



## **URBAN EARTHQUAKES AND BUSINESSES IN NEW ZEALAND: LEARNING FROM THE 2007 GISBORNE EARTHQUAKE**

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### **ABSTRACT**

Using quantitative and qualitative techniques, the recovery of business following a moderate earthquake in Gisborne, New Zealand, is investigated. In a city that is remote from other places, community support was important to recovery. Business owners have learned from the earthquake, but it is not certain that this will result in better hazard preparation or alter their behaviour after another earthquake event. Owners of some of the worst affected businesses did not take responsibility for decisions that increased their losses due to a natural disaster, blaming other organisations for their slow return to normal operations.

### **Introduction**

As shoppers took part in late-night Christmas shopping, a magnitude 6.8 earthquake occurred 50km southeast of Gisborne just before 9p.m. on 20 December 2007. Damage was moderate in this small New Zealand city, with the earthquake's main axis of motion running parallel to the city's main street, resulting in debris to fall sideways from building parapets along the main road and its side roads whilst building frontages were left largely intact. The police promptly closed the central business district (CBD) and no businesses were allowed to trade until all buildings were assessed by structural engineers. From late afternoon the following day, owner-managers were allowed back into the CBD and builders started to undertake essential repair and demolition work. The total cost of the damage caused by the earthquake based on insurance claims is estimated to be NZ\$55 million (Brennan 2008; ICNZ).

The recovery of businesses after a natural disaster warrants special attention as it is important they reopen quickly to provide income and employment to local residents, and thus facilitate the community's recovery. Whilst the closure of an individual business may have little impact on a local community, the collective loss of a large number of small businesses could be devastating (Yoshida and Deyle 2005; Zhang *et al.* 2009). For a remote community like Gisborne, where businesses employing less than 20 people constitute 92% of all businesses and

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employ 45% of the city's workforce (Statistics New Zealand), the resilience and recovery of small businesses is critical. Yet disaster research tends to place greater emphasis on units of analysis other than businesses, such as families, households and government agencies (Webb *et al.* 2002; Zhang *et al.* 2009). It is therefore the intent of this research to fill this knowledge gap.

In this presentation we report the findings from questionnaire surveys of Gisborne businesses conducted in 2008 and 2009, and from interviews in 2009 with Gisborne business people, which collectively investigated the recovery of the local business community. We briefly outline our research in Gisborne and address four questions: (1) What was the initial recovery experience of businesses? (2) What preparedness measures did businesses have in place? (3) What catalysts and barriers to recovery did businesses experience? and (4) What have business owners learnt from the experience of recovery?

### **Methodology**

Questionnaires were sent to 925 businesses throughout the Gisborne region in March 2008, three months after the earthquake. A response rate of 31% was achieved, with 286 completed surveys returned. This first survey sought information about initial perceptions of damage, interruption to trade, and recovery after the earthquake. A second survey was sent in April 2009 to the same 286 businesses and 143 completed surveys were returned, giving a response rate of 50%. The follow-up survey sought a deeper insight into business recovery.

The response rate for open questions in the second survey was low, with some respondents leaving boxes blank or indicating that the questions were not applicable to them. It was also observed in the later survey that some owners, whose buildings had sustained structural damage, were still waiting for repairs to be completed. For these reasons, it was decided that conducting interviews with individuals at different stages in the recovery process would reveal more detailed information on their recovery. Fourteen semi-structured interviews were conducted in September 2009 with owners of commercial buildings in Gisborne that had sustained structural damage in the earthquake; four of these owners were still waiting for rebuilding to commence. In addition to being at different stages of recovery, interviewees were selected that represented a cross-section of: building ages, usage by a diverse set of industry sectors (e.g. retail, engineering or office), locations (i.e. inside or outside the CBD), and whether the building is owner-occupied or leased to tenants.

### **Results**

#### **What was the initial recovery experience of businesses?**

Contrary to findings in other studies (Alesch *et al.* 2001; Chang and Falit-Baiamonte 2002; Dahlhamer and Tierney 1998; Kroll *et al.* 1991), there was no evidence from the first study to suggest that smaller companies in Gisborne were more vulnerable to the effects of this earthquake. With the worst of the damage located in the CBD, it is unsurprising that businesses in the retailing and wholesaling sectors were amongst those most likely to have received damage or to close temporarily after the earthquake, thus sustaining a significant proportion of the revenue lost after the earthquake. The limited scale of damage resulted in only 18 (6%) of businesses closing for more than a day. Some businesses associated with the recovery and

rebuilding process, including retailers/wholesalers of furniture and building supplies, reported benefitting from the earthquake with sustained increases in revenue in the first months after the earthquake, and this is a fairly typical experience after a natural disaster event (Dahlhamer and Tierney 1998; Kroll *et al.* 1991; Meszaros and Fiegenger 2002; Tobin 1999).

Many businesses (72-81%) self-financed the costs of the earthquake, rather than claim on their insurance policies. This low propensity to claim is consistent with studies of businesses affected by a natural disaster elsewhere (Alesch *et al.* 2001; Chang and Falit-Baiamonte 2002; Webb *et al.* 2000). It suggests that the losses of around three-quarters of businesses are not discernible in official estimates of the earthquake's economic impacts, and that damage to businesses and the wider community in the Gisborne region was possibly more extensive than implied by statistics reliant on insurance claims. Another area for concern is that, because many businesses are self-financing the costs of the earthquake, there may be implications for their long term viability.

### **What preparedness measures did businesses have in place?**

In places that are vulnerable to natural hazard events, it would seem intuitive that businesses would be aware of the potential danger and seek to mitigate the potential impacts. However it is well-documented that businesses tend to have low rates of adoption of preparedness measures (Chang and Falit-Baiamonte 2002; Tierney 1997; Webb *et al.* 2000). In the initial survey, investigation into the types of measures in place prior to the earthquake found a heavy reliance on insurance policies and first aid provision with 77% and 57% of respondents respectively having these measures. This raises concerns as the former may offer only limited financial assistance to policyholders, and the latter would only be useful in the immediate aftermath of a disaster event. The use of other measures, like having a disaster recovery plan (9%), conducting earthquake drills (8%), or fastening cupboards to the walls (15%), was low in comparison.

The high consumption of insurance policies and first aid obscures the vulnerability facing many businesses in the region from not having in place effective measures to prepare for earthquakes. Indeed from our finding that businesses displayed a low propensity to claim from their insurance policies, their reliance on insurance to facilitate recovery appears problematic. It also indicates that businesses appear to have a preference for low-level preparedness measures that are simple to acquire over high-level measures that are time-consuming or resource intensive.

### **What catalysts and barriers to recovery did businesses experience?**

From the literature it was anticipated that the features of the earthquake, post-disaster community resources, external support, and planning and reconstruction strategies would be identified as important factors as the community recovered (Drabek 1986; Lindell *et al.* 2006). Respondents were asked a series of open questions about what helped and hindered their return to business following the earthquake. In the initial survey, we asked "Media reports claim that nearly all Gisborne businesses were trading as normal two days after the earthquake. What do you think was the most important reason for this speedy recovery?" In the follow-up survey, we

asked “What do you think helped most in restoring your business after the earthquake?” In addition to the time lapsed between surveys, the differences in these questions may account for the variation in answers between the surveys.

In the initial survey, economic imperatives and community support dominated the responses, followed by the role played by key emergency services groups, and aspects of disaster response. The notion of economic urgency being the most important pathway to recovery is not commonly cited as enabling recovery. Perhaps fearful that their local economy might be entering a recession and that a natural disaster would be likely to exacerbate existing economic trends in their community (Alesch *et al.* 2001; Cross 2001), the people of Gisborne rallied to enable businesses to reopen quickly to capitalise on Christmas spending, fulfil orders, and to meet the anticipated demand from visitors and especially for the annual Rhythm and Vines music festival due to take place on New Year’s Eve.

Responses to the second survey focussed on ongoing recovery past the initial phase, with no mention of key groups or economic urgency. Community resources continued to dominate, followed by company-related factors and disaster response aspects. The minor nature of damage was cited by almost the same number of people in both surveys. The prominence of community spirit in both our surveys supports Reser’s (2004) observation of the ‘honeymoon effect’, when people pull together in the aftermath of a disaster to restore their lives. In addition, owner/managers may feel that they are tied to the city as it is remote, requiring them to have strong community links and more likely to adopt a ‘business as usual’ attitude following an upheaval such as a natural disaster.

In the first survey, respondents were asked what they believed would be possible barriers to the ongoing recovery of businesses in Gisborne after the earthquake. In the follow-up survey, respondents were asked what made it difficult for their business to return to normal after the earthquake. Delays of some form or other were most frequently cited in the initial survey, suggested by 14% of respondents. The type of building stock in Gisborne was believed by 12% of respondents to be a potential source of future problems, as well as the extent of the damage to existing building stock and the difficulties in obtaining resource management consents for repair work and building. The lack of preparedness for potential earthquakes was considered to be another possible impediment to recovery, as 11% of respondents suggested that others had insufficient insurance cover to pay for repairs or losses, and that buildings were vulnerable as some owners had not had them earthquake strengthened. In the follow-up survey, delays were still believed to be the most significant barrier to recovery, with other suggested barriers receiving little mention.

The cause of delays was explored in more detail in the interviews with building owners. The length of time it took to reach settlement with their insurance company was the most frequently cited hindrance. Nearly half of the 14 interviewees revealed that negotiations with their insurance company had resulted in delays, typically relating to who was to pay for which aspects of the repairs and rebuilding. One owner waited nearly 18 months after the earthquake for his claim to be agreed, while another blamed their insurance assessor for deliberately slowing down their claim. In the latter case, the owner bypassed the assessor and went directly to the insurance company to reach settlement.

Hold-ups also occurred whilst owners waited for tradesmen to become available, although this was mentioned by only three interviewees. One owner went to visit family in Auckland, reassured that he was leaving his builder at work, only to find on his return that, unannounced, the builder had left Gisborne for work in Australia leaving the repairs undone. Another project stalled as builders had to wait for technical advice once they had commenced repair work.

Waiting for professional advice was also noted as causing delays. One individual waited nearly 10 months for his architect to come up with the specifications for the repair work on his building. This was in addition to the nine month delay he experienced due to negotiations with his insurance company as to who should pay for what. His annoyance with the delays was evident:

“It’s just dragged on and on and on. Every time we asked him ‘Where is it?’, ‘Oh, we’re getting there’, and all sorts of lame excuses. It’s just been frustrating waiting” (Interviewee #4).

The wait for engineer’s reports on the specification of the repairs/rebuilding was a source of considerable delay for two owners, one of whom claimed it took about a year for the detailed report to be compiled. For the other owner, who languished for months on his engineer’s waiting list, action was eventually kick-started when his insurance assessor appointed a different engineer. Within a week or two of the new engineer’s inspection, builders were on site to undertake urgent repairs.

The local authority in Gisborne was also blamed for holding up rebuilding. One owner was irritated by the slow process of paperwork as it was passed from one department in the Council to another. He also suspected that he was being made to apply unnecessarily for permits, and suggested that the reason for this was that the Council doubted he would rebuild the property if allowed to demolish it. A different owner cited the problems they had faced in respect of the current Building Code that required them to install paraplegic toilets and to make other modifications to their building. In the end a compromise was reached between both parties.

### **What have business owners learnt from the experience of recovery?**

The framework of a crisis management approach suggests there are three phases in how an organisation handles a crisis: crisis prevention, response and recovery (Elliott *et al.* 2005; Runyan 2006). This approach suggests that organisations may themselves play a significant role in ‘incubating the potential for failure’ (Elliott *et al.* 2005, p.338) through the decisions made by management to build resilience. After dealing with the recovery phase, organisations may seek to actively learn from their experience, altering their behaviour to become more resilient to future events (Elliott *et al.* 2005; Toft and Reynolds 1992). However empirical studies investigating the relationship between disaster experience and organisational learning are rare (Deverell and Hansén 2009; Runyan 2006). Our studies in Gisborne sought to identify what owners learnt from the earthquake that they might reduce the likelihood of a similar outcome arising from a future event.

Evidence from studies of small businesses elsewhere suggests previous disaster experience can influence the uptake of mitigation measures (Webb *et al.* 2000). Those most likely to add preparations after the earthquake were not the ones that experienced the most damage, but those that had already taken some precautions prior to the earthquake (Forsyth and Johnston 2005; Meszaros and Fiegenger 2002). In this sense, the careful became more careful. The results of our second survey support these findings, with 90% of those undertaking new measures after the earthquake having preparation measures in place prior to the earthquake. The Gisborne earthquake stimulated about a third of business owner/managers to better prepare for earthquakes, engaging in both mitigation and survival actions, a similar proportion to that observed after the Nisqually earthquake (Meszaros and Fiegenger 2002). Mitigation actions like securing furniture and fittings, checking and/or increasing insurance, and moving stock to safer positions and/or reducing the amount of stock on the premises were the most frequently cited. The most popular survival measure was earthquake evacuation plans and/or drills.

From the interviews a further example of modified decision-making is evident, as owners of earthquake damaged buildings acknowledged that they would pay more attention to the resilience of buildings in the future. Owners were asked what characteristics they would look for in a commercial building if they were to acquire another one. Ten owners said that they would pay more attention to the strength or structure of a prospective building, with a number of people emphasizing that this would be especially important if the building is an older building.

“I’d definitely take a long hard look at the actual structural condition of the building, and where it stands in that whole strengthening process if it’s an older building” (Interviewee #7).

Certainly the age of a building would be the most important criterion for two people, stating that they would only consider purchasing a modern building constructed to current building regulations. Only one person said that they would have no concerns about building resilience, as “what will be, will be” (Interviewee #13). A different person was also less concerned about the building itself, as his main objective was the yield of the property or return on his investment.

Whilst the evidence from the surveys and interviews suggests that business owners have modified their decisions around building more resilience into their business, it seems that the experience of the earthquake has not altered the way in which they would respond to a future hazard event. When asked how they would react if another earthquake was to hit Gisborne, not one person said they would act differently. Four people were confident that they would experience less damage due to the repairs and strengthening work undertaken after the 2007 earthquake. Four others presented a more fatalistic outlook.

“I think they [earthquakes] are just part of the rich fabric of life, and every now and again they’re going to happen” (Interviewee #6).

Only one person hesitated when answering, saying “At one stage I said to the council ‘It’s just not worth me investing in this town’, but I’ll hang on here, I live here” (Interviewee #10), before deciding that he wouldn’t act any differently, but would be wiser on another occasion. Finally,

one other owner said that they had learnt from the 2007 earthquake that it is possible to sustain significant damage and for the business to survive.

### **Discussion and conclusions**

Our research into the Gisborne earthquake used a combination of quantitative and qualitative methods, enabling the triangulation of findings and providing a rich source of data. It is recognised, however, that there are limitations to this research into a single event that mean that its conclusions may not be wholly adaptable elsewhere: (1) the small sample size, due mainly to the Gisborne region's low population, although care was taken to select interviewees that represented a cross-section of building types and progress in recovery, (2) the earthquake was moderate in nature, resulting in low levels of damage, may mean that our findings are not applicable in situations with a greater level of damage, and (3) the data collection occurred within the first 20 months after the earthquake, so our findings relate only to recovery in the short and medium term.

The results from our analyses suggest that the recovery of businesses from a natural hazard event can be a slow and complex process. In Gisborne, it appears that the size of businesses did not influence their vulnerability, which contradicts the findings of other studies. We suggest that this inconsistency is probably due to the business demographic in the Gisborne region, which is dominated by small businesses (less than 10 businesses employing more than 50 employees participated in the first and largest of our surveys).

Whilst many businesses had low-level preparedness measures in place prior to the earthquake, the effectiveness of these in reducing the impacts of the earthquake on businesses and facilitating recovery is questionable. After the earthquake about a third of businesses had increased the number of preparedness measures they had in place, but nearly all of these had also had preparedness measures in place prior to the earthquake. As found elsewhere, the earthquake experience failed to prompt those businesses that had sustained the worst damage to implement additional measures, and only a very small number of businesses that had no measures in place prior to the earthquake introduced measures afterwards.

As time passes the catalysts and barriers to recovery can vary whilst the significance of certain types of factors remains more constant. Our findings suggest that in Gisborne community support was an important recovery mechanism in both the short and medium term, whilst the economic urgency of reopening businesses before Christmas was a significant factor in the initial recovery. Delays of one form or another were regarded as the main impediments throughout the rebuilding process.

Managerial decisions affect the potential to reduce the impact of a crisis or natural disaster, such as the failure to comply with regulations or to minimise the risk. Certainly in Gisborne the evidence indicates that the owners of the worst hit businesses failed to take action prior to the earthquake that would have reduced its impacts and eased recovery. Nearly half the owners interviewed admitted that they had taken the decision not to strengthen their buildings to current standards as the deadline for doing so was some way off or because regulations had changed meaning that their building was no longer officially regarded as earthquake prone.

Several owners also disclosed that they had made choices regarding their insurance cover which resulted in their cover being insufficient to cover their losses from this earthquake.

Using a crisis management approach, the final phase of recovery is when organisations seek to learn from the event to become more resilient, and this may include scapegoating in order to blame someone for the crisis (Elliott *et al.* 2005; Smith and Sipika 1993). Many owners of earthquake damaged buildings seem to have learnt from the earthquake in one way or another, especially in relation to the significance of having business premises that can withstand an earthquake. It is also observed that some owners have improved their preparation measures. However it seems unlikely after a future event that owners would act differently, suggesting that there are limits to what businesses learn from a disaster.

Although decisions to strengthen buildings and minimise their potential losses rested with owner-managers, it is evident from what owners said that the blame for slow recovery was laid outside their organisation with the insurance industry, in particular, accused. Whilst the scapegoating process in organisations after a crisis is usually dominated by internal restructuring and the removal of management in place prior to the crisis (Smith and Sipika 1993), in a small business where the owner has taken the decisions that left the business exposed to the impacts of a natural hazard, it appears that the blame for their problems is laid externally. Although as researchers we should remain objective (Mansveldt and Berg 2005), it is difficult not to be sympathetic with the worst affected owners, whose ordeals seem genuine and for whom the personal financial cost of putting things right is significant. However, the regrettable reality is that a few owners would not be in their predicament if they had made better managerial decisions before the earthquake.

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