Alan Bollard: Economic impacts of seismic risk – lessons for Wellington

Speech by Dr Alan Bollard, Governor of the Reserve Bank of New Zealand, and Mr Satish Ranchhod, to the Rotary Club of Wellington and Victoria University of Wellington one day conference "Organisational Effectiveness in Times of Seismic Risk", Wellington, 18 October 2011.

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Introduction

The earthquakes in Canterbury have had a profound human and economic impact that will continue to be felt for many years. The devastating nature of these events has highlighted the importance of risk management and the consequent organisational preparedness. This is particularly true for Wellington, a city that is built on hills, flood plains and reclaimed land, overlooking a harbour connected to Cook Strait, and dissected by a major active fault line at the intersection of the Indo-Australian and Pacific tectonic plates.

It has been a little over a year since the first of the major earthquakes in Canterbury and we have seen these events produce highly complex and unforeseen outcomes. One of the least expected outcomes has been the long lasting nature of the earthquakes through their associated aftershocks. Planning in the face of such uncertainty is a great challenge, but it is vital to ensure that our society is able to continue to function effectively in times of considerable disruption. From the perspective of the Reserve Bank, organisational preparedness means both business continuity considerations for the Bank itself, as well as working to maintain economic stability.

This paper focuses, firstly, on the impact of the Canterbury earthquakes on the economy and how the Bank has responded; secondly, the business continuity planning of the Bank itself; and thirdly, the lessons we can learn from Canterbury that we, as institutions, can apply in Wellington. It does not cover the important topics of seismology, engineering, and human issues.

Economic effects of the Canterbury earthquakes

The earthquakes in September 2010 and February 2011, as well as the associated aftershocks, significantly affected the economic environment. In addition to the considerable impact these events had on people's lives, there was substantial damage to assets, as well as disruptions to economic activity.

The affected areas are home to around 12 percent of the country's population and damage to housing was extensive. Out of a total housing stock of approximately 220,000 homes, around 165,000 were impacted, including many that are now uninhabitable. There has also been substantial damage to commercial assets and infrastructure, particularly within Christchurch's central business district.

It has proved very difficult to calculate the cost of the damage. It is likely over $20 billion (most of this involving damage to housing, with significant damage also to commercial buildings and infrastructure). Of course estimates of damage, estimates of insurance claims, and estimates of reconstruction can all differ somewhat. Our working assumption is that there will be approximately $20 billion of rebuild. This is equivalent to around 10 percent of GDP, which represents a very large shock in relative terms. (As a comparison, the massive earthquake that struck Japan in March 2011 is estimated to have caused damage equivalent to around

3 to 4 percent of Japan's annual GDP.) We recognise that there is considerable uncertainty around these numbers and that revisions to this estimate are likely to continue for some time. Indeed, we frequently note that our working assumption is to the nearest $5 billion.

It is also important to note that this assumption relates to the current replacement value of damaged assets. The nominal cost of rebuilding these assets could be larger as construction costs and prices for materials may well increase over the coming years, and as reconstruction incorporates quality improvements. Indeed, the Reserve Bank's Insurance Oversight Team estimates that total property insurance claims (including buildings and other assets) stemming from the earthquakes could be considerably higher than these numbers. In addition, some of the damage caused will not have been insured or will not be repaired.

The response to these events

The devastating impact of the Canterbury earthquake necessitated a large and coordinated response by central and local government, as well as private sector agencies. New Zealand was also fortunate enough to receive assistance from other nations during the disaster recovery period that followed the February earthquake.

For the Reserve Bank, the earthquakes raised a number of broad concerns related to protecting the soundness of the financial system. We were also conscious of our aim of maintaining medium-term price stability. When determining the appropriate response to achieve these goals, we considered three distinct phases in economic activity following the earthquakes: disruption, stabilisation and reconstruction. Rather than representing specific time periods, each of these phases relates to the underlying state of the economic environment. In turn, each raised a different set of concerns.

- In the period of disruption that immediately followed the earthquakes, human life and safety were the dominant concerns, with recovery efforts led by Civil Defence. The Reserve Bank and other organisations were focused on ensuring that essential economic activity could continue. This involved the maintenance of payments systems, including the supply of additional cash. We also focused on ensuring that key financial institutions were able to continue operations.
- After immediate safety factors were addressed, concerns shifted to ensuring the stability of business and economic activity. During this period, we have been focused on the soundness of the financial system, including the financial health of key economic organisations. We have also focused on providing appropriate support for economic activity.
- Over time, CERA and other organisations' response to these events will shift again as economic conditions in Canterbury and the economy more generally improve. As this occurs, the Reserve Bank's focus will move away from the provision of emergency support, and towards ensuring that the degree of economic stimulus provided is appropriate for achieving our medium-term policy aims.

Uncertainty about the state of the economy following the earthquakes has been very high. Over the past year, we have been engaged in a process of ongoing learning about the state of the economy following the earthquakes that has fed into our policy deliberations. This process will continue for an extended period, even as the economy continues to recover, although our focus will gradually shift.

The earthquake and financial system soundness

Cash handling and payments systems

One of our most pressing concerns immediately following the earthquakes was the maintenance of payments systems. In the aftermath of events such as natural disasters, there is strong demand for food, water, petrol and other necessities. And with damage to power and telecommunications systems, access to cash is a key concern. Only two hours after the February earthquake the Reserve Bank started receiving orders from banks for more cash for delivery to Christchurch. Ensuring cash was available required us to work closely with banks and Cash in Transit companies to meet the spike in demand. This task was complicated by damage to roads that meant travel, where possible in Christchurch, was taking about three times as long as normal.

The public also needed information about where cash was available. To ensure this, Bank staff used Google maps to provide a live feed of operational and accessible ATMs. Overall about $150 million of extra cash was sent to Christchurch in the week of the earthquake, representing about $350 per resident. There was a big drop in electronic payments and increased demand for cash, initially in the form of $20 and $50 notes through the surviving ATM machines. We learned a lot about ATM configuration to ensure operability, and the internet was very useful to provide up to date information on ATM availability.

Banking

An additional concern following the earthquakes was the stability of key financial institutions including banks and insurers. These institutions play an important role in shaping the ongoing conditions in Canterbury. Further, we were conscious that significant disruptions in one region could affect the functioning of these organisations at a national level.

Most commercial banks do not have their core banking systems located in Christchurch, and those that do had effective back-up systems located outside the Christchurch region. Additionally, banks' disaster recovery procedures proved to be quite effective, and certainly had become much better honed by the time of the February earthquake. Banks took a long-term view of their customer relationships through the provision of generous customer assistance packages, and generally adopted a helpful, constructive attitude to their customers' difficulties. Banks came together as an industry throughout the disaster, sharing a lot of information and advice amongst each other, and have opened small business support centres.

Some households and businesses came under financial stress as a result of the earthquakes and this had an impact on banks and other financial institutions. However, the banking industry has not been subject to significant financial risks from the earthquakes. Losses on residential mortgages are expected to be relatively light due to insurance coverage and the Government's earthquake recovery packages. In addition, many smaller commercial businesses were not located in areas where major damage occurred. Bank provisioning for credit losses totalled nearly $100 million. Nevertheless, there remains a great deal of uncertainty in quantifying the effects of the earthquakes.

Insurance

The insurance sector has had a number of significant and complex concerns. A well funded and functioning insurance sector assists with the recovery from a significant destructive event. New Zealand is fortunate that insurance will fund the majority of the costs of the Canterbury earthquakes, and most of this funding comes from large offshore reinsurers. In other parts of the world, such as Japan, government, businesses and households bear a much greater share of disaster costs. Since the September earthquake, almost $4 billion of insurance claims have been paid out by the Earthquake Commission (EQC) and private insurers. There is still much more to be paid out by insurers, and this will occur over several years while Christchurch is rebuilt.

The importance placed on the role that public and private insurers have in reducing the financial burdens of disasters can be seen from the EQC's $11 billion of funds and reinsurance, which were built up over decades and are available to meet disaster claims. This is backed up by a Government guarantee if more funds are needed. The Government also decided in April to support AMI (the biggest residential insurer in the Christchurch region), in order that policyholders with earthquake claims could have certainty that their valid claims would be paid.

The magnitude and ongoing nature of the earthquakes raise a number of challenges for the insurance sector, and potentially the economy more generally. A number of insurers have suffered significant hits to their balance sheets. On the other hand it appears that the international reinsurance market has worked as we would hope, bearing in mind that we have now suffered a series of insurance "events".

Following the Canterbury earthquakes there have been both temporary and longer term changes in the insurance market. While the ground is still moving, there is limited availability of new cover for earthquakes in the Christchurch area. For most businesses and households this means they are not free to change insurers at present, while for those currently without insurance cover the impact is more significant. Some earthquake-prone buildings and infrastructure can no longer get insurance cover in Canterbury or elsewhere in New Zealand. Other changes to date include higher nationwide premiums to fund increased reinsurance costs and bigger excesses.

Property insurers that have had their reinsurance program renewing since February, have generally been able to maintain or increase their reinsurance cover. However, reinsurance premiums have more than doubled, and in many cases a higher retention (claims borne by the insurer before reinsurance starts to pay out) also applies. We are now seeing delays in payouts and some litigation around liabilities. This may look untidy, but it may also be inevitable in such a complex situation.

The effects on economic activity

The earthquakes have resulted in severe disruptions to short term economic activity, and a loss in balance sheet values, but will bring significant stimulus in the medium term. Disruption was mainly due to reduced household and business spending, as well as lost exports and production in Canterbury. Furthermore, following the earthquakes we saw sharp declines in consumer confidence and business sentiment economy-wide. Sectors most affected have been tourism, education and central business district retailing. Encouragingly, however, some of the significant contributors to Canterbury's economy, particularly agriculture, manufacturing and professional services have been remarkably resilient after the first few weeks. Construction and related services have been through a frustrating period of disruption and prolonged wait. But next year they will enter an era of huge expansion, New Zealand's largest ever construction project, big enough to drive the nation's growth by an extra 1 to 2 percent, but with the potential to also cause bottlenecks, skill shortages, cost increases and planning problems. Already there has been some population loss to the region, but next year this may turn around.

Monetary policy and the earthquakes

The Reserve Bank's immediate focus following the earthquakes was the soundness of the financial system. We remained conscious of our focus on the maintenance of medium-term price stability. In the aftermath of the February earthquake, we did observe some near-term prices increases (for instance, in commercial and residential rents). Consistent with the Policy Targets Agreement, monetary policy does not react to such short-term price changes.

However, we were also conscious that the substantial reconstruction required in Canterbury would provide a large boost to economic growth over a period of five years or more. During this period, residential investment spending is likely to rise to a share of GDP similar to that seen during the mid-2000 construction boom. But in contrast to that earlier period, there will be a much higher concentration of work in one geographic area. Combined with increases in business investment spending, this will boost medium-term activity and inflationary pressures for an extended period. It would therefore be inappropriate, all else equal, for monetary policy to be stimulatory during the reconstruction period.

This concern was balanced against the negative impact of the earthquakes on near-term activity. In the Canterbury region, activity certainly reduced. In addition, there were declines in nationwide consumer confidence, as well as investment and hiring intentions among businesses economy-wide. It was difficult to know how large or long lasting such impacts would be and there was a risk of a marked deterioration in economy-wide activity. Furthermore, although GDP growth was likely to be higher than it might otherwise have been during the reconstruction period, the destructive effects of the earthquakes meant that New Zealand would still be worse off.

Given these risks, the Bank reduced the official cash rate by 50 basis points following the February earthquake. We described this as an insurance measure, one that aimed to avoid a significant and persistent deterioration in activity. We were conscious, however, that depending on wider economic conditions, this insurance would need to be removed as rebuilding, and a recovery in activity more generally, drew the economy's resources into production. Since that time however, monetary policy has had to account for a number of significant developments. These include the continuing sovereign debt concerns in Europe and related developments in financial markets. Business confidence appears to have now recovered well nationwide, and to a large extent also in New Zealand. We believe the cuts in the OCR assisted this.

Fiscal impact of the earthquakes

The impact of the earthquake on the Government's fiscal position has also been significant. Central and local government have faced significant cost increases as a result of the earthquakes. The largest of these has been the $11.7 billion EQC insurance cost. This has exceeded EQC's reinsurance cover of $4.2 billion, with the shortfall exhausting the National Disaster Fund. The Government also faces significant expenses related to the purchase of residential properties in the red zone, support for AMI, and costs associated with damage to infrastructure.

In addition to these costs, the government faced significant costs related to welfare and emergency responses (totaling around $363 million at end of June 2011). Following the earthquakes, the employment situation of many individuals was affected with around 40,000 employees and 9,000 sole traders seeking assistance. It was also necessary for the Government to increase spending related to healthcare, social services and public administration and safety services.

Earthquake-related expenditure estimated at $13.6 billion contributed to a marked deterioration in the Government's operating deficit over the 2010/2011 year, and further earthquake related expenditure will be required over the coming years. The resulting pressure on the Government's debt position was highlighted by Standard and Poor's when they downgraded New Zealand's long-term sovereign rating to "AA" earlier this year. Fitch also noted some concerns about the impact of the earthquakes on the fiscal debt in their latest assessment.

In response to the costs associated with the earthquakes, the Government's June *Budget* incorporated an increased focus on fiscal consolidation with a reduction in new discretionary spending over the coming four years. In addition, the Government has recently announced an increase in the earthquake cover levy component of home insurance, to cover the costs faced by the EQC and to rebuild its Natural Disaster Fund.

As part of our response we have also been researching how other countries have responded to similar earthquakes. Rapid recovery of communications infrastructure, speedy decisions on rebuild, and availability of finance, have led to rapid bounce-backs in industrial production, confidence and growth. Where the New Zealand situation looks most different is in the lingering seismic instability.

The lessons for Wellington

We have learned that an event like a major earthquake has many unpredictabilities and uncertainties about it, elements that are incident and location-specific, with characteristics that unfold in different ways. And these make it difficult to plan crisis responses in detail. We have learned the same thing about financial crisis, as in the semi-ironic title of the classic Reinhart & Rogoff book on international economic crises entitled "This Time Is Different". This means institutions need to focus on general preparedness, competency, leadership, delegation powers and resilience, rather than on detailed plans for specific situations which may not repeat themselves.

We have also learned that some earthquakes cannot be thought of as a short sharp event, but rather are a rolling set of shocks with a long period of continuing after-quakes. These can cause on-going damage, delay assessment, continue disruption, and slow reconstruction. The impact of ongoing seismic instability on insurance and construction can be very marked.

We have seen how earthquake damage is hugely sensitive to magnitude, depth, location and timing of day and week. In 2009 the biggest earthquake in the Southern Hemisphere occurred in Fiordland, 7.8 on the Richter Scale. It caused no damage at all. The much smaller February 22 Christchurch aftershock was so disastrous, not just because of its vertical acceleration, but its location under Christchurch and its timing on a week-day lunchtime. The same sensitivity could apply to Wellington.

We also know now that structural damage is only part of the story. The February Christchurch earthquake showed that soil liquefaction can also cause land damage that is highly problematic for buildings and underground infrastructure. Given that most private insurance does not cover this, it presents major problems for rebuild. This is further exacerbated by land-slips. Both liquefaction in valleys and reclaimed land, and slips on higher ground could cause major economic complications in Wellington.

Christchurch has also taught us that some sectors are very sensitive to earthquake disruption. For Wellington we might assume that certain people-based industries (like tourism and education) would be vulnerable, although much office-based services would relocate as necessary once telecommunications and electricity could be resumed. Wellington might be expected to be more resilient in that many of the buildings have been built or altered with earthquakes in mind (e.g. wooden houses with corrugated iron roofs and reinforced chimneys), or in the case of older commercial buildings, reinforced to meet earthquake standards. These standards are now being reviewed in the light of Christchurch, and will likely be increased, requiring significant further upgrading in Wellington (and possibly driving a small commercial building boom as happened in the 1980s). The challenge here will be to avoid a costly regulatory over-reaction to a one-off event.

Christchurch with its flat terrain and grid roading structure allowed easier repair of above-ground infrastructure and access to all suburbs. This cannot be assumed in Wellington where slips would close roads limiting access, and where the whole city could find its air, rail, sea, motorway and road links with the region cut completely for some time. Hill top communications and electricity transmissions are quite different in Wellington, gravity-flow underground piping is quite different, and the Cook Strait cable represents a particular vulnerability.

A further concern is that earthquake insurance coverage could become much more limited, more expensive, and more restrictive in Wellington, following the Christchurch experience. Already we are seeing big increases in reinsurance premiums, tighter covenants, high excesses, and a move from full replacement to indemnity policies.

Following the September and February earthquakes, there was immediate transmission of images world-wide with passers-by posting cell phone pictures live to television stations and on the internet. This engendered an immediate (but limited) market reaction, hitting the New Zealand dollar and stock prices. At the Reserve Bank, we spent time explaining the event to overseas financial institutions and that limited excessive financial market reactions. A bad Wellington earthquake with an epicentre in the nation's capital, could engender a more extreme financial market reaction, and it would be the Reserve Bank's role to intervene to ensure an orderly foreign exchange market if that proved necessary. If the country's political leadership and key administrative infrastructure were caught up in an earthquake, this could drive a bigger financial reaction, and make government policy responses much harder.

Reserve Bank planning for emergencies

In the event of an emergency the Bank's focus would remain on the maintenance of economic stability, as much as possible. With this in mind, the Bank has been proactive in developing its policies and procedures to ensure the resilience of our organisation and the economy in the event of significant disruptions.

Central to our planning has been the establishment of business continuity plans focused on the needs that may follow a major event, and how the Bank's ability to perform its operations may be impeded. To ensure plans can be implemented successfully, key people from each department are assigned to support the Bank and its critical business functions in the event of disruptive incident. These plans and the related systems are tested regularly.

The Bank has also focused on ensuring that the necessary infrastructure is in place. In particular, a seismic assessment of the Reserve Bank's main office was undertaken in September. The results from this assessment show the building should withstand an earthquake greater than the Christchurch earthquake experienced.

But even though our building could be standing after an earthquake, there is a risk that damage to surrounding buildings could make the Wellington office inaccessible. To ensure that the Bank's core functions can be maintained in such circumstances, an Auckland office has been set up that houses a dozen staff on a day-to-day basis. These staff are engaged in a number of business critical roles (including foreign reserves management, domestic liquidity, and payments and settlement systems) to ensure the economy of New Zealand would continue to function with some stability in the event of a major disaster. Furthermore, provisions in the Reserve Bank Act provide for the delegation of key aspects of the Governor's role to the Auckland Office Manager, with appropriate safeguards.

Conclusions

The events in Canterbury are particularly salient for Wellington. We have long known that this region is at risk from seismic events, and clearly we must prepare for potential disruptive events of any sort. However, we must also consider what degree of preparedness is appropriate to ensure the survival of people, as well as organisational effectiveness. Several factors are relevant in this regard.

- Disaster preparedness is necessary and desirable, but not costless. Increases in safety standards (such as seismic strengthening) can result in significant costs for an economy that linger long after the risks they aim to address have occurred. They can also create a complicated regulatory environment that may result in significant impediments for activity.
- A related consideration is the frequency of events. While it is possible to prepare for very low-frequency high-impact events, doing so may be constraining in terms of activity and prohibitive in terms of costs. The assessment of such risks in New Zealand is currently very complex and there is a lot of work currently going on to assess this.

- We must also be conscious of New Zealand's characteristics as a nation. In contrast to many other developed economies, we are geographically and economically isolated. If we face large challenges, we may do so with little external financial support.

Determining the appropriate balance of such concerns in advance will always be a challenging task. For decision makers, it is important to ensure that key organisations will have the capacity to operate effectively in the event of a significant shock. Additionally, we must be conscious that our response to events could be a drawn out process, and one that needs to evolve over time.