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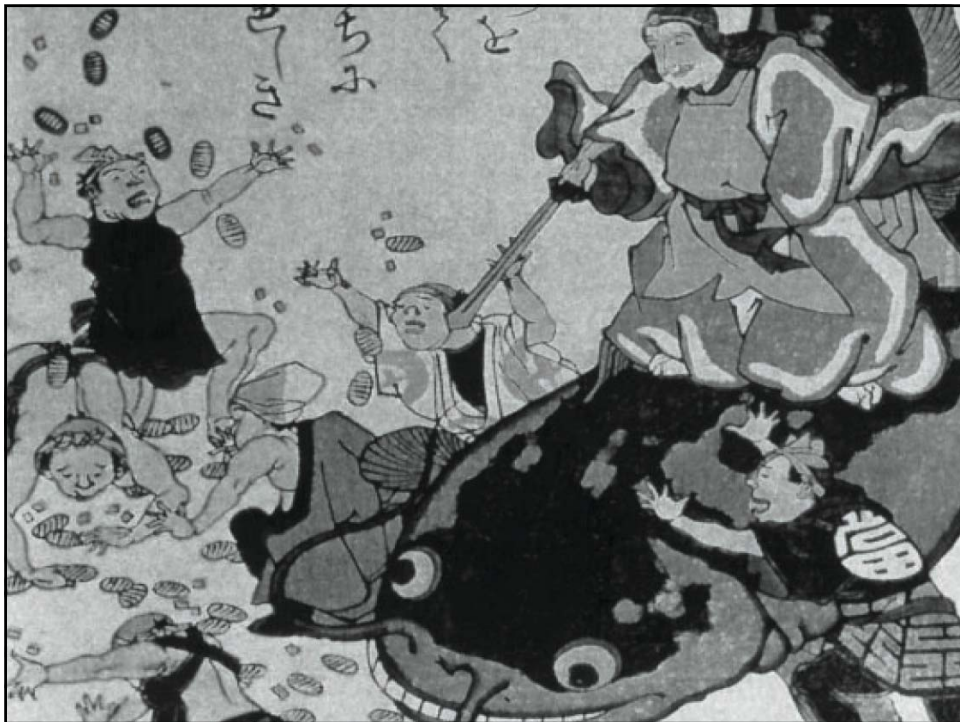
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# On the Macroeconomics of Natural Disasters

Oliver Zenklusen



The economics of natural disasters

## Overview

- 1 The controversy on disaster economics
- 2 An empirical reply
- 3 Explanations  
for the macroeconomic invisibility of disasters
- 4 Disaster risk and the poor
- 5 Conclusions

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## About the speaker

**Academia**

- MSc ETH: Environmental Sciences
- PhD HSG: Economics

**Work**

- Engineering: brownfield recycling
- Consultancy: Management of environmental and socio-political risk. Banks, World Bank, public sector, multilateral institutions.
- Lecturer at the ETH Zürich: environmental and development economics, theory of risk
- The Fair Trade Insurance Project

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# 1 Controversy

## Views on disaster economics

*"... disasters ... can wipe out years of development in a matter of hours ..." and they "... are a major threat to the global economy and to society."*

IFRC, World Disasters Report (2002)

natural disasters have *"... larger systemic impacts ... on regional or national economies ... disruptions can spread through economic networks ..."*

Pelling et al. (2002)

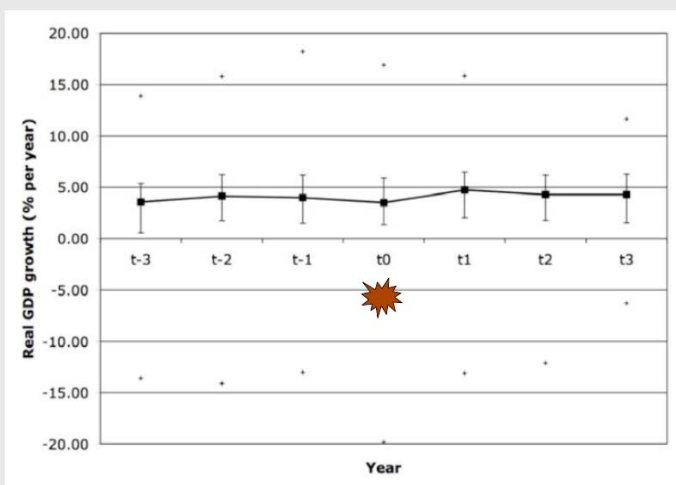
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→ What do the data say?

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# 2 An empirical reply

## GDP and the average disaster



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## 2 Empirical reply Growth effects

Studied: 110 large natural disasters 1950-2005

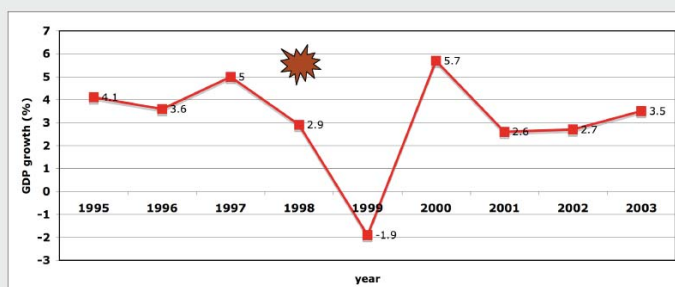
- Largest insured losses, largest total losses, largest losses of life
- 36 geophysical events, 58 storms/floods, 12 droughts, 4 others

Results: effect of disasters on GDP growth  
percentage points, disaster year compared to 3y pre-disaster average

All events, all countries (110)	- 0.12
Developing countries (DC; 101)	- 0.23
DC (excluding droughts, 90)	- 0.03
DC (geophysical, 32)	+ 0.57
DC (storms, floods, 58)	- 0.38

## 2 Empirical Reply Hurricane Mitch: an exception?

- Honduras: small developing country, huge shock to the capital stock (- 18%).
- *"... will have a long-lasting impact on the economy."* Mechler (2003)



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## 2 Empirical reply

### Summary

- Qualitatively: drop of GDP growth in the disaster year, subsequent increase (as expected)
- Droughts, floods and storms seem to have greater macro effects than other trigger events
- Effects small and **statistically not significant**: disasters invisible in the noise of economic data  
Not even at a 90% level of significance
- Note: some studies find significant macro effects of hurricanes in Caribbean islands
- **Growth effects of disasters are an exception rather than the rule**

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## 3 Explanations

### Localisation

**Localisation hypothesis:** most natural disasters are geographically or economically localised  
Macro effects decrease with country size and level of development.  
Unaffected regions and sectors compensate for lost production  
Albala-Bertrand (2006)

	<b>Economically localised</b>	<b>Economically widespread</b>
<b>Geographically localised</b>	Most disasters	Some disasters (if capital city or key industry is affected)
<b>Geographically widespread</b>	Some disasters in diversified economies (droughts, floods and storms)	Disasters in undiversified agricultural economies or in small islands

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### 3 Explanations

#### Resilience of economies

- **Production factors:** human capital contributes more to GDP than physical capital, substitution of capital by labour, underemployment, idle production capacity
- **Intertemporal reallocation:** domestic and foreign savings/credit, insurance, consumption/investment, (government intervention, foreign aid/emergency loans)

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### 3 Explanations

#### Reconstruction

- **Compensatory effects of reconstruction** replacement of lost capital increases GDP (but loss of capital does not directly decrease it). Important in case of earthquakes
- **Modernisation surge:** reconstruction using capital goods of the latest technology

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## 4 Disasters and the poor one more explanation

### Disaster risk is a matter of poverty

- Risk exposure correlates inversely with income  
Disastrous economic effects at the micro/meso level; small in absolute terms and if aggregated, invisible at the macro level

### Poor means informal means invisible

- In developing countries: large **informal sectors**  
economic data and data on the impact of disasters may simply be unavailable. Or they may not be considered in aggregate data
- The informal sector in figures (De Soto, 2000)
  - 50% - 75% of employment
  - 20% - 65% of GDP
  - 40% - 85% of property

## 5 Conclusion

***"... disasters are primarily a problem of development, they are not necessarily a problem for development."***

Albala-Bertrand (1993) - see also Strömberg (2007)

"Natural disasters as macroeconomic disasters":  
a **myth** rather than a sound basis for mitigation strategies.

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## 5 Conclusions

- **Even if invisible - natural disasters remain economically highly relevant:**
  - For small, poor, non-diversified economies
  - For the poor in developing countries
- **Measuring economic impacts of disasters is not straightforward:** diversity of methodologies, lack of data, risk of misinterpretation.
- **Focus on the most exposed** (ex ante) and the most affected (ex post) individuals, companies, sectors, regions.

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## 5 Conclusion

### Caveat and outlook

**Disaster risk in the future:** How robust are conclusions based on historical records?

**Trends that may fundamentally change disaster risk patterns:**

- economic growth and development
- population growth
- globalised and specialised supply chains
- urbanisation, megacities
- climate change

**Political economy of risk?**

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## Further reading

- Albala-Bertrand (1993): Book, paper
- Auffret (2003): working papers, World Bank
- Benson and Clay (2004)\*: World Bank Report
- Cochrane (various years)
- Hoogeveen (2000): World Bank report chapter
- Horwich (2000)\*: Paper
- Winchester (various years): Disaster Biographies
- Strömberg (2007)\*: Paper in JEP 21/3

Sources of the above publications (and a survey of disaster literature) are given in Zenklusen (2007): Natural disasters and economic development. Available as pdf: [www.unisg.ch/edis](http://www.unisg.ch/edis)