

TAX POLICY FOR GOOD TIMES AND BAD: AN ASSESSMENT OF TAX POLICY RESPONSES TO NATURAL DISASTERS

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Recent years have seen a series of natural disasters place significant social and fiscal strain on a number of economies. Determining the appropriate tax response to natural disasters involves multiple complex policy decisions, which often need to be made under significant time pressure with limited information. While natural disasters are predicted to become more frequent and costly, there has been little focus on the links between tax policy development and responses to natural disasters.

This study compares the tax responses in the pre-disaster, disaster response, and post-disaster recovery stages of the 2010-11 Queensland floods in Australia and the 2010-11 Canterbury earthquakes in New Zealand to assess whether jurisdictions with a stronger tax policy system, as measured by OECD, World Bank and other expert reviews, have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy. This expected result is compared to the findings from the Canterbury earthquake and Queensland flood case studies, involving analysis of 44 semi-structured interviews with tax policy makers (government officials, tax practitioners and tax academics) from Australia and New Zealand. A large number of legislative documents, policy reports, formal reports, technical guidance, submissions, academic literature and media items prepared by these policy makers were also analysed. After investigating three rival explanations for the types of tax responses made (risk of natural disasters, macro and micro economic settings, and government arrangements for responding to natural disasters), the study concludes that the empirically based patterns from the Canterbury earthquake and Queensland flood case studies suggest that countries with stronger existing tax policy systems have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy. Further, any weaknesses within these policy systems will also be reflected in the tax responses made.

1. INTRODUCTION

Recent years have seen a series of natural disasters place significant social and fiscal strain on a number of economies. Two such events, which are the focus of this study, were the 2010/11 Canterbury earthquakes in New Zealand and the 2010/11 Queensland floods in Australia, as illustrated in Table 1.

Table 1 – Impact of the Canterbury earthquakes and Queensland floods

	Canterbury Earthquakes ¹	Queensland Floods ²
Human impact	185 deaths 220,000 residences affected	33 deaths 136,000 residences affected
Economic impact	20 percent of GDP	1.1 percent of GDP

While natural disasters are predicted to become more frequent, more intense and more costly in coming years (Freeman, Michael, & Muthukumara, 2003; Laframboise & Loko, 2012), there has been little academic focus on the links between tax policy development and responses to natural disasters, including the complex interactions amongst those involved in the formation of tax policy. The literature that does exist focuses on single disaster tax issues

¹ (Smart, 2012; Tompkins et al., 2012).

² (Arklay, 2012; Howes et al., 2013; Smart, 2012).

(Omura & Forster, 2011; Watanabe, 2013), the taxation implications of individual disasters (Farmer, 2011b; Maples & Sawyer, 2015), or the taxation experiences of a single country (Vosslamber, 2012; Watanabe, 2008). As well as being limited in terms of breadth, the current literature is also not based on the views of actual policy makers involved or the full range of tax policy documents behind the actions taken, and does not consider the three phases of a natural disaster (Todd & Todd, 2011). As a result it misses the full range of tax responses made. In response to this gap in the literature, this study seeks to understand more about tax policy responses to natural disasters. Specifically:

- What tax responses were made in response to the 2010/11 Canterbury earthquakes in New Zealand and the 2010/11 Queensland floods in Australia?
- How did the tax responses relate to the strength of the existing tax systems?

A qualitative approach is adopted to answer both research questions because it aids interpretation of tax policy responses by allowing a picture to be formed of the features of the environment in which they were made. In addition, it creates awareness of the full range of factors that led to the particular tax policy outcomes and caters for the complexity of the situation, where it is not possible to hold everything else constant while only the tax treatment of a particular area is tested. It is also suited to investigating exploratory and descriptive questions which are not covered in the existing literature.

The primary data source for the study is 44 semi-structured interviews with tax policy makers from Australia and New Zealand, selected to represent the views of government officials, tax practitioners and tax academics. As well as providing data for analysis, the interviews offer insights into the policy environment and clarify details in the large number of legislative documents, policy reports, formal reports, technical guidance, submissions, academic literature and media items prepared by these policy makers, which are also analysed.

The study adopts an ‘interpretive-descriptive’ approach to qualitative analysis. This approach is appropriate where the research is primarily concerned with accurately describing what was understood and reconstructing the data into a recognisable reality for the people who have participated in the study (Maykut & Morehouse, 1994; Strauss & Corbin, 1990). In this case, the aim is to understand more about and describe the tax responses to the Queensland floods and Canterbury earthquakes. Specifically, Glaser and Strauss’s (1967) constant comparative method of data analysis is adopted.

A key limitation that arises from qualitative research is the potential for subjectivity in the analysis, with subjects selected by the researcher (such as the focus in this study on policy makers as opposed to individuals affected by natural disasters) and data interpreted with the particular beliefs of the researcher (such as the experience of this researcher as an advisor on the New Zealand tax policy changes). However, it is acknowledged that researcher awareness of these limitations may assist in reducing their influence on the research output. The research design for this study also incorporates procedures for data collection and analysis to increase the validity of this qualitative research. These include multiple methods of data collection, with data gathered from original policy documents in combination with interviewing the policy makers involved, and member checks (Maykut & Morehouse, 1994) with research participants.

No prior research has systematically compared international tax policy responses over the three phases of a natural disaster, based on the full range of tax policy documents and views of the policy makers involved. By summarising the responses in this way, a useful resource

for future tax policy makers is created. In addition, assessing how tax policy responses to natural disasters relate to the strength of the existing tax policy framework adds to the current policy debate and provides lessons that are relevant to modern tax policy makers.

2. METHODOLOGY

2.1. Underlying assumptions and theoretical perspective

The theory of tax policy is a set of general principles with strong neo-classical economic foundations (Henry, Harmer, Piggott, Ridout, & Smith, 2010; Musgrave & Musgrave, 1989; Smith, 1776; Tax Review 2001, 2001; Tax Working Group (TWG), 2010). The economic theory of tax policy, while acknowledging the influence of factors like political influence (Bird & Zolt, 2003; Mirrlees, 2011; Musgrave & Musgrave, 1989), assumes humans are rational decision makers.

However, the formation of tax policy is a social process. It involves politicians, treasury and tax administration officials, practitioners, representatives from professional organisations, and other interest groups including academics. Tax policy in practice is determined by real world context and the impact of human players. The meaning of tax policy principles and the way they are applied is open to different interpretations, likely to be influenced by social and political factors. This interpretation occurs at different levels: tax policy makers, legislators, implementers, and practitioners (Yanow, 2014). As such, tax policy principles are inevitably imbued with the assumptions, values, politics, patrons and priorities of their creators (Cooper & Morgan, 2013).

Analysing tax policy without considering its social context can mean that theory is somewhat divorced from the real world. For example, Mirrlees' optimal tax theory has been criticised because practical conclusions for policy cannot readily be drawn (Creedy, 2011; Kay, 1990), and Morgan (1988) argues that economic principles are unable to capture the complexity of real world policy decisions which involve many social and political choices.

2.2. Research methodology

This study was conducted using qualitative research. This style of research is appropriate where the researcher wants to: explore a complex problem or issue with changing and shifting phenomena where variables cannot be easily measured; understand an area where little is known, or previously offered understanding appears inadequate; understand an issue deeply and in detail; learn from participants about the way they experience something, the meanings they put on it and how they interpret what they experience; or construct a theory or theoretical framework that reflects reality (Creswell, 2013; Richards & Morse, 2013). As such it is appropriate for this study, for the reasons noted in section 2.1.

2.2.1. Research problem, objective and questions

No research has systematically compared international tax policy responses to natural disasters. As well as being limited in terms of breadth, the current literature is also not based on the views of actual policy makers involved or the full range of tax policy documents behind the actions taken, and does not consider the three phases of a natural disaster. As a result it misses the full range of tax responses made. In response, this study seeks to understand more about tax policy responses to natural disasters, specifically:

- What tax responses were made in response to the 2010/11 Canterbury earthquakes in New Zealand and the 2010/11 Queensland floods in Australia?
- How did the tax responses relate to the strength of the existing tax systems?

2.2.2. Research method – case study approach

This analysis uses case study method. This is a good approach when the researcher has clearly identifiable cases within boundaries and seeks to provide an in-depth understanding of a case or a comparison of several cases (Creswell, 2013). In this study the cases are clearly definable, being the tax policy responses to two recent natural disasters. The choice of methodology is appropriate for the purpose of the research, because the aim of both research questions is to understand the real world responses to natural disasters and how these relate to the strength of the existing tax system. The case study method has a number of defining features and the way these have been approached is discussed below.

Case identification and definition

Case study research involves the study of a case or cases within a contemporary context or setting, which is usually described within certain parameters such as a specific place and time (Yin, 2009). Typically cases are current, real-life situations that are in progress so that the researcher can gather accurate information not lost by time.

Yin (2012) argues that multiple-case designs are preferred over single-case studies as they provide a broader array of evidence, use the logic of replication and result in more powerful analytical conclusions than a single case. Multiple case-studies generally involve a small number of cases (no more than four or five), with a description of each case and its themes (within-case analysis), and a thematic analysis across the cases (Creswell, 2013; Yin, 2012).

The two cases in this collective study were chosen because of:

- **Timeliness.** Both were recent natural disasters where the responses were in progress. This meant it was possible to gather accurate information not lost by time.
- **Generalisability.** One aim of this study is to provide a narrative of different tax policy responses to natural disasters as a useful resource for future tax policy makers. A collective study of some recent natural disasters in OECD countries was identified as the best approach for doing so. Both natural disasters occurred within a six month window meaning similar international economic and political conditions existed. As developed countries and OECD members, these jurisdictions also have a generally agreed approach to the principles of good tax policy, allowing better cross-case analysis of their responses to natural disasters. The choice of New Zealand and Australia, in particular, supports the objective of being able to draw general lessons. New Zealand and Australia are well placed for comparative study. Both are first-world southern-hemisphere Commonwealth countries with similar demographic profiles and social policy objectives. Both have parliamentary governments, small populations and relative ethnic homogeneity. The two countries also have close trade relationships and considerable trans-Tasman exchanges of populations due to their geographic proximity (Marriott, 2008). Claims of similarity between New Zealand and Australia have been made in several studies. Mclean (2003) comments that New Zealand and Australia have more in common with one another than any other country and are more alike than any other two separate nations. Other studies, for example Peetz (1998) and Marriott (2008), have successfully compared Australia and New Zealand, with Peetz (1998) arguing that there is only one country that is suitable for comparison with Australia and that is New Zealand.
- **Personal experience and motivation.** New Zealand was chosen as one of the sites for this study because of the researcher's personal experience as a tax policy advisor at the

time of the Canterbury earthquakes and their significant impact on the New Zealand economy.

Data collection

A key factor in the data collection strategy in this study was the desire to provide a unique angle on the tax policy responses to natural disasters. A survey of the tax policy literature finds many examples which discuss tax policy in practice. For example, Kay (1990), McLure and Zodrow (1994), Messere, de Kam, and Heady (2003) and Slemrod (1999). However, despite the fact that the formation of tax policy is a social process and analysing tax policy without considering its social context can mean that theory is somewhat divorced from the real world, research on tax policy does not generally engage with those involved in the formulation of policy in practice. The few examples that do exist are predominantly limited to environmental tax policy (Barradale, 2010; Beuermann & Santarius, 2006; Deroubaix & L  v  que, 2006; Dresner, Jackson, & Gilbert, 2006; Kasa, 2000; Stigson, Dotzauer, & Yan, 2009), or only capture the perspective of one group involved in the policy process such as legislators (Hahn, Toumey, Rayens, & McCoy, 1999; Manley, 1968), officials (Bergman, 2003), taxpayers (Hasseldine & Li, 1999; Hessing, Kinsey, Elffers, & Weigel, 1988), businesses (Dresner, Dunne, Clinch, & Beuermann, 2006; Tasse, 2007), or tax practitioners (Rabino, 1980; Spilker, Worsham Jr, & Prawitt, 1999).

There are no studies which look at tax policy making from the perspective of real tax policy makers in periods of economic and social instability like a natural disaster. As such, there is a gap in the literature regarding the real life experiences of tax policy makers. This is where the approach in this study has advantages. It offers an understanding of tax policy in action, located in the everyday language of tax policy makers and using case studies to understand real life experiences (Chua, 1986). The approach complements traditional tax research which constructs rigorous but abstract models of tax policy. Conducting research from multiple perspectives allows researchers to seek multiple facets of complex and ambiguous phenomena, like tax policy (Lewis & Kelemen, 2002).

The timeliness of the cases selected and the researcher's personal experience as a New Zealand tax policy advisor, allowed access to the relevant tax policy makers in order to gain sufficient information to present an in-depth picture of each case from the perspective of the policy makers involved.

The primary data source for this study was semi-structured interviews with those involved in the development of tax policy advice, such as tax policy officials, tax academics and representatives from professional accounting organisations and the Big Four accounting firms (referred to in this study as policy makers). The main participants in the policy process were identified and contacted with the aim of collecting a "*purposive sample*" (Berg, 2009, as cited in Archel, Husillos, & Spence, 2011, p.333). This strategy is based on informational rather than statistical considerations with the purpose being to maximise information as opposed to facilitating statistical generalisation (Archel et al., 2011). Participants were selected on the basis of their differing roles in the tax policy development process to expand the variability of the sample, recruited through a personal network of tax professional contacts and interviewed in their places of work. The aim was to try and gain as complete a picture as possible of how tax policy principles were applied in responding to the two natural disasters and whether the ability to respond in line with standard tax policy principles was linked to the strength of the existing tax policy framework.

An emergent design (and sampling strategy) approach was applied. Interviews were undertaken after an initial analysis of policy documents produced at the time of each natural

disaster and subsequent to undertaking a pilot interview. After analysing the first round of interviews, further interviews were held to interrogate the reliability of initial interpretations, go into more detail on specific themes and expand the sample group. The interviews were guided by an interest in exploring the rationale behind the policy responses adopted, the dynamics of the policy process and actor perceptions regarding policy outcomes.

Interviews were semi-structured in order to allow the interviewer “to ask a series of regularly structured questions, permitting comparisons across interviews, and to pursue areas spontaneously initiated by the interviewee” (Berg, 2009, as cited in Archel et al., 2011, p.333). An interview guide was developed and followed during each interview so that “the same basic lines of inquiry [were] pursued with each person interviewed” (Patton, 2002, as cited in Archel et al., 2011, p.333). The guide was developed following an analysis of literature on the development of tax policy, pilot interviews, and an initial analysis of the related policy documents.

As well as interviewing tax policy makers, it is also important for the researcher to have contextual information available to describe the setting for the case (Creswell, 2013). The secondary data sources for the case studies included a range of documents prepared by tax officials, tax practitioners and tax academics on the tax policy responses. These were also identified through an emergent design, aided by the personal experience of the researcher as an advisor on the New Zealand tax policy changes. Table 2 summarises the primary and secondary data sources used for this study (collected until five years after each event).

Table 2 – Summary of data sources

	Interviews	Legislative documents	Policy advice	Formal reports and evaluations	Technical guidance	Submissions	Academic literature	Media	Total
Canterbury earthquakes:									
Tax Officials	10	3	70	3	4	0	9	0	99
Tax Practitioners	10	0	0	1	0	1	20	2	34
Tax Academics	8	0	0	3	0	0	17	0	28
Total	28	3	70	7	4	1	46	2	161
Queensland floods:									
Tax Officials	7	7	11	4	5	0	1	0	35
Tax Practitioners	4	0	0	2	1	2	5	0	14
Tax Academics	5	1	0	0	0	1	10	0	17
Total	16	8	11	6	6	3	16	0	66
TOTAL	44	11	81	13	10	4	62	2	227

Data analysis

This study has adopted an ‘interpretive-descriptive’ approach to data analysis. This approach is appropriate where the research is primarily concerned with accurately describing what was understood and reconstructing the data into a recognisable reality for the people who have participated in the study (Maykut & Morehouse, 1994; Strauss & Corbin, 1990). In this case, the aim is to understand more about and describe the tax responses to natural disaster. Specifically, Glaser and Strauss’s (1967) constant comparative method of data analysis was adopted. This methodology also draws on the work of Lincoln and Guba (1985) and Taylor and Bogdan (1984).

The constant comparative method of data analysis provides an audit trail of the research (research journal, focus of inquiry outline, original interview transcripts and field notes,

original policy documents, unitized data from interviews and policy documents, and category analysis) which allows others to follow the research approach taken from outset to outcomes.

Using NVivo software, each source has been separately recorded and then coded by unit (individual sections of meaning) using prior theory on the phases of natural disaster responses, and recurring phrases and themes in the data. After preliminary coding, the provisional categories (nodes) were refined by developing a category rule which captured the meaning contained in coded units. The remaining data was then coded based on these rules for inclusion. Once all units had been categorised, categories were reviewed for any overlap and ambiguity. Tools from NVivo were then utilised to test the coding structure (for example, word frequency checks) and comparative queries were run to contrast the interview responses by classification (role within the policy process).

An interrogation of the related policy documents was undertaken in the same manner as for the interview transcripts. Following analysis, draft findings were presented to interviewees who were asked to comment (see the discussion on Member Checks below).

The cross-case analysis in this study was completed in two parts. The first aim of this research was descriptive – to provide a narrative of responses to natural disasters as a useful resource for tax policy makers (Yin, 2012). An analytic strategy for a descriptive case study question involves developing a descriptive framework for the analysis, with ideas for the framework coming from an initial review of the literature (Yin, 2009). The data is then systematically organised into hierarchical relationships, matrices or other arrays (Miles & Huberman, 1994 as cited in Yin, 2012). This is done by assembling word tables to display data from the individual cases and searching for patterns across them.

The second aim of this research was to assess how tax responses to natural disasters relate to the strength of the existing tax policy system. This aspect of the research has an explanatory purpose – to present data on a cause-effect relationship and explain how or why events happened (Yin, 2012). The recommended analytic strategy for an explanatory case study question (and the one adopted in this study) is to: outline the expected relationship (in this case between the strength of the existing tax policy framework and policy process, and the types of tax responses made to natural disasters); compare this to the findings from each individual case study; and examine possible rival explanations (Mills, Durepos & Wiebe, 2010).

2.2.3. Limitations of the research methodology and features to address these

Research which is based on understanding an issue from the perspective of the participants is criticised for its assumption of social order, lacking an evaluative dimension other than the extent of agreement amongst participants (Chua, 1986), and the potential for subjectivity in the analysis. Subjects are selected by the researcher (such as a focus on policy makers as opposed to individuals affected by natural disasters) and data is interpreted with the particular beliefs of the researcher (such as the experience of the researcher as an advisor on the New Zealand tax policy changes). Researcher awareness of prejudices, viewpoints or assumptions which may be influencing what one is trying to understand assists in reducing subjectivity. In addition to this, measures such as triangulation and member checks have been built into the research design to mitigate limitations and increase the validity of the research results. These are discussed below.

Triangulation

In qualitative research, the criteria of internal and external validity, reliability and objectivity are replaced by terms such as credibility, transferability, dependability and confirmability (Denzin and Lincoln, 1994, as cited in Armstrong, Gosling, Weinman, & Marteau, 1997). One strategy for addressing these concepts is triangulation, where diverse confirmatory instances lend weight to findings.

One form of triangulation involves the use of a variety of data sources (Denzin, 1978 as cited in Armstrong et al., 1997). This study collects data from original policy documents in combination with interviewing the policy makers involved. Using multiple data sources helps to address subjectivity within particular sources (Maykut & Morehouse, 1994), with the simultaneous analysis of interviews and policy documents acting as a reliability test (Archel et al., 2011).

Member checks

Another technique used by qualitative researchers to help improve the accuracy, credibility, validity, and transferability of a study is member checking (Maykut & Morehouse, 1994). This is undertaken during the interview process and at the conclusion of the study to increase the validity of a qualitative study. Member checks serve to decrease the incidence of incorrect data and the incorrect interpretation of data, and help to provide findings that are authentic, original and reliable. Member checks also offer an opportunity to volunteer additional information which may be stimulated by the review process.

In an informal sense, member checks have been carried out throughout the conduct of the fieldwork for this study. During an interview, the researcher has constantly checked her understanding by utilising techniques such as paraphrasing and summarisation for clarification. After the conclusion of each interview, research participants were asked if draft interview transcripts accurately described their experience.

More formal member checks were also completed at the conclusion of the study by sharing the interpretive findings with the participants involved. This was a useful exercise as it allowed participants to analyse the findings and confirm that they reflected their views, feelings, and experiences. It also led to the discovery of some additional information regarding the tax responses made in response to the Queensland floods.

3. THE EXISTING LITERATURE

Before considering the extent to which Australia and New Zealand followed the principles of good tax policy when responding to the Queensland floods and Canterbury earthquakes, it is necessary to understand what constitutes such policy under normal circumstances, the role of taxation in how agents respond to a natural disaster, how that fits with standard tax policy principles, and whether there should be different tax policy in response to a natural disaster.

3.1. Good tax policy

Connolly and Munro (1999) recognise Musgrave's (1959) seminal work on public finance as identifying a set of generally agreed principles for a 'good' tax system. Musgrave's principles of revenue adequacy, equity, efficiency, ease of administration and compliance, and consistency with fiscal policy have been broadly accepted as those defining good tax policy. "The theory of public finance: a study in public economy" (Musgrave, 1959) has been cited over 5000 times, by authors such as Auerbach and Hassett (1999), Heady (1993), Steinmo (2003) and Stern (1984). Recently, a number of high profile tax reviews have also largely

adopted these same principles (Henry et al., 2010; Mirrlees, 2011; Tax Review 2001, 2001; TWG, 2010). This demonstrates that Musgrave's principles remain relevant for assessing tax policy. However, in applying these one must take account of political influences, practical limitations and policy intent, as standard policy principles are insufficient guidance on their own (Bird & Zolt, 2003; Musgrave & Musgrave, 1989).

3.1.1. Political influences

It is important to consider the policy process, as economic theories seldom take context into account (Susan, 1983) and tax policy reflects political factors (Bird & Zolt, 2003; Mirrlees, 2011). Similarly, natural disasters occur in a political space and the literature on disaster prevention and response has acknowledged the political dimension of disasters (Cohen & Werker, 2008). In respect of a natural disaster, political commitments can influence choices over whether to fund or incentivise risk mitigation activities, and impact judgements over the tax treatment of immediate relief measures and decisions on how to fund recovery, rehabilitation, and reconstruction activities in the post-disaster phase. Where a country has a decentralized political tax system there will be specific implications for tax policy (Bird & Zolt, 2003; Kay, 1990). The need to factor in political influences has been addressed in this study by the choice of a qualitative research approach. In particular, the use of semi-structured interviews with those involved in the development of tax policy advice provides an understanding of the social and political context in which the policy changes were made.

3.1.2. Practical limitations

Tax design must also take into account practical limitations and administrative capacity because economic concepts differ in how easily they may be applied in real life (Kay, 1990). Practical considerations include the robustness of the tax system, risk of tax avoidance and tax evasion, and the costs of tax compliance and administration. The level of electronic capability within a particular jurisdiction is also relevant as this opens up new ways that tax authorities can administer tax law, collect tax revenues and interact with the wider community (OECD, 1998). The need to take practical settings into account applies generally but is particularly relevant to natural disasters. Settings which might operate well under normal conditions might not do so when responding to a natural disaster; e.g., restrictions on information sharing between government departments, reliance on face-to-face interactions between tax authorities and taxpayers, and strict record-keeping requirements.

3.1.3. Intent

Design choices are also influenced by the purpose of a particular tax. In general, taxes can be categorised into two types: revenue and corrective taxes, with both types relevant when considering tax policy responses to a natural disaster.

Revenue taxes are necessary to fund preventative activities and restore public finances and meet the public cost of natural disasters. Revenue taxes fund government spending by raising sufficient funds (Bird & Zolt, 2003; Kay, 1990; Tax Review 2001, 2001; TWG, 2010). In doing so, a long-term view is advocated. Tax systems should not normally be altered on a temporary basis to meet current year shortfalls, as frequent tax changes increase administration, compliance and efficiency costs (Bird & Zolt, 2003).

Corrective taxes may be relevant when considering risk reduction measures that might be taken in advance of a natural disaster (such as earthquake strengthening or taking out private flood insurance) or as part of economic redevelopment in the post-disaster phase. Corrective taxes are designed to pursue social or economic outcomes by promoting or discouraging

certain behaviours (Kay, 1990; Tax Review 2001, 2001). This makes sense where the level of a particular activity is not socially desirable. When this occurs, governments may regulate, legislate, introduce direct subsidies or use corrective taxes (Bird & Zolt, 2003).

Corrective taxation is commonly applied in response to market failures associated with externalities or public goods (Kay, 1990). It usually takes the form of tax incentives to deliberately distort market signals about the relative attractiveness of activities (Tax Review 2001, 2001). However, there are concerns that the use of tax incentives may derive from paternalism (Kay, 1990) leading to over investment in subsidised activities (Bird & Zolt, 2003; Tax Review 2001, 2001), increased administrative and compliance costs, lobbying for further incentives and opportunities for tax avoidance (Bird & Zolt, 2003; Tax Review 2001, 2001), meaning costs may outweigh potential benefits.

3.2. The role of taxation in how agents respond to a natural disaster

In thinking about the role of taxation in how agents respond to a natural disaster, the literature generally identifies different stages in individual and government responses, each with a range of activities.³ Appendix A provides a summary of the issues that individuals and governments face in each phase, using Todd & Todd's (2011) three phase model (pre-disaster, disaster response, and post-disaster recovery). As natural disasters expose the cumulative implications of many earlier individual and collective decisions (The World Bank, 2010), this summary of issues is helpful for identifying the role of tax policy in a disaster response.

3.3. Fit with standard tax policy principles

Having understood the role that tax policy might play in a natural disaster, it is possible to stand back and consider how that role fits with the standard tax policy principles.

3.3.1. Revenue adequacy

Revenue adequacy is important when considering the funding of mitigation activities. Post disaster, it is an important consideration for governments contemplating how to finance both initial responses and longer-term rebuilding activities. Natural disasters also have a more general impact on public finances, which raises questions as to whether, post disaster, the revenue yield remains adequate.

3.3.2. Equity

The principle of equity needs to be considered as part of assessing tax responses to a natural disaster as the poor are especially vulnerable to natural disasters. They are more likely to live in areas known to be vulnerable (as they may be priced out of safer areas), with their assets more likely to be exposed to catastrophic risk (Freeman et al., 2003). As such, tax policy choices over the level of redistribution play a role in how natural disasters affect lower socio-economic groups. Equity also needs to be considered when assessing post-disaster tax responses. The way funds are raised to finance initial and longer-term responses will have distributional impacts, including whether, post disaster, the revenue yield remains adequate to provide services to those on lower incomes.

³ These phases do not have clear boundaries but overlap chronologically as well as in terms of ongoing activities (Todd & Todd, 2011).

3.3.3. Efficiency

Where tax policy is not efficient it may impact on individual or firm decisions on whether to move or mitigate risk, thereby increasing the costs of a natural disaster. For example, property transaction taxes can reduce property sales and encourage undervaluation (The World Bank, 2010) and reducing insurance premiums through tax policy runs the danger of perpetuating inadequate adaptation to the risk of natural disasters (Freeman et al., 2003). Governments also need to raise funds for responding and rebuilding in the most efficient manner, thereby minimising (as far as possible) impediments to economic growth.

3.3.4. Minimising compliance and administration costs

In the immediate response phase, tax compliance and administration costs need to be considered. There are unique challenges arising from delivering policies and programmes in the aftermath of a natural disaster, due to the scale and speed of the response required, as well as the difficult environment in which these must be delivered (Frost, 2013; Venn, 2012). Similar challenges are likely to apply to delivery of tax responses, with a well-operating tax system and its administration helping the economic and social recovery of the affected region and country (IRD, 2013).

3.3.5. Consistency with fiscal policy

Finally, when thinking about tax responses to a natural disaster, it is important to consider tax policy design within the context of broader fiscal policy. Effects of a natural disaster on individuals and firms translate into large and long-lasting macroeconomic impacts (Freeman et al., 2003). Depending on how governments respond, natural disasters can have a negative impact on the fiscal accounts and levels of public debt. Typically, fiscal revenues (taxation) decrease as economic activity declines. At the same time, emergency relief and reconstruction lead to a surge in government expenditures. If governments borrow to fund the deficit, public debt ratios rise. Knowing a disaster's effects on fiscal sustainability is important for making informed decisions, as while governments can borrow to fund a disaster response, they must ultimately pay these funds back, either from taxes or spending cuts elsewhere (The World Bank, 2010).

3.4. Differing tax policy in response to a natural disaster

While it is possible to see how standard tax policy principles play a role in response to natural disasters, a key question in assessing whether Australia and New Zealand followed standard tax policy principles when responding to the Queensland floods and Canterbury earthquakes, is whether they should do so?

The topic of natural disasters and their impact on tax policy is an area which is neglected in the literature (Cavallo & Noy, 2011; Cohen & Werker, 2008). In particular, there is very limited discussion on business responses (Runyan, 2006; Webb, Tierney & Dahlhamer, 1999) and the literature that does exist is dominated by work undertaken in the United States (Dahlhamer & Tierney, 1996; Runyan, 2006; Webb et al., 1999).

The literature does discuss the impact of natural disasters on government policy generally (Freeman et al., 2003; The World Bank, 2004, 2010; Todd & Todd, 2011; United Nations, 2007). However, there is a gap in the literature comparing international tax responses to natural disasters and considering the impact of natural disasters on tax policy.

The existing tax and natural disaster literature tends to focus on:

- A single disaster tax issue, such as: Omura and Forster (2011) on the relationship between charitable activities and tax; Watanabe (2013) on the relationship between disaster risk and the tax system; Maples (2012), Nagasaka (2008) and Suganuma (2006) on the tax treatment of earthquake strengthening; and Eiby (1975), Kozuka (2012a, 2012b), and Steven (1992) on national disaster insurance.
- The taxation implications of individual natural disasters, such as: Burgess (2011), Inland Revenue Department (IRD) (2012, 2013, 2014a, 2014b), Maples (2012); Maples and Sawyer (2015) and Poppelwell, Sun, and Bickers (2015) on the Canterbury earthquakes; Sherlock, Lunder, Liu & Klein (2010) on the Gulf of Mexico Oil spill; Baldwin, Plunkett & Herring (1990) in respect of Hurricane Hugo and the San Francisco earthquake; Bitter, Copeland & Dascher (2006), Burch (2013), Carr and Quinn (2006), Gardner (2006), Richardson (2006), Tolan (2010a, 2010b) and the United States Government Accountability Office (2007) in respect of Hurricanes Katrina and Rita; Farmer (2011) and PricewaterhouseCoopers (2011) in relation to the Queensland floods; and Kashiwagi (2011), KPMG (2011a, 2011b), Tiefenbach and Kohlbacher (2015), Zeirishi-Hojin PricewaterhouseCoopers (2011a, 2011b, 2011c, 2011d, 2011e) on the Tohoku Japanese earthquake and tsunami.
- The taxation experiences of a single country, for example: Watanabe (2008) on the relationship between natural disasters and tax policy in Japan; and Vosslamber (2012) on the historical role of tax in responding to natural disasters in New Zealand.

As well as being limited in terms of breadth, the current tax and natural disaster literature is not based on the views of actual policy makers involved or the full range of tax policy documents behind the responses made, due to the difficulty in accessing both of these.

The current literature also does not consider the three phases of a natural disaster response. As a result, it misses the full range of tax responses made. For example, while Maples and Sawyer (2015) is the most comprehensive discussion of Canterbury earthquake tax responses to date, it does not cover a number of the pre-disaster, immediate response and recovery tax issues, such as the existing disaster tax provisions, EQC scheme, full range of administration responses, charitable tax issues, employee welfare support, donated trading stock, social policy responses, extension of the redundancy tax credit, thin capitalisation exemption, capital contributions from insurance proceeds, GST on reinsurance, and funding options both considered and utilised, such as an earthquake levy.

Some guidance is provided more generally as to whether the standard principles of tax policy apply equally in good and bad times. A substantial literature on war financing notes that unusual macroeconomic conditions prevail during war (Caplan, 2002). Cappella (2012) concludes that leaders choose between alternative means of war finance, including taxation, based on their bureaucratic capacity to extract revenue, currency reserves and leaders' preferences. Grossman and Han (1991) argue that a state's choice of war financing involves weighing the cost of spending in reducing consumption against the benefit of avoiding defeat. More recently, public finance literature has discussed responses to the GFC. Schick (2012) writes that a financial crisis takes more time and resources to resolve than a conventional recession and therefore generally requires different policies and remedies. LeBlanc, Mathews and Mellbye (2013) note that, following the GFC, tax policy has been shaped by shorter-term fiscal and macroeconomic considerations. Based on this literature, there may be a case for tax policy responses to natural disasters to depart from standard tax policy principles.

4. CASE ANALYSIS

Having understood from the existing literature what role tax policy might play in responding to natural disasters, this section of the paper brings together findings from case studies on the Canterbury earthquakes and Queensland floods and conducts a cross-case theme analysis for each research question.

4.1. Tax responses to natural disasters

The first aim of this study is descriptive – to provide a narrative of responses to natural disasters as a useful resource for tax policy makers. Table 3 provides a comparison of tax responses to the Canterbury earthquakes and Queensland floods using Todd & Todd's (2011) three phase model (pre-disaster, disaster response, and post-disaster recovery).

Table 3 – Tax responses to the Canterbury earthquakes and Queensland floods

Canterbury Earthquakes	Queensland Floods
<i>Pre-disaster</i>	
Ad hoc disaster tax provisions	Ad hoc disaster tax provisions
National insurance scheme	Disaster fund or insurance scheme
Earthquake strengthening	
	Tax discretions
	Insurance taxes
<i>Immediate response</i>	
Administrative issues	Administrative issues
Social policy responses	
Charitable tax issues	Charitable tax issues
Employee welfare support	
Donated trading stock	
Extension of redundancy tax credit	
	Exemptions
<i>Post-disaster recovery</i>	
Timing of insurance payments and business deductions	
Damaged assets	
Special tax rates	
Rollover relief	Land swap
Employee allowances	
Earthquake levy and other financing	Flood levy Other post-disaster financing

4.1.1. Pre-disaster – similarities and differences in the tax responses made

While both countries had pre-existing provisions, Australia had much more established policies and procedures for responding to natural disasters. Australia's exposure to frequent natural disasters led to the creation of centralised 24-hour business continuity arrangements by the Australian Taxation Office (ATO). These operate under the Commissioner's broad discretionary powers and use a standardised disaster response framework. Australia's ability to rely on broad discretionary powers avoids the need for rushed legislation, allowing a faster response to a disaster situation. It also recognises that different disasters have different impacts as the administrative framework allows the ATO to alter its responses depending on the scale and impact of the natural disaster. As such, it provides significant flexibility for responding to natural disasters, as well as having a clear framework to ensure consistency of treatment between different events.

In contrast, while the New Zealand tax authority did have discretions to allow late filing and remit penalties and interest, these were not applied under a consistent framework. New

Zealand also lacked information-sharing discretions and special rules to allow taxpayers to vary their provisional tax payments, although they considered the latter unnecessary.

In terms of emergency support, while both countries provided tax relief for charitable donations, Australia also had tax exemptions for government and employer support. Australia's rollover relief rules were more extensive, covering trading stock, depreciating assets and assets subject to CGT. In contrast, New Zealand's rollover relief provision was limited to donated livestock, buildings, aquaculture, farming, forestry improvements, and for goods not used in deriving income because they were destroyed or rendered useless. The New Zealand rules were ineffective in avoiding a tax liability as a result of a natural disaster in cases where structures were insured, as owners are taxable on insurance proceeds received, with depreciation deductions no longer available for replacement buildings.

Both countries had specific tax rules for farming businesses, including the ability to obtain early release of deposits from income spreading accounts. New Zealand also had a specific adverse event scheme which allows farmers who experience adverse events to carry income from forced livestock sales over to the next income year.

Australia had further provisions that allowed businesses who might be denied deductions as a result of becoming non-commercial operations following a disaster, to defer deductions and be granted relief from the non-commercial loss and deemed dividend anti-avoidance rules.

In both Australia and New Zealand, having a pre-existing set of tax rules avoids the need to rush through changes for each event and means that taxpayers do not need to worry about the tax consequences of a disaster. However, in both countries there were gaps and a lack of consistency in the rules as a result of these developing as ad hoc responses to earlier events, with these issues more pronounced in New Zealand. This is particularly because many of New Zealand's pre-disaster provisions were targeted at agricultural assets and businesses, whereas the earthquakes largely affected urban areas.

While Australia had established policies and procedures for responding to natural disasters, from a public finance perspective, Australia primarily employed a pay-as-you-go funding model for natural disasters. Government funding is focussed on emergency support and infrastructure replacement, with no national natural disaster insurance or funding scheme. Instead there is heavy reliance on private insurance, potentially in conflict with comparatively high levels of Australian taxes on insurance.

In contrast New Zealand had a national insurance scheme managed by the Earthquake Commission (EQC) as part of its pre-disaster tax settings. The scheme is one of the principal sources of finance for reconstruction and a key mitigation strategy. It provides coverage to the owners of privately insured residential properties for loss from natural disasters and is financed by a mandatory levy on home and contents insurance, collected by insurance companies.

Both a national insurance scheme and private insurance are methods of spreading the cost of post-event funding. An alternative or complementary strategy is to invest upfront in mitigation to reduce the costs and tax revenue required to fund future disaster responses. However, despite these benefits, the tax responses in both countries were focused on responding to rather than preparing for natural disasters. While betterment provisions are included in the NDRRA⁴ in Australia, these have not been widely accessed, due to the cost of

⁴ The Natural Disaster Relief and Recovery Arrangements (NDRRA) were established in 1974 and assist Australian state governments with the fiscal burden of large scale expenditure on disaster relief and recovery (The Australian Treasury, 2012). They operate by reimbursing states for a portion of their expenditure on

undertaking mitigation and lack of funding, a position driven by the pressure to balance state and federal budgets and political influence.

Similarly in New Zealand the importance of mitigation has been recognised, with policy makers commenting on the risk of unreinforced masonry buildings. However, while pre-disaster tax responses can include incentivising property owners to invest in mitigation, such as earthquake strengthening, since 1 April 2011, no tax deduction has generally been available in New Zealand for such expenditure. As such, there is little tax incentive to strengthen a building, unless taxpayers are able to recharacterise the expenditure as a repair.

4.1.2. Immediate response – similarities and differences in the tax responses made

Reflecting the comparative lack of pre-disaster tax settings in New Zealand, a large number of changes were made in the period immediately after the Canterbury earthquakes. Part of the immediate response was establishing government support arrangements for employees and employers, as unlike Australia's pre-existing financial assistance arrangements, New Zealand's arrangements were limited.

From a tax policy perspective, the provision of financial assistance raises the question of whether support payments should be treated as exempt income. In Australia the tax treatment of relief arrangements varies. The AGDRP⁵ is generally treated as exempt income on the basis that it is a one-off payment to help individuals who have suffered as a result of a natural disaster. In contrast, income support by way of grants and relief payments will generally be taxable. However, in respect of the Queensland floods, NDRRA emergency grants, NDRRA clean up and recovery grants and the DIRS⁶ were treated as non-taxable. Similar tax changes were made in New Zealand to support the earthquake support package, including the creation of special information-sharing powers, exempting the Job Loss Cover⁷ from income tax and excluding the Earthquake Support Subsidy (ESS)⁸ from Goods and Services Tax (GST).

The tax response to the Canterbury earthquakes also involved changes to tax and social policy regimes administered by the Inland Revenue Department (IRD), including amendments to ensure that entitlements to various social policy benefits were not affected by

eligible disaster recovery activities and measures, once particular thresholds have been exceeded (Attorney-General's Department, 2012).

⁵ The Australian Government Disaster Recovery Payment (AGDRP) is a non-means tested payment of A\$1,000 for adults and A\$400 for children who are affected by a major disaster (Productivity Commission, 2014).

⁶ The Disaster Income Recovery Subsidy (DIRS) is an income replacement payment for individuals in who lose their main source of income as a direct result of a natural disaster, including small businesses and farmers. It is an income-tested payment equivalent to the unemployment benefit or Youth Allowance benefit and was payable for a maximum period of 13 weeks from the start of the flooding in Queensland (*Social Security Legislation Amendment (Disaster Recovery Allowance) Bill 2013*).

⁷ Earthquake Job Loss Cover was a benefit of NZ\$400 net a week for those working at least 20 hours per week, and NZ\$240 net per week for anyone working less than 20 hours a week, for six weeks for employees whose employers were un-contactable or who indicated their business was closed permanently (Ministry of Social Development, 2011a).

⁸ This programme allowed employers who intended to recommence operations a grant of up to NZ\$500 per week per full time employee and NZ\$300 for part-time employees (less than 20 hours a week) for up to six weeks (Ministry of Social Development, 2011a). Eligible businesses were New Zealand owned businesses based in Christchurch that were unable to access their workplace due to damage, a cordon, or the unavailability of essential services, or a small business that could open but was experiencing significant loss of trade (Ministry of Social Development, 2011a). On 28 March 2011, the government extended the ESS for another two weeks, and then for a further six weeks under restricted criteria (Ministry of Social Development, 2011b). Subsidies were reduced gradually throughout the six weeks, and businesses had to reapply for the second ESS round (Ministry of Social Development, 2011b). This was only open to businesses whose physical operation was directly impeded and which were able to demonstrate ongoing viability (Ministry of Social Development, 2011b).

relief payments, and expanding the KiwiSaver⁹ financial hardship definition so that members could withdraw funds early. New Zealand also amended the tax system to provide tax relief for employer welfare contributions, businesses that donated stock, and lump sum redundancy payments. Such changes were not required in Australia due to pre-existing provisions. However, unlike the general disaster relief provisions in Australia for employer welfare and donated trading stock, the New Zealand changes were restricted to the Canterbury earthquakes and time limited. Similarly, the extension of the redundancy tax credit for a set period was described as special Canterbury earthquake relief.

As well as government and business support, the immediate tax response in both countries included actions to support charitable relief. In Australia, the Queensland floods were declared to be a disaster, meaning donations to new disaster relief funds qualified for tax deductions, and payments received from these charitable funds were not subject to tax. In New Zealand, while charities are not required to establish new funds for each disaster, the tax status of new charitable vehicles still needed to be determined. As a result supporting charitable relief in both countries involved significant administrative effort. Australia also made a legislative change to support charitable bodies involved in rebuilding activities. Following the experience in Queensland, they extended the common law definition of charity to cover the rebuilding of not-for-profit community assets. In New Zealand, tax policy changes to support general charitable efforts were considered but did not proceed. However, the tax system was used to incentivise business support, in the form of employer welfare support and donations of trading stock discussed above.

The final aspect of the immediate response in both countries was significant administrative tax responses in the form of provision of information, tax and payment extensions, assistance with record reconstruction and participation in cross-government relief efforts.

Provision of information

Both the ATO in Australia and IRD in New Zealand provided disaster response information, including: public announcements using a range of communication channels, including website information; an emergency information line; deployment of staff at welfare centres; free seminars and presentations about complying with tax requirements; and tax agent liaison officers to support businesses and maintain compliance behaviour.

In New Zealand, the IRD made particular use of its close relationship with the professional accounting body to provide support to their members and the wider community. In Australia, perhaps reflecting the greater population and number of tax agents, there was separate call centre support for affected people and a dedicated natural disaster line for tax agents. The ATO was also more proactive in clarifying the tax treatment around common issues such as donations, grants and capital gains taxation.

Payment and filing extensions

In Australia, tax payment and filing extensions were automatically made under the existing business continuity arrangements. State and local authorities also announced temporary relief from the payment of taxes and lodgement of returns. In New Zealand, while IRD's Emergency Response Committee was called together for the first time, there was less structure to the response. The existing law provided some discretion for dealing with natural disasters, and IRD used these powers to establish payment plans for overdue tax, remit

⁹ A voluntary, work-based savings initiative with a range of membership benefits. Employees contribute automatically from their wages and may also receive contributions from their employer and the government.

penalties, seek adjournments for tax disputes and put debt, late return letters and tax audits on hold. However, officials felt that the existing discretions were insufficient and temporary earthquake Orders were passed to provide IRD with additional powers. These included powers to remit UOMI¹⁰ until 1 October 2012, if taxpayers were physically prevented from making payments, and the discretion to grant extensions of time limits until 1 October 2012.

Assistance with record reconstruction

In the initial period following both disasters one of the key issues for businesses was access to essential accounting records. Both the ATO and IRD responded by granting leniency for businesses that could not access their accounting systems, providing assistance to help recreate records, and allowed the use of estimates when lost records could not be recreated or duplicated.

Participation in cross-government relief efforts

In both countries the tax authorities were part of cross-government relief efforts. In Australia, the tax office worked as part of a coordinated response, with ATO staff working on call centres and processing emergency claims. This was supported by common systems, strong connections to the community, clearly agreed responsibilities, and natural disaster information-sharing powers. Similarly, in New Zealand, IRD worked closely with other government departments, co-locating with MSD, and sharing information with other agencies to ensure that social assistance and other government services could continue to be delivered in a timely way. However, unlike Australia, there were no common systems or existing arrangements to allow for the sharing of information. Therefore, another special earthquake Order was passed to allow IRD to share information with other government agencies from 24 February 2011 to 31 October 2012.

4.1.3. Post-disaster recovery – similarities and differences in the tax responses made

As with the immediate response period, New Zealand made a large number of changes to support post-disaster recovery which similarly reflected the comparative lack of pre-disaster tax settings. Post-disaster recovery changes included amendments in relation to the timing and taxation of revenue amounts, the timing of capital expenditure, and tax changes to alter the capital revenue boundary,¹¹ as summarised in Table 4.

There were three approaches taken in respect of these changes. Generic changes were made to treat amounts as taxable, such as reinsurance payments and capital amounts received for damaged assets. Where changes related to deferring deductions or income in a taxpayer's favour or capping or excluding the taxation of capital amounts, amendments were time-limited and Canterbury specific. Finally, there were a limited number of generic changes to clarify when income should be recognised in line with normal accrual accounting rules or common sense as to when amounts would be known.

¹⁰ Use-of-money interest (UOMI) is levied when a taxpayer underpays or overpays their provisional tax obligations in New Zealand.

¹¹ The terms capital, revenue and the capital revenue boundary refer to a legal distinction made for income tax purposes between amounts that are taxable or deductible for tax purposes (revenue income and expenditure) and amounts that are not taxable or immediately deductible for tax purposes (capital receipts or expenditure) (OECD, 2000).

Table 4 – Canterbury earthquakes post-disaster recovery tax changes

Altering the timing/ taxation of revenue expenditure	Altering the timing of capital expenditure	Altering the capital revenue boundary
<p>An amendment so that taxable income from insurance payments for business interruption is allocated to the later of the income year to which the replaced income relates or the income year the amount can be reasonably estimated.</p> <p>A change to allow a person whose income-earning activity was interrupted by the earthquakes a tax deduction for expenditure incurred during the period of interruption when their income-earning activity resumes, as long as this is before the 2019–20 income year.</p> <p>A change to the controlled foreign company rules to match tax deductions for insurance claims and receipts from reinsurers so that any reimbursement from a reinsurer is taxable.</p>	<p>A Canterbury-specific optional timing rule that allows taxpayers to carry forward income from insurance payments and match it against the cost of repairs, at the earlier of the time these have been incurred or derived, can be reasonably estimated, or the end of the 2018/19 income year.</p> <p>An amendment so that when an asset is destroyed it is treated as being disposed of in the earliest income year in which the insurance proceeds can be reasonably estimated.</p> <p>A Canterbury-specific optional timing rule that allows the net amount of insurance payments and disposal proceeds, less the tax book value and disposal expenditure for irreparably damaged assets and assets that are uneconomic to repair, to be brought to account for tax purposes when the insurance proceeds and disposal costs have been incurred or derived, can be reasonably estimated, or at the end of the 2018/19 income year.</p> <p>An amendment to allow a depreciation deduction for the 2010–11 to the 2018–19 income years when access to a property was temporarily restricted as a result of the Canterbury earthquakes.</p> <p>A change to the thin capitalisation rules to allow Canterbury taxpayers to carry back insurance proceeds to the date an asset was impaired and treat this as an asset until the insurance is recognised for accounting purposes (up to 2018-19 income year) to avoid the denial of interest deductions.</p>	<p>Extending tax losses/deductions for capital assets:</p> <ul style="list-style-type: none"> • Allowing a deductible loss for buildings that have to be destroyed to remediate land or to allow other buildings to be demolished as a result of damage from an event beyond the owner’s control. • Allowing disposal and demolition amounts to be dealt with as part of an asset disposal. <p>Capping/excluding the taxation of capital amounts:</p> <ul style="list-style-type: none"> • Limiting depreciation recovery income that arises in the 2010–11 to 2018–19 income years to the amount of depreciation deductions previously claimed for repairable assets and assets that are uneconomic to repair as a result of the earthquakes. • Switching off provisions that would tax income from rebuilding zoning changes, and disposals of Christchurch land by dealers/developers within 10 years in response to a red zone compensation offer or compulsory acquisition. <p>Taxing capital amounts:</p> <ul style="list-style-type: none"> • Treating business interruption insurance payments for replacement property as a taxable capital contribution if they are not otherwise taxed or used to reduce the cost base of the replacement property. • A generic amendment so that insurance receipts for asset repairs are taxable no matter whether they are received before or after the related repairs. • Clarifying that if damaged property is disposed of before insurance proceeds are received, the proceeds are derived and taxable immediately before the disposal. <p>Changes to correct gaps in the depreciation rules for pooled assets.</p>

Such changes were not required in Australia following the Queensland floods. This is because timing issues for revenue expenditure had previously been addressed by earlier generic tax changes, for example, rules that allowed the deferral of deductions for non-

commercial operations. With respect to the timing or taxation of capital expenditure, Australia's comprehensive Capital Gains Tax (CGT) also meant it did not have the same need to legislate for damaged assets or to correct an unclear capital revenue boundary. However, despite its broad capital base, Australia did propose additional CGT tax reliefs following the Queensland floods to deal with post-disaster mitigation (voluntary land-swaps). However, no tax legislation was forthcoming, and in December 2013 the Australian government announced that the relief would not proceed. From a state tax perspective (an issue not faced in New Zealand), there were tax responses in connection with the land swap transactions. However, rather than a legislative exemption, state officials provided ex-gratia relief utilising an existing power to cover transfer duty.

As well as tax changes to ensure the appropriate treatment of income and expenses (primarily necessary in New Zealand due to the limited pre-existing provisions for responding to natural disasters), both countries were also forced to consider funding options for recovery. New Zealand's approach to funding shocks is to run a strong fiscal position with low Crown debt levels which allows the cost of an event to be absorbed without unduly affecting core public services or the wider economy. However, the Canterbury earthquakes had a devastating impact on New Zealand's fiscal position. To a certain extent, pressure was mitigated by New Zealand's high levels of public (EQC) and private insurance. Despite this, in the aftermath of the disaster there were calls to introduce an earthquake levy to help fund recovery. In response, officials provided advice on using time-limited disaster taxes, including an income tax levy, a payroll tax, a central government levy on ratepayers, and a special increase in the EQC levy. However, the government elected to rely on existing taxes and instead increase debt. This was combined with partial asset sales, spending cuts, and transferring costs onto local government. While increased borrowing spreads the burden of recovery over time, concerns about the level of government debt led to New Zealand's long-term sovereign rating being downgraded in early 2012.

In contrast, the Australian government, which did not have a disaster fund or insurance scheme, announced that it would impose a one-year flood levy on individuals to help fund rebuilding. Other funding was raised through the sale of assets, delaying major infrastructure projects and spending cuts (primarily carbon abatement programmes). While tax policy makers were supportive of reducing government expenditure, they raised concerns about the particular programmes that had been targeted given the links to natural disasters. Tax practitioners and academics also supported borrowing as an alternative to a short-term levy, because it smooths income, spreads risk, allocates the cost of rebuilding over time, and is perhaps a less obvious and a lower cost method of financing. In contrast, cutting spending and raising taxes worsens economic activity in the short term. Policy makers also questioned the appropriate split of costs between federal and state disaster funding, with the NDRRA arrangements criticised for being administratively complex, out-of-date, and creating an expectation of support rather than incentivising mitigation.

Finally, there is the question of tax incentives to promote recovery. In New Zealand, the normal response to natural disasters is to operate within existing tax laws and avoid tax concessions. However, following the Canterbury earthquakes, tax changes to fix timing issues and alter the capital revenue boundary were considered insufficient to incentivise recovery and thought was given to ways the tax system could be used to promote recovery. Several taxpayers advocated reducing or deferring GST, and the government contemplated reducing the company tax rate for Canterbury businesses and allowing the carry back and cashing out of losses. Another alternative was to give immediate or accelerated tax deductions for capital expenditure as an incentive to rebuild in Canterbury. While this was a

scalable option, it would still be expensive and require a range of design issues to be resolved. Therefore, on balance, officials considered that it would be preferable to provide support for reconstruction through other measures, such as optional rollover relief.¹²

Tax incentives were also considered at an individual employee level. Calls were made to exempt foreign insurance assessors working in New Zealand. However, officials were concerned about the precedent this would set for other foreign rebuild workers. Instead, the government utilised administrative measures and legislated a special discretion which allowed IRD to waive interest for any foreign workers in the first year following the earthquakes. The government also provided tax concessions for employer-provided accommodation for rebuild workers.

In contrast to the tax incentives provided in New Zealand, no such measures were proposed or enacted in Australia. This is due to: Australia's comprehensive CGT which already incorporates rollover relief provisions; the extensive range of government disaster recovery grants available for individuals and businesses which reduce pressure for tax incentives to aid recovery; and existing rules for employee accommodation which only tax these benefits where they are the employee's usual place of residence, and also exempt housing in remote areas.

4.2. How tax responses related to the strength of the existing tax policy system

The second aim of this research is to assess how tax responses to natural disasters relate to the strength of the existing tax policy system. While noting the limitations of a qualitative case study methodology, this aspect of the research has an explanatory purpose – to present data on a cause-effect relationship and explain how or why events happened (Yin, 2012). The next section therefore outlines the expected relationship between the strength of the existing tax policy framework and policy process and the types of tax responses made to natural disasters. This is then compared to the findings from the Canterbury earthquake and Queensland flood case studies with a brief examination of three possible rival explanations.

4.2.1. Predicted findings

In assessing how tax responses to natural disasters relate to the strength of the existing tax policy system, the predicted findings from this comparative case study were that jurisdictions with a stronger existing tax policy system, as measured by OECD, World Bank and other expert reviews, would have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy.

4.2.2. Comparison against empirically based patterns

Prior to the Christchurch earthquakes, the New Zealand tax system was described by the OECD, the TWG and other commentators as having one of the best and most efficient designs in the OECD, with a simple, consistent and coherent policy framework, and a structured and transparent policy process, driven by policy makers and a broad-base low rate

¹² Applying the tax depreciation rules to assets damaged by the Canterbury earthquakes could have led to taxpayers facing unexpected tax liabilities, as insurance proceeds that exceed an asset's book value are taxable (IRD, 2011c). In response, the government gave taxpayers the option to defer this income into the value of replacement assets until the 2018/19 income year (IRD, 2011a). The rollover relief is for certain classes of depreciable assets: buildings, commercial fit out, pooled assets and other property destroyed in the Canterbury earthquakes (Maples & Sawyer, 2015). In the case of buildings, rollover relief is restricted to structures rebuilt in Canterbury (IRD, 2011b).

framework.¹³ PricewaterhouseCoopers and the World Bank ranked the New Zealand tax system as 8th out of 34 OECD countries in terms of taxes borne and the burden of tax compliance. In comparison, the Australian tax system was ranked 16th out of 34 OECD countries and described as highly redistributive but complex and inefficient, having high compliance costs, an emphasis on revenue adequacy, strong political influence and lengthy delays in legislating tax changes, resulting in reliance on administrative practice.

The same characteristics that give the New Zealand tax system its relative strength can be seen in responses to the Canterbury earthquakes (as summarised in Appendix B). In respect of pre-disaster settings, New Zealand's BBLR framework and lack of support for tax incentives overrode wider considerations supporting tax deductions for seismic strengthening. Officials argued that tax incentives for strengthening should be avoided due to concerns about boundaries between types of capital expenditure, unintended distortions, the ineffective nature of relief for those outside the tax system, and the fiscal cost of subsidising a select group of taxpayers. These concerns were shared by other policy makers, who, even when sympathetic to externality arguments, felt that government support would be better provided in other ways.

In the immediate response, policy makers acknowledged the importance of an administrative response that did not give rise to negative incentives by being too lenient but minimised compliance and administration costs through convenience, certainty, and speed of reaction. Officials also initially advised that employer support should remain taxable in line with BBLR, but were eventually convinced to support a limited exemption, due to concerns over compliance and administration costs.

In the post-disaster recovery phase, the choice of responses was determined by concerns about misalignment with BBLR, inefficiency, revenue adequacy and, to a lesser extent, the need to minimise compliance and administration costs. For example, officials and practitioners did not support targeted rollover relief as it ran counter to BBLR and risk diversification, but once a decision was taken to proceed, officials stressed the need for an appropriate and convenient time for payment, quick response to provide certainty, and benefits of a relatively simple design compared to more complex alternatives. Similarly, commentary on whether or not to impose an earthquake levy was focussed on revenue adequacy and efficiency concerns, with officials also worried about the complications of extending the levy to companies and the impact on a large number of taxpayers.

In contrast, the responses to the Queensland floods were more reflective of weaknesses in the Australian tax system (as summarised in Appendix C), such as its complex and inefficient nature, high compliance costs, emphasis on revenue adequacy and strong political influence and lengthy delays in legislating tax changes:

- In respect of pre-disaster settings, Australian policy-makers commented on the inefficiency of state insurance taxes which are influenced strongly by political concerns, and argued that revenue impacts from disasters, and high administration and compliance costs associated with special disaster levies, could be avoided by establishing a natural disaster fund and investing in mitigation. Academics and practitioners commented on the political difficulty of selling such a fund, as compared to a one-off levy, and identified a number of non-tax reasons for the lack of investment in mitigation, including funding, state and federal budget processes and politics.

¹³ A broad base low rate (BBLR) approach to tax policy involves lowering tax rates and widening tax bases to avoid creating tax preferred investments or income sources in order to reduce the economic harm of raising revenue.

- In the immediate response, as a result of political pressure surrounding legislative responses, Australia relied on its strong administrative processes. In doing so, officials emphasised the need to balance the use of administrative responses against the impact of revenue collection. The government also made significant use of emergency support payments to provide fast relief. However, these were not subject to strong accountability and reporting measures. There was also inconsistent tax treatment between relief payments.
- In the post-disaster recovery phase, while the land swap reliefs were intended to reduce compliance costs and remove tax barriers to economic decisions, the poor and politically driven policy process had the opposite effect. Similarly, while revenue adequacy was a key justification for the flood levy, there was significant discussion of the non-tax policy rationale, including Australia's history of creating special levies and the political commitment to a surplus. Other policy makers also commented on the levy's high collection costs, impact on economic activity and individual decision making (as compared to other financing options, such as government debt), and the lack of transparency around the policy process and levy's administrative arrangements.

This analysis demonstrates that the empirical patterns from the Canterbury earthquake and Queensland flood case studies support the predicted findings that jurisdictions with a stronger existing tax policy system, as measured by OECD, World Bank and other expert reviews, have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy.

However, while the relative strength of the New Zealand tax system can be seen in the responses to the Canterbury earthquakes, as compared to the tax responses to the Queensland floods, several potentially negative features of the existing New Zealand tax system were also identified by the OECD, the TWG and other commentators. The New Zealand tax system places less emphasis on redistribution, as compared to Australia. Concerns have also been raised about the lack of neutrality for saving and investment decisions, and slow policy process which can be abandoned for political expediency or to protect the revenue base (although this is also a risk in other jurisdictions). In the same way that the strengths of the New Zealand system can be seen in the tax responses to the Canterbury earthquakes, so can these potential weaknesses:

- In the pre-disaster settings, the lack of a comprehensive basis for taxing capital expenditure was used as rationale for denying tax deductions for earthquake strengthening, along with concerns about revenue adequacy. The tripling of the EQC levy was a political rather than policy response, although policy makers saw the EQC scheme as part of the New Zealand's social policy, rather than tax system, helping to soften the impact of BBLR from a distributional perspective.
- In the immediate response, while officials were keen to provide an equitable administrative response, they were focussed on their role as revenue collectors, emphasising horizontal rather than vertical equity. The design of the tax exemption for employer welfare support was also driven by worries about horizontal equity and fiscal risk, rather than vertical equity. In the approach to administrative responses and employer support, policy makers highlighted drivers outside the standard tax policy principles, such as the need to respond quickly, wider government objectives and political pressure. These impacted the policy process, both in terms of evaluation and consultation.

- In the post-disaster recovery phase, the lack of neutrality for saving and investment decisions, including the absence of a comprehensive basis for taxing capital expenditure, meant New Zealand had to make a large number of responses to alter the timing and taxation of revenue and capital expenditure. In doing so, while there were some references to vertical equity, revenue adequacy led to the rejection of a number of assistance options, in preference for targeted rollover relief. New Zealand tax policy makers, who are generally united in protecting BBLR, were prepared to accept targeted rollover relief on the basis that it was a time-limited location-specific incentive. This abandonment of the standard framework was influenced by external pressures, such as political influence and broader government objectives. Similarly, while policy makers suggested that the strong New Zealand framework helped to avoid an earthquake levy, many felt that increasing taxes would have been politically difficult following recent reforms. Policy makers also criticised the abandonment of the standard policy process, suggesting this had led to the complex and confusing nature of the rollover relief, with its related compliance costs.

These empirically based patterns from the Canterbury earthquake and Queensland flood case studies suggest that countries with stronger existing tax policy systems have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy. However, any weaknesses will also be reflected in the tax responses made.

4.2.3. Rival Explanations

The credibility of explanatory case study analysis is strengthened by searching for and testing rival explanations. Substantive rivals represent alternative explanations of the observed phenomenon or results of the study. They compete with the main interpretation of the study's findings and can therefore dramatically affect the study's conclusions. When case studies include the investigation of such rivals, and if the prevailing evidence can support their rejection, the research is able to place greater confidence in the case studies original explanation and conclusions (Yin, 2012). Therefore, in order to assess how tax responses to natural disasters relate to the strength of the existing tax policy system, it is necessary to examine the wider setting in which the responses were made. For example, the risk of natural disasters, macroeconomic and microeconomic settings, and government arrangements for responding to natural disasters. These potential rival explanations are based on a combination of those identified in the literature (Howes et al., 2013; Mendelson & Carter, 2012) and influences highlighted by the policy makers interviewed.

Risk of natural disasters

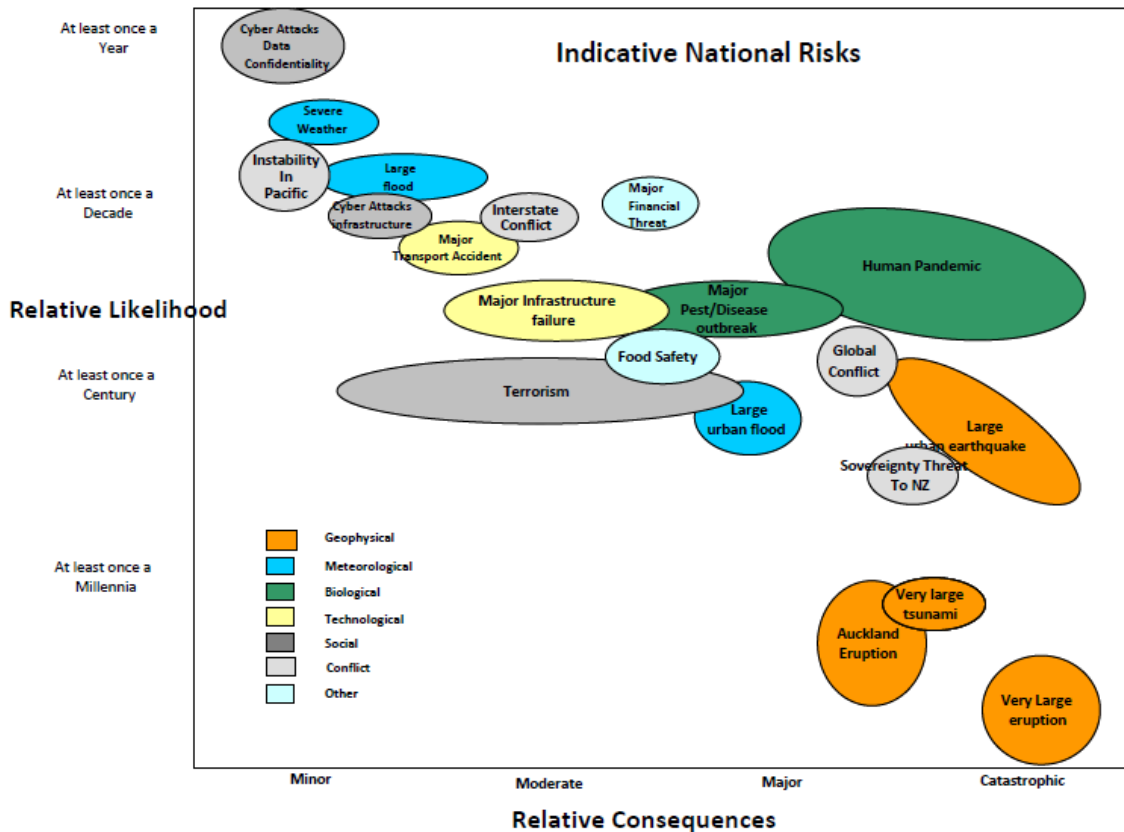
One rival explanation for a country having tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy could be differences in the risk, frequency and scale of natural disasters, with a country exposed to more risk and greater loss having tax responses which step outside the normal tax policy framework. Both Australia and New Zealand are exposed to a wide range of natural hazards. In respect of New Zealand, academics commented on the risk of geological and weather related hazards (particularly flood and earthquake risk), as well as animal and plant pests and diseases (Brookie, 2012; Hatton et al., 2012; Maples, 2012a; Miley & Read, 2013; Pawson, 2011; Wang, 2012). Similar comments were made by tax policy makers interviewed for this project. These risks and their potential impacts are summarised in Figure 1.

Australia is also exposed to frequent and large natural disasters, including storms, cyclones, floods, bushfires and earthquakes (Arklay, 2012; Bradley, 2011; Fleming, Manning, & Smith,

2015; Mendelson & Carter, 2012), and the risk is growing due to the increasing urbanisation of coastal regions (Biggs, 2012; Howes et al., 2013).

On the World Risk Index, which measures the risk of becoming a victim of a natural disaster for 171 countries, New Zealand and Australia are ranked numbers 116 (4.55 percent) and 121 (4.22 percent) respectively (Bündnis Entwicklung Hilft & United Nations University, 2016). Therefore, the level of risk is similar in both case studies and does not explain differences in the tax responses made.

Figure 1 – New Zealand’s relative national risks



(DPMC, 2011, p.22)

Perhaps frequency of events could influence tax responses to natural disasters? From 1967 to 2012, Australia experienced an average of four major natural disasters per year (Insurance Council of Australia, 2013, as cited in Deloitte, 2013). Interview participants referred to Australia’s disaster season. While perhaps slightly less frequent, New Zealand also suffers from regular natural disasters. From the period 1985 to 2007, there was an average of two natural disasters per year (Officials’ Committee for Domestic and External Security Coordination, 2007). Therefore, there does not appear to be a significant difference in the frequency of natural disasters between the two countries. As such, this factor is unlikely to have led to differences in the tax responses made, other than perhaps explaining Australia’s more extensive pre-disaster tax settings (tax discretions, centralised business continuity arrangements and more extensive pre-existing tax rules for dealing with natural disasters) and the need for New Zealand to make a greater number of changes in response to the Canterbury earthquakes.

While risk and frequency of natural disasters do not seem to explain why one country might have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy, perhaps a country which suffers from a more significant natural disaster might opt for tax responses outside the normal tax policy framework?

As shown in Table 1, the human and economic impact of the Canterbury earthquakes was greater than that for the Queensland floods. However, New Zealand's tax responses were more aligned with the standard economic principles of good tax policy, meaning scale, along with risk and frequency of natural disasters, are not possible alternative explanations.

Macroeconomic and microeconomic settings

Tax systems need to operate within fiscal constraints (TWG, 2010) and be designed for the economies in which they operate (Mirrlees, 2011). Therefore, another explanation for a country having tax responses which are more or less aligned with the standard economic principles of good tax policy could be differences in macroeconomic and microeconomic settings.

When macroeconomists study an economy they often judge its success based on three variables: the level of production in the economy and rate of growth; the unemployment rate; and the inflation rate (Blanchard, 2009).

The level of production in the economy and rate of growth

The OECD (2010) reviewed the economic situation and policies of Australia in October 2010. They concluded that the Australian economy has been one of the most resilient in the OECD during the GFC and was well-prepared to face major shocks. Australia had benefited from running large current account deficits to finance levels of investment that were high by OECD standards (Henry et al., 2010). This contributed to a strong fiscal position, which along with a resources boom, had significantly increased the terms of trade and boosted national incomes (OECD, 2010; The Australian Treasury, 2008). Australia's GDP in 2009 was A\$1,137 billion or US\$45,251 per head of population (OECD, 2010).

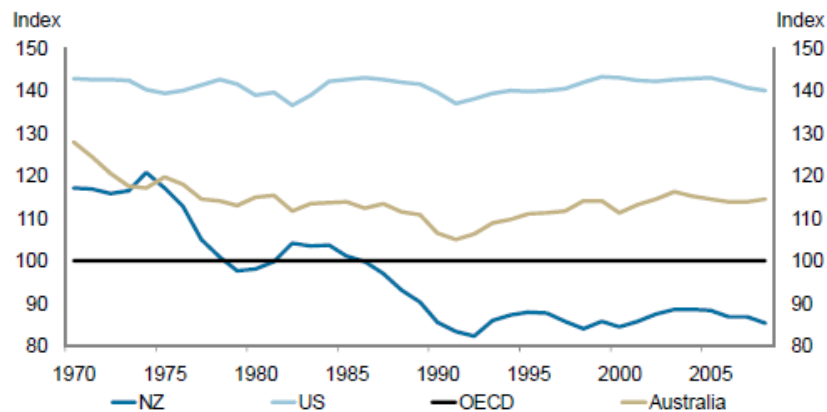
The OECD (2011) similarly commented on the strength of the New Zealand economy prior to the GFC. A string of fiscal surpluses had helped offset high levels of private-sector debt, meaning the fiscal position entering the crisis was also strong based on a low public debt-to-GDP ratio. GDP in 2010 was NZ\$194,629 million or US\$36,094 GDP per head of population. Buoyancy in Australia and Asia and large terms-of-trade gains, along with active monetary stimulus and a significant fiscal expansion resulting from structural spending increases and tax cuts supported the economy through the GFC.

The medium-term prospects in the two countries were less similar. While there were risks to Australia from further financial turmoil, a widening current account from financing investments, and inflationary pressures as business activity increased with little spare capacity in the economy, growth boosted by strong investment in the mining sector and continued immigration, together with Australia's strong fiscal position, meant prospects in Australia were generally good (OECD, 2010; The Australian Treasury, 2008). Australian policy makers did however acknowledge the risks, commenting that the Australian economy was approaching full employment (Ray, 2011), with strong excess demand driven by the government's GFC stimulus package (McKibbin, 2011). There were also potential vulnerabilities from a high current account deficit, which was likely to continue to widen due to increased investment, and the economy moving into deficit (Ray, 2011; The Australian Treasury, 2008). While the Australian government was committed to returning to surplus

(AU Practitioner 3), policy makers emphasised the need to focus on the quality rather than quantum of spending (McKibbin, 2011). Concerns were also raised about Australia’s government debt to GDP ratio (McKibbin, 2011), although this was low by world standards, with net debt estimates of A\$79.6 billion or 5.7 percent of GDP (Ray, 2011).

In New Zealand, the OECD (2011) commented that weak business investment and low national saving have for some time contributed to poor growth performance, as illustrated in Figure 2 and Table 5.

Figure 2 – GDP per capita



(OECD, as cited in 2025 Taskforce, 2009, p.22)

Table 5 – GDP percentage changes

	2008	2009	2010	2011	2012
Australia	2.1	1.2	3.3	3.6	4.0
New Zealand	-0.7	0.0	2.5	0.8	4.5

(OECD, 2010, 2011)

Unlike Australia, the expected gradual economic recovery in New Zealand was held back by private sector efforts to reduce debt as well as a strong currency. A widening current account deficit had been largely financed by foreign credit, adding to already high external debt. Therefore, households, businesses and farmers were attempting to repair over-extended balance sheets in the aftermath of a property boom which had prompted additional household spending. The structural spending increases and tax cuts which had supported the New Zealand economy through the GFC, along with automatic stabilisers, caused a shift to a substantial deficit of over five percent of GDP.

The unemployment rate

The employment position was also more favourable in Australia than in New Zealand prior to the disasters, as illustrated in Table 6.

Table 6 – Unemployment rate percentage changes (actual and projected)

	2008	2009	2010	2011	2012
Australia	4.4	1.8	2.9	2.8	2.9
New Zealand	4.2	6.2	6.5	7.0	6.3

(OECD, 2010, 2011)

The Henry Review (2010) observed that policy reforms over the past 25 years had made the Australian economy flexible and responsive to price changes. The structural flexibility of the Australian financial and labour markets, combined with appropriate monetary and fiscal policy, restored confidence rapidly when the crisis struck (OECD, 2010).

In comparison, the OECD (2011) commented that the rise in New Zealand unemployment to over seven percent resulted from a number of factors, including: immigrants boosting the labour force, firms reducing hours, a tightening of labour-market regulations (higher minimum wage and tighter dismissal rules), disincentives from a sharp expansion between 2003 and 2008 of public transfers to working-age people, and a petering out of earlier reforms that had enabled a step-up in participation rates.

The inflation rate

The inflation position was relatively similarly in both countries, although with slightly higher average rates in New Zealand, as illustrated in Table 7.

Table 7 – CPI percentage changes (actual and projected)

	2008	2009	2010	2011	2012
Australia	4.4	1.8	2.9	2.8	2.9
New Zealand	4.0	2.1	2.3	4.6	2.7

(OECD, 2010, 2011)

Monetary tightening in both countries before the onset of the crisis left significant room for loosening once the crisis hit (OECD, 2010, 2011).

In terms of microeconomic settings, both Australia and New Zealand are recognised for the flexibility of their financial and labour markets (Frances, 2004; OECD, 2010; The Australian Treasury, 2008). In 2009, the World Bank benchmarked the business regulations of 183 countries and ranked Australia 1st and New Zealand 4th in respect of the flexibility of hiring, firing and the conditions of employment in OECD countries. In terms of financial markets, the Global Competiveness Report ranked Australia 3rd and New Zealand 10th out of 139 countries in terms of financial market development (World Economic Forum, 2010).¹⁴ The slightly lower ranking in New Zealand perhaps reflects that while New Zealand's banking

¹⁴ The strength of the financial market was assessed on the ability to access capital from a sound banking and properly regulated securities market, venture capital and other financial products, that were trustworthy and transparent, with appropriate regulation.

sector is sound, efficient and well-developed, many other parts of the financial system (with the exception of the foreign exchange market) are relatively under-developed (Cameron, Chapple, Davis, Kousis, & Lewis, 2007).

For natural disasters, building and land use settings are also key (Deloitte, 2013). In Australia, the development and management of building codes is undertaken at a national level, however, building standards and land use planning are implemented and regulated at a state level, meaning different principles apply across Australia (Deloitte, 2013). While standards have undergone constant review, particularly after major natural disaster events, changes to building codes which apply to new residential buildings impact only a tiny percentage of the total housing stock (Deloitte, 2013). Also of concern is the ongoing use and development of land in areas that are continuously affected by natural disasters (Deloitte, 2013). In response, the Productivity Commission (2012, as cited by Deloitte, 2013) has recommended that state and local governments incorporate the impacts of weather volatility into land use planning decisions, to promote planning decisions that are robust across a range of climate change outcomes and are proportionate to the risks involved.

In New Zealand there are also national building and land use settings. The *Building Act 2004* governs the building industry, including construction of new buildings and alteration and demolition of existing buildings, with a building code specifying building performance standards (Hatton et al., 2012). The *Resource Management Act 1991* (RMA) governs how the environment should be managed (Brookie, 2012), and attempts to integrate all environmental costs and objectives into private resource-use decisions (OECD, 2011). However, like Australia, much is reliant on decisions at a local level. Under the *Building Act 2004* plans must be submitted to local councils and consents issued before construction commences. Additionally, the earthquake prone buildings section of the *Building Act 2004*, requires local authorities to develop a policy in consultation with their communities. In practice, this has meant commercial building owners have been allowed considerable time to consider strengthening their properties (Hatton et al., 2012). Similarly, implementation of the RMA is devolved to regions. The RMA mandates that any activity affecting the environment requires a consent which is granted by the regional or local council depending upon the type of activity and specific rules and standards for the area (Hatton et al., 2012). This has led the OECD to recommend that national standards and policy statements be established to better guide local decisions (OECD, 2011).

Like Australia, New Zealand continues to update its building and land use settings. Building codes for earthquake design have been modified frequently since 1931 (Wang, 2012). Despite this, consents for residential subdivisions were granted in Christchurch with little apparent consideration of the potential (and now established) liquefaction risks (Pawson, 2011). Recent events have also produced forces which exceed those allowed for in the existing codes of practice (Tompkins et al., 2012). In response, the New Zealand government has announced planned amendments to the RMA to give greater weight to managing the risks of natural hazards like earthquakes (Brookie, 2012; Hatton et al., 2012), and a review of the earthquake-prone building policy framework (Maples, 2012a). However, like Australia, many of these changes will only affect new buildings (Maples, 2012b; Tompkins et al., 2012; Wang, 2012).

In conclusion, a rival explanation for a country having tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy could be differences in macroeconomic and microeconomic settings, with a country exposed to greater macroeconomic challenges, or greater risk from its microeconomic policies, having tax responses which step outside the normal framework. However, New Zealand's tax responses were more aligned with the standard economic principles of good tax policy despite having

macroeconomic and microeconomic settings prior to the Canterbury earthquakes which were similar to or more negative than those in Australia. Therefore, differing macroeconomic and microeconomic settings is not a possible alternative explanation.

Disaster response arrangements

A final rival explanation to be explored is whether differences in government arrangements for responding to natural disasters could explain why tax responses in one country are more aligned with the standard economic principles of good tax policy. While funding arrangements have been incorporated into the analysis of the tax responses made to the respective natural disasters due to their close association with the principle of revenue adequacy, both countries have an array of other legislation, organisations, instruments, and coordination mechanisms designed to manage disasters, including the building and land use settings discussed above.

In Australia, the responsibility for dealing with natural disasters rests with state governments. However, due to the need to coordinate across state boundaries, there are a range of federal measures to manage natural disasters, such as:

- Emergency Management Australia, in the Attorney-General's Department, whose role is to coordinate Commonwealth assistance to states and territories in the event of a natural disaster (Winkworth, 2007, as cited in McGowan & Tiernan, 2014);
- the Australian Emergency Management Arrangements (AEMA) which were agreed between the Australian and state governments in 2007 (AEMA, 2009, as cited in McGowan & Tiernan, 2014), and whose purpose is to more clearly define government roles and responsibilities in managing natural disasters (COAG, 2004, as cited in McGowan & Tiernan, 2014); and
- the National Emergency Management Committee (now the Australian and New Zealand Emergency Management Committee) who has responsibility for coordinating development of a National Strategy for Disaster Resilience. This includes: understanding and communicating disaster risk, supporting emergency management capabilities and reducing disaster risk to communities (McGowan & Tiernan, 2014).

While the latter does fund disaster mitigation projects, the natural disaster arrangements are primarily focussed on post-disaster response and recovery.

Brookie (2012) provided a summary of the New Zealand disaster response and recovery framework prior to the Canterbury earthquakes. Like Australia, there is a high level of devolution, with local authorities and their communities leading response and recovery. While the Ministry of Civil Defence and Emergency Management is responsible for disaster response and recovery at a national level under the *Civil Defence Emergency Management Act 2002* (CDEM Act), CDEM Strategy, Plan, and Guide, both planning for and implementation of a disaster response is led at a local level through CDEM groups, which are partnerships between local authorities, fire, police, health services, government departments, and lifeline utilities. Local authorities as part of the CDEM groups are legally required to prepare for and be able to respond to disasters. New Zealand does not have a specific stand-alone organisation to manage disasters or a national body for disaster risk reduction.

While New Zealand has effective, modern and well-resourced emergency services for dealing with small-scale localised emergencies, the Ministry of Civil Defence and Emergency Management (2005) has acknowledged significant gaps and deficiencies with respect to dealing with major nationally-significant disasters. Similarly, Rotimi's 2010 critique of the

New Zealand disaster recovery arrangements highlighted the inadequacy of statutory powers to coordinate recovery. In response, due to the scale of the damage suffered from the Canterbury earthquakes, the Government appointed a Minister for Earthquake Recovery and established a special Cabinet Committee. Legislation was enacted and a new recovery commission established on 14 September 2010. After the February earthquake, further legislation was passed giving the Minister and a new agency (CERA) wide powers to manage recovery (Tompkins et al., 2012).

In conclusion, a rival explanation for a country having tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy could be differences in government arrangements for responding to natural disasters. However, comparing the two cases, disaster arrangements in both jurisdictions have a high level of devolution and are generally directed at response rather than prevention or recovery. Therefore, differing national disaster arrangements does not appear to be an alternative explanation.

5. CONCLUSIONS

Recent years have seen a series of natural disasters place significant social and fiscal strain on a number of economies. Determining the appropriate tax response to natural disasters involves multiple complex policy decisions, which often need to be made under significant time pressure with limited information. While the literature discusses the impact of natural disasters on government policy generally, there has been little focus on the links between tax policy and responses to natural disasters. The literature that does exist focuses on single disaster tax issues, the taxation implications of individual disasters, or the taxation experiences of a single country. No research has systematically compared international tax policy responses to natural disasters. As well as being limited in terms of breadth, the current literature is also not based on the views of actual policy makers involved or the full range of tax policy documents behind the actions taken, and does not consider the three phases of a natural disaster. As a result it misses the full range of tax responses made. In response to this gap in the literature, this study sought to understand more about tax policy responses to natural disasters. Specifically:

- What tax responses were made in response to the 2010/11 Canterbury earthquakes in New Zealand and the 2010/11 Queensland floods in Australia?
- How did the tax responses relate to the strength of the existing tax systems?

5.1. Key findings

The analysis showed that both countries had a range of pre-existing rules for dealing with natural disasters but there were gaps and a lack of consistency, which were more pronounced in New Zealand. In particular, Australia had much more established administrative policies and procedures for dealing with natural disasters. There were also different funding approaches, with New Zealand having a national insurance scheme and Australia employing a primarily pay-as-you-go model.

The immediate response in both countries involved significant administrative effort including actions to support charitable relief. In New Zealand there were also a large number of legislative changes which reflected the comparative lack of pre-disaster tax settings.

New Zealand also made a large number of changes to support post-disaster recovery. Such changes were not required following the Queensland floods, because timing issues for revenue expenditure and the timing or taxation of capital expenditure had previously been

addressed by earlier generic tax changes and Australia's comprehensive CGT. While both countries were forced to consider funding options for recovery, pressure was mitigated in New Zealand by high levels of public and private insurance, allowing the government to rely on existing taxes and increased debt. The Australian government, which did not have a disaster fund or insurance scheme, implemented a one-year flood levy. To promote recovery, New Zealand provided optional rollover relief. Tax incentives were also implemented at an individual employee level. In contrast, no such measures were proposed or enacted in Australia, due to Australia's comprehensive CGT which already incorporates rollover relief provisions, the extensive range of government disaster recovery grants which reduce pressure for tax incentives to aid recovery, and existing rules for employee accommodation.

After comparing and contrasting the tax responses to the Canterbury earthquakes and Queensland floods, the second aim of this research was to assess how tax responses to natural disasters relate to the strength of the existing tax policy system. The empirically-based patterns from the two case studies suggest that countries with stronger existing tax policy systems have tax responses to natural disasters which align more with the standard economic principles of good tax policy, even when they are less prepared for an event. However, any weaknesses will also be reflected in the tax responses made.

The empirically based patterns from the Canterbury earthquake and Queensland flood case studies suggest that countries with stronger existing tax policy systems have tax responses to natural disasters which are more aligned with the standard economic principles of good tax policy. Further, any weaknesses within these systems will be reflected in the tax responses made. Assessing how tax policy responses to natural disasters relate to the strength of the existing tax policy framework adds to the current policy debate and provides lessons that are relevant to modern tax policy makers.

5.2. Directions for future research

Possible future research could involve testing the conclusions from this study against tax responses to recent natural disasters in other OECD countries, for example, Hurricane Katrina in 2005 in the United States, the 2011 earthquake and tsunami in Japan and the 2015 earthquake and tsunami in Chile.

Another area for exploration is a comparison of tax responses to natural disasters in developed and developing countries, as developing countries are both more susceptible to natural disasters (The World Bank, 2010) and also differ in several important tax relevant respects to countries in the OECD, including income per capita, the relative size of the agricultural sector, the typical size of businesses, the size of the formal sector labour force and the capabilities of their tax administrations (Heady, 2002).

5.3. Summary

This study has addressed a gap in the literature with respect to the links between tax policy and responses to natural disasters. No prior research has systematically compared international tax policy responses over the three phases of a natural disaster, based on the full range of tax policy documents and views of the policy makers involved. Hopefully these findings will be useful for the development of future tax policy with respect to natural disasters, meaning that such policy can be made on less shaky ground.

Appendix A: Phases of the disaster management cycle

	Firms and individuals	Governments
Pre-disaster: Risk identification	The cost of a natural disaster can be substantially reduced if people are well informed and motivated towards a culture of prevention. This requires the collection and dissemination of information on hazards, vulnerabilities and capacities (United Nations, 2007).	Knowledge of vulnerabilities helps governments determine how much to insure and spend on mitigation (IPCC, 2012; Laframboise & Loko, 2012). As the cost of a disaster can be reduced if people are well informed, this information should also be made available to individuals (The World Bank, 2010).
Pre-disaster: Risk reduction	Individuals may choose to rely on ex post assistance, as paying for prevention is costly while receiving relief from others is free (Cavallo & Noy, 2011; Cohen & Werker, 2008; Freeman et al., 2003). Alternatively, firms and individuals could respond by moving to a safer location. Households and firms can also choose to save and accumulate reserves to cushion loss from disasters (Phaup & Kirschner, 2010). Finally, agents may choose to invest to reduce damage. From a purely economic point of view, investing in risk reduction pays off (Freeman et al., 2003; The World Bank, 2004). However, mitigation requires resources and involves an evaluation of the impacts and probabilities of a disaster occurring (Cavallo & Noy, 2011). With respect to evaluating risk, people differ, they do not always correctly perceive risk and they may not always act in their own best interests (The World Bank, 2010).	Governments can take a range of risk reduction activities: legislating for risk reduction, allocating resources to risk management, promoting community participation in risk reduction, natural resource management, protecting and strengthening critical infrastructure, promoting public-private partnerships for risk reduction activities, and land-use planning (Laframboise & Loko, 2012; The World Bank, 2010; United Nations, 2007). However, politicians and policy makers face weak incentives for adopting preventative measures (Healy & Malhotra, 2009). Diverting resources away from current services has a visible opportunity cost. Disasters are also considered to be “acts of God”, with politicians not blamed for a lack of preparation (Cavallo & Noy, 2011). In contrast, officials are held accountable and rewarded for responding quickly once a disaster occurs (Phaup & Kirschner, 2010). Even if governments want to take action, they must finance preventative measures, trading-off between the cost of ex post responses as compared to pre-disaster activities (Cohen & Werker, 2008).
Pre-disaster: Risk transfer	Insurance plays a significant role in coping with disasters by transferring risk (Freeman et al., 2003; The World Bank, 2010). However, many private households and firms are inadequately insured. This may be linked to a number of problems associated with insurance for large natural events, for example: uncertainty with regard to size of potential losses, moral hazard, adverse selection, highly correlated risk (Cavallo & Noy, 2011; Kunreuther & Pauly, 2009), and uneven protection (Freeman et al., 2003). Due to these challenges, governments may choose to mandate the purchase of insurance or offer insurance directly (Phaup & Kirschner, 2010). However, mandated insurance has higher administrative costs resulting in higher premiums (Phaup & Kirschner, 2010). Individuals also bare counterparty risk, although this may ultimately be passed back to government. Where insurance is provided directly, there can be challenges with controlling costs as there may be political pressure to lower premiums, opposition to risk-based pricing and capping coverage (Freeman et al., 2003; The World Bank, 2010).	Governments can transfer risk by taking out insurance (Freeman et al., 2003; Phaup & Kirschner, 2010; The World Bank, 2010). Insurance can be beneficial where premiums are lower than expected losses (The World Bank, 2010). Risk assessment to determine the amount of insurance and payment of premiums focuses attention on mitigation. The transfer of funds also puts money beyond the reach of politicians and officials who might otherwise divert funds. Disadvantages with insurance are that it leaves the government with counterparty risk (Phaup & Kirschner, 2010) and contracts can be expensive, with prices fluctuating every time there is a major event (Cavallo & Noy, 2011). An alternative is a catastrophe bond. However, the market for such instruments is in its infancy (Cavallo & Noy, 2011). Governments may also self-insure by establishing a general fund or annual budget allocation to provide for natural disaster expenditure (Freeman et al., 2003; Laframboise & Loko, 2012). These provide incentives to undertake mitigation activities and reinsurance to potential insurers and donors (Freeman et al., 2003). However, fully funding disaster costs may be expensive (Cavallo & Noy, 2011) and will divert resources away from other infrastructure and social spending (Laframboise & Loko, 2012). An alternative is to adopt a stable, sustainable fiscal policy, which gives governments the ability to fund responses by increasing international borrowing (Phaup & Kirschner, 2010).

	Firms and individuals	Governments
Immediate response	The response phase begins immediately after a disaster happens and includes both immediate relief and responses to re-establish systems and infrastructure (Todd & Todd, 2011). For firms and households, the focus is fast effective relief – to help those affected to recover from the immediate effects of the disaster by providing food, shelter and medical care (Freeman et al., 2003; The World Bank, 2004; Todd & Todd, 2011; Venn, 2012).	In determining how to respond, governments assess physical damage and the likely impact on economic activity (The World Bank, 2010). An assessment of the effects of the disaster is needed to guide decisions on the level of relief to provide as support is limited by the government’s fiscal situation (The World Bank, 2010). Governments also need to consider how their recovery responses impact on private incentives to prepare for disasters, as Government relief can displace the efforts of others and increase the cost of government responses (Phaup & Kirschner, 2010). Government relief in this phase often takes the form of transfers in cash or in kind. Short-term measures like income support and wage subsidies are used to help workers who have been displaced by temporary firm closures and to provide support for firms to preserve jobs (Venn, 2012). Medium-term government responses can also include public works programmes to employ displaced workers and financing for firms affected by a disaster (Venn, 2012).
Post-disaster	This phase includes recovery, rehabilitation, and reconstruction activities (Venn, 2012), and may also include developing risk reduction measures to reduce future vulnerability (IPCC, 2012; The World Bank, 2004). Medium term responses take the first steps towards recovery by assessing damage to infrastructure, communities, institutions, and business and planning restoration activities (Todd & Todd, 2011). Assessing the impact of a natural disaster on individuals and firms is likely to identify a reduction in productive capacity caused by damage to business assets and infrastructure, and damage to agriculture (The World Bank, 2004) and natural resources (Freeman et al., 2003). There is also likely to be change in demand (negative for those with reduced clients and positive for those involved in construction or outside the affected areas), banking losses, increased insurance premiums, reduced employment and decreased housing market activity, followed by property and rental increases where the loss of dwellings outstrips the loss of population (Parker & Steenkamp, 2012). These impacts on individuals and firms raise a number of issues for governments.	Private effects of a natural disaster translate into large long-lasting macroeconomic impacts (Freeman et al., 2003). Disasters impact the level of GDP, leading to a worsening fiscal position as the tax base contracts and spending needs rise (Freeman et al., 2003). They result in a weakening trade balance as the capacity to produce exports falls and reconstruction needs increase imports and divert domestic products to the home market (Laframboise & Loko, 2012). This (and foreign investors’ concerns about future earnings and tax pressures) puts downward pressure on the exchange rate (Freeman et al., 2003). Inflationary pressures arise from an excess of monetary holdings in the face of reduced incomes and wealth, monetization and exchange rate depreciation (Freeman et al., 2003). Natural disasters can also have a negative impact on the fiscal accounts and levels of public debt. Typically, tax revenues decrease as economic activity declines and emergency relief and reconstruction lead to an increase in government expenditures (Melecky & Raddatz, 2011). If governments borrow to fund the deficit, public debt ratios rise. A fall in domestic savings is also likely, leading to an increase in borrowing abroad. While these economic impacts are relatively well understood, quantifying the economic impact can be difficult as it is hard to disentangle the effects of the disaster, and timely and reliable data can be hard to obtain or interpret (Parker & Steenkamp, 2012).

Appendix B – Links between New Zealand tax system and Canterbury earthquake responses

	Highly efficient with BBLR framework	Lack of neutrality for saving and investment	Less emphasis on redistribution	Slow policy process which can be abandoned for political expediency/to protect base
Pre-disaster	Lack of support for tax incentives for seismic strengthening.	Policy makers advocating for tax relief for earthquake strengthening did so on the basis that a lack of deductions led to a lack of neutrality. Applying a BBLR framework, officials argued that the exclusion of such costs mirrored the treatment of related gains.	The EQC scheme appears inconsistent with the tax policy framework, as rather than adhering to BBLR it plays a corrective role. However, this makes sense when it is seen as part of the social policy system, helping to soften the impact of BBLR rather than align with it.	The tripling of the EQC levy appeared to be more of a political rather than policy response. Academics and practitioners were also of the view that policy decisions with respect to earthquake strengthening were being made on revenue adequacy grounds alone.
Response	Policy makers highlighted the risk of negative incentives from taking a lenient approach to lost accounting records and emergency powers, and the importance of minimising compliance and administration costs. They also argued that loss of wealth meant employer support payments were not economic income. Compliance and administration cost factors convinced officials to support a limited exemption.		While officials were keen to provide an equitable administrative response, they were focussed on their role as revenue collectors, emphasising horizontal rather than vertical equity. This meant they were keen to limit relief. Similarly, the design of the employer welfare support exemption was driven by worries about horizontal equity and fiscal risk, rather than vertical equity.	In the approach to administrative responses and employer support, policy makers highlighted drivers outside the standard tax policy principles, such as political pressure. These pressures impacted the policy process, both in terms of evaluation and consultation, with officials relying on their network of contacts and consultation after the fact instead of the GTPP.
Recovery	Officials and practitioners did not support targeted rollover relief as it ran counter to BBLR. However, once proceeding, there was a focus on minimising compliance and administration costs. Other policy makers interviewed suggested that following the standard policy process would have avoided the lack of simplicity and related compliance costs. Advice on whether or not to impose an earthquake levy was focussed on revenue adequacy and efficiency concerns, along with minimising compliance and administration costs.		In designing rollover relief, policy makers were generally focussed on horizontal equity. This was demonstrated in concerns about which assets and events rollover relief should apply to, and concerns about tax planning and inconsistencies between the relief and wider tax system. However, it appears that officials were happy to accept a lack of horizontal equity for a short time or where they thought it would only affect a limited number of taxpayers.	New Zealand tax policy makers, who are generally united in protecting BBLR, were prepared to accept targeted rollover relief, partially because it provided a shield against, or substitute for, other less palatable responses. This abandonment of the standard framework was influenced by external pressures, such as political pressure. Similarly, while policy makers saw the strong New Zealand framework as helping determine whether there should be an earthquake levy, many felt that increasing taxes would have been politically difficult following recent reforms.

Appendix C – Links between Australian tax system and Queensland flood responses

	Complex and inefficient	High compliance costs	Emphasis on revenue adequacy	Strong political influence and reliance on administrative practice
Pre-disaster	Tax policy makers commented on the inefficiency of high state insurance taxes which mean people pay more to achieve the same level of risk reduction. By encouraging under-insurance and non-insurance, insurance taxes may lead to an increase in government expenditure in the event of a disaster.		Both academics and practitioners cited evidence of the economic returns that can be expected from prevention and mitigation. However, other than the proposed land swap relief, the traditional focus in Australia continues to be on responding to rather than preparing for disasters.	A number of non-tax policy reasons were given for the lack of investment in mitigation, including politics. Academics and practitioners saw a natural disaster fund as helping to address political economy problems where governments make short-term investment decisions. However, they raised the political difficulty of being able to sell a long-term fund as compared to a one-off levy.
Response	While tax policy makers were keen to talk about how tax exemptions and administrative responses improved equity in the tax system, there was no discussion about the efficiency impacts.		Officials emphasised the need to balance administrative responses against the impact on revenue collection. However, practitioners argued that the tax system could afford to assist people without compromising revenue adequacy due to the small numbers affected. Similarly, the fiscal costs of exempting emergency support payments were accepted.	As a result of the political pressure surrounding legislative responses, Australia relied on its strong administrative tax processes for responding to the Queensland floods.
Recovery	In terms of the flood levy, tax officials managed their efficiency concerns by trading off the level of funding against the levy rate and base. However, other tax policy makers were less convinced that efficiency concerns had been addressed through the levy design. They were worried about its impact on economic activity and individual decision making, including charitable donations.	While the land swap reliefs were intended to reduce compliance costs, the poor policy process had the opposite effect. Treasury officials also felt that the flood levy was easy to administer and comply with. This was disputed by other policy makers, who were concerned about collection costs, the lack of transparency around the policy process and ongoing administrative arrangements, and the precedent effect. They felt administration and compliance costs associated with disaster levies could be avoided by establishing a natural disaster fund.	The flood levy was justified as necessary to fund reconstruction, although officials were unclear about the quantum of funding required. Other policy makers challenged whether the scale of the disaster justified a new source of government funding and criticised the short-term nature of the levy. Tax practitioners and academics raised alternative methods of post-disaster financing, such as increased borrowing, which was seen as advantageous because it smooths income, spreads risk and cost and does not directly reduce economic activity in the short term.	The non-tax policy rationale behind the flood levy was highlighted, including Australia's history of creating special levies, and the political commitment to a surplus. Similarly, while Australia was quick to announce land swap tax changes, these were cancelled three years later as part of addressing the backlog of announced but unlegislated tax measures. This legislation by press release, and subsequent back-tracking, causes considerable uncertainty for taxpayers who have already suffered the emotional and financial effects of a natural disaster.

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