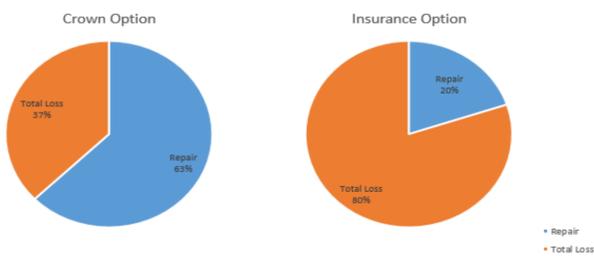
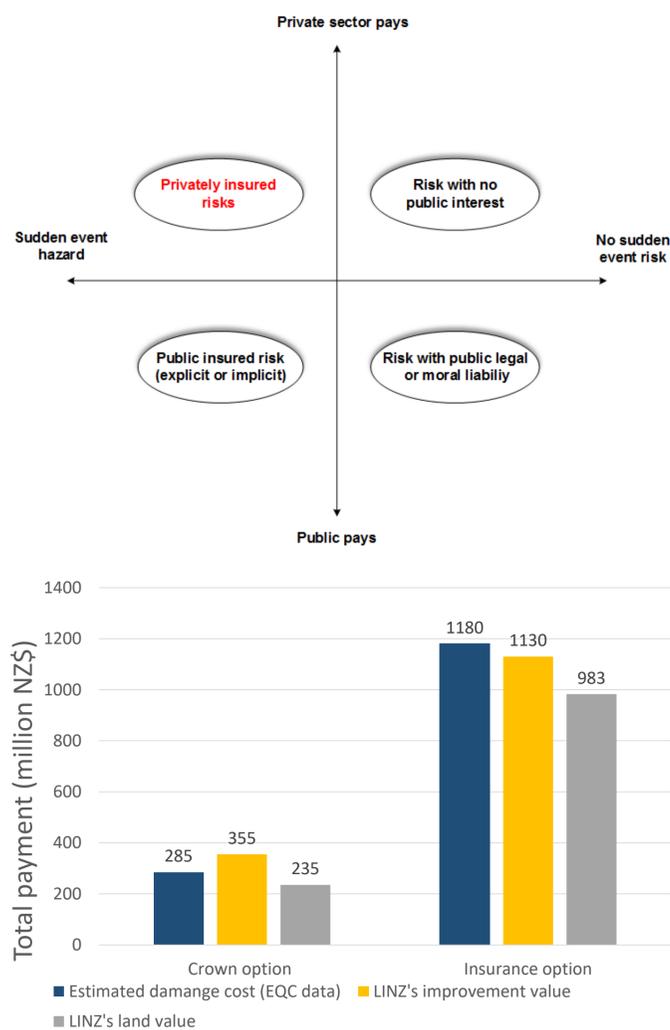


# Who Pays for a Managed Retreat?

## Lessons from the Christchurch Residential Red Zone

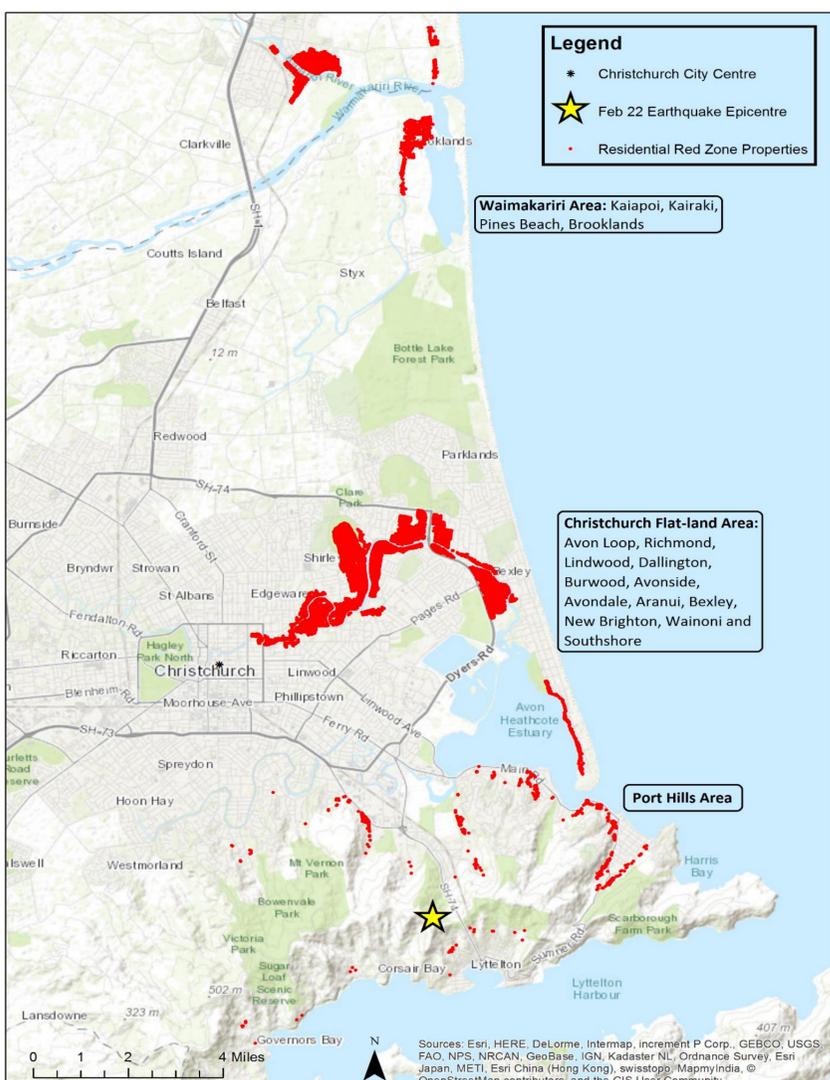
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### Homeowner choice regarding Crown offer

$$\Pr(\text{Option}_i = 1 | x_i) = F(\beta_0 + \beta_1 \text{property value}_i + \beta_2 \text{earthquake damage}_i)$$



### Crown Option:

Owners sell their property to the Crown (including both land and improvements) based on the 2007 rating valuation. The Crown takes over any outstanding insurance claim.

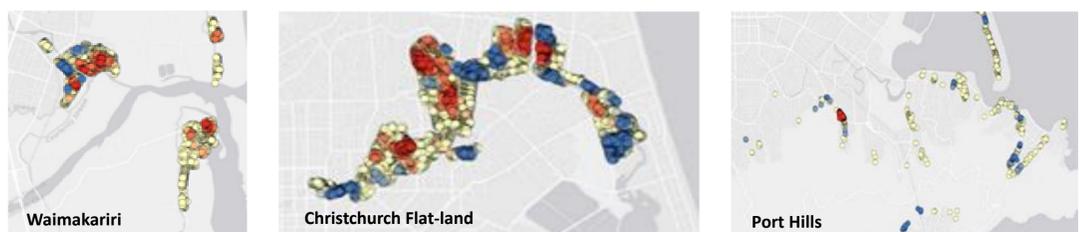
### Insurance Option:

Owners sell only their land to the Government at the 2007 rating valuation of the land. Owners pursue any insurance claim they may have against their insurer for damage to the dwelling.

Table 3 – Estimation results - Spatial linear probability model

VARIABLES	Dependent dummy variable – Option choice					
	OLS	SAR	SDM (Total)	SDM (Chch. city)	SDM (Port Hills)	SDM (Wakamariri)
<b>Main</b>						
Improvement Value (log)	-0.177*** (0.011)	-0.171*** (0.010)	-0.160*** (0.011)	-0.167*** (0.014)	-0.105*** (0.028)	-0.166*** (0.020)
Land Value (log)	0.264*** (0.017)	0.254*** (0.014)	0.265*** (0.015)	0.300*** (0.018)	0.0311 (0.039)	0.270*** (0.042)
Damage Status	0.372*** (0.012)	0.366*** (0.009)	0.368*** (0.009)	0.325*** (0.012)	0.573*** (0.035)	0.451*** (0.018)
<b>Spatial</b>						
$\rho$		0.138*** (0.016)	0.132*** (0.017)	0.114*** (0.020)	-0.067 (0.076)	0.214*** (0.039)
<b>Wx</b>						
Improvement Value (log)			-0.093*** (0.022)	-0.092*** (0.028)	-0.115** (0.054)	-0.053 (0.041)
Land Value (log)			-0.028 (0.027)	0.001 (0.031)	-0.046 (0.065)	-0.197** (0.078)
Damage Status			0.021 (0.021)	0.006 (0.026)	0.225** (0.097)	0.0303 (0.042)
MB fixed eff.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7482	7482	7482	5592	502	1388
Pseudo- R <sup>2</sup> (%)	29.30	32.06	32.26	28.72	58.87	40.44

\*\*\*/\*\*/\* Indicating the significance levels of respectively 1%, 5% and 10%. Robust standard errors are shown in parentheses. Rho -  $\rho$  is the spatial autoregressive coefficient and Wx is the spillover effect coefficients. All models have Hausman p-value equal to zero.



### Optimized Hot Spot Analysis - RRZ Option choice

Optimized hot spot analysis (Getis-Ord  $G_i^*$ ) is carried out to identify areas where clusters of homeowners made the same decision regarding the option choice. Clusters of red dots represent areas where homeowners choosing the insurance option, while areas with blue dots show the cluster of homeowners choosing the crown option

### Preliminary findings

In the Crown option ( $\text{Option}_i = 0$ ), the RRZ households would receive the 2007/08 rating valuation of their house from the government. The properties with high improvement value tends to choose the Crown option.

Every homeowner in the RRZ received the QV 2007 of its land from the Crown. In the Insurance option, homeowner would deal with EQC and insurers to settle claim from the earthquake damage. We find that high land value would make the property owner taking the Insurance option ( $\text{Option}_i = 1$ ). The correlation between land value and the damage indicator is small but significantly positive

Damage indicators are positively associated with our dependent variable ( $\text{Option}_i$ ). The insurance claim payment was based on the assessed damage on the property. Homeowners would be more likely to choose to deal insurers for claim payment when the earthquake damage on their property was high. On average, having the "Total loss" status will increase the probability of choosing the Insurance option by over 30 percent, holding everything else constant.