Change to the EQC cap

What does it mean for insurance prices?

In this article we have a look at the change to the EQC cap and what it might do to insurance prices. We look at differences between regions and by sum insured, to see who are likely to be the winners and losers from this change.

EQC cap change

The cap on EQC's share of disaster risk is changing in October 2022 from $150,000+GST to $300,000+GST. This applies to policies as they renew after October so will gradually affect insurance portfolios over the subsequent 12-month period.

The change in cap will be accompanied by a change in the EQC levy – currently 20c per $100 sum insured (up to $150,000), moving to 16c per $100 (up to $300,000). For most homes this will mean that the EQC levy increases from $300+GST to $480+GST i.e. a 60% increase. The fact that the levy hasn't simply doubled (like the cap has) reflects the fact that doubling EQC's exposure doesn't automatically double its risk.

The Minister Responsible for EQC has made it clear that he expects insurance premiums to reduce as a result of this change and noted: *If insurer pricing doesn't behave as expected, the Government is open to considering options such as a competition study to give consumers assurance the market is competitive.*

How much of a premium reduction does the Minister expect to see? How will these reductions vary by location and sum insured? To examine these questions, we consider how a hypothetical insurer might react. However, first we step back and discuss the mechanics of catastrophe insurance pricing.

Community rating vs. risk rating

In an open and competitive market, insurance pricing will generally tend toward risk rating. Insurers are free to charge (almost) whatever price they want, but competitive pressures push them toward charging premiums commensurate with the risk for each policyholder (a.k.a. risk rating). To stray from this model (e.g. toward community rating where everyone pays the same price) usually requires some sort of government intervention e.g. EQC charging a flat rate for a fixed tranche of the disaster risk.

EQC has increased the size of the flat-rated tranche. This means that the portion of risk which is community-rated will increase and the portion which is risk-rated will decrease.

What does this mean for insurance pricing?

The answer of course varies by location and sum insured. In the following sections we've undertaken some high-level analysis on which regions might see large or small decreases in their premium, and how this compares to the increase in EQC levy.

The analysis is based on insurance pricing in a perfect world. Later we discuss some ways in which the world is not perfect and how this affects pricing decisions.

Technical insurance pricing

Insurance premiums need to cover four things:

- Expected claims (net of reinsurance)
- Reinsurance costs
- Administrative expenses and commissions
- Profit / cost of capital

These four things effectively represent the cost to the insurer of providing cover to the insured, including a cost for using the insurer's capital. With things like motor vehicle claims, insurers estimate the cost of providing this cover by analysing their experience over time.

With natural disasters, the bulk of the risk is transferred to reinsurers, especially for earthquakes. This means that the cost to the insurer is less about the actual cost of earthquakes, and more about the cost of reinsurance.

A good pricing model for an insurer is one in which the insurer has a good understanding of the cost that it incurs in providing cover to each policyholder, and is able to pass that cost on to policyholders with appropriate margins. For natural disaster cover, this includes attributing the cost of reinsurance appropriately between policyholders.

Hypothetical insurer

Let's imagine we have a small-mid size insurer writing policies for 54,000 residential dwellings with an even spread of risks around the country, something like:

Region	Num. dwellings	Sum insured
Northland	2,450	$1,470m
Auckland	13,925	$8,355m
Waikato	5,800	$3,480m
Bay of Plenty	3,475	$2,085m
Gisborne	675	$405m
Hawke's Bay	2,225	$1,335m
Taranaki	1,500	$900m
Manawatu-Whanganui	3,500	$2,100m
Wellington	5,425	$3,255m
Tasman	775	$465m
Nelson	650	$390m
Marlborough	575	$345m
West Coast	725	$435m
Canterbury	7,625	$4,575m
Otago	3,225	$1,935m
Southland	1,425	$855m
Other	25	$15m
Total	**54,000**	**$32,400m**

The average sum insured for this insurer is about $600,000 i.e. $450,000 in excess of the current EQC cap.

Let's also imagine that this insurer has done a really good job of allocating natural disaster costs where they lie. That is, the insurer:

- Worked out its expected claims below the catastrophe retention and attributed these at an individual policy level.
- Worked out the cost of reinsurance, how it relates to different potential events and allocated this to individual policies.

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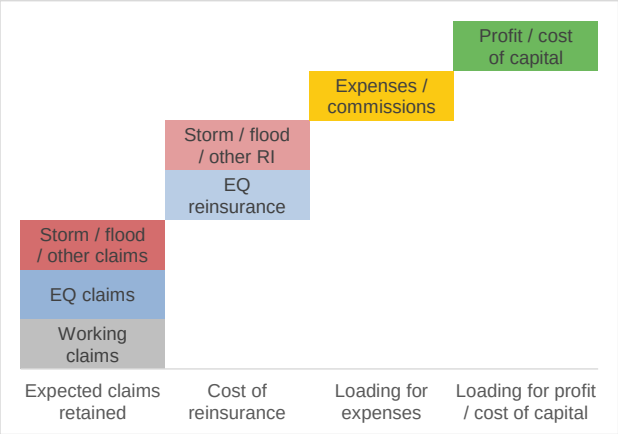
- Charged each policyholder a premium which fully reflects the cost to the insurer of providing natural disaster cover.

Components of the premium

As noted above, the premium charged to a policyholder needs to cover four things. Breaking this down a bit further, the premium comprises:



For now let's focus on the blue parts i.e. the cost to the insurer of providing earthquake cover to the policyholder. We've undertaken some modelling to estimate the size of these components for a typical policy, and how those components might change with the increase in EQC cap.

Impact on the reinsurance programme

We modelled the potential costs to our insurer using some catastrophe modelling software. We've estimated that:

- The 1 in 1,000 year earthquake event for our insurer is around $280m (based on a $150,000 EQC cap). The Reserve Bank requires the insurer to purchase a reinsurance programme up to at least this amount.
- The current reinsurance programme for our insurer starts at $5m and has various layers up to $280m.
- After adjusting for the new EQC cap the 1 in 1,000 year earthquake event reduces to around $150m.
- The new reinsurance programme still starts at $5m but now tops out at $150m.

We've estimated the reinsurance premium for each of these programmes, as well as the claims which will be retained by the insurer, and how much of this relates to earthquakes. We then attributed the cost of providing earthquake cover down to each individual policy.

Cost of EQ cover under $150,000 cap

The following table shows an estimate of the average cost to our hypothetical insurer of providing earthquake cover to each policyholder. We've assumed these costs are well understood by our insurer and passed on to policyholders.

The table also shows the current average EQC levy, which is slightly less than $300 due to the few residential buildings insured for less than $150,000.

Average earthquake premiums based on $150,000 cap

	Insurer EQ premium	EQC levy	Total EQ premium
Northland	$2	$298	$301
Auckland	$10	$298	$308
Waikato	$32	$298	$330
Bay of Plenty	$79	$298	$377
Gisborne	$569	$298	$867
Hawke's Bay	$798	$298	$1,097
Taranaki	$39	$298	$338
Manawatu-Whanganui	$441	$298	$739
Wellington	$1,467	$298	$1,765
Tasman	$108	$298	$406
Nelson	$116	$298	$415
Marlborough	$386	$298	$684
West Coast	$446	$298	$745
Canterbury	$231	$298	$530
Otago	$151	$298	$449
Southland	$77	$298	$375
Other	$0	$298	$298
Overall average	**$285**	**$298**	**$583**

It will come as no surprise that the highest earthquake premium is in the Wellington region. This is due to both the high seismic risk and the concentration of buildings in the area. The modelled premiums for Canterbury are relatively low, although this is a function of different catastrophe models and how they allow for the heightened seismicity following the Canterbury and Kaikoura earthquakes.

For Auckland and Northland the modelled EQ premium is minimal due to the very low seismic risk. However, different catastrophe models have different treatment of volcanic risk, and other insurers (or reinsurers) may take a different view.

Impact of the cap change on the cost of EQ cover

We reran the analysis using a $300,000 cap to compare. The following table shows the total earthquake premium from the previous table alongside the premium under the new cap.

Average earthquake premium (insurer+EQC)

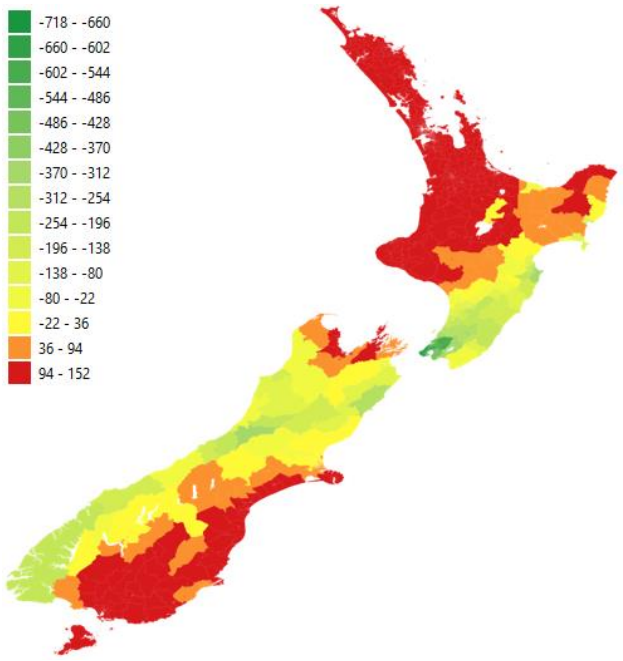
	$150,000 cap	$300,000 cap	Change
Northland	$301	$451	+$150
Auckland	$308	$454	+$146
Waikato	$330	$464	+$134
Bay of Plenty	$377	$483	+$106
Gisborne	$867	$726	-$141
Hawke's Bay	$1,097	$859	-$237
Taranaki	$338	$467	+$129
Manawatu-Whanganui	$739	$662	-$77
Wellington	$1,765	$1,197	-$568
Tasman	$406	$500	+$94
Nelson	$415	$508	+$93
Marlborough	$684	$625	-$59
West Coast	$745	$661	-$84
Canterbury	$530	$563	+$33
Otago	$449	$526	+$77
Southland	$375	$485	+$110
Other	$298	$450	+$152
Overall average	**$583**	**$592**	**+$9**

The average EQC levy goes up to around $450 i.e. about $152 higher than under the current cap. The average is less than the full $480 EQC levy as dwellings under $300,000 bring the average down. The average insurer

premium comes down by about $143. Therefore, the change in EQC levy seems to be broadly in line with the average change in risk, although the average hides some big regional differences.

In Northland the average policyholder's premium increases by $150 (due to the levy increase) with no appreciable decrease in the insurer premium. In Wellington the average insurance premium decreases by around $719, and this is only partially offset by the $152 increase in average EQC levy. The overall impact is a $568 decrease in average premium in Wellington.

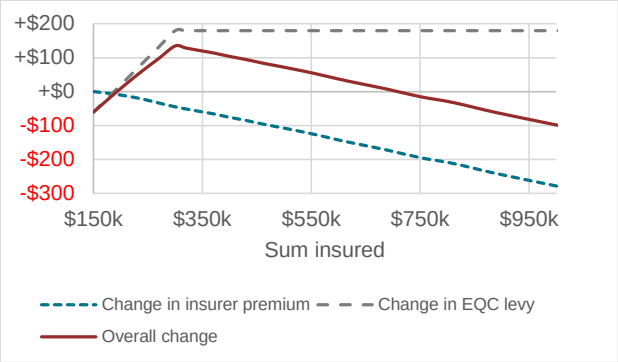
The figures above are regional averages. Within regions there are some areas with even greater impacts. The map below shows the overall change in premium at a more granular level.



Unsurprisingly, the areas likely to see a decrease (yellow/green) tend to be those along our main fault lines running from Fiordland, through Wellington, and out past Hawke's Bay.

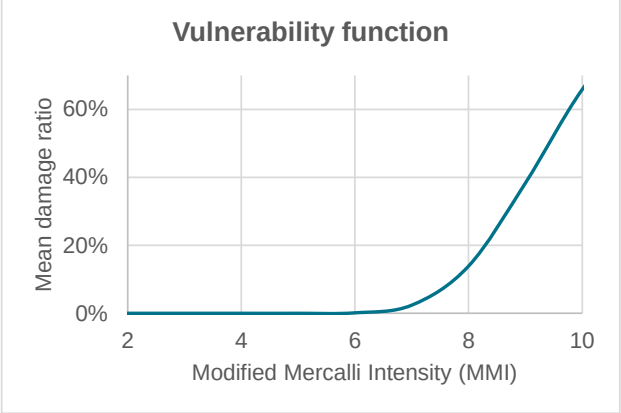
Impact by sum insured

It's also interesting to look at the impact for different sums insured. The chart below shows the change in total earthquake premium (averaged across the country) for different sums insured.



At the lower end, policyholders see a decrease in overall earthquake premium. For example, a policyholder with a $150,000 sum insured currently pays an EQC levy of $300. When the EQ cap increases to $300,000 and the levy rate reduces to 16c per $100, the EQC levy for this policy decreases to $240 i.e. a $60 decrease. The insurer doesn't hold any earthquake risk for this policy under either the $150,000 or $300,000 cap (although see some comments later), so there is no change in insurance premium, only a change in EQC levy.

To understand the impact for dwellings with higher sums insured, we need to understand how vulnerability functions work. A vulnerability function translates a measure of intensity (e.g. level 8 on the Modified Mercalli Intensity scale) into a mean damage percentage (e.g. 15% of sum insured). Damage tends to increase rapidly when intensity exceeds a certain level.



Most potential earthquake events cause small to moderate amounts of damage (e.g. less than 10% of sum insured). It is rare for an event to cause shaking intense enough to result in more than, say, 20% damage.

For a policy with a $300,000 sum insured, under the current $150,000 EQC cap, the insurer only bears the cost where damage exceeds 50% of the sum insured (i.e. only when the intensity at that location is very strong). So for most events the insurer bears no liability, and removing this liability from the insurer (by increasing the EQC cap) doesn't result in a very significant premium reduction (although this varies geographically). On the other hand, every $300,000 policy will see an increase in EQC levy of $180 and in most locations this increase outstrips the reduction in premium for the insurer.

As the sum insured increases, the portion of damage covered by the insurer moves lower down the curve. For example, for a $1m dwelling, the insurer currently steps in when the damage exceeds 15%. When the EQC cap increases, the insurer will step in once damage exceeds 30%. The intensity required to cause damage in the range of 15-30% is more moderate. Because shaking at this level is more frequent, the cost to insure this damage is higher. In other words, the 15-30% tranche of a $1m dwelling costs more to insure than the 50-100% tranche of a $300,000 dwelling. Therefore, our hypothetical insurer offers a significant reduction in premium for the $1m dwelling as the EQC cap increases. In most locations this reduction exceeds the $180 increase in EQC levy and results in an overall decrease for the policyholder.

The world is not perfect

Our hypothetical insurer operates in a market where every policyholder pays a premium which accurately reflects the cost that the insurer incurs in providing that cover. However, in the real world:

- Catastrophe models are subjective and can change over time.

- The reinsurance market goes through hard and soft cycles.
- Competitive pressures affect an insurer's ability to charge the 'right' premium.
- IT constraints sometimes inhibit the use of very granular pricing models.

All these factors interact with the change in EQC cap and mean that things will not play out exactly as we've modelled. Moreover, an increase in the EQC cap has been expected now for some time and some insurers may have been holding back on fully rating for Wellington earthquake risk, given that some of that risk was likely to be transferred to EQC in the near future. If that's the case, then we might not see the sort of decreases in Wellington that our model predicts.

We've also made some simplifications in our modelling. For example, insurers cover ground-up earthquake damage to most paths, driveways and fences, regardless of the EQC cap, and we haven't modelled this. Also, we've assumed similar distributions of sums insured and construction type across the country, when in practice this isn't the case.

Despite these simplifications, our model still provides some idea of what to expect, and it will be interesting to compare our model against the actual changes in premiums as they are implemented next year.

Why is EQC cap changing?

In the Minister's press release, Hon Dr David Clark makes reference to some significant premium increases in high-risk locations due to 'granular risk-based pricing.' This seems to be a problem that EQC is attempting to fix by increasing the EQC cap. Will it work? See our comments below.

The Minister has also signalled that there will be other changes to the EQC Act. Perhaps this is part of a change in EQC's role from *providing natural disaster insurance* to *managing the price of natural disaster insurance*.

Granular pricing and EQC cover

Natural disaster risk varies throughout the country, but it doesn't vary in the same way for all risks.

In the main centres, earthquake risk is highest in Wellington and lowest in Northland, and this applies across these entire regions or cities. There are small pockets of high-risk areas (e.g. where soil is known to be liquefiable) but, by and large, earthquake risk doesn't vary significantly from one suburb to the next.

On the other hand, flood risk varies at a very granular level. Some properties are at significant risk of flooding or coastal inundation, whilst properties a few streets over (and maybe on higher ground) are much safer. Where policyholders have seen vast year-on-year increases in premium, this is often as a case of the insurer recognising that the property is in a flood zone or subject to some other non-earthquake risk.

Updates to earthquake modelling and pricing don't generally result in significant variations in pricing between streets or suburbs, like updates to flood modelling might.

So will the increase in EQC cap help to deal with some of these unpalatable premium increases? This seems unlikely as EQC only covers damage to residential buildings resulting from earthquakes, landslip, volcanic activity, hydrothermal activity and tsunami. Importantly, EQC does not cover building damage due to storms or flooding, other than where these cause a landslip which results in building damage.

In essence we think that high risk coastal property isn't about to see a huge reduction in their insurance premium due to the increase in EQC cap.

Conclusion

By increasing the EQC cap, EQC is choosing to community-rate a greater portion of a policyholder's earthquake insurance premium. This leaves a smaller portion which is likely to be risk-rated by the insurer.

In theory, this should result in premium reductions for policyholders in high-risk locations. For policyholders in locations with minimal earthquake risk, one might expect to see the EQC levy increase with no offsetting decrease in the premium to their insurer.

In effect, the EQC levy requires policyholders in Northland to subsidise the high cost of earthquake insurance in Wellington.

Because EQC operates as a first loss insurer (i.e. covering the first tranche of damage) the change in EQC cap makes for some interesting effects by sum insured. For very low sums insured (around $150,000) policyholders will see a decrease in EQC levy and minimal change in premium to their insurer. For sums insured above $300,000, our earthquake modelling suggests a larger decrease in insurer premium at higher sums insured, despite all policies seeing the same increase in EQC levy.

Of course, different insurers will see things differently. There are a variety of catastrophe models on the market and numerous choices of vulnerability functions to use. There is no one right way to allocate reinsurance costs between policyholders, nor is there a right way to allocate overheads. Different insurers have different priorities and will make different decisions.

In short: individual results may vary.

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