

The 9th IIASA-DPRI FORUM on Integrated Disaster Risk Management
Special Session: Economics of DRM and Climate Change: New Insights

Disasters and Debt: The Role of the Financial Position in Explaining Longer Term Impacts

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Contents

- Backgrounds
- Research questions
- Methodologies and data
- Results and discussion

Motivation:

Disasters lead to Positive Impacts ?



Reconstruction activity increases GDP

->Disasters are good to economic development ?

True?

There is ongoing debate..

e.g. Skidmore and Toya(2002), Creasma et al(2008)

Research questions

- Focusing only on GDP is enough ?
- WHEHE disaster gives longer-run impact to the economy?
- Development situation in the countries affects the longer-run impacts? How?
- How reduce longer-run impact? Ex-ante/ex-post financing measure?

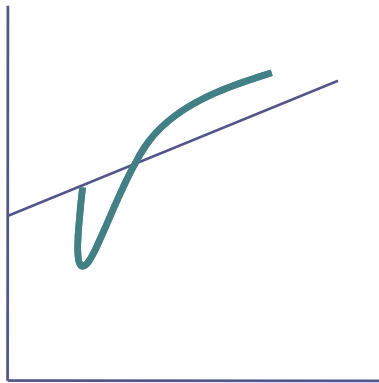
Hypothesis:

Longer-run negative impact:

Increase in external debt

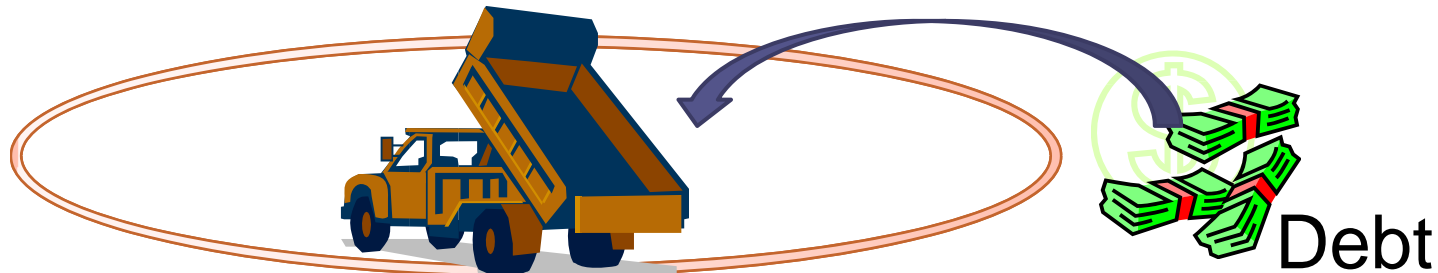
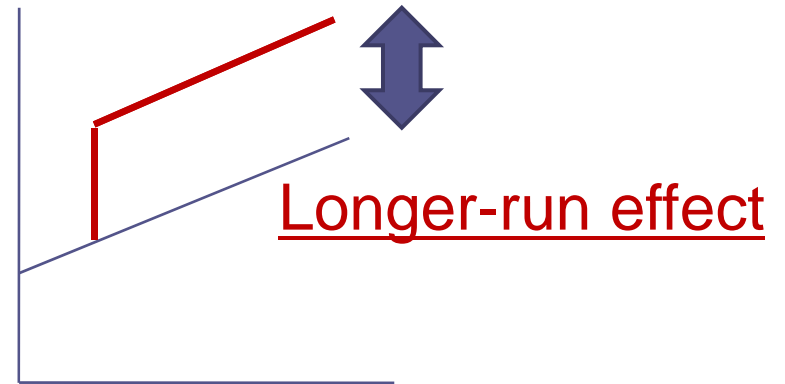
Flow

GDP



Stock

External debt



Methodology and data

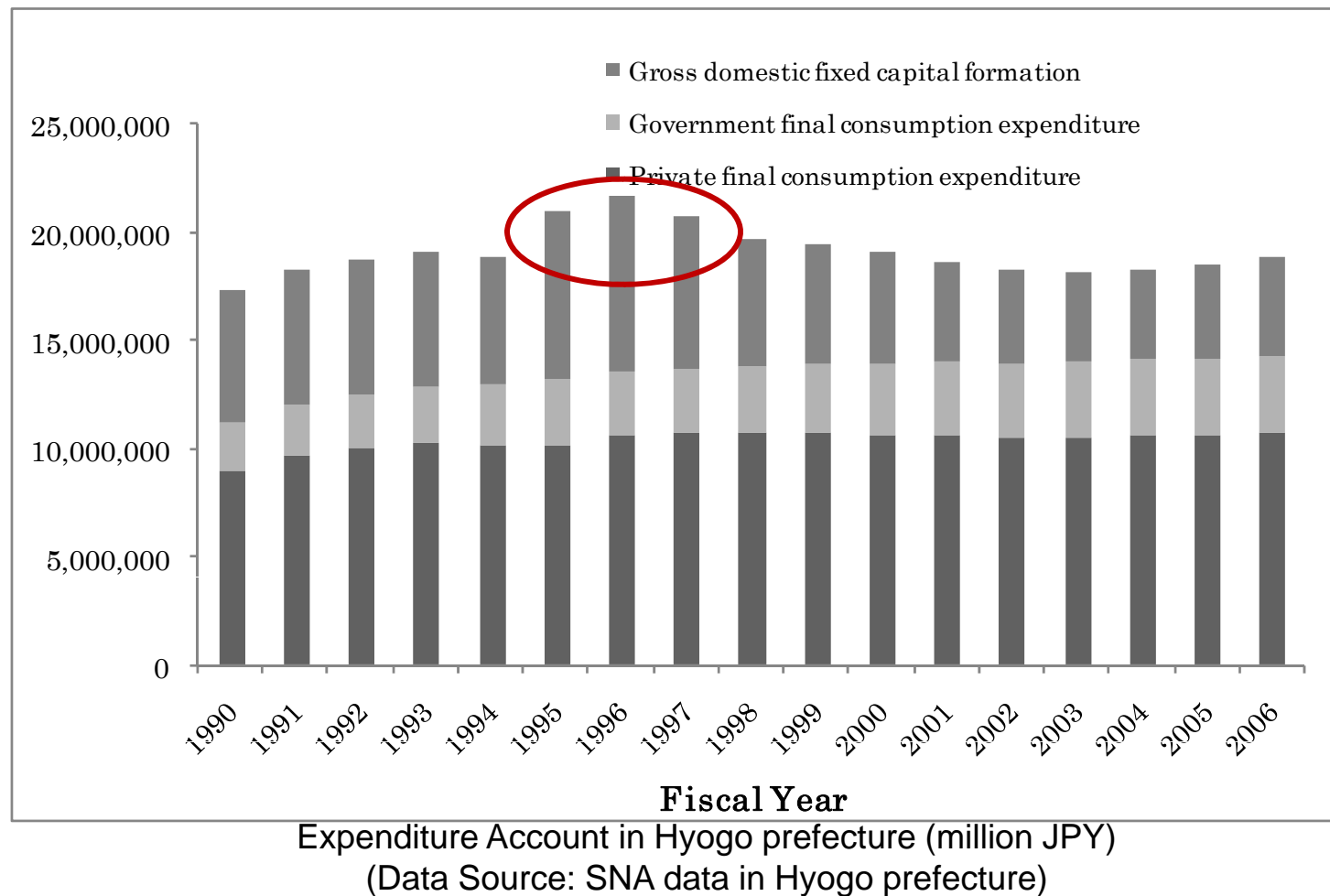
- Case Studies – Regional / Country level
- Regression analysis – Country level-
 - Data
 - Economic variable: World Development Indicator(WDI), World bank
 - Disaster losses: EM-DAT(CRED)etc



Case Study – Regional level- Kobe EQ 1995

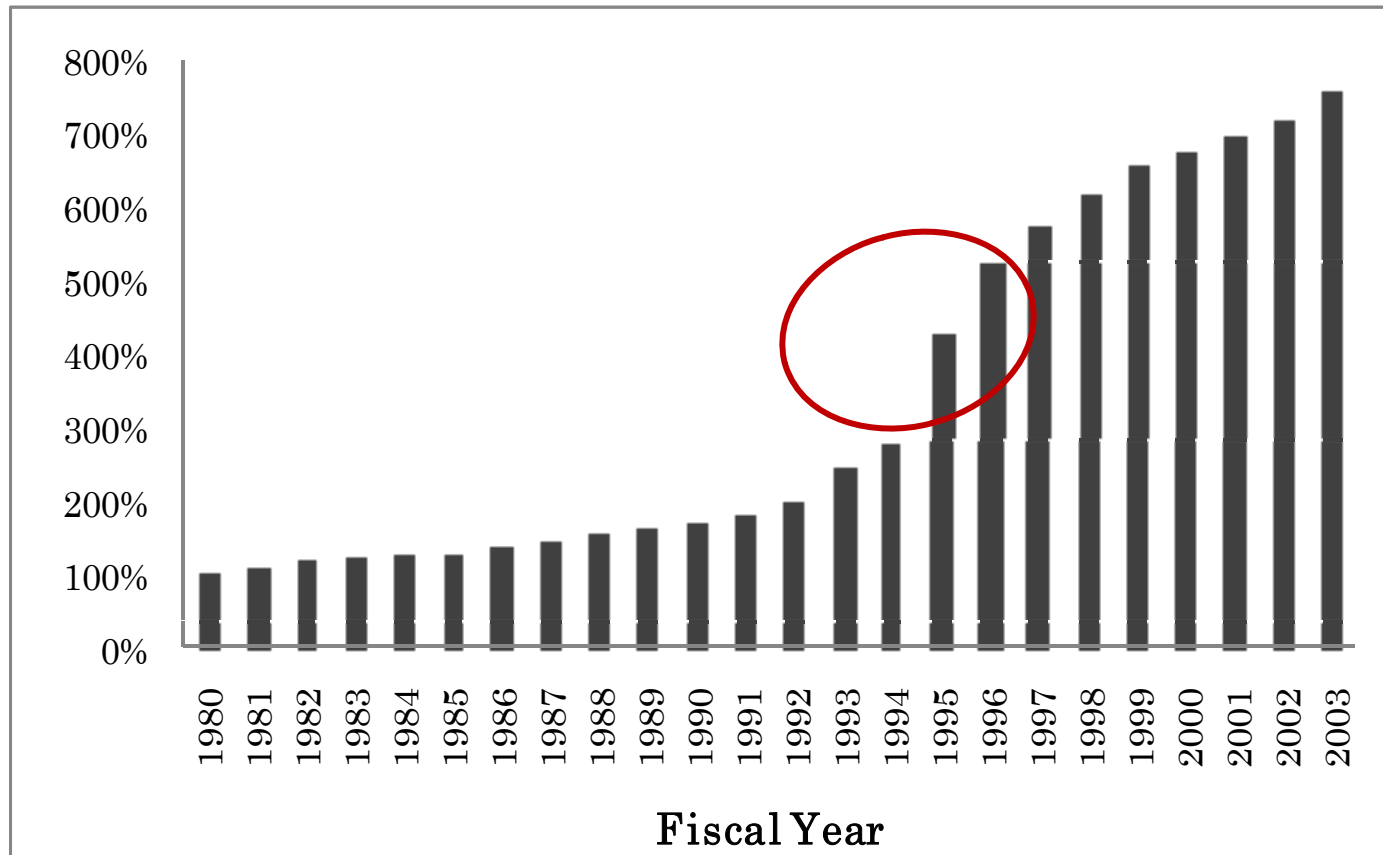
GDP in Hyogo Prefecture

Increase, as investment



Public debt : Hyogo Prefecture

Increase



Amount of the public debt of Hyogo prefecture: ratio to FY 1980
(Data Source: Hyogo prefecture)

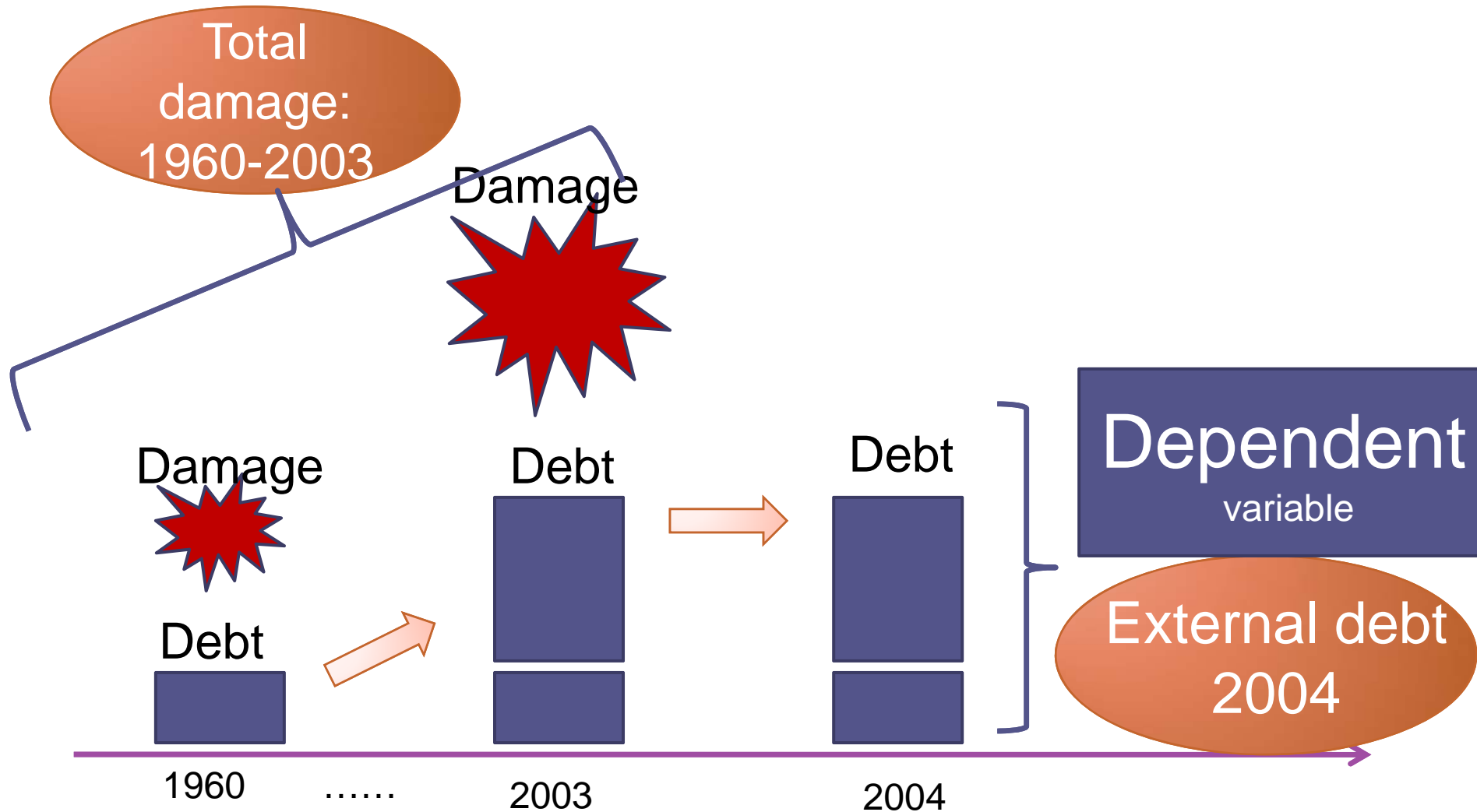


Regression Analysis

-Country level-

Independent
variable

Regression Model



Total Damage affects in the longer-run significantly

Independent Variables	Dependent Variables <i>ln(External Debt)</i>		
	LI group (N=46)	MI group (N=67)	HI group (N=28)
<i>Constant</i>	19.932*** (26.015)	15.194*** (13.171)	18.904*** (12.511)
<i>ln(Total Damage)</i>	0.166** (2.673)	0.555*** (6.597)	0.520*** (5.100)
R-Square:	0.140	0.401	0.620

Significance of Total damage



Findings (1)

- Regardless of the development situation,
larger observed disaster losses in the past
II
more external debt in the longer-run.



Still problems...

- Other variables should be incorporated
 - Assuming that the effect of variable in the past is the same as recent one
 - Possibility of correlation in adverse direction
 - Quality of data
 - etc..
-
- But want to start to discuss...



Discussion (1)

- Focus not only on GDP but also **external debt** in understanding the longer-run economic impact.

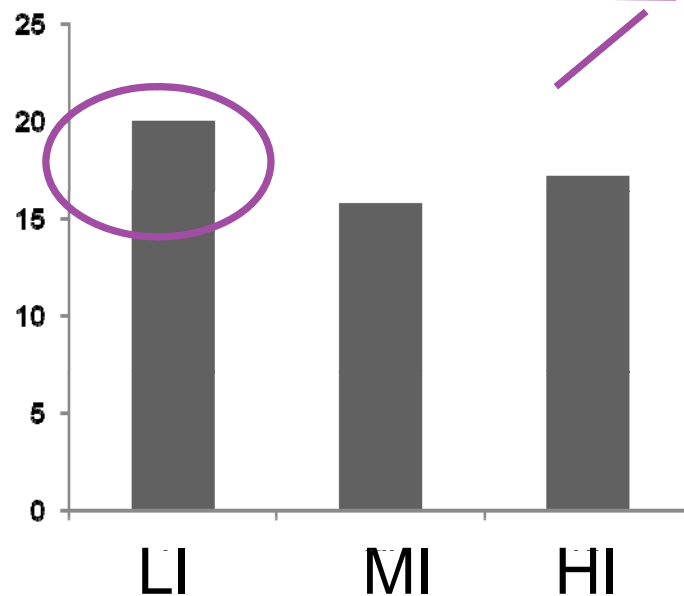
Research questions

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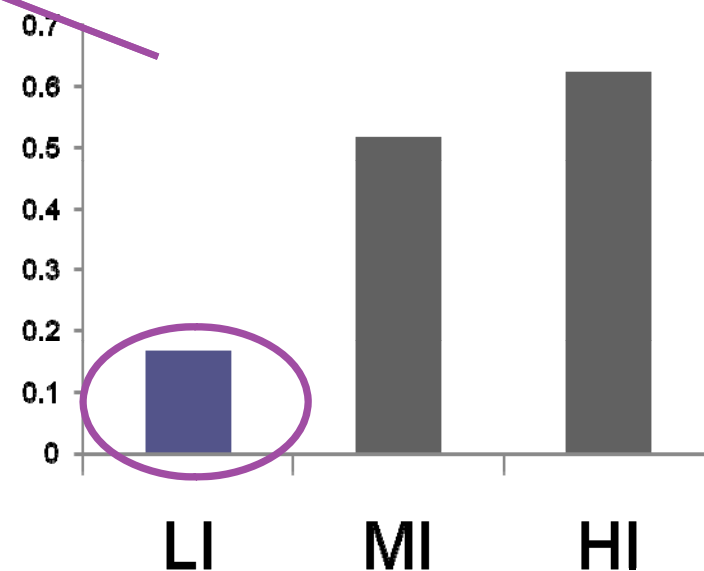
Findings (2)

Development situation affects

$$\ln(\text{External Debt}_i) = \alpha + \beta \ln(\text{Total Damage}_i) + \varepsilon_i$$



Constant (average)



Partial effect of disaster

- LI countries: higher levels of external debt on average
- relatively not affected as much by disasters.

Discussion (2)

Low Income countries

Role of Aid? etc?

Role of Borrowing

Borrowing constraint? (e.g Honduras case)

Summary

- Focusing only on GDP is enough ?
- **Not enough**
- WHEHE disaster gives longer-run impact to the economy?
- **External debt**
- Development situation in the countries affects the longer-run impacts? How?
- **Yes. External debt in LI countries relatively not affected by disaster.**



Future Research

- “How disaster impacts can be measured including change in stock side?”
 - Tatano et al(2000, 2006);
- ->in terms of welfare,
 - Tatano and Nakano(2008)



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Thank you for your attention!

