Flood Risk and Property Values

Sebastian Kropp

Motivation
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Flood Risk and Property Values

Source: dpa Source: EPA (Armin Weigel)

Sebastian Kropp

Climate Change

IPCC 5th Assessment Report:

- global warming
- sea level rise
- increase in extreme weather events

Source: GDV

Major natural hazards in Germany
Insurance claims in million Euros

Lothar storm 1999 900
Elbe flood 2002 1,800
Jeanette storm 2002 820
Kyrill storm 2007 2,400
Emma/Kirsten storm 2008 440
Xynthia storm 2010 500
Saxony flood 2010 300

Source: GDV

medium damage (in million €)

Return period (years)

0.5 1 5 10 50 100

0 250 500 750 1,000 1,250 1,500 2,000

Flood Risk and Property Values

Sebastian Kropp
“Location in a designated flood plain area results in lower property values”

- flooding parameters
- market situation
- “flooding amnesia”
- insurance premiums
- protective measures

**methods:**

- expert interviews, simple statistical methods, hedonic pricing, repeat sale

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**Expert Survey**

- more than 1.550 real estate valuation experts
- response rate: 32% (502)

<table>
<thead>
<tr>
<th>Location in a designated flood plain area (no flood event)</th>
<th>Consideration within the valuation process?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location in a designated flood plain area and a flood event</td>
<td>If yes, at what point?</td>
</tr>
<tr>
<td></td>
<td>If no, why?</td>
</tr>
</tbody>
</table>

**specific questions:**

- insurance premiums
- time period for recovery of property values after a flood event
- extension of marketing period
Would you consider this circumstance within the valuation process by decreasing the property value?

- **Without** flood event:
  - Yes: 65%
  - No: 35%

- **With** flood event:
  - Yes: 93%
  - No: 7%

No consideration because of...

- **Without** flood event:
  - Other: 59%
  - No market significance: 46%
  - Compensation by the positive effect of waterfront location: 8%
  - Already considered in the used comparable prices or the official standard ground values: 19%

- **With** flood event:
  - Other: 36%
  - No market significance: 14%
  - Compensation by the positive effect of waterfront location: 14%
  - Already considered in the used comparable prices or the official standard ground values: 4%
How would you consider this situation?

### Location without a flood event...

#### Top 3

1. **Discount on the land value**
   - 6-10%: 31%
   - 11-15%: 20%
   - 16-20%: 20%

2. **Increased property yield**
   - 0.1-0.25%: 24%
   - 0.25-0.5%: 41%
   - 0.5-1.0%: 20%

3. **Other approaches**
   - Mercantile decrease: 19%
   - Combination of different approaches: 49%
   - Orientation at damage removal costs: 25%

### Location with a flood event...

#### Top 3

1. **Discount on the property value in relation to...**
   - Insurance rates: 42%
   - Loss of income for the flooding and repair period: 26%
   - Damage removal costs: 25%

2. **Increased property yield**
   - 0.1-0.25%: 27%
   - 0.25-0.5%: 38%
   - 0.5-1.0%: 46%

3. **Other approaches**
   - Mercantile decrease: 19%
   - Combination of different approaches: 49%
   - Orientation at damage removal costs: 25%
Flood Risk and Property Values

**Discounts...**

*without* flood event

*with* flood event

on the land value

<table>
<thead>
<tr>
<th>Yield Range</th>
<th>1.5%</th>
<th>6-10%</th>
<th>11-15%</th>
<th>16-20%</th>
<th>more than 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>without</strong></td>
<td>9%</td>
<td>31%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>with</strong></td>
<td></td>
<td></td>
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on the property value

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<th>more than 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>without</strong></td>
<td>22%</td>
<td>32%</td>
<td>14%</td>
<td>22%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>with</strong></td>
<td></td>
<td></td>
<td></td>
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**Increased property yield...**

*without* flood event

*with* flood event

<table>
<thead>
<tr>
<th>Yield Range</th>
<th>0.1-0.25%</th>
<th>0.25-0.5%</th>
<th>0.5-1.0%</th>
<th>more than 1.0%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>without</strong></td>
<td>24%</td>
<td>41%</td>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>with</strong></td>
<td>7%</td>
<td>19%</td>
<td>49%</td>
<td>25%</td>
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⇒ „a variation of 0.5% in the property yield results in a change of around 10% in the capitalized income value“

*without* flood event: discount between 5-10%

*with* flood event: discount between 10-20%
Do higher insurance premiums result in lower property values?

- Yes: 43%
- No: 57%

Specific question...

How long does it take until property values have recovered after a flood event?

- No effect: 6%
- 1-2 months: 1%
- 3-6 months: 2%
- 7-12 months: 4%
- 1-2 years: 14%
- 3-10 years: 39%
- Longer than 10 years: 17%
- Never: 18%
**Specific question...**

How long can a flood event extend the marketing period of a property?

- **no extension**: 4%
- **up to 1 month**: <1%
- **up to 2.6 months**: 14%
- **longer than 6 months**: 81%

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**Summary...**

- flood risk has to be considered
- different options for a consideration
  - **without** flood event: **6-10%**
  - **with** flood event: **>20%**
- methods to determine the discount rate:
  - additional costs for flood protection measures
  - capitalization of the loss of income
  - damage removal costs
  - capitalization of additional insurance premium costs
  - consideration of the individual case
Flood Risk and Property Values

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