



**RBA ECONOMICS COMPETITION 2011**

*The Economics of Natural Disasters*

**Best Essay from a First Year Student**

**HANS ZHU**

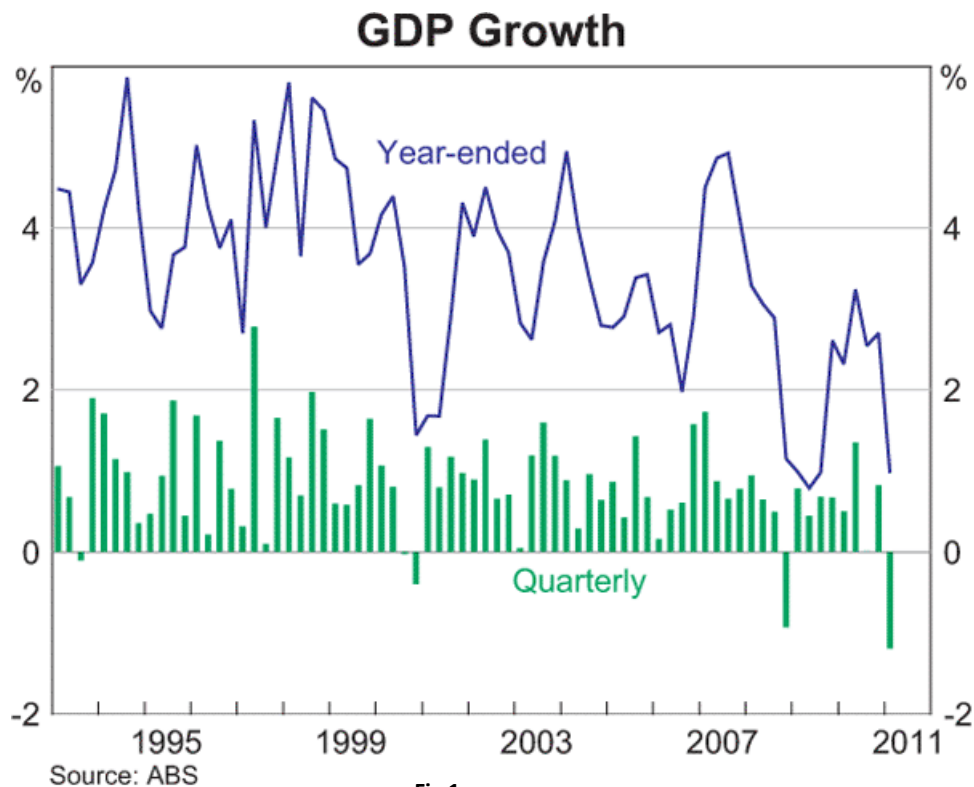
**The University of Melbourne**

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# RBA Economics Competition 2011

## The Economics of Natural Disasters

Most people tend to associate natural disasters with chaos, utter destruction and perhaps a little anarchy. In an optimistic twist, this essay's analysis will reveal that in the long-run, the effect of natural disasters can actually be quite minimal. To make this point, I examine recent Queensland flooding and the Sendai Earthquakes in Japan, and the effects they have had on Australia's economy.



### Short-Run Effects From Domestic Disasters On Economic Growth, Infrastructure & Capital Stock:

Flooding of Australia in 2011 has been particularly devastating in Queensland, with the flood hitting one of our capitals; Brisbane. Thankfully, the effect of the flooding was rather minimal on human life. However, there have been significant short-run effects on the economy, and some of them have been realised with already a contraction in economic growth for the first quarter of 2011, of 1.2% (Australian

Bureau Of Statistics (ABS), 2011) being recorded as shown by fig 1<sup>1</sup>. This should be of no surprise, considering that Queensland is one of the resource-rich states responsible for the mining boom, and also a large agriculture producer with 75% of land being managed by agricultural business (ABS,2011). As a result of the floods, many mines for coal and iron ore have been flooded, while there has also been significant damage to vital infrastructure, such as roads and railways used by mining companies and agriculture business. Similarly, many of the crops that were growing, such as sugar cane and cotton would have been destroyed leaving farmers with little, but wasted production. As a result, it would be expected that there would be a significant reduction in exports, contributing to a reduction in Aggregate Demand (AD) and thus Gross Domestic Production (GDP).

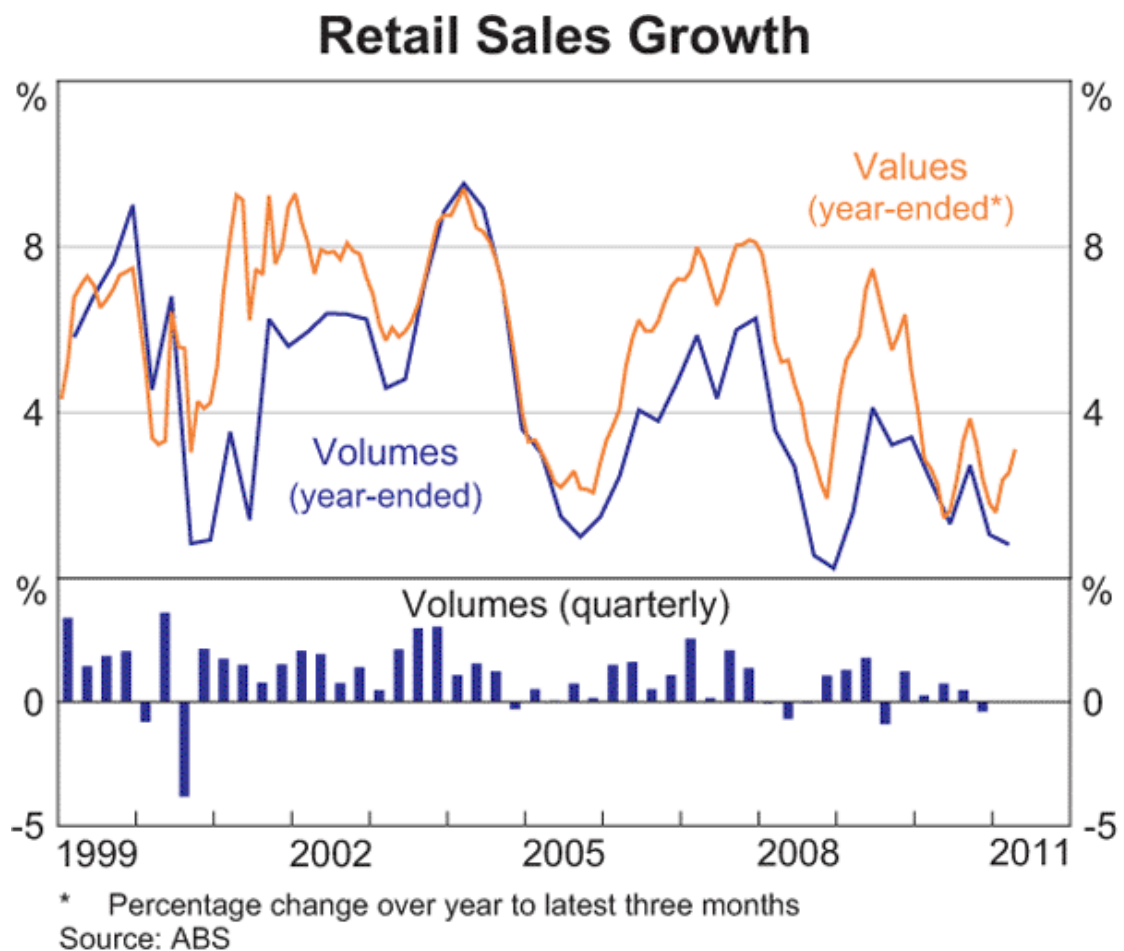
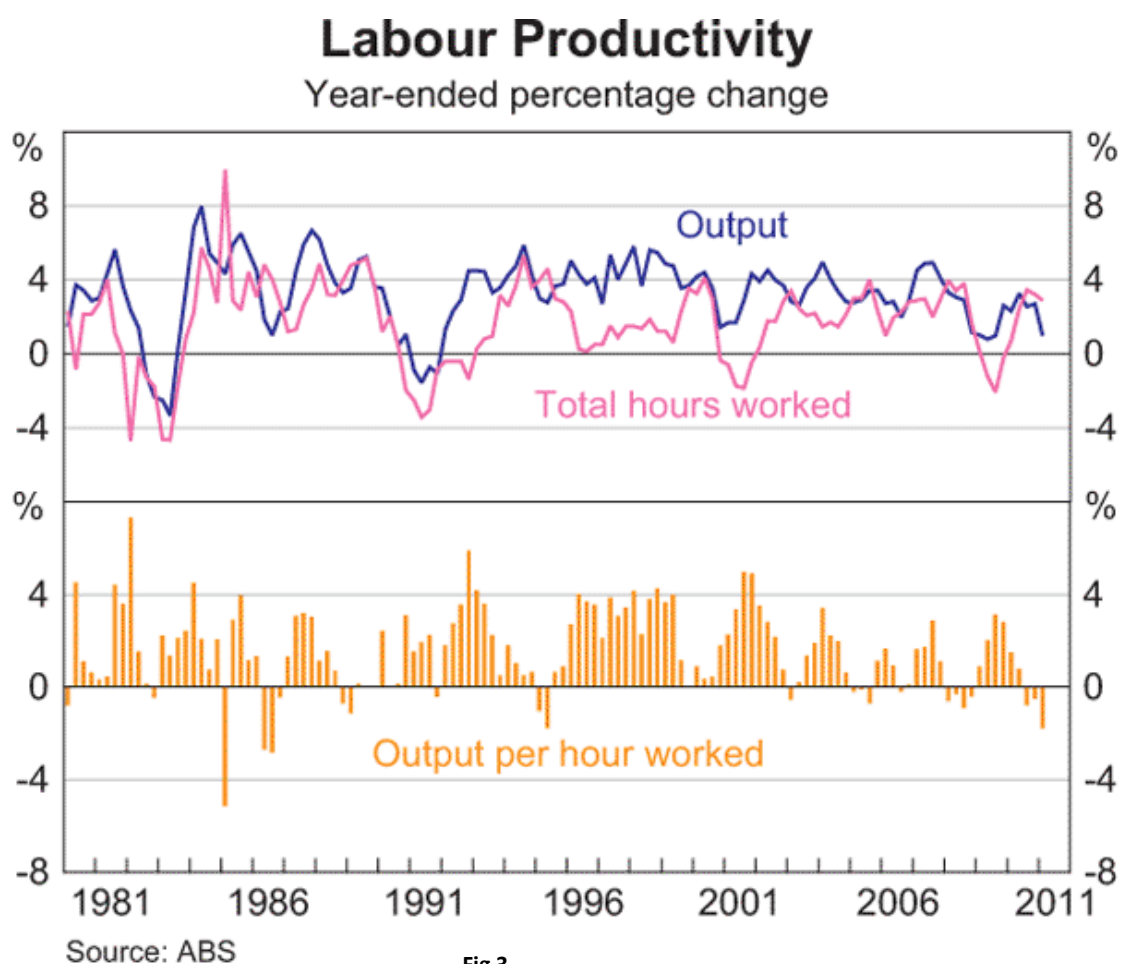


Fig 2

In addition, we should also consider the effects from private consumption on

<sup>1</sup> GDP Growth Graph from RBA June 2011 Chart Pack

economic growth. Comparatively, the effect of consumption spending should be small compared to the significant loss in exports. This is because there is a loss in retail trading days in Queensland due to the flooding, and a reduction in spending on luxuries, as households cope with the immediate challenge of the floods. This is shown by the contraction in retail growth volumes as shown by the graph in fig 2<sup>2</sup>. As the floods abate, we would expect from the replacement of some of these household goods, for a return to normal retail spending to occur, supporting private consumption spending (Reserve Bank Of Australia (RBA), 2011). Furthermore, Queensland only accounts for a smaller part of the total population unlike total exports; therefore the reduction in private consumption spending, would also be expected to be smaller than the reduction in exports.



<sup>2</sup> Retail Sales Growth Graph from RBA June 2011 Chart Pack

### Short-Run Effects From Domestic Disasters On Productivity:

Natural Disasters also tend to have a significant impact on Productivity in the short-run. As fig 3<sup>3</sup> shows, for the first quarter of 2011, there was a significant decrease in the output per hour worked or productivity. An examination of the graph shows that hours worked has not decreased significantly, but output has. Two factors may be behind this. Firstly we would expect in many cases for there to be decreased capacity or ability for workers to work, despite being hired for similar hours, for instance, if a mine is flooded then there's not much mining they can do until the water has been pumped out or evaporated. Another plausible explanation for this, is that the flooding in Queensland resulted in significant damage and loss of capital stock or infrastructure as mentioned above. Since capital stock allows workers to complete their jobs faster and more efficiently, in the short-run as workers no longer have the relevant equipment, their output per hour worked should decrease.

### Short-Run Effects From Domestic Disasters On Inflation:

	Consumer price index					
	All groups	Excluding interest and tax changes of 1999–2000	Excluding volatile items	Market prices excluding 'volatile items'		
				Goods	Services	Total
Year-ended percentage change						
Last updated:	28-Jul-11	28-Jul-11	28-Jul-11	28-Jul-11	28-Jul-11	28-Jul-11
Source	<a href="#">ABS</a>	<a href="#">RBA</a>	<a href="#">ABS</a>	<a href="#">ABS</a>	<a href="#">ABS</a>	<a href="#">ABS</a>
Mnemonic	GCPIAGYP	GCPIEITCYP	GCPIEIRVIYP	GCPIMPGYP	GCPIMPSPYP	GCPIMPTYP
Sep-2010	2.8	2.8	3.0	1.8	2.5	2.1
Dec-2010	2.7	2.7	2.5	1.5	1.7	1.6
Mar-2011	3.3	3.3	2.6	1.7	2.0	1.8
Jun-2011	3.6	3.6	2.5	1.1	2.8	1.8

Fig 4 Source: RBA, ABS

Finally we would also expect there to be significant effects on inflation in the short-run. <sup>4</sup>From the table above we can see that from the December 2010 quarter

<sup>3</sup> Labour Productivity Graph from RBA June 2011 Chart Pack

<sup>4</sup> Table copied from Reserve Bank Of Australia 'Measures Of Consumer Price Inflation – G1'

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to the June 2011 quarter, there was a significant increase in headline inflation (No exclusions) from 2.7 to 3.6, however no change in underlying inflation (excluding “volatile” groups). Volatile groups comprise of goods and services whose prices can fluctuate dramatically due to unforeseen events such as natural disasters, the classic example being fruit and vegetables. The Queensland flooding in particular, had the effect of decreasing the supply of fruit and vegetables, as it reduced the ability of Queensland suppliers to supply. Therefore from the supply and demand model, a decrease in supply (a shift to the left) results in an increase in the equilibrium price, which results in increased inflation.

### **Long-Run Effects From Domestic Disasters On Economic Growth, Infrastructure and Capital Stock:**

So far we have only considered the short-run implications of local disasters. Now we will be examining the long-run implications of local disasters. In this there is good news; it is probable that the long-run negative effects of the flooding are likely to be minimal, providing that there is a timely, well managed rebuilding process.

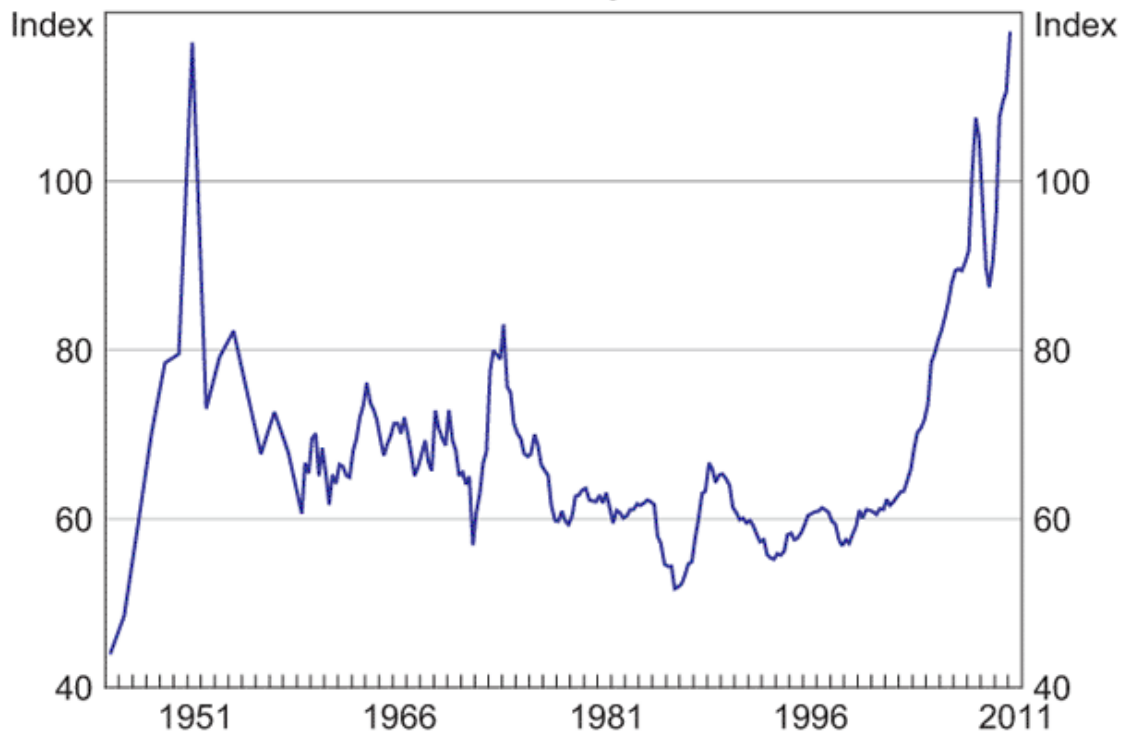
First we should consider that associated with the flooding damage there will be a rebuilding process. For households this will consist of construction of new homes to replace those that are damaged beyond repair, while some houses will need to undergo repairs. This in itself will provide a boost to private consumption and GDP in the long-run, while there will also be a lot of work for engineers and construction workers (RBA, 2011). Data on construction work done for the March quarter of 2011 shows that already there is a strong rebuilding of public infrastructure, with a 3.9% increase in engineering work done since the December quarter of 2010 (ABS, 2011). Therefore we would also expect incomes to rise, and *ceteris paribus* for there to be an increase in private consumption from rising incomes, further boosting GDP in the mid-long run.

A similar case can be made for infrastructure. Public infrastructure including roads,

water supply, waste management and airports that have been damaged or destroyed by the floods will all need to be rebuilt. Indeed the rebuilding process would be expected to be timely as the 2012 Queensland state elections are approaching, while mining companies also have vested interests in a fast rebuilding process to ensure productivity is returned to pre-flooding levels. In fact, findings by Skidmore and Toya (2002) show that for climatic disasters such as flooding, in the long-run there is a positive correlation between natural disasters and economic growth. A possible explanation is that the damage is more heavily borne by destruction of buildings and infrastructure, for climatic disasters like flooding and cyclones. Therefore such disasters provide opportunities to replace old infrastructure with new and improved infrastructure that may be superior to their predecessors in a variety of ways that improve productivity and promotes economic growth in the long-run.

### Terms of Trade\*

2008/09 average = 100



\* Annual data are used prior to 1960  
Sources: ABS; RBA

Fig 5

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In rebuilding, we should also consider the response from the private non-residential sector (ie: business). In this we should consider that Australia has a strong reputation for having abundant and profitable resources including iron ore, coal and natural gas. Our terms of trade is performing very well, with an increase of 22.4% from last year's March quarter putting the index at the highest in a long time as fig 5<sup>5</sup> shows, suggesting that export prices are high and thus profitable. In the long term we should expect that our terms of trade and commodity prices will remain high.

A key reason for this is as The Economist aptly describes it "The tyranny of distance, so long Australia's enduring curse, has been turned on its head" (The Economist, 2011, pg. 7 (special report)). Australia is poised as the closest supplier for many of these commodities to Asian countries, and therefore has a decisive advantage against other suppliers from places such as the Middle East and Brazil. Thus, it is reasonable to conclude that Australia will always have fortunes from resources, despite the somewhat weak global economic conditions seen as of late. Mining companies will be keen to repair and replace damaged or destroyed infrastructure as quickly as possible to maintain good productivity and profits. This increase in Business Investment (A component of Aggregate Demand) will result in economic growth that is at least the same in the long-run as would be without the flooding (The Economist, 2011).

#### **Long-Run Effects From Domestic Disasters On Productivity and Inflation:**

Natural disasters are a once-off event and thus their effects are limited to the short-term. Inflation similarly would not be expected to change in the long-run due to natural disasters, because it is expected that with a timely rebuilding process, productivity and infrastructure return to pre-flooding levels, therefore returning aggregate supply to pre-flooding levels.

#### **Important Effects From International Disasters:**

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<sup>5</sup> Terms Of Trade Graph from RBA June 2011 Chart Pack

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It is important to remember that Australia has not been alone in suffering from natural disasters. Most notably the Sendai Earthquake in Japan. As the earthquake struck a widespread region and severely disrupted production. Being a major trading partner, these earthquakes are likely to have effects on our economy. Firstly it is likely that there will be a negative impact on exports in the short term. As Moore (2011) suggests, many power plants (including coal-fired ones) were closed following the disaster, reducing the demand of coal exports from Japan in the short-term. In Queensland alone, state budget papers (2011) show that there could be a loss of up to 1 billion dollars in lost export revenue reducing economic growth. In the long-term, the outlook is more positive. It is likely that Japan will reduce their reliance on nuclear-power generation, in the wake of the Fukushima fiasco, and replace the shortfall with natural gas or coal plants and consequently in the long-term increase the demand for coal and natural gas exports from Japan.

From an import perspective, there are negative impacts from the Sendai earthquakes. According to Dr Shane Oliver (2011) the earthquakes affected regions where automobile and electronic-making industries were operating. Thus with direct damage to infrastructure, capital equipment and power supplies in Japan, there will be disruptions on imports to Australia of important components for manufactured goods, such as cars as well as Japanese cars themselves. As a result car sales and production has fallen, as sales of cars fell 7.6% in May from the previous month. This reduction in private consumption may tend to reduce economic growth, in the short-term (Cole, 2011).

#### **Implications For Monetary Policy:**

Finally we will consider the recent disasters and their implications on monetary and budgetary policy. So far we have seen that the RBA has left the cash rate unchanged at 4.75% for 2011, suggesting that overall the disasters have had little impact on monetary policy. While it is true that the disasters would have had the short-term impact of increasing the headline inflation rate in general, monetary policy actions

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are known to have a significant time lag associated between the implementation and realisation of effect.

Therefore the RBA board generally considers and evaluates the economy in the medium and long term rather than the short term and considers the underlying inflation rate to be more important than the headline rate with respect to the goal range of 2-3%. As the RBA notes in the February decision “the focus of monetary policy should remain on the medium-term outlook...the information available to date suggested that the medium-term prospects for the economy were largely the same as they had been prior to the floods.”(RBA, 2011) As discussed afore, the medium and long term economic prospects despite the recent disasters are strong hence, the need to apply an expansionary monetary policy was therefore unnecessary and there were no major implications on monetary policy.

**Implications For Budgetary Policy:**

On the other hand the recent disasters had major implications for budgetary policy. Budgetary policy is a more appropriate response to these random events. This is mainly because budgetary policy can be much more specific than monetary policy and choose exactly where to help and what infrastructure to rebuild, as opposed to the lowering of the cash rate which affects Australia as a whole.

Therefore it is no surprise both the federal and state governments significantly utilised budgetary policies in response to these recent events. Hence one key implication for budgetary policy is the deepening budget deficit for both the Queensland State and federal governments. In the short term we would expect major increases in budget expenses as funds are allocated towards the rebuilding and compensation efforts. For instance the federal government pledged 2 billion as a lump sum payment to the Queensland state government to aid the rebuilding of Queensland (Levy,2011). The Queensland state government on the other hand will have to contend with a damage bill estimated at 6.8 billion (Moore, 2011).

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In the medium term we should also consider that budget receipts will decrease too as businesses hit by the floods will have significantly lower profits or even losses causing less company tax receipts for the federal government. Similarly decreased royalties from coal companies and decreased stamp duty is also expected to reduce receipts for the Queensland State government.

One other major implication is that it is quite possible that resources will need to be allocated differently and spending diverted away from some areas. An example of this is the axing of a number of carbon-reduction programs such as stopping of the green car innovation funding (Levy, 2011).

Interestingly and quite optimistically our economic analysis of the effects of natural disasters, shows that contrary to the pictures of destruction and trauma we are shown from the media, natural disasters may only have minimal effects on the economy in the longer term. There may be significant infrastructure damage and loss of life with negative implications on the economy in the short term, however in the long term a well organised rebuilding process can return entire towns and suburbs to normality, while providing opportunities to build new and better infrastructure. We should be quite aware however that the damage from a natural disaster in both the short-run and long-run is highly dependent on the scale or nature of the disaster and as Noy (2011) contends, the wealth and quality of infrastructure of the economy, for instance Haiti was not nearly as fortunate as Queensland or Japan for which it is estimated that at least 250,000 people died in the devastating earthquakes (The Telegraph, 2010).

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