

REGIONAL DEVELOPMENT BEFORE AND AFTER AN EARTHQUAKE: THE CANTERBURY NEW ZEALAND EXPERIENCE

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ABSTRACT: The authors were responsible for leading the preparation of the Canterbury Regional Economic Development Strategy (CREDS) in September 2009, twelve months before a series of three devastating earthquakes destroyed large parts of the central business district of the region's largest city, Christchurch. The authors were commissioned to prepare an evaluation of the impact of the first earthquake and to write a report on opportunities for one of the region's two universities in the post-earthquake environment. They have acted as advisors to planners before and after the earthquakes. Drawing on these experiences, the paper presents the analytical model that was used in 2009 to identify key sectors for regional economic development and reflects on the implications of that analysis for planning after the natural disaster.

Keywords: Disaster recovery; earthquake; regional economic development.

1. INTRODUCTION

The Canterbury region covers 4.8 million hectares in the middle of the South Island of New Zealand (see Figure 1). To the east, the Canterbury coastline extends along the Pacific Ocean, from Kekerengu Point in the north to the Waitaki River in the south. The Canterbury Plains extend westwards to the Southern Alps, overseen by Aoraki/Mt Cook, the tallest mountain in Australasia (3,754 metres). Eighteen major rivers flow across the plains to the sea: Clarence (Waiau-Toa), Conway (Tūtae Putaputa), Waiau, Hurunui,

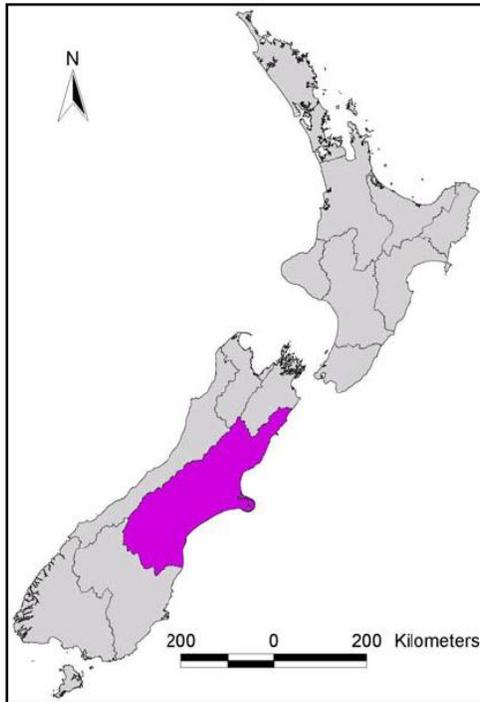


Figure 1. The Canterbury Region.
Source: Morgan *et al.* (2002, p. 8).

Waipara, Kowai, Ashley (Rakahuri), Waimakariri, Selwyn (Waikirikiri), Rakaia, Ashburton (Hakatere), Hinds (Hekeato), Rangitata, Orari, Opihi, Pareora, Waihao and Waitaki. Nearly 90 per cent of the region is covered by pastoral grasses, tussock, scrub or bare land, with another 8 per cent devoted to forests.

The first settlers in the region were Māori, beginning with the Waitaha tribes, followed by Ngāti Māmoe and then Ngāi Tahu. As successive migrations arrived, they defeated or intermingled with their predecessors, so that today Ngāi Tahu describe themselves as ‘the iwi comprised of Ngāi Tahu whānui; that is, the collective of the individuals who descend from the five primary hapū of Ngāi Tahu, Ngāti Māmoe and Waitaha,

namely Kāti Kurī, Ngāti Irakehu, Kāti Huirapa, Ngāi Tūāhuriri and Ngāi Te Ruahikihiki’ (see www.ngaitahu.iwi.nz/About-Ngai-Tahu/).

The first wave of organised European migrations began in England with the formation of the Canterbury Association by John Godley and Edward Wakefield in 1848 and the arrival at Lyttelton of the Association’s first four ships in December 1850. Further vessels brought the number of European settlers in Canterbury to 3,000 by the end of 1851. In 1852, New Zealand was divided into six self-governing provinces, including Canterbury. These were replaced by a national government on 1 November 1876, with local government devolved to 64 counties. The system of local government has continued to change over the decades. Canterbury now has a Regional Council, known as Environment Canterbury, which covers territories governed by nine District Councils and the Christchurch City Council.

In the 2006 census, two-thirds of Canterbury's normally resident population (521,832 people, which was 12.9 per cent of the national population) lived in Christchurch City (348,435 people). Christchurch International Airport is the point of arrival into the province for many visitors from overseas and the rest of New Zealand; it recorded three million passenger arrivals in 2010 (www.christchurchairport.co.nz). The Lyttelton Port of Christchurch is the largest port in the South Island and the third largest port in New Zealand. Total volumes through the port are approximately 10 million tonnes per annum (www.lpc.co.nz).

On 4 September 2010, Canterbury experienced a large and reasonably shallow earthquake (magnitude 7.1 at a depth of 10 km), centred 40 km west of Christchurch city. At the time, this was the most damaging earthquake in New Zealand since the Hawke's Bay earthquake in 1931, but fortunately there was no loss of life, in part because of the timing of the earthquake (4.35am on a Saturday morning) and its distance from the main population centre of Christchurch.

On 22 February 2011, a second and more devastating earthquake occurred. It was smaller (magnitude 6.3), but took place at 12.51pm on a working day and was centred in Lyttelton Harbour, much closer to Christchurch city. It is regarded as one of the most significant disasters in New Zealand history, causing 181 fatalities. The Reserve Bank has estimated that out of approximately 220,000 homes in the city, around 165,000 were affected, including many made uninhabitable (Bollard and Ranchhod, 2011). The Christchurch central city business district was effectively closed down, and the Reserve Bank estimates the total cost of the damage to be in excess of \$20 billion (around 10 per cent of the country's gross domestic product).

A third large earthquake occurred on 13 June 2011, at 2:20pm. It was another magnitude 6.3 shock, again centred close to Christchurch. It followed a magnitude 5.6 shock just 80 minutes earlier. There were no fatalities, but there were 46 serious injuries and further damage to property, including in parts of the city that had not been so badly affected by earlier shocks.

By the end of October 2011, the Canterbury region around Christchurch had experienced 33 seismic shocks measuring above 5.0 on the Richter scale, and more than 2,750 shocks greater than 3.0 (www.geonet.org.nz/canterbury-quakes/aftershocks/). The Canterbury Earthquake Recovery Authority summarised some of the property damage as follows (CERA, 2011, p. 9):

More than 100,000 houses have been damaged requiring repair or rebuilding. A significant number of properties will not be able to be redeveloped in the short to medium term due to serious land damage. Many homeowners and occupants will move to new locations. More than 60% of the 5,000 businesses in the CBD and their 50,000 employees were displaced, although overall unemployment levels were largely unaffected. More than one third of central city businesses are unable to operate, with another third operating from makeshift premises. The earthquakes closed many swimming pools, historic buildings, museums, churches and sports clubs, with many facing demolition or extensive restoration work. Organisations and community services have been dislocated and the large volunteer networks that run activities and organisations have been disrupted.

Before the earthquakes, the authors of this paper had been involved in the development of two major regional economic development strategies: the Canterbury Regional Economic Development Strategy (CREDS, final document completed 25 September 2009) and the Christchurch Economic Development Strategy (CEDS; consultation document completed 3 August 2010). The authors were also involved in an initial assessment of the economic impact of the earthquake of 4 September 2010, which became outdated once the more devastating earthquake of 22 February 2011 had occurred.

The purpose of this paper is to summarise those initiatives and to begin to ask the question: what changes, if any, need to be made to the analysis in the previous regional economic development strategies as a result of the damage caused by the Canterbury earthquakes?

The structure is as follows. Section 2 summarises the main results of the CREDS exercise. Section 3 explains the Canterbury Economic Development Model, which was created as a joint venture between the AERU and the Canterbury Development Corporation as part of the work to produce the CEDS consultation document. Section 4 summarises the evaluation completed by the AERU after the first earthquake. Section 5 concludes with a discussion of the above research question. There is a brief conclusion in section 6.

2. THE CANTERBURY REGIONAL ECONOMIC DEVELOPMENT STRATEGY

The Canterbury Regional Economic Development Strategy (CREDS) was prepared by a research team appointed at the end of November 2008, comprised of the AERU research unit at Lincoln University and the region's five economic development agencies: Enterprise North Canterbury, Canterbury Development Corporation, the economic and community development officers in the Selwyn District Council, Enterprise Ashburton and the Aoraki Development Trust. The exercise followed a template produced by the Ministry of Economic Development and published its final reports in September 2009.

Following that template, the AERU produced a report on the Canterbury regional profile and economic outlook in March 2009 (Dalziel and Saunders, 2009). That report collected and analysed statistical data on the province under a variety of headings. This was supplemented with a series of consultations with business leaders and key stakeholders, carried out by the project's economic development agencies. Strategic themes were identified from these two sources, and then drafted into strengths and constraints as listed in Table 1.

The strengths and constraints were paired, based on the view that the key constraints to be addressed in an economic strategy were those that were limiting the region's ability to build on its identified strengths. That view was used to define the strategic objectives, as set out in Table 2. The table repeats in the left-hand column the constraints from Table 1, and shows how these were translated into objectives on the right-hand column. Note that two of the constraints had two elements each, and so this produced twelve strategic objectives.

The twelve strategic objectives in Table 2 were presented in CREDS as a broad framework for the economic development of Canterbury as a region. In order to develop priorities from these objectives, the research team identified key themes based on considerations such as time sensitivity, reinforcing nationally important regional strengths, promoting stepwise changes in regional development capability, producing large returns for small outlays, addressing equity and inclusiveness, and capturing engagement.

Table 1. Strengths and constraints in the Canterbury Economy, 2009. Source: Dalziel and Saunders (2009, p. 9).

Strengths	Constraints
Canterbury is a great place for people to live.	The region is not promoted well, nationally or internationally.
The Canterbury economy has long been built on export growth.	Access to international marketing expertise is not always easy.
There is a wealth of experienced business people in Canterbury.	Access to capital, especially venture capital, can be difficult.
Canterbury businesses are responsive to market signals.	Volatility from overseas and demand seasonality can be issues.
Canterbury has abundant land, water and other natural resources.	Water storage has not been planned well for economic development.
There is a solid skill base in the Canterbury labour force.	Skill shortages, and workers with low skill levels, have been issues.
Canterbury has strong public and private research institutions.	Linkages between researchers and businesses are often weak.
Canterbury offers visitors a range of national iconic attractions.	Planning and marketing of tourism are not well integrated regionally.
Canterbury has good infrastructure, including the airport and seaports.	Infrastructure planning is disjointed and rural broadband is expensive.
Canterbury is well-connected, with effective working relationships.	Regulations and compliance costs can hinder business growth.

This analysis paid particular attention to: the evidence gathered for the Canterbury Regional Profile and Economic Outlook; the importance of avoiding duplication of work being carried out under existing Canterbury strategies; and feedback from public meetings across the region that reported findings from the consultations that had carried out by the region's economic development agencies. There was also a further round of consultation with key regional-level stakeholders.

Table 2. Constraints and Objectives in the Canterbury Economy, 2009.
Source: Dalziel and Saunders (2009, p. 18).

Constraints	Objectives
The region is not promoted well, nationally or internationally.	Potential migrants and investors are easily able to obtain reliable information about the quality of life in Canterbury.
Access to international marketing expertise is not always easy.	Canterbury businesses with export potential are easily able to access expertise in international marketing.
Access to capital, especially venture capital, can be difficult.	Effective systems support Canterbury firms obtaining access to capital, especially venture capital.
Volatility from overseas and demand seasonality can be issues.	Canterbury businesses are able to manage commercial volatility from overseas and seasonality of demand.
Water storage has not been planned well for economic development.	Canterbury producers are able to increase yields as a result of well planned investment in water storage.
Skill shortages, and workers with low skill levels, have been issues.	Firms in Canterbury are able to employ all the skilled and unskilled labour they need to grow.
	All Canterbury citizens are able to participate in quality education, training or employment.
Linkages between researchers and businesses are often weak.	Regional innovation systems include strong linkages between Canterbury researchers and businesses.
Planning and marketing of tourism are not well integrated regionally.	The planning and marketing of Canterbury tourism is integrated regionally.
Infrastructure planning is disjointed and rural broadband is expensive.	Planning for infrastructure investment in Canterbury is integrated across the different types of investment.
	Canterbury citizens in rural districts are able to access quality services such as affordable broadband.
Regulations and compliance costs can hinder business growth.	Central, regional and local governments do not impose unjustified regulations and compliance costs on Canterbury businesses.

This led to eight priority themes being identified by the research team. The governance structure for the CREDS exercise further refined the eight themes to focus on five key areas where enterprise and innovation were required to address fundamental issues in the Canterbury economy. The five key areas were:

- Canterbury Water
- Canterbury Intellectual Property
- Canterbury Trade Alliance
- Canterbury Connectivity (especially Broadband)
- Canterbury Tourism

Following the Canterbury earthquakes in 2010/11, two questions about the CREDS exercise arise. The first is whether the broad framework set out in Tables 1 and 2 is still applicable, or is it necessary to revisit the strengths, constraints and objectives in the light of the devastation caused by the earthquakes? The second question is whether the priorities identified in 2009 are still relevant in 2011, again given the devastation caused by the earthquakes? These questions are discussed in section 5 below.

3. THE CANTERBURY ECONOMIC DEVELOPMENT MODEL

In 2009, the AERU began working with the Canterbury Development Corporation (the economic development agency of the Christchurch City Council) to produce the Canterbury Economic Development Model (CEDM). The purpose of the model was to provide economic planners a tool for evaluating the strengths of industry sectors in the regional economy and for performing economic impact assessments of positive and negative economic shocks to sectors in Canterbury. The economic impact assessment module is a standard input-output model and will not be discussed any further in this paper. The sector selection module sought to integrate international market opportunities with local industry capabilities. This produced some surprising results and so will be explained in more detail.

The theoretical structure of the CEDM sector selection module (and its planning context) is shown in Figure 2. It begins with a definition of sectors. This is based on standard Statistics New Zealand classifications, but there is

scope for user-defined sectors to be incorporated. For this exercise, 48 sectors are analysed. This is followed by an analysis of the international opportunities for each sector and its economic contribution to the region, as shown in the figure. Before the selection is made, consideration is given to the profile and history of the sector in the region and the sources of competitive advantage. The final row in the figure shows how a strategy can be designed by analysing the drivers for growth of each selected sector, focusing on industry inputs (labour, capital and natural resources) and on infrastructure, enabling industries and business conditions.

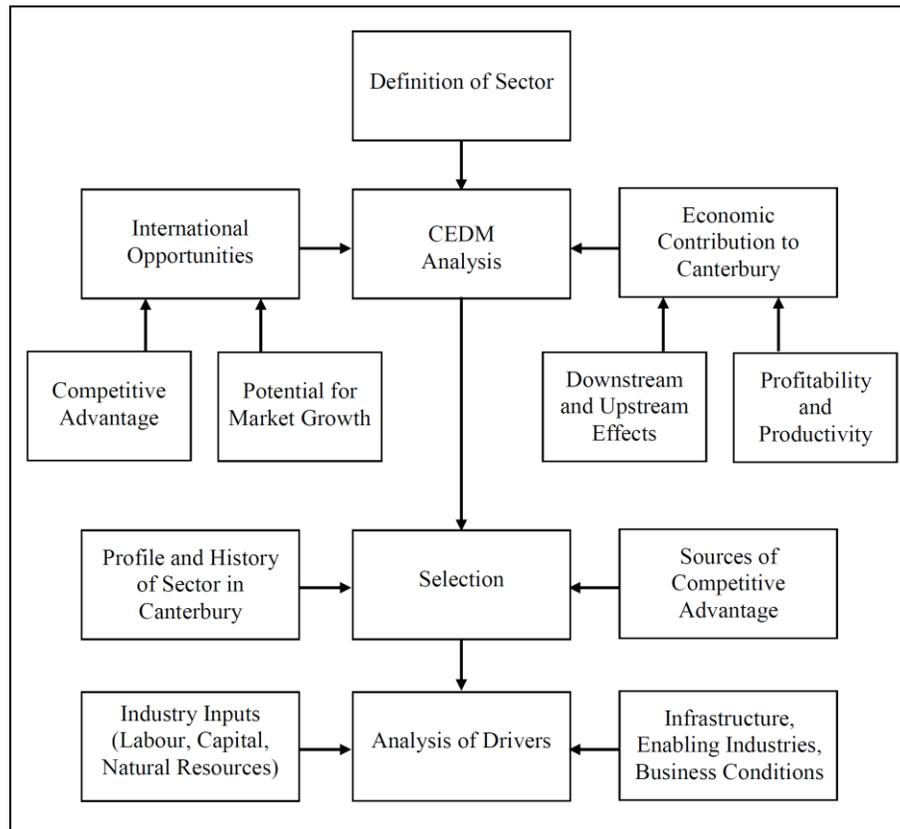


Figure 2. Structure of the CEDM Sector Selection Module.

Table 3. Indicators Used in the CEDM.

Contributor	Indicators
Competitive Advantage	Value-added per person engaged in the sector compared to equivalent sectors in Australia, Germany, Japan, UK and US.
	Value-Added per person-engaged comparing the region to the rest of New Zealand.
Potential for Market Growth	Historical trend of personal consumption expenditure in the UK and the US.
Downstream and Upstream Effects	Value-added effects using standard input-output multipliers.
	Employment effects using standard input-output multipliers.
Profitability and Productivity	Value-added per person engaged in the sector.
	Percentage of employees in the sector with Level 4 qualifications or higher.
Profile and History in Canterbury	Historic share of exports in the sector's production in Canterbury.
	Proportion of the region's gross domestic product contributed by the industry.

Thus there are six contributors to the selection of key sectors using the CEDM. For all but the last of these contributors (which relied on a qualitative assessment of government policies and trade barriers), the AERU research team identified one or two statistical time series that could be used as

indicators. Descriptions of the data series are provided in Table 3 above. In total nine indicators are used in the CEDM.

The model allows sectors to be ranked from 1 (the strongest sector) to 48 on each indicator. An overall ranking is obtained by ranking the unweighted sums of the nine indicators for each sector. It is important, of course, not to apply the model mechanically without considering what drives the overall ranking of each sector. The strength of the model is that it provides a strong discipline to sector selection by requiring the planner to consider all of the pre-identified factors contributing to the region's economic development.

The model can be used to analyse either Christchurch city or the wider Canterbury region. The model's results for Christchurch city revealed that "business and finance services" was the first ranked sector. Its strong points were: it had the second highest potential for market growth (expenditure in this sector increased by two per cent per annum between 1975 and 2005 in the UK and US); it had the second highest productivity with each worker contributing around \$90,000 in value added; and it was the second highest contributor to the city's GDP, at around 17.1 per cent. It is also a sector with highly qualified employees, with 53 per cent having a qualification at level 4 or above. New Zealand has competitive advantage in this sector and Christchurch a competitive advantage to the rest of New Zealand.

This identification of business services as a key sector in Canterbury was surprising; it had not been a sector often mentioned in policy advice about regional economic development. Yet the evidence seems clear; this sector (when including property) had the largest increase in employment between 2001 and 2006, was the third largest employer in Canterbury, and grew much more strongly in Canterbury than would be expected from national trends. If the Canterbury region is to prosper economically, this analysis concluded that it is important that this sector develops in a way that enhances its own productivity growth and the productivity of the businesses it serves.

"Health and Community Services and Education" was identified as the second sector most likely to facilitate growth. It recorded the highest potential for market growth with average proportion of expenditure in the UK and US increasing by 3.2 per cent per year between 1975 and 2005. It also had a relatively strong impact on total employment and value added in the region. It is also a sector with the highest percentage of qualified employees (71 per cent having level 4 or above qualifications) and was a strong contributor to the city's GDP.

The third highest ranked sector was “Information and Communications Technology”. This was the third highest potential for market growth with proportion of expenditure increasing by 1.3 per cent per year between 1975 and 2005 as well as having the third highest productivity at an average of \$90,000 per employee. It had 41 per cent of employees with high qualifications and had a high value added impact with \$1.06 million in increased GDP to the region from a \$1 million increase in output. Christchurch also has a strong competitive advantage in this sector (4th) with employees on average producing 2.7 per cent more than New Zealand on average.

The next highest ranked sector was “Specialised Manufacturing”. Its strengths included being Christchurch’s largest exporter in the city, accounting for around 24 per cent of exports from the two ports and having a strong competitive advantage for the city (second highest), around 5.9 per cent more productive than New Zealand on average. It is also a sector with highly qualified workers (fourth highest), with 41 per cent of workers having a high qualification and a highly productive sector (fourth highest), with around \$90,000 in value added per worker.

The fifth ranked export sector was “Tourism”. This had the second highest employment effect with 17.5 additional people employed for a \$1 million increase in output. It was the fourth highest potential for market growth with expenditure increasing by 1.12 per year per person on average between 1975 and 2005 in the UK and US.

“Food and Beverage Manufacturing” was also highly rated as a potential sector. It was the city’s second biggest exporter, accounting for around 19.1% of exports. New Zealand has a strong competitive advantage (4th highest) in this sector with Christchurch having a competitive advantage when compared to New Zealand (5th highest), being on average 2.6% more productive per worker.

The above analysis was for the city of Christchurch. A key sector for the wider region of Canterbury is “Agriculture, Forestry and Fishing”. This is key sector for the region and has potential for growth especially given the opportunity for increased irrigation. Approximately 41 per cent of the Canterbury land area is grassland, for example, and another 41 per cent is tussock, with arable 6 per cent. Sheep, dairy cattle and beef cattle are the main livestock in the Canterbury region: 18.6 per cent of sheep in New Zealand are located in the Canterbury region, 14.4 per cent of dairy cattle and

13.3 per cent of beef cattle. There is a range of arable crops produced in the Canterbury region, accounting for 72 per cent of the arable area in New Zealand. Wheat and barley are the dominant crops in terms of tonnes harvested and hectares planted although specialist seeds are also important especially in terms of value added. Canterbury is also a significant producer of horticultural crops in particular potatoes and onions although their importance has fallen. Canterbury is the fourth largest wine region in New Zealand behind Marlborough, Hawke's Bay and Gisborne.

These considerations have been important for regional economic development planning in Christchurch. At the time of writing, for example, the Canterbury Development Corporation identifies five key sectors for its strategy (see www.cdc.org.nz/key-sectors/):

- Professional services;
- Manufacturing (especially specialised manufacturing);
- Information and communications technology (ICT);
- Food and beverage; and
- Agribusiness.

Following the Canterbury earthquakes in 2010/11, the question must be asked whether these key sectors are still relevant given the devastation caused by the earthquakes. This question is also discussed in section 5 below.

4. EVALUATING THE 4 SEPTEMBER EARTHQUAKE

Three months after the earthquake of 4 September 2010, the AERU was commissioned by the Canterbury Development Corporation and New Zealand Trade and Enterprise to review from an economic perspective the short and long-run implications of the earthquake for the Christchurch and Canterbury economies, and to test whether Council and central Government need to reconsider existing policy on development of the region. The analysis was out of date even before it was published as a result of the more devastating earthquake of 22 February 2011. Nevertheless, the report provided some empirical results on the impact of the initial earthquake that offer lessons for the discussion in section 5 to follow.

In particular, the AERU research team did not find anything in its study to suggest that the initial earthquake had had an impact that would warrant radical change to existing planning documents. Instead, the underlying comparative advantages of different areas of the region, and of the region within the national economy, appeared to have remained intact.

The report did find that some areas had been disproportionately affected, notably the central business districts of Christchurch and of Kaiapoi (a small town north of the city), and the sectors most affected tended to be in some parts of retail, education and tourism. Overall retail spending began to recover during the period, but consumer preferences moved to other centres, leaving a potentially long-term issue for the Christchurch CBD and Kaiapoi. The research noted that the earthquake did not create the issue for both CBDs, but rather seemed to have exacerbated a longer-term trend. Some specific findings from the research were:

- 60 per cent of respondents to a survey undertaken for the research project stated that after ten weeks, the earthquake either had not affected their business or was no longer affecting their business.
- The direct impact of the earthquake on Canterbury business revenue after ten weeks was a reduction of \$130.2 million per month. The estimated impact on costs was an increase of \$3.8 million per month, giving a total reduction in net income of \$134.0 million per month.
- The largest percentage impact on direct income was in Kaiapoi (down 17.7 per cent) and the central business district of Christchurch (down 10.6 per cent).
- Five sectors accounted for more than half the region's loss of income: Professional, Scientific and Technical Services (15%); Other Store-based Retailing (13%); Property Operators and Real Estate Services (12%); Food and Beverage Services (7%); and Finance (7%).
- Largest falls relative to the size of the sector were: Sport and Recreation Activities; Library and Other Information Services; Other Store-Based Retailing; Accommodation; Insurance and Superannuation Funds; Food and Beverage Services; Rental and Hiring Services (excluding Real Estate); and Non Store Retailing, and Retail Commission Based Buying and/or Selling. All of these

sectors experienced a reduction in current revenue of more than 9 per cent.

- The value of exports through the Port of Lyttelton and Christchurch International Airport remained higher from July to October 2010 than in 2009. This suggested that the export sector in Canterbury was not greatly affected.
- Based on survey replies, the anticipated impact of the earthquake in a year's time (after week 10) was an increase in monthly revenue of \$77.2 million, an increase in costs of \$22.9 million and hence an increase in net income of \$54.3 million. Hence, businesses were anticipating that revenue would rebound within a year but only by 59.3 per cent of the losses experienced by week 10. Further, it was anticipated that this rebound will be offset by increased costs.
- Paymark transactions data show a large fall in consumer spending immediately after the earthquake in some areas (notably the central business districts of Christchurch City and Kaiapoi) and in most sectors (notably personal retail). The aggregate figures show that consumer spending bounced back in October, but that Kaiapoi remained adversely affected and four sectors recorded reductions of more than \$1 million in September/October 2010 compared to July/August 2010.
- Based on the survey responses, the AERU/CDC Economic Impact Assessment Model projected a loss of 826 jobs ten weeks after the earthquake and a recovery of 509 jobs within a further twelve months.
- The increase in the number of unemployment benefits in September 2010 was just 205. This was one-quarter of the predicted impact in the modelling exercise, which provides some evidence that the government's emergency wage subsidy had the intended effect of keeping people in employment who would otherwise have lost their job as a result of their employer not being able to cover their costs.

Some consumer spending data can be presented to illustrate the more general point that there had been important distributional impacts, even though aggregate spending in the economy had remained buoyant following the 4 September earthquake. The AERU research team was provided with

limited access to aggregate data on electronic card transactions. These data were provided by Paymark, which is New Zealand's major electronic payments provider, processing more than 75 per cent of all electronic transactions in the country.

Figure 3 presents monthly values of Paymark electronic transactions for Canterbury for the months of July to October in 2009 and 2010. The impact of the earthquake on the September 2010 value is clear, but so is the quick rebound in October. The Paymark database recorded 8.0 million transactions in Canterbury in August 2010; this fell to 7.7 million in September and rebounded to 8.4 million in October 2010. There was a small increase in indirect taxes introduced on 1 October 2010; this fall in the number of September transactions and rise in October goes against the trend that would be expected with that increase in indirect taxes. Hence this series probably underestimates the impact of the earthquake on what would have happened in its absence.

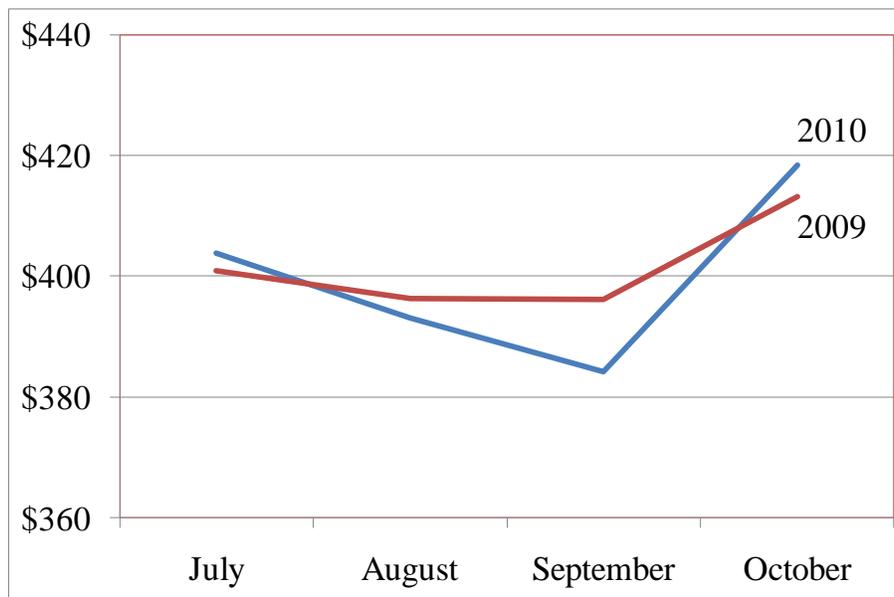


Figure 3. Monthly Values of Paymark Electronic Transactions for Canterbury (millions of dollars).

A further indication of the resilience of aggregate spending in Canterbury after the earthquake is provided in Table 4. Comparing spending in September/October with spending in July/August, it can be seen that spending grew faster in 2010 (2.8 per cent) than in 2009 (1.5 per cent).

Table 4. Average Consumer Spending Recorded by Paymark Transactions, July/August and September/October, 2009 and 2010. Source: Paymark Electronic card transaction values.

Year	July/August	September/October	Percentage Increase
2009	\$398,617,323	\$404,663,847	+1.5%
2010	\$398,369,925	\$409,349,397	+2.8%

Although the aggregate data reveal that consumer spending in September/October 2010 was stronger than might have been expected from the 2009 trend, it is possible that some sectors of the Canterbury economy suffered falls as other sectors experienced growth. The Paymark data disaggregates the transactions into 22 sectors based on standard ANZSIC codes, and so it is possible to analyse this possibility taking the average value of Paymark transactions for the months of July and August 2010 as the starting point and comparing this with the average value in September and October 2010. The largest sector changes featured in that analysis are presented in Figure 4.

Fuel Retailing and Food Retailing both showed strong increases although in the former case this would have been assisted by an increase in the price of petrol of 11 cents per litre (6.3 per cent) in October. Household goods retailing continued to show strong growth and the residual retail category (which includes department stores) also bounced back strongly over the combined two months. There was also strong growth in the Professional, Scientific and Technical Services sector (up \$1.1m, or 15.6 per cent).

Only four sectors continued to show a reduction in consumer spending over the combined two months. These were: Public Administration and Safety and Education and Training (down by 36.3 per cent); Arts and Recreation Services (12.4 per cent); Recreational Goods Retailing (9.2 per cent); and Health Care and Social Assistance (6.7 per cent).

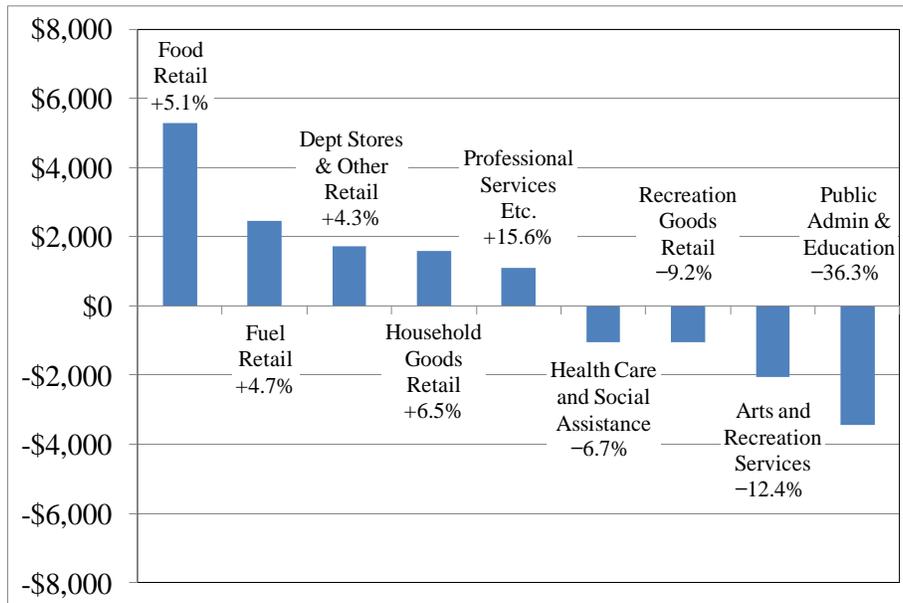


Figure 4. Largest Sector Changes in Paymark Transactions, September/October Compared to July/August 2010 (\$000).
Source: Paymark (2010) Electronic card transaction values.

Thus, while the economy as a whole demonstrated strong resilience, some sectors suffered serious losses of consumer spending in the two months after the earthquake. Within the retail sector, there were considerable disparities in different segments: fuel retail, food retail, department stores (and other retail not elsewhere classified) and household goods retail experienced more spending than might have been expected; electrical and electronic goods retailing as well as clothing, footwear and personal accessories retailing experienced small falls in consumer spending; and recreation goods retailing and arts and recreation services endured a loss of consumer spending close to ten per cent. Outside the retail sector, the Paymark data suggest that health care and social assistance experienced a moderate reduction in consumer spending, and that public administration and education experienced a very sharp fall.

An important consideration when analysing potential impacts of the earthquake on consumer spending is the geographic area where purchases were made, to examine possible shifts or redistributions of sales from one part of the city or the region to another. For this study, Marketview provided aggregate data on their customers' spending in 12 shopping locations. The Marketview database is derived from BNZ credit and debit card holders spending with retail merchants to provide a tool for understanding and measuring consumer spending behaviour.

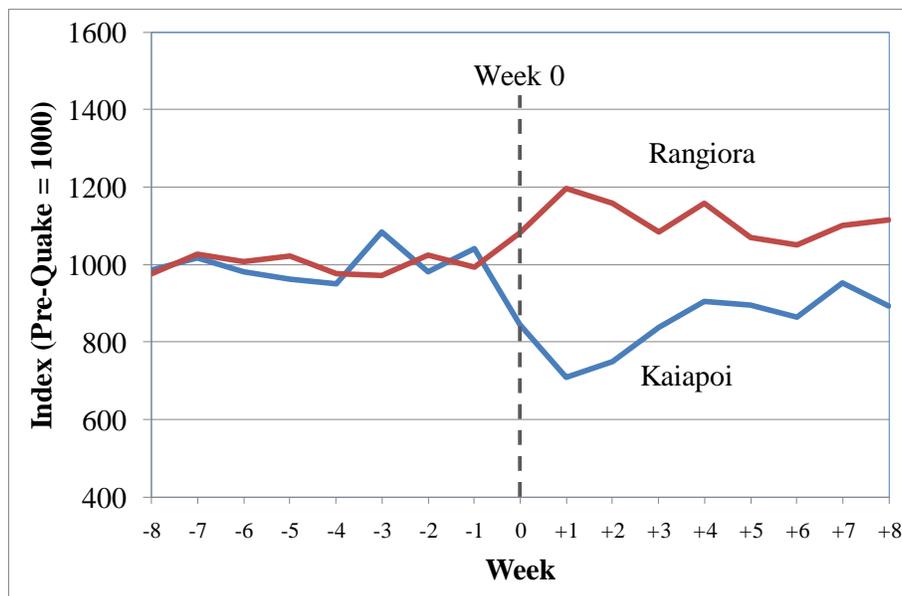


Figure 5. Index of Weekly Spending in Rangiora and Kaiapoi, 5 July to 31 October 2010.

Source: Marketview Consumer Spending – BNZ transactions.

Paymark data are available weekly, with weeks beginning on the Monday. This means that the earthquake on Saturday 4 September took place in the week beginning 30/08/2010. For the purposes of this study, that week was defined as Week 0. To protect confidentiality, the data for different shopping areas were normalised so that average spending for the eight weeks prior to

the earthquake (5 July to 29 August) was set equal to 1000. This allowed percentage changes to be shown but not the relative turnover of each shopping centre.

Kaiapoi and Rangiora are two small towns north of Christchurch city separated by about ten kilometres. Kaiapoi was greatly affected by the 4 September 2010 earthquake, losing its supermarket, while Rangiora was largely unscathed. Figure 5 above draws the time series for Kaiapoi and Rangiora. A disastrous fall in consumer spending in Kaiapoi after the earthquake is obvious in the Figure. Spending in Week 1 after the earthquake was 29.9 per cent below its weekly average for the eight weeks before the event. Spending slowly recovered over the next seven weeks, but was still 10.7 per cent below the pre-quake average in the last week of November.

It is equally clear from the graph that some of the lost custom in Kaiapoi made its way to Rangiora. Spending increased 19.7 per cent in Week 1. Although there was some erosion of this increase since that peak, in Week 8 spending in Rangiora was still 11.4 per cent higher than the weekly average before the earthquake.

5. REGIONAL ECONOMIC DEVELOPMENT AFTER THE EARTHQUAKES

In thinking about whether the large earthquakes in 2010/11 (and the ongoing aftershocks) require major changes to the regional economic development strategies previously in place, there are two underlying factors to consider:

- Have the earthquakes changed the fundamental strengths and opportunities that had previously been the core drivers the region's economic development (equilibrium effects)?
- Do the short-term impacts of the earthquakes, including the transition path taken during the recovery phase, have long-term impacts on the region's economic development (hysteresis effects)?

To answer these questions, the AERU returned to the ten strengths identified in the Canterbury Regional Economic Development Strategy (CREDS),

listed in Table 1 above. There are weaknesses in some of these strengths, but the overall assessment is cautiously optimistic.

Canterbury is a great place for people to live

Canterbury is not as good a place for people to live as it had been before the 4 September 2010 earthquake. To illustrate, consider this summary from CERA (2011, p. 9):

By August 2011, more than 7,000 aftershocks had shaken the greater Christchurch area. Communities have been significantly impacted, interrupting day-to-day life and damaging the infrastructure and services that communities rely on to function. In the worst affected suburbs, after each major quake, houses and facilities were without power, water and sewerage for days on end, and roads were damaged and unsafe for travel. Liquefaction caused flooding of houses, punched holes in roads and covered the ground with tonnes of silt. Some schools were forced to relocate, and hundreds of students have left secondary and tertiary education facilities many not returning to the facilities they were using in September 2010.

The same source commented that ten performing arts venues were out of action (including the Christchurch Town Hall and Convention Centre). There was major disruption to sporting and recreation facilities (including the loss of the city's AMI Stadium and the consequent decision to shift Rugby World Cup games out of the region). On top of this, the loss of infrastructure has meant that undertaking routine tasks can be more difficult such as shopping, access to schools, commuting and recreation.

The quality of the city's education institutions has been an important part of the quality of life in Christchurch. This sector was particularly hard hit through damage to school infrastructure (leading some schools to "double-bunk" on less damaged sites) and reductions in school rolls through movements away from the city. This latter impact is anticipated to continue, leading to discussions about teacher redundancies in 2012.

The importance of restoring Canterbury as a great place to live is reflected in the overarching vision statement of the Canterbury Earthquake Recovery Authority (CERA, 2011, p. 18):

Greater Christchurch recovers and progresses as a place to be proud of – an attractive and vibrant place to live, work, visit and invest – *mō tātou, ā, mō kā uri a muri ake nei* for us and our children after us.

The Canterbury economy has long been built on export growth

The preliminary assessment of this driver of economic development has been positive. Christchurch International Airport and the Lyttelton Port of Christchurch have continued to operate. The agricultural, forestry and fishing sectors were not significantly affected by the earthquakes. Some damage to agribusinesses was reported in the September earthquake but this was relatively easily remedied and exports were not affected. Some diversion of routes for export may have taken place due to temporary closure of ports but with no discernible long-lasting impact. Indeed, exports and imports from the two major ports and the airport had grown above their August 2010 levels by October 2011.

In the case of ICT, specialist manufacturing and food and beverage manufacturing again no serious loss of output was reported with facilities generally being able to continue operating. The outlook for education of overseas students in Christchurch is not positive, however; there is an understandable nervousness about travelling to study in a region with ongoing seismic activity, particularly since a large proportion of the fatalities in the February 2011 earthquake involved foreign nationals attending an English language school.

There is a wealth of experienced business people in Canterbury

Prior to February 2011, the Christchurch central business district housed more than 6,000 businesses, employing 51,300 people. A large percentage of these were in the retail sector, with the Christchurch central city accommodating 618 shops, employing 4,250 people. Further, prior to February 2011, there existed 446,000 square metres of office space within the

central business district (CCC, 2011b). Thus the on-going closure of the inner city for safety reasons represents a major blow to business in Christchurch.

Nevertheless, resilience has been a key theme in public discussions of the business sector in Christchurch. A survey of 260 businesses across the city by MYOB (2011) found that two-thirds were planning for revenue and customer growth over the next twelve months, compared to a national average of 48 per cent. It is further suggested that the damage in the earthquakes might create new potentially attractive business opportunities in Christchurch.

The CEDM model found that business services are a key growth sector in Christchurch. The relocation of businesses from the central business district has impacted on this sector. Some find themselves in temporary office accommodation, often not in ideal conditions with crowded office space. Thus there are important issues around the retention of personnel and businesses within the region and how to facilitate their recovery. In general these types of businesses favour locating in central business districts where facilities and places to meet are readily available. Also to attract key staff to these businesses a vibrant city centre is generally thought important.

Canterbury businesses are responsive to market signals

This is an interesting issue in the post-earthquake environment. There is considerable confusion around planning requirements, ranging from what land will be classified as unable to be used for buildings to what restrictions will be placed on building height in the central business district. There are uncertainties around insurance entitlements and how firms can meet shortfalls between insurance payouts and the costs of a new building designed for the increased seismic risk. The fundamental market signal of what is the value of a square metre of office space in the central business district may take some time to be determined, especially as the heart of the central business district remains closed as demolition of some high rise buildings continues. In the meantime, business owners previously located in the central business district are not standing still. Rental office space on the main roads leading into the city centre have quickly been leased to relocated businesses, and new office space is being build to accommodate the displaced demand. This is an example of a potential hysteresis effect, where the short-term response to market signals may have a long-term impact on the transaction costs of doing business in Christchurch.

Canterbury has abundant land, water and other natural resources

At one level, Canterbury continues to have abundant land, water and other natural resources. At another level, however, the seismic activity has created a serious issue for real estate in Christchurch and the district immediately north of the city. On 23 June 2011, the Government announced that all land in Christchurch and Waimakariri District are categorised into four residential zones – white, green, orange and red. The white zone (essentially on the hills to the south of the city) needed further data to be collected before an assessment could take place. The green zone had no significant land issues. The orange zone contained areas where many buildings had been damaged beyond repair but more detailed assessment was needed before a final classification to green or red. The red zone classification meant the land itself had been extensively damaged with a high risk of future damage from seismic activity. Land repair would be impossible or uneconomic, and so residents cannot remain in these zones. There were about 5,000 properties in Christchurch and around 100 properties in Waimakariri inside the residential red zone. This means that in the short-term there is a shortage of residential properties in the greater Christchurch area.

There is a solid skill base in the Canterbury labour force

The Canterbury Economic Recovery Agency and the Canterbury Development Corporation have created the Canterbury Employment and Skills Board (see www.cesb.org.nz) to develop a ten-year strategic labour market and skills plan to assist in the recovery. The Board recognises that a substantial number of construction-related jobs will be created in the region as the rebuild commences. At the same time, the demand for skilled workers in the region's knowledge-based sectors is expected to continue.

Canterbury has strong public and private research institutions

Canterbury has two research universities in the province. The University of Canterbury is based in Christchurch city. It reports that due to the earthquakes, it lost about 1,500 students (out of a total EFTS role of 15,673 in 2010), including about 25 per cent of its first-year students and about one-third of its international students. Some buildings and facilities suffered

major damage and many have extensive remediation requirements. Although only a few buildings have been identified for deconstruction, there are a number which will remain closed for up to two years. Consequently the University of Canterbury faces a major funding shortfall of about 12 per cent over the period 2012 to 2019. Lincoln University is a specialist land-based university located about 15 km to the south-west of the city of Christchurch. It one little-used building closed by the September 2010 earthquake, but two major buildings were closed on engineering advice at the end of 2011.

Canterbury offers visitors a range of national iconic attractions

Tourism, prior to February 2011, generated NZ\$2.3 billion to Canterbury's regional economy, representing a considerable portion of economic activity in the region. Canterbury saw a significant reduction in international and domestic visitors in the period March to April 2011. The total amount of international visitors to Canterbury in March 2011 declined by 45 per cent (representing 130,000 people) compared to March 2010, with an added decline of 14 per cent (or 35,000) of domestic visitors over the same period (Statistics New Zealand, 2011). The total number of guest nights for the Canterbury region also declined between March 2010 and March 2011, showing a decrease of 30 per cent (or 165,000), most likely due to a lack of capacity (Statistics New Zealand, 2011).

Six months after the February earthquake the downward impact was continuing. In August 2011 international guest nights in Canterbury declined by 30 per cent compared to the same month in the previous year. In contrast, domestic guests nights decreased by 9 per cent during the same period. The loss of accommodation due to the earthquakes had a major impact on the tourism industry in Christchurch. After the February earthquake the number of establishments had decreased by 25 per cent compared to the same month in the previous year. Half a year later, in September 2011, the number of establishments was down 18 per cent compared to the same month in the previous year (MED, 2011c).

In the longer-term, the earthquakes have had a profound impact on the heritage built environment of Christchurch city. Following the February 2011 earthquake, the buildings within the central city were assessed by structural engineers, with 362 buildings assessed being deemed to require some kind of structural work or demolition. Of these 362 buildings, 241 were targeted for

complete demolition, including 86 buildings holding significant cultural or historical value within Christchurch. A further 82 buildings were targeted for partial demolition, of which 22 were heritage buildings, with the remaining 39 buildings (from the original 362) assigned to be “made safe”, or given structural reinforcement, of which 22 were heritage buildings (CCC, 2011a).

With the substantial number of heritage buildings requiring demolition or partial demolition comes a significant loss of cultural capital in Christchurch. The loss of such buildings also marks the loss of historically significant sites in the city, which was viewed by many as a crucial part of Christchurch’s broader identity and attractiveness to some tourists. The CERA (2011, p. 53) draft recovery strategy recognises that the recovery of the local economy and tourism needs to be supported through “ensuring culture and heritage forms part of the region’s identity and contributes to a quality urban environment”, but it is clear that much has been lost.

Canterbury has a good infrastructure, including the airport and seaports

The core large infrastructure assets of the region, including the airport and seaports, remain operational. For the most part, road, rail, electricity and sewerage networks have been restored to a functional level or better. It is generally accepted that there is a need for new investment in sport and recreation facilities and in arts and culture venues.

Canterbury is well-connected, with effective working relationships

This is an interesting heading about which opinions might differ. New collaborative partnerships have been formed. The Canterbury Employers’ Chamber of Commerce and the Canterbury Development Corporation combined to create the Canterbury Business Recovery Group as a joint venture. The Canterbury Business Leaders Group brings together some private sector business leaders to aid economic recovery. The Canterbury Central Government Leaders Group is made up of senior leaders of central government agencies based in the region so that they can collaborate to restore and enhance services for recovery.

At the same time, however, there have been public disputes between business interests and the Christchurch City Council, and arguments between local and central government about decisions and processes. Central

Government created its own agency (CERA) to lead and coordinate the ongoing recovery effort. Legislation has vested special powers in CERA and in the Minister for Canterbury Earthquake Recovery “in order to enable an effective, timely and co-ordinated rebuilding and recovery effort” (<http://cera.govt.nz/about-cera>). The arrival of a new and very powerful central government agency into Christchurch inevitably disrupts some local relationships and creates some tensions when multiple parties are contesting local leadership (see, for example, Dalziel and Saunders, 2003).

6. CONCLUSION

The discussion in this paper is necessarily preliminary. Although it has been more than twelve months since the first major earthquake on 4 September 2010, the region continues to experience sizeable aftershocks and there are parts of the central business district that remain closed until unstable high-rise buildings can be safely demolished. The discussion is based on the premise that the pre-existing regional economic development strategies continue to offer a useful framework for discussing the future regional policies. Section 5 has highlighted how that framework can be used, without coming to any simple conclusions.

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