Disasters and economic resilience: Income effects of the Black Saturday Bushfires on disaster-hit individuals

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## About us – end users

<table>
<thead>
<tr>
<th>State</th>
<th>Department</th>
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<tr>
<td>CTH</td>
<td>Emergency Management Australia</td>
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<td>QLD</td>
<td>Queensland Reconstruction Authority</td>
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<td>Inspector General of Emergency Management QLD</td>
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<td>SA</td>
<td>Department of Environment, Water and Natural Resources</td>
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<td>VIC</td>
<td>Department of Environment, Land, Water and Planning</td>
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<td>Inspector General of Emergency Management VIC</td>
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<td>WA</td>
<td>Department of Fire and Emergency Services</td>
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Victorian Black Saturday Bushfires 2009: $7 billion loss

“The most devastating bushfires in Australia’s history”

Deloitte Access Economics, 2016
The research need?

“It would be a mistake to treat Black Saturday as a ‘one-off’ event. With populations at the rural–urban interface growing and the impact of climate change, the risks associated with bushfire are likely to increase”

Victorian Bushfire Royal Commission Report, 2009
Disaster response

“It is crucial that funding and policies acknowledge the long-term social impacts of natural disasters.”

Deloitte Access 2010

Forecast total economic costs of natural disasters, per state

Source: Deloitte Access Economics analysis
Disaster resilience

“Some characteristics are associated with an individual’s level of vulnerability before, during or after a disaster...a community which has low levels of vulnerability can be considered resilient”

DELP Report¹, 2016

“It was not just the fire event itself that affected people. Experiencing major life stressors after the bushfire impacted on ongoing mental health

Beyond Bushfires Report², 2016

VULNERABILITIES¹

- Income
- Age (young, elderly)
- Accommodation type
- Personal relationships (single parents)
- Community volunteering
- Education level
- English proficiency
- Indigenous
- Need assistance
- Car ownership

STRESSORS²

- Severity
- Type
- Response

Income
Accommodation
Personal relationships

³ Income
³ Accommodation
³ Personal relationships
1. What is the impact of the VIC Black Saturday Bushfires on individuals’ income?

2. What are the vulnerable groups that are particularly hit by the disaster?

3. How – if at all – did government monetary assistance contribute to returning individual income to its pre-disaster trajectory?
Methodology

Difference in difference modelling

- Natural Experiment Design
- Ethical, replicable and feasible
- Modest assumptions
- Works well with available data
Individual data

ABS SA2 Groupings

80 comparator groups

38 bushfire affected groups


Income attributes

- income
- employment status
- employment type
- employment sector
- working hours

Vulnerabilities

- Gender
- Age
- Marital status
- Children
- Education level
- Home ownership
- Post-disaster migration status

105,230 obs
Disaster severity measure

Victorian Bushfire Royal Commission Report 2009

**STEP 1: Disaster zone**

**STEP 2: Disaster severity**
Disaster severity measure

15%
Average share of SA2 burnt area

72%
Comparison groups

ABS SA2 GROUPINGS

80 comparator groups

37 bushfire affected groups

TOP 5 INDUSTRIES OF EMPLOYMENT (ABS, 2006)

- AGRICULTURE, FORESTRY AND FISHING: 11.5% (11.7%)
- MANUFACTURING: 12.0% (11.5%)
- RETAIL TRADE: 11.3% (10.5%)
- HEALTH CARE AND SOCIAL ASSISTANCE: 10.4% (10.4%)
- CONSTRUCTION: 9.6% (8.7%)
Findings
Individual income effects

- Migrate to unaffected SAS: 20% decrease
- Employed: 5% decrease
- Individual income: 11% decrease
- Gender: 9%
- Home owner: 8% decrease
- Low income: 8% decrease

Overall: 8% decrease
<table>
<thead>
<tr>
<th>Industry of Employment</th>
<th>2006 Rank</th>
<th>Income Change</th>
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</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>1</td>
<td>▼ 21%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2</td>
<td>▼ 7%</td>
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<tr>
<td>Retail trade</td>
<td>3</td>
<td>▼ 12%</td>
</tr>
<tr>
<td>Education and training</td>
<td>6</td>
<td>▼ 11%</td>
</tr>
<tr>
<td>Accommodation and food services</td>
<td>7</td>
<td>▼ 20%</td>
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<tr>
<td>Rental, hiring and real estate services</td>
<td>18</td>
<td>▲ 14%</td>
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**Individual income effects**
Individual income effects

MIGRATE TO UNAFFECTED SAS

MIGRATION (excl. comparator groups)
11%

INCOME LOSS
20%
HOME OWNERSHIP STATUS

Individual income effects

OWNED
OUTRIGHT
-8% w/ MORTGAGE
-9% OVERALL

-20% RENTER
Policy implications

“States are encouraged to provide same type and level of assistance to individuals who are affected by the same or similar eligible disasters.”

NDRRA Determination 2017

1. Significant negative effect on individual income (-11%)

2. Some groups are more adversely affected and may need more assistance in short term to prevent life stressors affecting longer term mental health

3. Communities’ real recovery may be masked by most severely affected individuals’ decision to migrate out

4. More questions raised than answered!
   1. Role of government assistance
   2. Decision to migrate
   3. Housing
Thank you

CENTRE OF ENERGY, THE ENVIRONMENT AND NATURAL DISASTERS

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