limitations of cover so that they do not inadvertently believe they are receiving comprehensive coverage at a basic price.

### 3.3.4 Changing premium payment frequency

Paying premiums on a monthly rather than annual basis can improve access to insurance for some policyholders. Many insurers offer this option directly to policyholders. However, as noted by the ACCC's Second Interim Report, most (but not all) insurers charge an additional amount for monthly payments. The amount varies by insurer but can be up to 20 per cent of the annual premium. The surcharge is to cover additional administration costs, as well as additional expected claims costs from monthly payers in some insurers. This can present affordability challenges as a customer is faced with a choice of either needing to fund an annual premium in a single instalment or pay a significant loading on their premiums but in instalments.

Premium funding is another option offered by some insurance brokers, where the broker will pay for the annual insurance premium upfront and then the policyholder repays the broker in monthly instalments. This can be available for both domestic and commercial products. There are also insurance premium funding products available as part of business lending facilities (e.g. BOQ's Premium Funding<sup>10</sup> product and Allianz' Hunter Premium Funding channel<sup>11</sup>).

A premium funding product through either the private market or government could improve insurance affordability. With interest rates at record lows, the private market may be able to develop a lending facility for customers' annual insurance premiums with interest rates lower than the surcharges currently applied by insurers. If it were a government funded product, this could be means tested in a similar way to the direct subsidy option.

### 3.3.5 Parametric insurance

A few examples of domestic parametric insurance products have been developed in overseas markets. These covers provide small payments after the occurrence of a specified peril (e.g. earthquake or hurricane). They are designed as supplementary products to traditional home insurance, rather than as a replacement. For examples see:

<https://www.stormpeace.com/>

<https://www.jumpstartrecovery.com/>

While the products themselves are relatively affordable in terms of premium, they do not offer the comprehensive level of cover available from traditional insurance and may expose a buyer to uncovered loss due to 'basis risk', the risk that the index underlying the parametric payment does not exactly correlate with loss. There is the potential to adapt products to better suit the insurance needs of customers. However, this would need to balance the upfront premium savings with the cover available to customers, should an event occur.

## 3.4 Reducing taxes and other costs

### 3.4.1 Removal of frictional costs (taxes, brokerage)

The ACCC's Second Interim Report discusses in detail the frictional costs of purchasing insurance - taxes (stamp duty and GST) and, for commercial policies, broker remuneration. It recommends the removal of stamp duty and conflicted broker remuneration.

There is a strong economic case for removing stamp duty from insurance contracts. It has been canvassed in numerous Federal and State/Territory government reviews and inquiries with some of the key issues noted in Section 2.5. For Northern Australia in particular, policyholders are paying a disproportionate share of stamp duty due to the design of stamp duty calculation methodology (levied as a flat percentage of premium), which further exacerbates affordability issues.

Broker commissions are often also based on a percentage of premium. Under this structure, the affordability issues for high risk properties are worsened. It is unlikely that the increased commission is fully commensurate with an increased workload from obtaining policies and managing claims. However, the removal of broker commissions may have unintended consequences on financial literacy and non- or under-insurance rates. A move to a fixed dollar per-policy commission structure may assist in a more equitable outcome for high risk properties, relieving insurance affordability pressure.

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10 <https://www.boq.com.au/business/loan-and-finance/insurance-premium-funding>

11 <https://www.hpf.com.au/internet/hpf.nsf/docs/AU+Hunter+Premium+Funding>

### 3.4.2 Tax deductible catastrophe reserves

Pre-event catastrophe reserves would allow private insurers and reinsurers to establish reserves for catastrophic losses. Tax deductions may be offered on catastrophe reserve contributions. Catastrophe reserves are used in several jurisdictions, including Japan, some Caribbean countries and some European countries<sup>12</sup>.

In Australia, accounting rules stipulate that loss provisions can only be established for incurred claims that are known or yet to be reported and that unexpired risk provisions can only be held for premiums written but not yet earned. No tax credit is allowed for accumulation of reserves to meet a future event beyond the timescale of the accounting period. This means that Australian insurance companies are heavily reliant on reinsurance and capital (shareholder equity) to meet claims from catastrophe events and may release more profit to shareholders through dividends.

Establishing catastrophe reserves can progressively remove the need for purchasing the lower attaching, most expensive levels of reinsurance. The premiums for low attaching reinsurance will need to cover the expected cost of reinsurance recoveries, reinsurance expenses and the cost of the reinsurer's capital. In a competitive market, if these low layers are retained by the insurance company and funded from on-balance sheet reserves, there is potential for savings (from reinsurance expenses and the difference between the reinsurer's cost of capital and the insurer's cost of equalisation reserves) to be passed on to consumers, improving the affordability of insurance. The differential between the reinsurer's cost of capital and the insurer's cost of equalisation reserves may be enhanced by tax deductions on these reserves. We note that given that Australia is a diversifying risk to the global reinsurance system, the level of capital cost in reinsurance rates is relatively low. This will limit the potential benefit of these catastrophe reserves relative to high Probable Maximum Loss (PML) locations like Japan or Florida.

Catastrophe reserves are not allowed under current Australian accounting standard for insurance companies AASB1023. IFRS 17 accounting changes mean that AASB 17 will supersede AASB 1023 in 2023; AASB 17 does not allow catastrophe equalisation reserves either, which means that insurance companies are not allowed to carry over provisions on multi-year basis for future business (i.e. if no loss has occurred during the year then reserves must be released as profit). This accounting treatment likely makes catastrophe reserves an impractical solution for insurance affordability in Australia.

However, there is a possibility for the treatment of catastrophe reserves by the Australian Taxation Office (ATO) to deviate from the IFRS 17 standard by allowing a tax deduction. The ATO's treatment of insurance profits under IFRS 17 has not yet been finalised and it is possible that accounting profits will differ from taxable profits. It is noted that allowing pre-tax catastrophe reserves may reduce tax revenue to the ATO while the catastrophe reserves are built up by insurers and entail material deviations between financial statements for external disclosure and tax purposes.

## 3.5 Direct intervention

### 3.5.1 Direct subsidies, concessions and rebates

The ACCC's Second Interim Report provides a detailed discussion of the costs and benefits of direct premium subsidies payable by the government. This includes cost and eligibility criteria for a subsidy. The report concludes that a direct subsidy is the most direct way to relieve acute affordability issues experienced by some customers.

However, while subsidies may alleviate the short-term affordability issues, they can have the impact of lessening risk signals and communities' understanding of inherent risks, reducing policyholders' incentive to invest in risk reduction. Conversely, if the cost of a subsidy to the government depends on the underlying insurance premium, this could provide an incentive for community level mitigation to reduce these costs.

There are some important design considerations for a premium subsidy program.

- Means testing a householder's premium level can ensure benefits accrue to those most in need.
- The scope of the program would need to be well defined (i.e. covering just residential property or extending to strata and commercial properties or limiting eligibility to only owner-occupied primary residences).
- Defining whether the premium or excess (which is sometimes also referred to as a deductible) is subsidised. By subsidising an excess, the policyholders can choose a higher excess and reduce their upfront insurance costs. Similarly, subsidising a premium will permit policyholders to choose a lower excess and provide greater coverage.
- Limiting subsidies to existing properties so that further development is not encouraged in high risk areas.

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12 [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=893154](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=893154)[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=893154](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=893154)

### **3.5.2 Regulatory involvement in insurance**

Government involvement can occur in a variety of ways. Government can give direction, approval or oversight of private insurers' pricing (e.g. in relation to premium levels, profit margins and insurers' expenses). This can be an effective method in addressing affordability issues. Government can also intervene directly on the cost base of insurers, as in some personal injury schemes, where government can set fee schedules for service providers (for example, scheduled rates for builders) or set price ceilings on individual claim items. Caps on claim benefits can also be imposed.

Australian insurers operate with strong prudential requirements that require holding significant capital. Government can also intervene through provision of cheaper capital to insurers or by relaxing capital requirements.

## 4. Pool methods

Risk pooling mechanisms may also, or alternatively, be used to address insurance affordability and availability issues, with the ultimate goal of managing risk and alleviating the financial consequences of natural hazard or man-made disasters. The objectives of the pool will determine the method and features of the pool design but will generally be focused on reducing a protection gap arising from affordability and/or availability issues. The pool's key function may be to move risk from potential policyholders and the private insurance market and ultimately transferring it onto a government or government sponsored entity's balance sheet, redistributing risk across policyholders to smooth the price for high risk policyholders, or a combination of the two. Australian and international examples are set out in Appendix B to this report, and we summarise the different pooling methods below.

### 4.1 Types of pools

As set out in Appendix B, we have reviewed Australian and international pools, divided into two key types of pooling approach: **reinsurance pools** and government or semi-government direct insurers which essentially act as **insurance pools**. Pools often have an element of subsidy, either from government revenue or between policyholders, and compulsion to spread the expected higher costs of policyholders of higher risk properties across a wider pool of policyholders, thereby reducing affordability issues for policyholders of higher risk properties. Importantly, unlike private sector insurers which must fund losses temporally, government sponsored pools can defer part of the cost of current risk into the future through capital market financing, direct support from government revenues or similar mechanisms. Thus, government pools can spread losses across space (e.g. to overseas reinsurance markets) and time (e.g. future generations through capital markets bond issuance).

There is a third method of pooling, which is compulsory and comprehensive insurance pooling for an entire country's risk sector at a controlled price. An example of this is the Accident Compensation Corporation (ACC) in New Zealand, which provides no-fault compulsory insurance cover for personal injury in an accident, whether a citizen, resident or visitor of New Zealand. We have not looked in detail at this pooling method, as it does not seem applicable to the issue of the natural disaster protection gap in Australia.

Insurance pools provide coverage directly to policyholders, often via utilising traditional private insurers as distribution mechanisms to issue policies, collect premiums and pay claims. Examples of insurance pools are the Earthquake Commission of New Zealand, the National Flood Insurance Program in the US, Citizens Property Insurance Corporation in Florida and the California Earthquake Authority. The common theme across these insurance pools is that they were often established after a major loss event. They are intended to address availability issues where retail policyholders are heavily exposed to a peril but have evolved over time to address affordability in some cases. The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is an example of an insurance pool that provides insurance solely to member nation governments.

Reinsurance pools act as reinsurers of the private insurance market and will commonly cover one peril or part of the risk from one peril. Reinsurance pools will charge reinsurance premiums or levies to individual insurers. They often access reinsurance markets (as retrocession) or capital markets, in addition to government/treasury acting as reinsurer of last resort. Examples of reinsurance pools are Flood Re in the UK, the Florida Hurricane Catastrophe Fund and the Australian Reinsurance Pool Corporation. Reinsurance pools may be particularly useful to improve the efficiency of access to reinsurance and capital markets where there has been a disruptive fluctuation in reinsurance availability.

The key distinction between the two types of pools is the way they interact with policyholders. Insurance pools directly set prices, coverage, eligibility and other parts of the insurance cover, allowing policy makers more direct control over the offering to the public. Introduction of an insurance pool will tend to replace or shrink the market share of private insurance companies, particularly in periods of insurance capacity scarcity. Reinsurance pools operate indirectly, by providing benefits to insurers operating in the market, such as efficient access to international reinsurance markets or implicit benefit of a government backstop. Private insurers will still retain and manage significant risk on their own balance sheets, passing only part of the risk to the reinsurance pool. Thus, policy makers have less direct control over

what is offered to the consumer, but gain more participation in funding losses from insurers and increasing the private market's role in providing coverage. This potentially reduces government exposure to directly funding losses through social security and ex gratia payments.

## 4.2 Observations of pool methods

Based on our observations of the sample pools in Appendix B, we find a few common themes relating to pools.

Clearly the benefit of having cover in place post-event can be demonstrated, even for those pools where the take up rate was relatively low. However, actual premium savings arising due to the pool operation are difficult to assess. A number of the pools self-estimate the premium savings/discounts, but in these cases it is difficult to independently verify the savings estimates, either because there was no immediate benchmark premium available in the private insurance market or the pool may be covering risks where coverage was previously unavailable, or was provided without cost due to lack of recognition, e.g. terrorism cover pre-2001. Even in those cases such as the California Earthquake Authority (CEA) where the pool operates alongside the private insurance market, the sub-set of risks covered by the CEA are not comparable to the risks retained by insurers.

As government or semi-government entities, there are several instances where pools have been financially resilient in extreme natural catastrophe events. Examples of this are EQC NZ after the 2011 Christchurch Earthquakes and the National Flood Insurance Program after severe hurricanes (Katrina in 2005 and Sandy in 2012); in both cases, the pools were technically insolvent, but due to their explicit government backing they were able to continue to operate and move to regain solvent status. Capital requirements for government pool entities are often lower and more flexible than for private insurance market entities and the ability to borrow from government or from capital markets with the benefit of a government guarantee are clear operational advantages.

It is not common practice for pools to have specific termination dates and only the minority of pools in our survey have exit or windup plans. While in some cases, such as Citizens Property Insurance Corporation of Florida, the pool was set up to address an insurance availability gap that government expected to be short-term in nature, it does not have an exit strategy or windup plan, though it does engage in 'depopulation' initiatives to reduce its exposure.

Our pool sample has only a few examples of pool windup or exit upon meeting specific assessment criteria (e.g. in case the private insurance market is judged to have expanded capacity and be adequately addressing the original protection gap). UK Flood Re's statutory purpose includes a specific transition plan for risk reflective insurance pricing for households at risk of flooding, and to exit the market by 2039 assuming its objectives are met by that time.

The Australian Reinsurance Pool Corporation's (ARPC) governing Act includes a requirement that, at least once every three years, there is a review of the need to continue in operation. At the 2018 review, it concluded the global reinsurance market had insufficient capacity to offer uniform terrorism risk insurance coverage to the Australian market at affordable prices, a situation unlikely to change in the near term. The combination of a stated target windup date and regular reviews against plan may be considered a best practice approach.

There are two basic reasons driving the issues underlying government decisions to create natural disaster pools. In some cases, the level of exposure is so large that a location represents a 'peak zone' for global reinsurance, meaning the potential loss is so large that the risk is difficult to diversify across global markets. In such cases the cost of capital supporting the reinsurance offered can be such that the system is unable to offer sufficient capacity at a price considered 'affordable'. Examples of this situation include Florida hurricane, California earthquake, and Japan earthquake or tsunami. In other cases, the issue is not the aggregate size of loss but the level of risk at a particular location as expressed by Average Annual Loss (AAL). Here, the issue is not cost of capital but rather cost of expected loss. Examples of this include flood risk along rivers in the US or cyclone risk in Northern Australia.

There has been considerable discussion in government and industry forums as to establishing a pool to cover pandemic risks, such as business interruption risks arising from pandemic. This type of systemic risk poses significant aggregation of risk across multiple industries and locations. These types of risks are better suited to the third type of pool referenced above, with compulsory and comprehensive insurance pooling at a controlled price. Our pool sample did not look at these types of pools, as we focused on natural and man-made hazard risk pools.

### 4.3 Pool objectives and success

Measurement of success against pool objectives is discussed in detail in Section 5, however from our review of information on sample pools we observe several common factors across multiple pools.

The main purpose of establishing a pool is financial protection of those who are potentially un- or under-insured, with a goal of increasing community financial resilience. For selection of the pool method, there should be a clear remit and defined measure of success, specifically the measure of the protection gap, so it can be assessed against agreed objectives. One of the more difficult aspects to reconcile is the different perspectives and objectives of pool stakeholders, including government, policyholders, insurers and others such as real estate developers. While these parties will often agree that successful methods will have elements of both bridging the protection gap via financial means and reducing the protection gap by encouraging risk reduction, the balance between these priorities may vary widely by stakeholder.

For example, the Earthquake Commission in New Zealand is generally viewed by stakeholders as a successful example of a pool. It operates as an effective and efficient insurance pool for earthquake and related perils covering the first NZ\$150,000 of damage per property, including coverage for types of risks that are often under-insured in the traditional insurance space, such as the peril of natural landslip and damage to land value. It provides access to global financial markets to provide capital for recovery following a disaster (i.e. reinsurance, alternative capital providers such as Insurance Linked Securities and/or post-loss funding via debt issuance). However, since its primary objective is affordability, the flat rate levy pricing means there is minimal risk signal in its pricing. While it does encourage resilient construction after a disaster, it has few methods to financially incentivise homeowner risk reduction measures for cover to continue. EQC does, however, play a central role in risk identification and education to assist with disaster resilience. It actively participates in earthquake knowledge sharing, particularly via open data sources/tools to develop an aligned view of where the risk lies.

Our key observation as to the measurement of success against the sample pools' goals and objectives is that such measurements may be difficult to make in an objective and rigorous manner. In the case of any insurance or reinsurance pool that may be established, we recommend not only that the pool's goals and objectives be clearly defined at establishment, but that the framework for measurement of progress against such goals and objectives be established also, including the timing, quantification and potential response to such measurement. Time limitations on the pool (e.g. windup or re-purposing) should also be considered as part of this measurement framework.

## 5. Success factors and design features

### 5.1 What does success look like?

There are multiple stakeholders to consider in the home insurance affordability equation, as noted in Section 2. These stakeholders have some common and unique interests and view 'success' differently.

Two broad lenses through which the market is viewed by the various stakeholders are:

1. Consumer-focused: availability and affordability of cover are more important to consumers who are focused on the quantum of their insurance premium and the value they get from it<sup>13</sup>, as well as the Australian Securities and Investments Commission (ASIC) and local and state governments whose primary interest is to advocate consumer outcomes (we refer to these stakeholders collectively as 'Group 1 stakeholders'); and
2. System-focused: Insurers, APRA and the Commonwealth government focus on ensuring longer term sustainability of the home insurance market and industry, in terms of suitable products, fair pricing and access for consumers, and appropriate consideration of risks, including climate-related, to ensure longer term profitability and solvency of the industry with the underlying aim of protecting consumer interests (we refer to these stakeholders collectively as 'Group 2 stakeholders').

Some stakeholders, such as the ACCC, real estate and building industries, and related parties, cannot be neatly categorised

If a longer-term view of success were taken by each stakeholder, understanding the weight of costs from future disasters would likely lead to a re-prioritisation of how success is achieved. Risk mitigation would take priority because this assists in keeping premiums down for consumers via reduced claims costs, reduces the cost of post-disaster relief for the government, and creates a more sustainable insurance industry in the long term, particularly considering risks associated with a changing climate. Ultimately, increasing consumer participation will allow a smoother transition over the medium to longer term to a more normal insurance market structure whereby the benefits of risk mitigation allow relief of insurance affordability pressure, requiring less government intervention. There is strong evidence within Australia and abroad that insurers will pass on risk mitigation discounts, allowing government funding to reduce over time as the benefits of risk mitigation are realised. (Further details are provided in section 5.4.)

However, given the current, immediate affordability concerns faced by the home insurance market in Northern Australia, other short-term measures to mitigate acute affordability concerns should continue alongside risk mitigation work.

Determining the mix of methods to address the affordability problem requires location specific analyses to understand:

- the root cause of the affordability pressure - whether it is driven by natural-hazard risk (impacting insurance premiums), economic factors (impacting individuals' ability to pay or absorb changes in risk), or by a combination of natural hazard and economic risk (recall Figure 1);
- how effective each method is likely to be in improving affordability and manifesting in increased insurance coverage (the end objective). Part of this depends on the scale and timeframe of investment required and how, in the case of mitigation investments, that will alter the risk of losses from natural disasters occurring in that location. Other aspects include how tightly targeted the method is to consumers who are most vulnerable and responsive. Cost-benefit analysis is a tool which can inform this analysis; and
- the extent to which unintended consequences can be avoided, especially that price signals are not reduced to the point where mitigation incentives are excessively eroded.

### 5.2 General observations

Generally, well-functioning competitive private insurance markets which limit government intervention are desirable in an economy such as Australia's given its mostly open and transparent markets and high standards of prudential and corporate regulation.

<sup>13</sup> We note that while these views are not backed by consumer research, actuaries have sound knowledge of insurance risk drivers, consumer price behaviours, and more broadly have been involved in or read related research.

Where there is a public policy case for intervention *targeted premium or direct subsidies which are provided via means testing can target acute affordability concerns at the individual consumer level better than the other methods*. However, without consideration to the underlying risk of individual properties this approach may not result in the right price signals being sent to consumers. For example, if using a targeted subsidy results in the same premium being charged for a high-risk property with affordability concerns as a low risk property with no affordability concerns, the price signal may be the same, while the underlying risk is not, and therefore the price signal is distorted.

There are potential methods of reducing the price signal distortion, including disclosure of the dollar amount of government subsidy on insurance policy documents with clear indication that this is not intended to be provided for the long term, and implementing guidelines for accessing premium subsidy benefits such as joining in a proposed government risk mitigation program.

*Government reinsurance pools and government insurers are more aggregated methods in comparison to targeted premium subsidies*. These may improve affordability in aggregate across a group of consumers, however they may not target individual consumer affordability concerns as well, depending on the structure of the program. These methods may bring expected costs down from an insurer's perspective, allowing insurers to reduce premiums. Our assumption is that this will be passed on by insurers to consumers proportionate to the underlying risk, which does not take account of ability to pay. A similar point can be made for taxes and levies.

*Adopting a combination of methods is possible*. There are some downsides to this, including increased operational complexity and potentially greater difficulty for the government to reduce its financial involvement.

### 5.3 Specific methods and design factors

The tables in Appendix C give examples and options for specific design factors for each of the three key methods of targeted premium or direct subsidies, a reinsurance pool, and government insurers, as well as the option of risk mitigation.

There is a wide range of possible design choices for each method with some overlap across different methods, most notably between government reinsurance pools and government insurance. The different design choices can be considered across four key categories.

#### ► Product design features

Product design choices impact how funding is allocated across different consumers and risk exposures to reduce the ultimate cost to the consumer. Consequently, these design factors will have a significant impact on the success or otherwise of any selected method(s). Design factors include:

- Geographic restrictions
- Eligibility restrictions
- Whether compulsory or voluntary
- Events/perils covered
- Specific product structure or risk exposure – e.g. quota share vs excess of loss reinsurance

#### ► Pricing and funding

This entails the source and cost of funding, and the consequential level of potential premium relief. Group 1 stakeholders may be more motivated by the latter, while Group 2 stakeholders will likely have a greater interest in the former. Design factors include:

- Targeted level of spend/premium relief
- Pricing approach and mechanics
- Feasibility of pricing – e.g. available expertise and data
- Source of funding

#### ► Operations and the market

Any selected method(s) must be embedded or closely interact with the existing insurance market and stakeholders identified above. Avoiding friction, or positively benefiting from available operational synergies, may reduce costs or

enhance the scale and effectiveness of any selected method(s). Design factors include:

- Relationship of proposed solution to current players – e.g. player in a free market or state privileged entity
- Distribution arrangements
- Possible operational synergies with current players

#### ► **Maintenance, monitoring and exit**

Any solution would need to consider how it would evolve in the face of changing social, market or environmental conditions. How restrictive should its mandate be? Should a scheme be able to evolve and solve new social issues as they arise, or should the scheme's goals and reasons for funding be tightly fixed at inception? If change is anticipated, how should the scheme initially be set up to facilitate it, including winding up the initiative if required? Once the public's expectations have been set, there could be significant inertia to keep things as they are. Design factors include the ability to:

- Smooth early adverse experience/costs
- Transfer costs/benefits between years
- Monitor effectiveness
- Respond to changing conditions, e.g. by changing terms of reference/mandate
- Terminate arrangements

As highlighted above, the impact on insurance affordability will depend on the specific details and thresholds of each selected factor and any potential unintended consequences.

In this analysis we have not included the effect of reducing the taxes and levies discussed in Section 2.5 because doing so would directly reduce affordability pressure and thus would confuse the discussion of the policy methods which are the focus here.

However, reform of taxes currently associated with insurance premium to a more equitable basis would have significant benefits.

- It could enable greater insurance protection for all Australians. Currently, homeowners (and by extension, renters) with higher risk premiums make the greater contribution to tax revenue, increasing affordability pressure. Often homes in areas of high insurance risk are occupied by people with a lower income, reducing the equitable contribution to this government revenue stream.
- In NSW it could also enable fairer funding of emergency services. Currently, in NSW those not buying insurance, or under-insuring, are not equitably contributing to the service levies for emergency services. The legacy of insurers collecting fire service levies dates to a time when insurance companies had their own fire service for their own customers. Reform to remove these charges from insurance premiums, as has occurred in other States, is required to ensure all users of emergency services contribute equitably through other mechanisms such as rates or income tax.

## **5.4 Long-term considerations and case studies**

All stakeholders have a role to play in improving affordability in Northern Australia. The consideration of the long-term potential impact on government balance sheets and following case studies show a significantly higher benefit to consumers and the government, and the stability of the insurance market more broadly, from investments in preventing loss. Further material is available in numerous reports, including by the Productivity Commission (2015), the ACCC Northern Australia Insurance Inquiry process and the Royal Commission into National Natural Disaster Arrangements.

### **5.4.1 Balance sheet impact of increased mitigation investment**

In the longer term, absent of increased investment in risk mitigation, we expect that post-disaster funding will continue to increase at least with the inflation of building material costs and potentially at a much steeper rate considering climate change. If government does not carefully reconsider its mix and level of financial intervention, post-disaster mitigation may become material to government balance sheets on an ongoing basis. The cost of pre-disaster funding is expected to be proportionally much lower than the cost of natural disasters to the government.

### 5.4.2 Roma levee risk mitigation case study

The Roma flood levee and associated infrastructure to protect against future flood risks and hazards has been well documented, including in the ACCC's Northern Australia Insurance Inquiry Second Interim Report.

Although the Roma example relates to a different peril, floods rather than cyclones, and relates to community rather than individual property-based risk mitigation, it shows the impact of risk mitigation on insurance premiums over the short and longer term, increasing affordability to consumers.

The cost of the levee was \$23.9 million over two stages; stage 1 commenced in 2013 and was completed in 2015 costing approximately \$15.6 million and stage 2 was completed in 2019, costing \$8.3 million.

The benefits of the levee to consumers and government have been clear.

- Some insurers provided public mitigation discounts of around 21 and 30 per cent as an immediate response for new customers in Roma. For a limited number of insurance policies that were written since 2012–13, the retail premium has decreased by up to 90 per cent. Customers who had maintained insurance cover since 2012–13 appear to have been rewarded more. These reductions were maintained or increased slightly in subsequent years. There is a strong correlation between the changes in average retail premiums and changes in the flood component across all insurers, with both decreasing substantially in 2012–13 to 2014–15 and remaining relatively stable from 2015–16 to 2018–19.
- The Queensland Government announced the flood risk for more than 500 Roma properties was officially downgraded, with the approval of updated flood maps for the area<sup>14</sup>. Decreases in flood risk rating levels were generally consistent with the decreases in the average retail premium and average flood component for 2012–13 to 2014–15, coinciding with the timing of the stage 1 levee.
- An Urbis report<sup>15</sup> showed 4.9 times benefit to cost ratio over a 50-year horizon reflecting the long-term nature of the levee structure. This is significant benefit to consumers and the government in the long term. Reductions in insurance premiums were included on the basis that construction of a flood levee reduces uncertainty and therefore provides greater ability by insurers to adequately and appropriately price premiums based on risk. A 60 per cent reduction in insurance premiums was expected in Roma based on market information from insurers and up to a 90 per cent reduction in premiums was achieved. This discount was applied to households and businesses considered at risk of flooding.

### 5.4.3 Queensland Cyclone Risk Mitigation case study

As part of its economic stimulus response to the COVID-19 pandemic, the Queensland Government extended funding to help improve the resilience of homes and reduce premiums in cyclone-affected regions via the 'Household Resilience Program'. This is further supported by Federal Government funding. The Program has already proved successful in supporting local jobs and helping people save on household insurance premiums. The State Government notes 1,749 households from Bundaberg to Cape York Peninsula have already seen insurance premiums reduced by an average of \$310 p.a. under the program. Importantly, this shows that many insurers have already proved willing to recognise improvements that lower risk to cyclones via lower premiums. Suncorp's Cyclone Resilience Benefit provides customers in the region with premium reductions of up to 20 per cent for making their homes more cyclone resilient.<sup>16</sup>

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14 Queensland Government (2019).

15 Urbis (2014), pages 14-15.

16 The Household Resilience Program is now closed for new applications.

# Appendix A: Affordability measurement

The conceptual framework adopted to measure affordability pressure in home insurance is shown in Figure A.1.

Average retail **premium** per \$m of property insured is indicative of relative insurance risk, a large part of which is driven by the risk of natural perils. Equivalised disposable household income (income available after tax) less ABS Housing costs (which excludes insurance costs) is indicative of the economic capacity to pay or absorb the insurance risk. Using equivalised household income allows for comparisons to be made across different household sizes. The higher the ratio of premium to income, the greater the affordability pressure.

An important limitation, which has been driven by data available to the Working Group, is that premium is new business quotes, which may or may not reflect actual premiums paid, and at a postcode average level. This data is collected by Finity and was available to the Working Group. It covers more than 3,000 postcodes. Areas for improvement would be obtaining actual premiums paid and examining variability within individual postcodes.

Figure A.2 shows the results of applying this framework. The colour shows the level of affordability pressure. Dark green indicates the lowest pressure of 0-2 weeks of income required to pay the premium and red the greatest pressure of more than 6 weeks of income required. The size of circle shows the total sum insured in the postcode. Our sample indicates there are many postcodes where affordability pressure is low (shown in green) – 88 per cent have low or no affordability pressure.

Figure A.1: Key concepts in the Affordability Measurement Framework

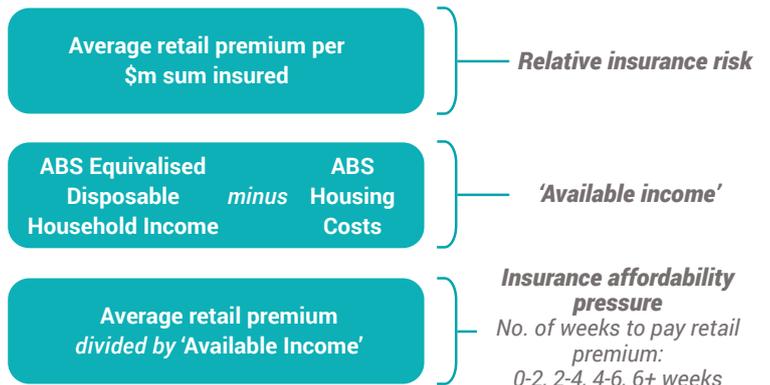
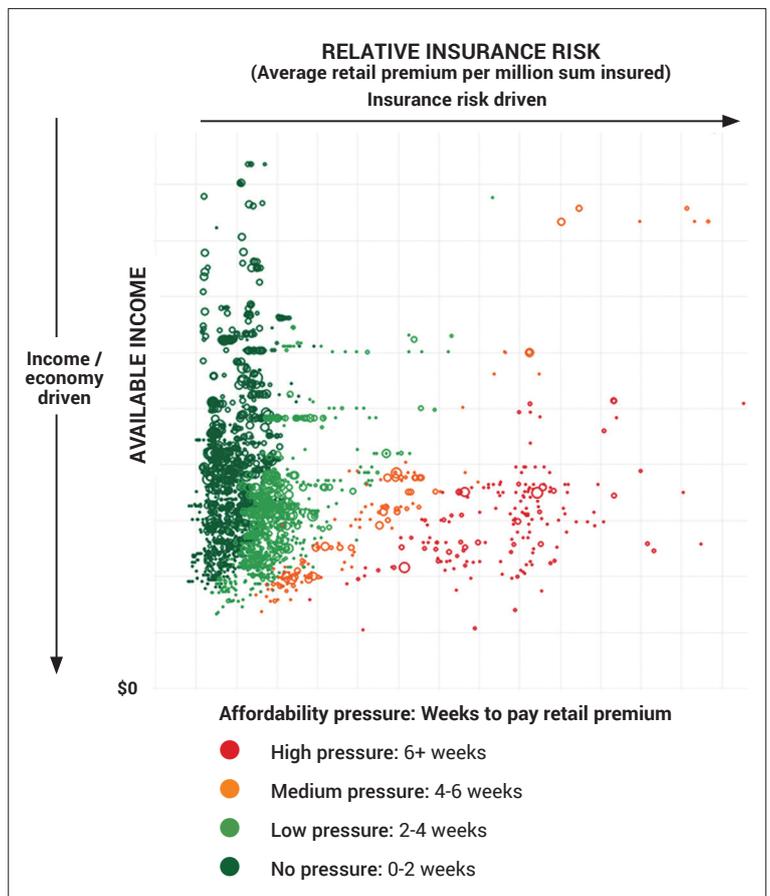


Figure A.2: Illustrative application of the Affordability Measurement Framework



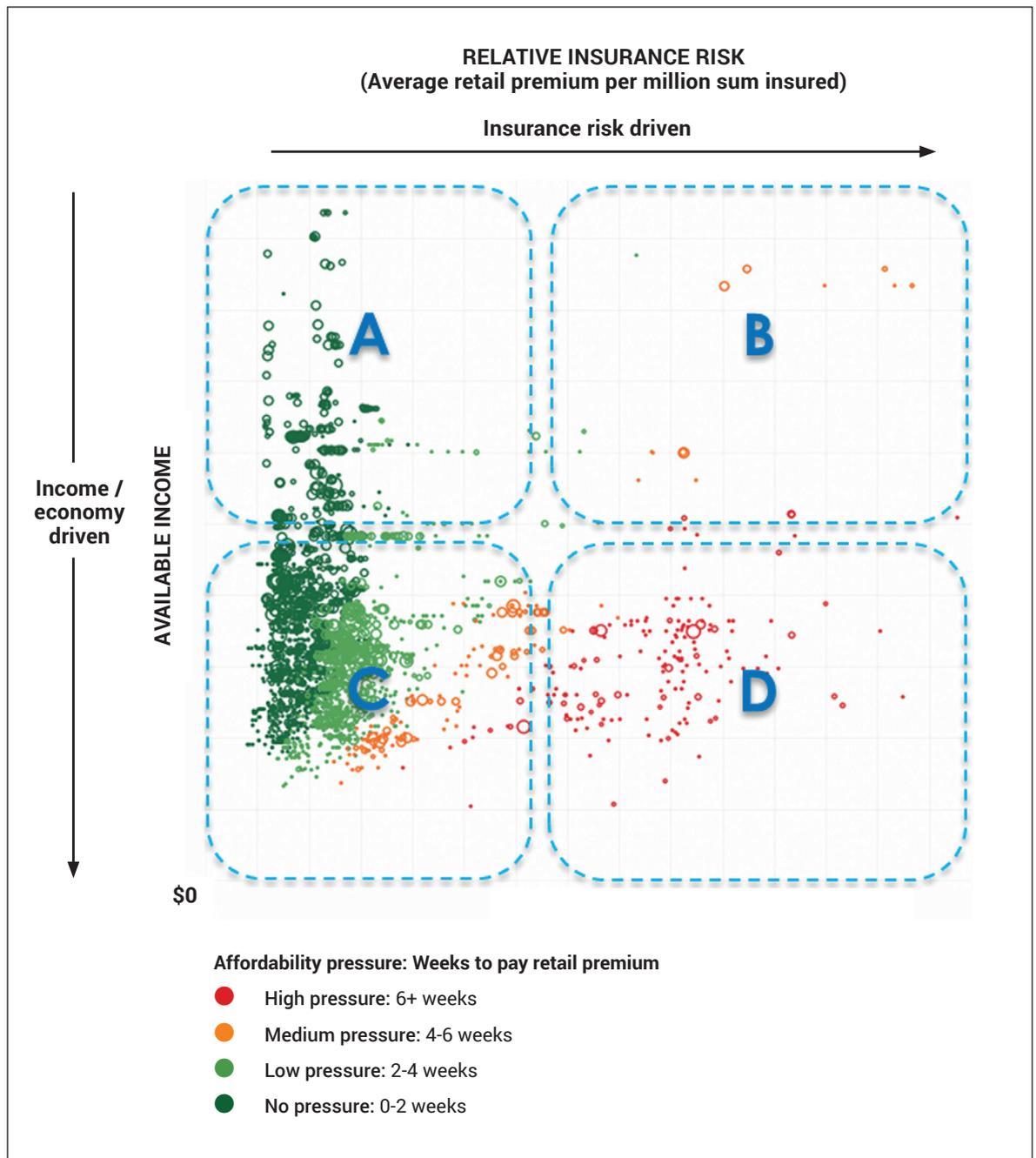
Sources: ABS, Finity.

The affordability pressure for the other 12% of postcodes can be better understood by analysing the data more closely as shown in Figure A.3. For postcodes in:

- Quadrant B there is insurance risk-driven affordability pressure – there is high exposure to natural perils and minimal income pressure;
- Quadrant C there is economic-driven affordability pressure - the drivers relate to any combination of low income, unemployment and/or high housing costs which affect capacity to pay or absorb risk; and
- Quadrant D there is peak affordability pressure – these locations have both high insurance risk and low available income, creating the greatest affordability pressure. These are the most vulnerable households and communities.

In Quadrant A there is no to very low affordability pressure. These postcodes have high available income and low insurance risk.

**Figure A.3: Understanding the nature of affordability pressure**

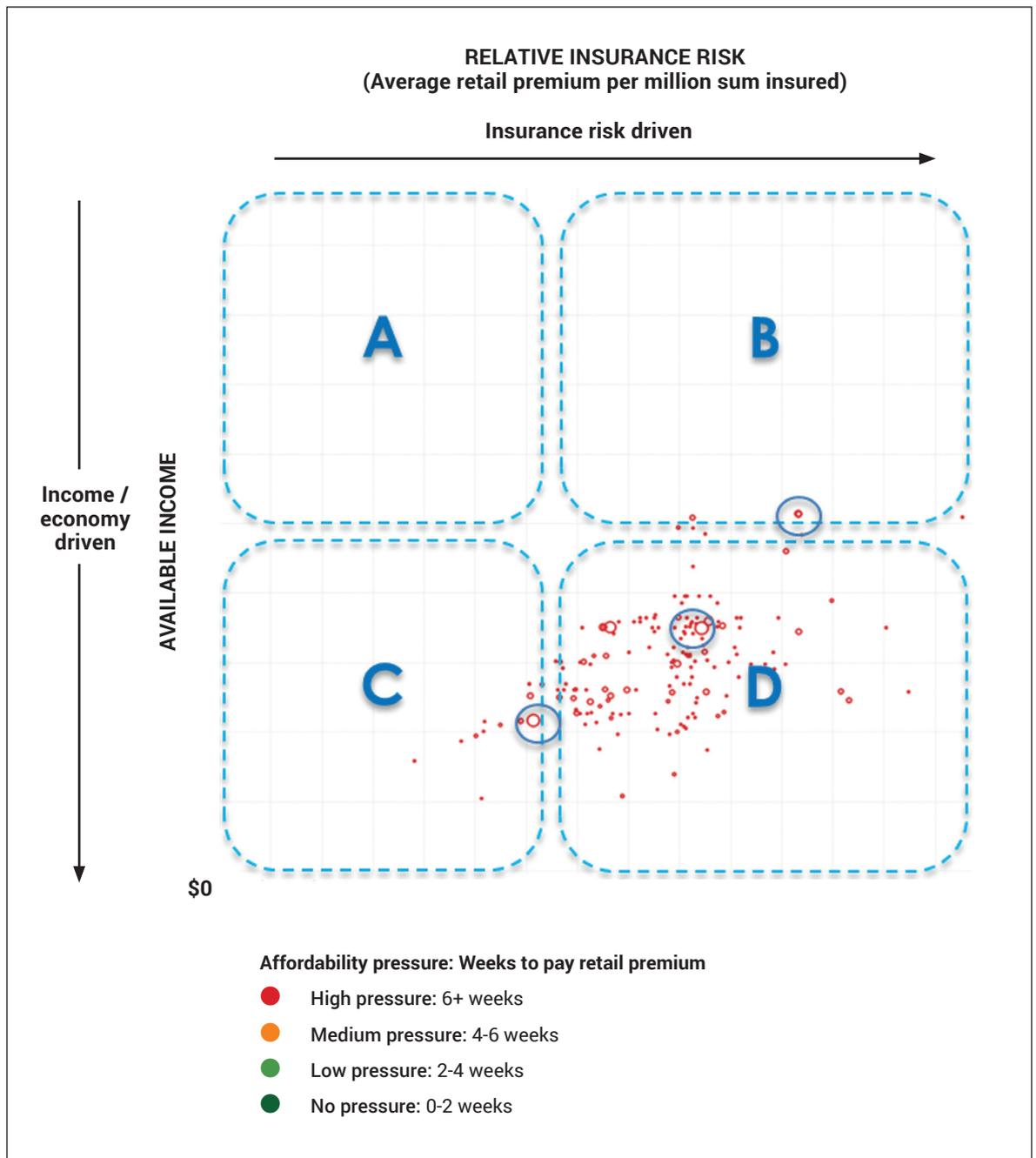


For these 12 per cent of postcodes with medium affordability pressure or higher, just over half – 7 per cent of postcodes – have peak affordability pressure. Three specific examples, to contextualise the issue, are highlighted as the larger circles.

- Quadrant B – Broome (Coastal WA) 6725 is in the quadrant with insurance risk driven affordability pressure.
- Quadrant C – Bundaberg (QLD) 4670 is in the quadrant with available income driven pressure, although it is nudging towards Quadrant D and parts of Bundaberg are known to have material flood risk.
- Quadrant D – Greater Geraldton (Coastal WA) 6530 is in the quadrant with peak affordability pressure. Although halfway down the WA coastline, there is material cyclone risk and economic driven affordability pressure in this location.

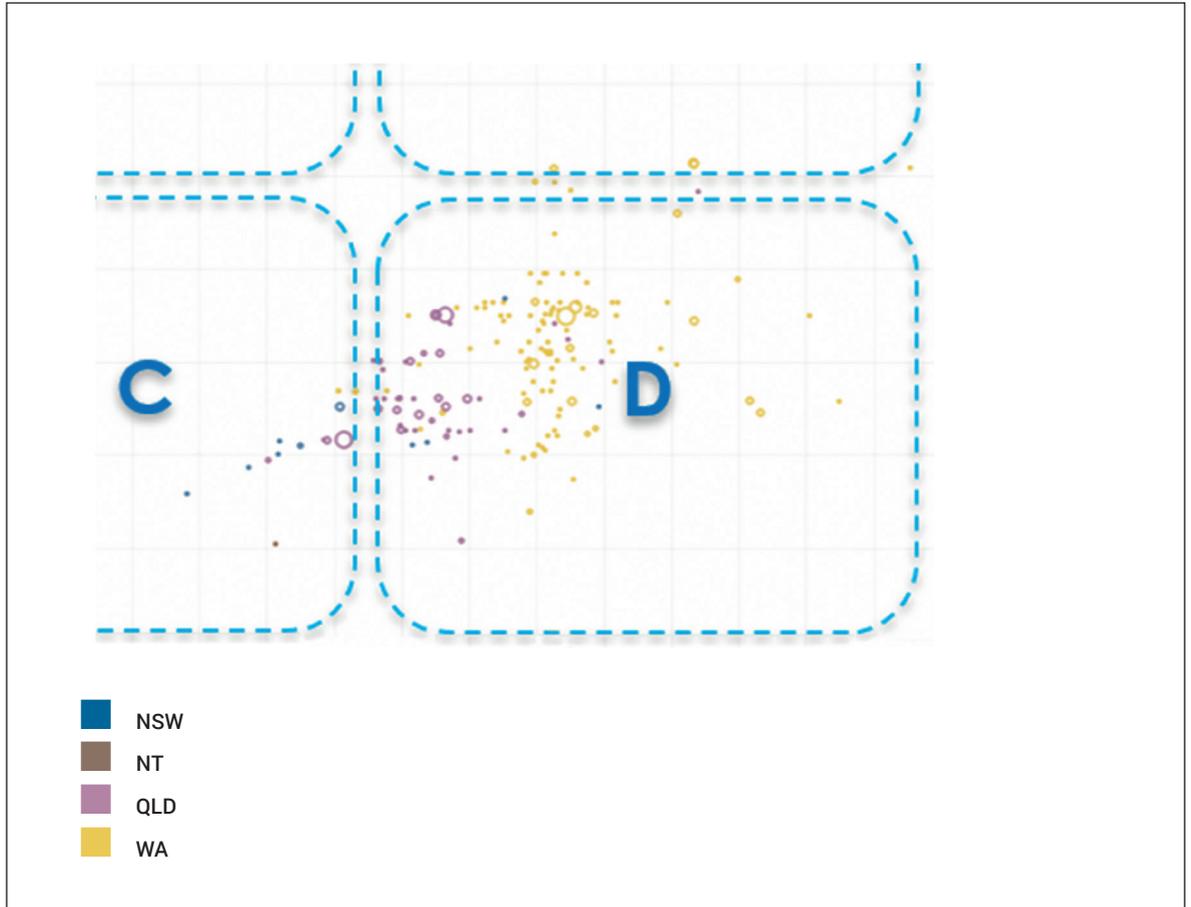
Also, nine postcodes are not plotted as the average retail premium per million sum insured is greater than the scale. These nine postcodes sit in Quadrant B in Northern WA where mining incomes have been high.

**Figure A.4: Drill down into peak affordability pressure**



Drilling down further into the postcodes with peak affordability pressure shows the pressure is greatest across Northern Australia, and especially in WA and Queensland (Figure A.5). In WA there are 112 postcodes from Esperance to Broome with peak affordability pressure. In Queensland there are 46 postcodes from South East to the North with peak affordability pressure. There is also one postcode in the Northern Territory and 10 in NSW with such pressure.

**Figure A.5: Understanding peak affordability pressure by location**



# Appendix B:

## Survey of pools used around the world

**Table B.1 – Part 1**

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
<b>Pool focus (affordability vs availability)</b>	Affordability and availability.	<p>Affordability.</p> <p>The Earthquake Insurance, whose objective is to stabilize the livelihoods of the affected by earthquakes, is established with the government reinsuring massive earthquake damage which exceeds of certain amount of liability that private insurance companies underwrite.</p> <p>For the purpose of stabilizing the livelihoods of those affected by earthquakes, Reinsurance premiums are collected and managed separately in the Special Account for Earthquake Reinsurance. Reinsurance claims are paid out to private insurance companies at the time when massive earthquakes occur.</p>	Availability and affordability.	Availability.	Availability and to some extent affordability (if delta to private market is more than 15%).
<b>1. Scheme Structure and Governance items</b>					
<b>Governance</b>	Board is comprised of six Commissioners and is accountable to the Government Minister responsible for the Earthquake Commission.	Scheme is owned by 10 domestic non-life insurance companies.	California Earthquake Authority was established under Act of legislation in California in 1996. Governing Board is made up of three elected officials including the California Governor and the Governing Board oversees the executive management of CEA and votes on all issues related to earthquake insurance in California.	Nine-member advisory council – The Advisory Council is required to include an actuary, a meteorologist, an engineer, a representative of insurers, a representative of insurance agents, a representative of reinsurers, and three consumer representatives.	Board of Governors administers a Plan of Operations, nine board members are appointed by the state government (3), state senate speaker, speaker of the house and state CFO (2 each).
<b>Type of Pool (i.e. Insurance or Reinsurance)</b>	Insurance pool, mandatory, for the first layer of all private residential risks against named perils.	Board of Directors under Auditor’s supervision.	Insurance.	Reinsurer.	Insurance pool for mainly wind risks, ‘plan to act as residual insurer’ as they actively push policyholders to the private market if no longer eligible.

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
<p><b>Structure of Scheme</b> (e.g., XOL, From Ground Up (FGU), 100% govt owned)</p>	<p>Flat rate levy imposed on all households who purchase a homeowner insurance policy to fund EQC's National Disaster Fund (NDF).</p> <p>The scheme is Government owned.</p>	<p>Reinsurance but operates as an insurance pass-through for EQ.</p>	<p>Insurance offered through participating insurers as an add on to residential property insurance.</p>	<p>Tax-exempt.</p> <p>State trust fund provides reinsurance to private insurers at lower prices.</p> <p>USD17b capacity.</p> <p>Reimburses an insurer's ultimate net loss + 5% LAE xs its retention for each occurrence.</p> <p>Mandatory participation for all insurers writing residential property insurance.</p> <p>Similar product to private reinsurance – with some significant differences.</p> <p>XOL cover.</p> <p>Premiums, retentions, and coverage limits are based on each insurer's annual reporting of insured values by line of business, construction, and ZIP Code and on the hurricane loss projection models found acceptable by the Florida Commission on Hurricane Loss Projection Methodology.</p>	<p>Personal lines property, home and business owners, as well as renters, can apply if eligible (no private market cover available or too expensive, 15%).</p>

Pool	Earthquake Commission (ECQ), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Coverage (e.g. single vs multiple perils) / Exclusions / Limits for single events/similar coverage as private sector or simplified?	<p>Multi-peril coverage for home (e.g. earthquake, natural landslip, volcanic eruption, hydrothermal activity, tsunami).</p> <p>Residential land is insured (within limits) against storm and flood damage.</p> <p>Fire resulting from any of these natural disasters is also covered.</p> <p>EQCover is automatically purchased with private residential home insurance policies that include fire insurance. From 1 July 2019, ECCover for contents is no longer sold.</p> <p><b>Limits (per event), all amounts in NZD.</b></p> <p>EQCover purchased prior to 1 July 2019, the maximum EQC levy, per year, for one home and its contents is NZD240 (+ GST). This provides a maximum cover of NZD100,000 (+ GST) for the home, NZD20,000 (+ GST) for contents, and cover for insured residential land. This amount of insurance is available for each natural disaster event.</p> <p>EQCover policies taken out or renewed from 1 July 2019 provide a maximum cover for residential buildings of NZD150,000 (+ GST). The increase in residential cover and removal of contents cover will result in a net maximum increase in the EQC levy from NZD240 to NZD300 (+ GST).</p>	<p>Residential earthquake insurance in Japan is provided jointly by the public and private sectors.</p> <p>Major earthquakes can result in massive insurance payouts. As a precaution against such an event, both private-sector companies and the government share the potential insurance liabilities through reinsurance.</p> <p>Firstly, all earthquake insurance policies directly underwritten by non-life insurance companies are ceded to Japan Earthquake Reinsurance Co., Ltd (JER). JER then homogenizes the risk exposure and partially retrocedes it back to non-life insurance companies and to the government up to predefined liability limits for each. Any remaining exposure is retained by Japan Earthquake Reinsurance.</p>	<p>Single Peril, CEA earthquake offers various policy options for houses, mobile homes, condo-units, and rental homes. Insurance offering is a basic, no-frills 'mini policy' with sum insureds that are generally smaller than full coverage policies which include swimming pools and external addons. In 2017, CEA introduced coverage enhancements such as more deductible options and coverage choices with lower premiums.</p>	<p>Single peril (hurricane).</p>	<p>Named perils, with focus on wind/hurricane, depending on location and occupancy, various options are available: Replacement cost, actual cash value, contents, loss of use, personal liability, medical payments to others. Peril-specific deductibles (various, 200, 100, 2500, 2%, 5%, 10%) also available, sometimes mandatory. For some policy types, exclusions apply (e.g. water damage). Coverage limited to USD1m per basic home.</p>
Coverage – High risk areas only vs all areas	All areas.	Perils insured are fire, destruction, burying and washing-away caused by earthquake, volcanic eruption or tidal wave resulting therefrom (tsunami).	California region only.	All areas.	No geographical restriction within Florida. Provide insurance to policyholders who cannot find cover in private markets, so possibly not the highest quality risks.

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Retention level for Insurers / Policyholder deductibles	Private insurance policies apply excess of EQCover. If your approved claim is for NZD20,000 or less, EQC will deduct an excess of NZD200 and pay the rest. If your approved claim is for more than NZD20,000, EQC will pay 99% of it, deducting an excess of 1%.	All areas.	Deductibles exist, subtracted from damage payout.	Insurers can select 45, 75, or 90% coverage above a retention (deductible level for losses). The retention for the insurance industry is USD4.5b per event, which is adjusted annually with exposure growth. However, each insurer's retention is allocated based on its FHCF premium. An insurer's premium is based on the residential business it writes in the state. This includes personal residences, mobile homes, commercial residential structures (apartments and condominiums), and coverage on the contents of such structures along with additional living expenses. The insurer's retention is based on its share of the FHCF's total retention (USD7.2b for the 2018-2019 contract year), and the maximum payout is the insurer's share of the statutory coverage limit (currently USD17.0b).	Various policyholder deductibles, some can be mandatory, others by choice.
Retrocession programme/ access to reinsurance	CAT XoL type retrocession programme. EQC negotiates to buy reinsurance on the international market on an annual basis. In 2019, EQC had NZD6.2b xs NZD1.75b in reinsurance cover. CAT XoL type retrocession programme. EQC negotiates to buy reinsurance on the international market on an annual basis. In 2019, the EQC paid around NZD170m in reinsurance premiums for NZD6.2b in reinsurance cover. Like many other forms of insurance, EQC must pay an excess or 'deductible' for any claim it makes to reinsurers. EQC's current deductible on reinsurance cover is NZD1.75b, which means that EQC must meet the cost of all claims up to NZD1.75b before it is able to call on that reinsurance cover. The deductible is charged for each natural disaster 'event'. Claims from the Kaikoura earthquake, for example, are expected to cost EQC between NZD600–700m, so this will come from the Natural Disaster Fund rather than from reinsurance.		Yes. Makes extensive use of reinsurance and regular issue of cat bonds.	Some retrocession is placed although most funding is through insurer surcharge and revenue bonds.	Yes. Makes extensive use of reinsurance and regular issue of cat bonds.

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Level of underwriting by Reinsurers	The EQC levy charged to homeowners' policyholders is flat rated at NZD0.20 per NZD100 (plus GST) of home or contents EQCover. Part of the levy collections are then used to purchase the outwards retrocession program described above, and these retrocession premiums are underwritten and priced on open market basis by reinsurers on normal risk-adjusted basis. Due to the risk pooling nature of the EQC scheme, changes in retrocession premiums or coverage are not reflected in the EQC levy.	JER partially retrocedes claims to non-life insurers and to the government.	N/A	Reinsurance premiums vary by flood risks – see above.	
<b>2. Pool from Government perspective</b>					
Funding sources (Govt resources vs Insurer levies, pre vs post funding)	<p>Pre-funded. Flat rate levy imposed on all households who purchase a homeowner insurance policy to fund the National Disaster Fund (NDF). EQC then uses the money in the Fund to settle claims made to EQC; purchase reinsurance from international financial markets; meet the costs of administering the EQC scheme; and improving understanding of natural hazard risk and how to reduce it by funding research and education.</p> <p>If unable to obtain EQCover for residential building via private insurers (e.g. policy doesn't have fire cover), then households can apply through EQC for Direct EQCover against natural disaster damage.</p> <p>Direct EQCover provides the same benefits as the EQCover product.</p>	<p>Japan Earthquake Reinsurance Co. receives and manages reinsurance premiums, and accounts for them separately in the Special Account for Earthquake Reinsurance so that it can pay out reinsurance benefit at the time when massive earthquakes occur, to which the private sector alone cannot respond.</p> <p>All insurance premiums general insurance companies have received from policyholders are reinsured by Japan Earthquake Reinsurance Co., Ltd. (JER). JER divides them into the portion held by JER itself, the portion reinsured again by general insurance companies, and the portion reinsured by the government (Special Account for Earthquake Reinsurance), in proportion to their respective liability.</p>	Publicly operated, privately funded, not for profit organisation.	<p>Pre and post funding. Funded via a 1.3% surcharge on most property/casualty insurance policies issued in the state.</p> <p>If the cash balance is not sufficient to cover losses, the law requires the issuance of revenue bonds, which would be funded by emergency assessments on all property and casualty policyholders excluding workers' compensation and medical malpractice.</p> <p>The FHCF also engages in financing and risk-transfer activities intended to improve liquidity and potentially minimize the need for assessments.</p>	Pre-funded through premium payments of policyholders and building up of reserves.

Pool	Earthquake Commission (ECQ), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Term of Scheme	Scheme has been in operation since 1945.	Scheme has been in operation since 1966.	Indefinite.	Scheme has been in operation for 27 years (established in 1993).	Indefinite, set up by Floridian legislature in 2002.
Tax concessions	EQC is exempt from the payment of income tax under the Income Tax Act 2007.	Income tax credit exists for earthquake insurance premiums. This was established to support independent efforts of the people to prepare for damage caused by earthquake disasters.	As a not-for-profit, CEA does not pay federal income tax.	Tax exempt trust fund.	Operates as non-profit, so tax-exempt.
<b>3. Success/Failure from Government perspective</b>					
Take up rate of pool	EQC is provided automatically for home and contents policies with fire cover (i.e. 100% take-up rate). For home and contents policies without fire cover, households have to apply through EQC for catastrophe cover directly (take-up rate of this is not specified).	Around 34% of households in areas at risk of major earthquakes (Great Kanto, Tokyo metropolitan, Nankai trough) purchase earthquake insurance.	1m + policyholders, 24 participating insurers, writes two-thirds of all residential earthquake policies sold in California. Insurers pay a charge to participate in the CEA and participation in CEA is not mandatory.	2018-2019: 165 participating insurers, USD1.1b reimbursement premiums.	As of Q3 2020, 446,327 in force policies, USD897m premium written against USD113b exposure, market share of 4% by TIV, down from 23% in 2011.
Access to capital (other than reinsurance)	See discussion on Funding sources above.	None.	Access to Insurer Assessment Layer, where CEA can access up to USD2b from participating insurers. Also use risk transfer contracts and Bonds.	See discussion on Funding sources above.	Florida Hurricane Catastrophe Fund.
Incentives for Risk Mitigation (community)	One of the purposes of the pool is improving understanding of natural hazard risk and how to reduce it by funding research and education.	Premium discounts for adhering to certain building standards.	Resilient Homes Initiative in 2019 launched to help more Californians prepare for next earthquake, including greatly increasing the number and types of seismic-retrofit grants CEA can offer, particularly for low-income households.	The FHCF statute requires that the Legislature annually appropriate funds from the investment income of the FHCF for the purpose of reducing future hurricane losses and related activities. A minimum of USD10m must be appropriated each year, up to a maximum of 35% of the prior audited year's investment income.	
Unfunded deficit after fund has been wound up		Not specified.	Unfunded deficit could be met by public borrowings.	Not specified.	None.

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Fit for the future			CEA is USA's largest provider of residential earthquake insurance and expected to continue as such. Earthquake insurance take-up rates are low, around 11% of homeowners buying coverage, although higher % in high risk areas. Some private insurers now provide competing EQ coverage, but CEA should still be sustainable, particularly post-event (CEA market share of CA EQ insurance is around 41%).	On track – USD13.5m was spent on mitigation funding during FY2018-2019.	Yes, no plans to stop operations, but potential plans to become a reinsurance company.
<b>4. Pool from Policyholder perspective</b>					
Incentives for Risk Mitigation in Pool Structure	No financial incentive, as levies do not reflect risk.	Premium discounts for adhering to certain building standards.	CEA offers grants to retrofit houses making them more resistant to earthquakes. Also, older houses that have been retrofit can qualify for up to 25% discount of the policy premium. Lesser of USD5m or 5% of investment income is set aside for mitigation activities.	Not specified.	Windstorm mitigation credits awarded to 83% of policies.
Magnitude of Premium Reduction for Policyholders	EQC levies make up part of home and contents insurance premiums. As the levy is flat across all policies, the better risks cross-subsidise the poor risks.	Magnitude of premium reduction is unknown. Up to 50%.	CEA policies are sold as an add on to existing residential property insurance – because CEA is not for profit, the premiums may be cheaper than privately sold covers.	Subsidies passed onto policyholders indirectly. Magnitude of reduction for policyholders is unknown.	No details given.
Payment of claims	No issues with paying claims recorded so far. Still paying open claims from Canterbury Earthquakes in 2011.	No issues with paying claims recorded so far.	CEA has a claim-paying capacity of more than USD18b. CEA could cover all claims if the 1906 San Francisco, 1989 Loma Prieta, or 1994 Northridge earthquake reoccurred today.	No issues with paying claims recorded so far.	Policyholders feedback is rather negative.
Levies required if pool is in deficit?	No, government assumes implicit guarantee.	No.	No levies. If an earthquake causes insured damage greater than the CEA's claim-paying capacity, policyholders with earthquake damage may be paid a prorated portion of their covered losses. Or, the CEA Governing Board may approve instalment payments. CEA is also authorised to surcharge its policyholders if all other capacity paying features are exhausted.	Yes. Levies were implemented from 2005 to 2015 after fund went into deficit after 8 storms in 2 years.	No, State of FL will step in as it is considered a 'government entity'.

Pool	Earthquake Commission (EQC), New Zealand	Earthquake Insurance, Japan	California Earthquake Authority, USA	Florida Hurricane Catastrophe Fund, USA	Citizens Property Insurance Corporation, USA
Other comments					Basic coverage, less options than private market, but competitively priced.
<b>5. View from Insurance industry perspective</b>					
Cumulative Profit/Loss Information	Profit before tax 2020 NZD-154m, 2019 NZD414m, 2018 NZD-179m.	JPY1m in FY 2018.	At Dec 2019, net capital position USD6.69b, net income USD500m. At Dec 2018, net capital position USD6.19b, net income USD297m.	Net position of USD10.29b (June 2019), Net loss USD2.41b (June 2019).	As of Dec 2019, net income of USD86m, capital surplus of USD6.3b.
Solvency		Non-consolidated Solvency-margin ratio 297.6% as at end of FY 2018.	1 in 400-year probability that CEA won't be able to pay its claims. CEA has an AM Best rating of 'A-' (Excellent).		Not separately rated, can withstand 100 yr event.
Utilisation of funding sources outside of fund	EQC rendered technically insolvent after 2011 Christchurch earthquake sequence wiped out reserves accumulated since 1945. Fell back on government guarantee.	None so far.	No does not receive Government funding.	FHCF ran out of funds in 2005 after Florida was hit with eight storms over the course of just two years. The fund had to borrow USD2.6b to pay off obligations to private insurers after Hurricane Wilma, the last of these eight storms, hit in 2005. This prompted the current 1.3% insurance policy surcharge (ended in 2015). This was executed as planned.	No does not receive Government funding but has access to the Florida Hurricane Catastrophe Fund for roughly USD2.3b.
Access to reinsurance capital	See above discussion on access to reinsurance.	Yes.	Yes. Makes extensive use of reinsurance and ILS capital.	Yes – limited amount of retrocession is placed.	In 2019, total of USD237m premium ceded (on USD616m earned), resulting in a cover of USD1.4b.
Other comments					Not much 'crowding out' as eligibility is limited and incentives are given to policyholders to move to private market whenever possible.

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<https://theactuarmagazine.org/extreme-measures/>

Citizens Property Insurance Corporation: <https://www.citizensfla.com/>

**Table B.1 – Part 2**

Pool	National Flood Insurance Program (NFIP), USA	Floor Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
Pool focus (affordability vs availability)	Availability.	Affordability.	Affordability and availability.	Availability.
<b>1. Scheme Structure and Governance items</b>				
<b>Governance</b>	Scheme is headed by an Administrator, with various offices underneath (e.g. Office of Professional Responsibility, Office of the Administrator, Office of Chief Counsel, etc.).	Board comprises of finance and insurance industry experts. Number of Board committee and sub committees sitting under Board covering risk, audit, compliance, capital and remuneration.	CCRIF is unusual as a multi-country risk pool, so governance is more complex than single country. CCRIF SPC is a segregated portfolio company, owned, operated and registered in the Caribbean. In April 2015, CCRIF signed an MOU with COSEFIN – the Council of Ministers of Finance of Central America, Panama and the Dominican Republic – to enable Central American countries to formally join the Facility. 19 Caribbean governments and 3 Central American governments. Sponsored by World Bank.	Australian Reinsurance Pool Corporation (ARPC) has a non-executive Chair and six other non-executive Members, who are all appointed by the Minister under the Terrorism Insurance Act 2003. ARPC is a corporate Commonwealth entity established under the Terrorism Insurance Act 2003 (TI Act). ARPC is also subject to requirements under the Public Governance, Performance and Accountability Act 2013 (prior to 1 July 2014, the Commonwealth Authorities and Companies Act 1997) and is within the Treasury portfolio.
<b>Type of Pool (i.e. Insurance or Reinsurance)</b>	Largely voluntary insurance pool for homeowners, business owners and renters in participating communities. In the NFIP, communities are not required to participate in the program by any law or other regulation. Rather, communities voluntarily participate in the NFIP to secure access to primary flood insurance, backed by the federal government. Communities need to show some degree of risk mitigation to be eligible to participate in the NFIP. Flood insurance can be mandatory for certain loans secured by buildings located in participating communities.	Mutual reinsurance pool.	Insurance for governments.	Reinsurance.

Pool	National Flood Insurance Program (NFIP), USA	Floor Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
Structure of Scheme (e.g., XOL, From Ground Up (FGU), 100% govt owned)	Government owned. From ground up coverage.	Fixed premium charged to insurers based on the property's council tax band (aimed at providing a greater amount of subsidy to lower income households). Structure is based on a Treaty arrangement – annual aggregate loss limit is GBP2.198b as at 31 March 2019.  (Private company with limited liability).  Compulsory participation by insurers.	Parametric cover for EQ, TC and excess rainfall cover to Caribbean and Central American governments. Also offers Aggregated Deductible Cover (ADC) which is new policy feature for TC and EQ from 2017, works as a dedicated reserve fund providing a minimum payment for events that do not trigger CCRIF policy, because modelled loss is below attachment point. In July 2019, added coverage for fisheries sector.  Optional participation by government insureds.	ARPC is responsible for administering the terrorism reinsurance scheme, providing primary insurers with reinsurance for commercial property and associated business interruption losses arising from a declared terrorist incident. Eligible property has been extended to include buildings that have a floor space of at least 20% used for commercial purposes or that have a building sum insured (BSI) of at least AUD50m, whether used for commercial or other purposes. This change was introduced for all eligible policies issued or renewed on or after 1 July 2017.  Legislation has also been amended to clarify that losses attributable to terrorist attacks using chemical or biological means are covered by the scheme. This change came into effect for all policies in force or renewed from 1 July 2017.
Coverage (e.g. single vs multiple perils) / Exclusions / Limits for single events/similar coverage as private sector or simplified?	Coverage limits: USD250,000 for the building and USD100,000 for the building contents.	Single peril (flood).  All residential policies include flood cover.  Residential properties built before 2009 only.  Covers single residential units or a building comprising of two or three residential units only.  No limit specified for single events.  Similar coverage as private sector or simplified - coverage in the private sector not impacted (cost is subsidised)..	Uses parametric insurance for member governments to purchase earthquake, hurricane and excess rainfall catastrophe coverage.	Coverage of commercial property insurance for buildings that have a floor space of at least 20% used for commercial purposes or that have a building sum insured (BSI) of at least AUD50m, whether used for commercial or other purposes.  Coverage for property damage, business interruption and consequential loss from terrorism, including losses attributable to terrorist attacks using chemical or biological means are covered by the scheme.
Coverage – High risk areas only vs all areas	Coverage available for homeowners, business owners and renters in participating communities.	All residential policies to include flood cover.	High risk coverage for governments. Governments can select perils.	All commercial property insurance.

Pool	National Flood Insurance Program (NFIP), USA	Flood Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
Retention level for Insurers / Policyholder deductibles	Separate deductibles apply for Building and Contents coverage.	Fixed excess of GBP250 for each policy.	Parametric cover, so retention level is modelled loss amount by country.	Generally, terrorism risk is 100% ceded to ARPC, excess of low annual aggregate deductible (AUD100k+ per treaty, sum AUD200m industry retention). It is not compulsory for insurers to reinsure the risk of eligible terrorism losses through ARPC. However, the TI Act compels all insurers to provide full terrorism cover on eligible policies. Local and foreign insurers have the option to: <ul style="list-style-type: none"> <li>• purchase terrorism reinsurance from ARPC;</li> <li>• purchase terrorism reinsurance from a commercial reinsurer; or</li> <li>• elect to hold the exposure themselves.</li> </ul>
Retrocession programme/ access to reinsurance	Reinsurance is purchased from the private market, which reduces the likelihood of FEMA needing to borrow from the Treasury to pay claims. Funds are taken from the fund to pay for reinsurance, meaning that it increases the cost of insurance to policyholders. FEMA has also purchased reinsurance backed by catastrophe bonds. The catastrophe bond reinsurance is facilitated by a single company, with the risk then transferred to capital market investors who purchase the bonds.	Flood Re purchases a programme with a maximum liability limit of up to GBP2.198b. Flood Re places its outwards reinsurance programme on the global reinsurance market.	CCRIF purchases retro cover via ILS and reinsurance markets.	ARPC purchases significant retrocession capacity via the traditional Australian and overseas reinsurers. Current year retrocession cover provides AUD3.45b of cover.
Level of underwriting by Reinsurers		Reinsurance premiums do not vary by individual flood risks.	Reinsurance premiums are fully underwritten by reinsurers, but set on parametric basis, risk adjusted for hazard/peril only.	Retrocession premiums are fully underwritten.

Pool	National Flood Insurance Program (NFIP), USA	Flood Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
<b>2. Pool from Government perspective</b>				
<b>Funding sources (Govt resources vs Insurer levies, pre vs post funding)</b>	<p>The NFIP has been funded through three methods:</p> <ol style="list-style-type: none"> <li>receipts from the premiums of flood insurance policies, including fees and surcharges (the premium rate for most NFIP policies is intended to reflect the true flood risk.);</li> <li>direct annual appropriations for specific costs of the NFIP; and</li> <li>borrowing from the U.S. Treasury when the balance of the NFIP has been insufficient to pay the NFIP's obligations (e.g. insurance claims).</li> </ol> <p>The NFIP was not designed to retain funding to cover claims for truly extreme events; instead, the National Flood Insurance Act of 1968 allows the program to borrow money from the Treasury for such events.</p>	<p>Prefunded. Reinsurance provided at a subsidised rate to insurers.</p> <p>Private/Public partnership levy on insurers based on market share, at a level designed to cover the overall subsidy needed for the high-risk customers (GBP180m collected every year).</p> <p>No direct financial liability for Government.</p> <p>Government was reluctant to assume responsibility for losses surpassing the GBP2.2b limit.</p> <p>There remains a possibility of Flood Re being bailed out by the Govt should it fail, however the possibility of this occurring is assumed to be low (due to being regulated + reinsurance cover).</p> <p>No govt guarantees.</p>	<p>Premiums paid by individual member governments. Multi-Donor Trust Funds (funded by World Bank and developed countries such as Canada, UK and France) provided original capitalisation in 2007 and further funds to develop new products via ongoing contributions (2014, 2017, 2018).</p>	<p>Premiums paid by insurers from commercial property premiums, passed through from underlying policyholders. The premium due to ARPC is calculated as a percentage of a cedant's gross base premium. However, the amount paid by the insurer to ARPC is calculated by multiplying the appropriate tier rate (postcode specific) to the gross base premium per postcode processed by the insurer each quarter.</p> <p>First AUD200m of loss is within policy deductibles and industry retention, then AUD 250m funded from ARPC net assets, then AUD3.45b retrocession, then up to AUD10b post-loss Commonwealth guarantee.</p>
<b>Term of Scheme</b>	<p>Scheme has been in operation since 1968.</p>	<p>The scheme is temporary (until 2039) and is designed to promote private market coverage.</p> <p>Scheme established in April 2016.</p> <p>Premiums and levies reviewed every 5 years.</p> <p>Once the scheme is over, the plan is for home insurance prices to fully reflect flood risk.</p> <p>Transition plan in place.</p>	<p>Established in 2007. Appears to be indefinite term.</p>	<p>No term specified, intended to be indefinite, but subject to triennial review.</p>
<b>Tax concessions</b>	<p>No apparent tax concessions.</p>	<p>No apparent tax concessions available for the Scheme.</p>	<p>No apparent tax concessions available for the Scheme.</p>	<p>No apparent tax concessions available for the Scheme.</p>
<b>3. Success/Failure from Government perspective</b>				
<b>Take up rate of pool</b>	<p>FEMA estimates that the residential flood insurance market penetration rate in the 100-year floodplain (also known as the special flood hazard area, or SFHA – which mainly consist of coastal areas) is approximately 30%. Outside the 100-year floodplain, take-up rates are very low.</p>	<p>164,480 policies written.</p> <p>94% of the home insurance market offer scheme.</p> <p>Take up rate for homeowners (98%, 2016).</p>	<p>Variable between member countries. Generally, sum insured remain relatively small and only contribute liquidity post-event, not nearly large enough vs economic losses.</p>	<p>Very high – participation of more than 70 reinsurers.</p>

Pool	National Flood Insurance Program (NFIP), USA	Flood Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
Access to capital (other than reinsurance)	See discussion on Funding sources above.	None.	Predominately World Bank. Multi-Donor Trust Funds (funded by World Bank and developed countries such as Canada, UK and France) provided original capitalisation in 2007 and further funds to develop new products via ongoing contributions (2014, 2017, 2018).	Australian Government AUD10b post-lost guarantee.
Incentives for Risk Mitigation (community)	<p>The NFIP attempts to reduce comprehensive flood risk by requiring participating communities to:</p> <ol style="list-style-type: none"> <li>collaborate with FEMA to develop and adopt flood maps called Flood Insurance Rate Maps (FIRMs), and</li> <li>enact minimum floodplain standards based on those flood maps.</li> </ol> <p>A high-percentage of local authorities imposed flood plain management schemes based on 1-in-100 year flood heights.</p>	<p>Premiums are expected to increase to reflect the full extent of flood risk once the scheme has wound up – as such, homeowners are encouraged to become aware of flood risks at their property and take actions to reduce it if possible.</p> <p>There is a transition program in place, which aims to help communities manage and mitigate flood risk.</p> <p>(First Transition Plan commits Flood Re to consider resilience initiatives within first two years of operation.)</p> <p>However, recent studies have shown that very few formal options for incentivising risk reduction have been adopted and there is limited commitment from Government to do more for flood risk reduction.</p>	CCRIF works with Caribbean governments and Non-profits to strengthen resilience to the insured perils in at-risk communities, for example through flood mitigation initiatives, risk financing training and disaster prevention.	<p>Thought leadership on terrorism – holding seminars on local and global terrorism threats, espionage and foreign interference, cyber terrorism, the financial loss caused by exclusion zones that follow terror attacks.</p> <p>ARPC is working on providing property owners with a risk mitigation resource – ARPC is collaborating with Standards Australia to produce a quick reference guide, containing commentary and resources on risk mitigation for deliberate acts of physical damage.</p> <p>Incentives for mitigation to be reflected in pool pricing.</p>
Unfunded deficit after fund has been wound up		Not specified.	Not specified.	In the situation where the total amounts paid or payable by the Australian Government would exceed AUD10b, individual policyholders will fund the deficit in the form of reduced claim payments from their insurers.
Fit for the future		<p>Flood Re wishes to transition to risk reflective pricing at the conclusion of the scheme. Flood Re is due to run until 2039, with the plan that in 2039 the Flood Re scheme will end and there will be a free market for flood risk insurance. Transition plan includes 5 yearly reviews to assess progress.</p> <p>In this new pricing environment, risk reduction strategies will be required in order to keep premiums affordable.</p> <p>There are concerns regarding whether the scheme is fit for the future due to a lack of clear plans for incentivising risk reduction, mitigation funding put towards reducing cost of flooding and whether increased competition in the market will eventuate.</p>	Operates well within its defined mandate and scope i.e. not to cover all losses on the ground, but provide liquidity for emergency relief and early recovery needs), current benefit levels (payouts) are quite small relative to member government needs. 2018-2021 Strategic plan calls for CCRIF SPC to scale up coverage levels among existing members, add new members and offer new products.	The scheme remains fit for purpose (to protect Australia from the economic losses caused by terrorism catastrophe) with regard to its coverage and readiness to respond to a Declared Terrorist Incident (DTI).

Pool	National Flood Insurance Program (NFIP), USA	Flood Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
<b>4. Pool from Policyholder perspective</b>				
<b>Incentives for Risk Mitigation in Pool Structure</b>	See discussion on incentives for risk mitigation for communities above.	See above discussion re encouraging homeowners to take actions to reduce risks at their properties.	Small scale support for risk mitigation incentives, mostly via Technical Assistance Programme. CCRIF's 2nd strategic objective is 'Resilience: to enhance capacity for disaster risk management and climate change adaptation'. Provides financial and technical support for local disaster risk reduction initiatives being run by NGOs and charity organisations and/or mandated by local disaster coordinator across CCRIF member countries. Examples are disaster risk training courses for local government officials, improvements in rainfall monitoring and assessment, scholarship funding.	See discussion on incentives for risk mitigation for communities above.
<b>Magnitude of Premium Reduction for Policyholders</b>		4/5 households with previous flood claims have seen a price reduction in premiums of more than 50%. Premium reductions for insurers of 12.5% (buildings) and 33% (contents). The first three years have demonstrated that the Scheme is delivering as envisaged, fulfilling its purpose to make home insurance more available and affordable and that this is having the desired effect on the market. Premiums not subsidised and are risk based – subsidies are provided indirectly.	Not applicable since insurance not previously purchased. CCRIF SPC self-estimates that its risk pooling keeps premium costs 'up to 50% lower than if countries purchased coverage outside of CCRIF' but it is difficult to verify this due to the lack of comparison data and specialised nature of the parametric covers.	Unknown, since terrorism coverage was essentially unavailable post September 11, 2001 terrorism event.
<b>Payment of claims</b>	No issues with paying claims recorded so far.	No issues with paying claims recorded so far.	No issues with paying claims recorded so far. Claims paid quickly due to parametric insurance structure. Total parametric insurance claims paid for the period June 2007 to October 2019 = USD152.0m. Total paid claims under the TC/EQ Aggregated Deductible Cover (ADC) = USD1.1m.	Limited claims experience date.
<b>Levies required if pool is in deficit?</b>	No.	No.	No.	No.
<b>Other comments</b>				
<b>5. View from Insurance industry perspective</b>				
<b>Cumulative Profit/Loss Information</b>	Cumulative debt owed to US Treasury of USD20.5b at 2018 end. This debt is serviced by the NFIP and interest is paid through premium revenues. The NFIP's debt is conceptually owed by current and future participants in the NFIP.	(2019) GWP – GBP34m, GBP180m collected in levies per year. Profit before tax – GBP136m. Flood Re is regulated so has to maintain certain solvency levels.	Retained earnings USD62.7m as at May 31, 2019 from audited financial statements.	Premium revenue AUD234.4m (FY20), Retained assets – AUD521m (FY20).

Pool	National Flood Insurance Program (NFIP), USA	Flood Re, UK	CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility), Caribbean (multi-country)	Australian Reinsurance Pool Corporation
Solvency		Solvency capital ratio – 349% (2019).	Adequate capital base provided CCRIF has ongoing access to reinsurance capital. Long-term shadow rating A/A+.	Solvency up to AUD10b guaranteed by Government.
Utilisation of funding sources outside of fund	Katrina (2005) and Sandy (2012) rendered NFIP technically insolvent, and funds needed to be borrowed from the US Treasury.	None so far.	None so far, other than donors and member governments.	Australian Government AUD10b post-lost guarantee.
Access to reinsurance capital	See above discussion on access to reinsurance.	Yes.	Yes. Access both traditional reinsurance market and ILS.	Yes, see discussion on retrocession above.
Other comments				

**Sources:**

NFIP: <https://www.fema.gov/national-flood-insurance-program>, International Actuarial Association Flood Risk Discussion Paper June 2019  
Flood Re: [www.floodre.uk.co](http://www.floodre.uk.co) and [https://www.actuaries.org/IAA/Documents/Publications/Papers/REWG\\_Flood\\_Risk.pdf](https://www.actuaries.org/IAA/Documents/Publications/Papers/REWG_Flood_Risk.pdf)  
CCRIF (formerly Caribbean Catastrophe Risk Insurance Facility): <https://www.ccrif.org/>  
Australian Reinsurance Pool Corporation: <https://arpc.gov.au/>

# Appendix C:

## Design features of alternative potential solutions

**Table C.1: Product features**

An important design factor is how the proposed method is specifically structured, which parties may benefit from it, and which events/perils would be covered. Product design choices impact how funding is allocated across different consumers and risk exposures to reduce the ultimate cost to the consumer. Consequently, these design factors will have a significant impact on the success or otherwise of any selected method(s).

PRODUCT DESIGN FEATURES	METHOD CONSIDERED				COMMENTS
	Government Reinsurance Pool	Government Insurer	Direct Subsidy	Risk Mitigation	
Events/perils covered	<p><b>Types of perils covered:</b></p> <ul style="list-style-type: none"> <li>• Cyclone only.</li> <li>• Flood only.</li> <li>• Bushfire.</li> <li>• Secondary perils.</li> <li>• All perils.</li> </ul> <p><b>Scope of cover:</b></p> <ul style="list-style-type: none"> <li>• Single event.</li> <li>• Multiple events/whole of term.</li> </ul>				Any framework should be robust enough to handle multiple perils. Restricting cover to certain events may have unintended consequences. For example, not covering consequential flood damage following a cyclone may not actually alleviate affordability issues or may perversely motivate homeowners to mitigate one risk at the expense of, or without due care for, another.
Geographic restrictions	<ul style="list-style-type: none"> <li>• All of Australia.</li> <li>• All of Northern Australia.</li> <li>• Target areas in Northern Australia, e.g. high risk.</li> </ul>				Many climate researchers suggest a decrease in frequency and increase in severity of cyclones due to climate change, however cyclones are expected to extend further south into more populated areas over coming decades. This may lend weight to the idea of a national initiative.
Eligibility	<ul style="list-style-type: none"> <li>• Open to all with obligatory acceptance.</li> <li>• Open to all.</li> <li>• Sub-sets of insurers/consumers (examples below).</li> <li>• Eligibility may be time based, e.g. only available for existing properties rather than new home builds.</li> </ul>				
Examples of restricted eligibility criteria	<ul style="list-style-type: none"> <li>• Insurers must show a minimum volume/proportion of policies sold to low income consumers.</li> <li>• Insurers must provide cyclone cover for target areas in NQLD.</li> <li>• Insurers must offer insurance with premiums under prescribed maximums in key areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Strata only.</li> <li>• Low income consumers.</li> <li>• Vulnerable customers.</li> <li>• Welfare recipients.</li> </ul>	<ul style="list-style-type: none"> <li>• Residents of target areas only (see geographic restrictions).</li> <li>• Customers must show evidence of mitigation activity.</li> <li>• Restrictions on multiple payouts (cf. US NFIP).</li> </ul>	<ul style="list-style-type: none"> <li>• Insurers or individuals could be restricted from joining or continuing to have access to the chosen option, depending on initial eligibility criteria or their recent activity or performance.</li> </ul> <p>An equalisation process may be appropriate to ensure different insurers are not disadvantaged by potential adverse outcomes of the adopted method.</p>	

PRODUCT DESIGN FEATURES	METHOD CONSIDERED				COMMENTS
	Government Reinsurance Pool	Government Insurer	Direct Subsidy	Risk Mitigation	
Compulsory or voluntary	<ul style="list-style-type: none"> <li>• Compulsory for all/eligible parties.</li> <li>• A basic form of cover is compulsory. <ul style="list-style-type: none"> <li>• Voluntary.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• Compulsory – regional or individual mitigation strategies/subsidies mandated by government.</li> <li>• Voluntary at either regional or individual level.</li> </ul>		<p>Choice of this design feature will affect risk selection, and therefore impact choices around pricing and funding.</p> <p>Compulsory schemes would require regulatory support, e.g. building codes could mandate that all future house builds or repairs apply prescribed risk mitigations.</p>
Risk exposure/product structure	<ul style="list-style-type: none"> <li>• FAC cover.</li> <li>• XOL Treaty.</li> <li>• QS Treaty. (various coverage and limit structures possible).</li> <li>• Individual vs community rating.</li> <li>• Cross-subsidies.</li> <li>• Single year vs multi-year.</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional direct insurance.</li> <li>• Government insurance, e.g. takes first layer of any insurance sold by any insurer (cf. NZ EQC)</li> <li>• Statutory scheme.</li> <li>• 'Bare bones' lender of last resort.</li> <li>• Particular risk limiting structures, e.g. high excesses or low sums insured rather than full replacement, limits for single events. <ul style="list-style-type: none"> <li>• Individual vs community rating.</li> </ul> </li> <li>• Cross-subsidies.</li> <li>• Single year vs multi-year.</li> </ul>	<ul style="list-style-type: none"> <li>• Welfare type payment made regardless of whether of insurance is purchase.</li> <li>• Subsidy at point of insurance purchase.</li> <li>• Welfare payments at time of event.</li> <li>• Subsidy made at point of claim.</li> <li>• Subsidy tied to eligibility criteria, e.g. means tested, dependent on family size.</li> <li>• Caps on total benefits payable.</li> </ul>	<ul style="list-style-type: none"> <li>Target risk avoidance – e.g. migrating populations from high risk areas.</li> <li>• Target individual mitigation – e.g. enhanced building codes/storm-proof doors.</li> <li>• Target group/community mitigation activities – e.g. levees.</li> <li>• Reward/subsidy made up front, e.g. coupons to be cashed in for cheaper storm-proof doors.</li> <li>• Benefit occurs after the mitigation activity, e.g. reflected in lower premiums, can apply to government for rebate.</li> <li>• Negative incentive - e.g. high risk area tax which increases year on year.</li> </ul>	<p>These design decisions are critical in effectively addressing individual consumers' affordability issues.</p> <p>Risk exposure is not necessarily correlated to affordability concerns, or the customer's perceived value of the insurance.</p> <p>For a given structure, how will the benefits flow through to the target customers?</p>

**Table C.2: Pricing and funding**

The source and cost of funding, and the consequential level of potential premium relief are important design decisions. Group 1 stakeholders may be more motivated by the latter, while Group 2 stakeholders will likely have a greater interest in the former.

PRICING/FUNDING DESIGN FACTORS	METHOD CONSIDERED				COMMENTS
	Government Reinsurance Pool	Government Insurer	Direct Subsidy	Risk Mitigation	
Target level of spend/relief	Various – ranging from zero spend, with improvements in affordability achieved by efficiency or risk redistribution, to 100% government liability for selected risks.				The effective flow of spend to targeted relief will critically depend on the product design factors discussed in Table 1, above.
Pricing mechanic	<ul style="list-style-type: none"> <li>• Pure technical price (ACCC definition).</li> <li>• Technical price with concentration type adjustments.                             <ul style="list-style-type: none"> <li>• With profit above Cost of Capital.</li> <li>• No profit, just Cost of Capital.</li> </ul> </li> <li>• No profit, subsidised, e.g. via zero or reduced frictional costs.                             <ul style="list-style-type: none"> <li>• Caps and floors on pricing.</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• Constrained by government budget and priorities.</li> <li>• Set to target KPIs of affordability/mitigation in key groups.</li> </ul>		<p>The selected price for an insurance or reinsurance product will have a link to expected losses. The link from spend via subsidy or mitigation to cost is generally more direct.</p> <p>We note that for the reinsurance pool and state insurance methods, regardless of the chosen structure, customer premiums would only be reduced if the cost of the cover offered for a given exposure was cheaper than would otherwise be available in the market (or motivated other players to reduce their costs). This would principally have to be achieved either through efficiency or subsidy (ignoring any second order effects, such as diversification impacts on the insurers. A key go/no-go decision for such a solution would be whether this could be achieved.</p>
Reliance on available expertise	<ul style="list-style-type: none"> <li>• Would a government scheme have access to suitable pricing experts?</li> </ul>		<ul style="list-style-type: none"> <li>• Would a government scheme have access to suitable scheme structure experts?</li> </ul>		One potential issue for any government initiative which did not rely on existing market players would be the availability of suitable experts and data.
Reliance on available data	<ul style="list-style-type: none"> <li>• Would a government scheme have access to enough experience/pricing data?</li> </ul>		<ul style="list-style-type: none"> <li>• Is the data available to target the desired groups/calculate appropriate subsidies? e.g. aggregated group vs anonymised individual vs identifiable individual salary data.</li> </ul>		
Source of funds	<ul style="list-style-type: none"> <li>• National or Regional source.</li> <li>• Priced to be self-funding, though requires initial capital.                             <ul style="list-style-type: none"> <li>• Levy on current insurers.</li> <li>• Tax on individuals/businesses.</li> </ul> </li> <li>• Direct government funding (State or Federal).</li> <li>• Government or CAT bonds (State or Federal).</li> <li>• Non-government bond (issued by separate entity) – does not become government debt if entity runs out of money.                             <ul style="list-style-type: none"> <li>• Tax concessions.</li> <li>• Pre- or post-funded?</li> </ul> </li> </ul>		<ul style="list-style-type: none"> <li>• National or Regional?                             <ul style="list-style-type: none"> <li>• Levy on current insurers.</li> </ul> </li> <li>• Tax on individuals/businesses.</li> <li>• Charity/public contributions.</li> <li>• Direct government funding (State or Federal).</li> <li>• Government or CAT bonds (State or Federal).</li> <li>• Non-government bond (issued by separate entity) – does not become government debt if entity runs out of money.                             <ul style="list-style-type: none"> <li>• Tax concessions.</li> <li>• Pre- or post-funded?</li> </ul> </li> </ul>		

**Table C.3: Operations and the market**

Any selected method(s) must be embedded or closely interact with the existing insurance market and stakeholders identified above. Avoiding friction, or positively benefiting from available synergies, may reduce costs or enhance the scale and effectiveness of any selected method(s).

OPERATIONAL/ MARKET DESIGN FACTORS	METHOD CONSIDERED				COMMENTS
	Government Reinsurance Pool	Government Insurer	Direct Subsidy	Risk Mitigation	
Relationship with current players	<ul style="list-style-type: none"> <li>• New, independent agency.</li> <li>• Equal player in a free market.</li> <li>• Automatically takes a part of any insurance/reinsurance sold by other market players.</li> <li>• Monopoly provider for key catastrophe perils.</li> </ul>		<ul style="list-style-type: none"> <li>• New, independent agency.</li> <li>• Cooperates with current government structures/state welfare apparatus, e.g. Centrelink.</li> <li>• Cooperates with other structures, e.g. charities.</li> </ul>	<ul style="list-style-type: none"> <li>• New, independent initiatives.</li> <li>• Cooperates with current initiatives/manufacturers.</li> </ul>	An appropriate level of 'emotional intelligence' would be required when considering the interaction of any proposed solution and the current insurance market and wider stakeholders to effectively solve affordability concerns.
Distribution channel	<ul style="list-style-type: none"> <li>• Direct to target market.</li> <li>• Distributed via existing reinsurers/insurers.</li> </ul>		<ul style="list-style-type: none"> <li>• Direct to individuals (e.g. cash, or welfare credit).</li> <li>• Direct to insurers when insurance is taken out.</li> </ul>	<ul style="list-style-type: none"> <li>• Direct government payments.</li> <li>• Subsidised mitigation products.</li> </ul>	<p>One possibility for any government initiative would be to leverage existing distribution or administration structures, at least in the short term, allowing immediate scale and reach.</p> <p>Good design could reduce friction throughout the process, e.g. when taking out a mortgage there could be a requirement to buy insurance, distributed via the mortgage providers. Customer awareness of risk could be enhanced by including an assessment of cyclone and flood risk in land titles.</p> <p>Some design decisions may require regulatory support.</p>
Other synergies with current players		<ul style="list-style-type: none"> <li>• New administration entity/solution.</li> <li>• Shared/outsourced with current players.</li> </ul>			
Automatic/Manual	<ul style="list-style-type: none"> <li>• Automatically applied, e.g. as a tax, or a loading in insurance prices.</li> <li>• Automatic enrolment, e.g. as part of welfare system/when applying for insurance</li> <li>• Manual process.</li> </ul>				There would be different operational requirements for opt-in or opt-out, and automatic and manual processes.

**Table C.4: Maintenance, monitoring and exit**

Any solution would need to consider how it would evolve in the face of changing social, market, or environmental conditions. How restrictive should its mandate be? Should a scheme be able to evolve and solve new social issues as they arise, or should the scheme's goals and reasons for funding be tightly fixed at inception? If change is anticipated, how should the scheme be initially set up to facilitate it, including winding up the initiative if required? Once the public's expectations have been set, there could be significant inertia to keep things as they are.

MAINTENANCE DESIGN FACTORS	METHOD CONSIDERED				COMMENTS
	Government Reinsurance Pool	Government Insurer	Direct Subsidy	Risk Mitigation	
Ability to smooth early adverse experience	<ul style="list-style-type: none"> <li>• New funding injections</li> <li>• Ability to transfer costs between years or locations (e.g. see below).</li> </ul>		<ul style="list-style-type: none"> <li>• May be an issue if access to the scheme/benefits are guaranteed. Alternative structures could put a cap on the maximum cost in a given year.</li> </ul>		A large event in the early years of any programme could impact funding and long-term viability.
Ability to transfer costs/benefits between years	<ul style="list-style-type: none"> <li>• Multi-year arrangements.</li> <li>• Additional rewards for renewal.</li> <li>• Future eligibility restrictions for breaks in service.</li> <li>• Profits retained for future use</li> <li>• Bonding - losses paid at claim then reclaimed from external source for debt service.</li> </ul>		<ul style="list-style-type: none"> <li>• Partnerships with government grant schemes.</li> </ul>		The ability to transfer cost/benefits between years may protect the scheme against adverse changes. Too much transfer, or transfer without a transparent cause could be for breaking the link between the cost to a given cohort and the benefit they receive.
Ability to respond to changing conditions	<ul style="list-style-type: none"> <li>• Planned timescale vs dynamic ability to enact change e.g. due to climate change, evolving social expectations, regulatory or legislative demands</li> <li>• Plan/ability to phase from one mitigation option to another?</li> <li>• Planned to be time limited or ongoing?</li> </ul>				Could the proposed solution react to give quick and effective relief if required, e.g. following another incident like Roma?
Ability to terminate arrangements	<ul style="list-style-type: none"> <li>• Impact of remaining debt or surplus on wind-up of arrangement?</li> </ul>				A clearly articulated vision of anticipated changes and/or eventual termination communicated at inception would manage expectations.
Ability to monitor effectiveness	<ul style="list-style-type: none"> <li>• Ability to directly measure impacts on affordability and other KPIs?</li> <li>• Ability to measure alternative proxies for success?</li> </ul>				Key decisions need to be supported by accurate measurement and monitoring of KPIs. These will likely depend on the definitions of a scheme's success.

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