

Introduction

Background:

- Natural hazard-induced disasters cause human and economic losses, which may in turn **affect economic growth** of countries and regions.
- the relationship between different disasters and output growth in a single country have rarely been discussed.

Key question:

- Whether there is a significant impact on macroeconomy in China;
- Whether such impact differ by disaster-type in 3 region of China.

Methods

Indexing provinces by i and years by t , main estimation equation:

$$GDPG_{i,t} = \alpha_i^1 + \alpha_t^2 + \beta GDPG_{i,t-1} + \gamma Meteor_{i,t} + \chi Meteor_{i,t-1} + \gamma' Eq_{i,t} + \chi' Eq_{i,t-1} + \phi X_{i,t-1} + \varepsilon_{i,t}$$

$GDPG$: GDP growth
 $Meteor$: Direct economic loss from meteorological disasters (% of last year's GDP)
 Eq : Direct economic loss from earthquake disasters (% of last year's GDP)
 α_i^1 : Province fixed effect α_t^2 : Time fixed effect X : Control variables $\varepsilon_{i,t}$: Error term

Intraregional comparison:

Base group

- Eastern Region:**
Shanghai (areas relatively least damaged by meteorological disasters)
- Central Region:**
Henan (areas relatively least damaged by meteorological disasters)
- Western Region:**
Guangxi, Guizhou, Shaanxi, and Ningxia (rare earthquakes in these areas)



Results (1)

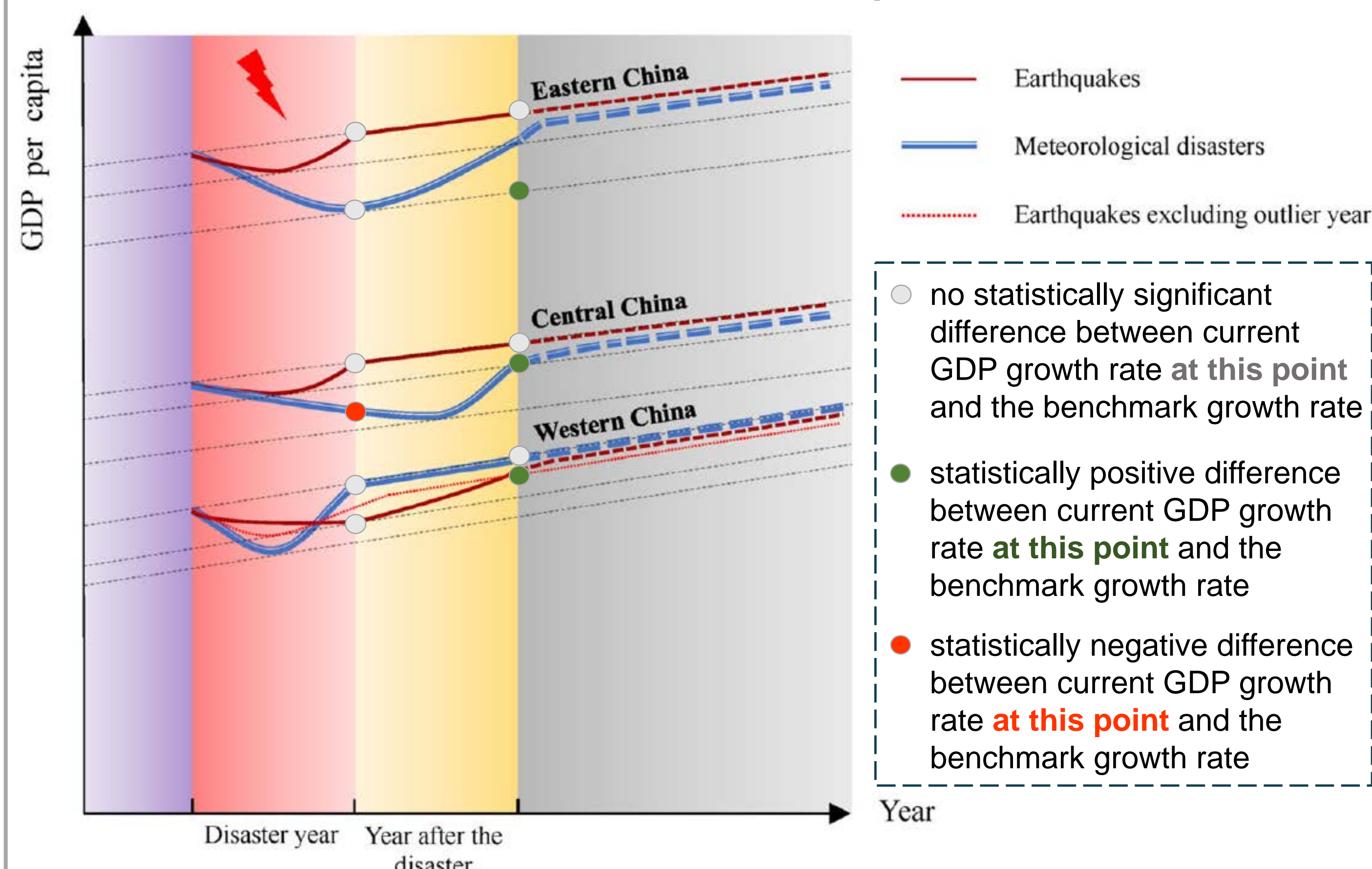
Main result: the short-term effect of disaster on growth by disaster-type

	Dependent Variable: GDP Growth		
	(1) Western Region (1a)	(2) Central Region (2a)	(3) Eastern Region (3a)
Growth Lag	0.285*** (0.006)	0.393*** (0.007)	0.507*** (0.000)
$Meteor$	-0.0283 (0.855)	-0.196** (0.011)	-0.109 (0.457)
$Meteor$ Lag	-0.106 (0.271)	0.186** (0.025)	0.207** (0.027)
Eq	-0.00841 (0.797)	0.643 (0.715)	6.810 (0.503)
Eq Lag	0.0421** (0.018)	-0.779 (0.436)	-16.73 (0.135)

— The growth in central and eastern China are related to meteorological disasters, whereas in western China, the impact of earthquakes is statistically significant.

Discussion (1)

Scenarios of main result: a schematic representation



Results (2)

Intraregional comparison: coefficients show the difference of each province relative to base group

Dependent Variable: GDP Growth	Dependent Variable: GDP Growth	Dependent Variable: GDP Growth
(1) Western Region	(2) Central Region	(3) Eastern Region
<i>Beijing</i> -3.116 (0.141)	<i>Anhui</i> -0.639** (0.033)	<i>Chongqing</i> -3.645** (0.014)
<i>Beijing</i> Lag -1.697 (0.647)	<i>Anhui</i> Lag -0.615** (0.042)	<i>Chongqing</i> Lag -0.0394 (0.966)
<i>Fujian</i> 0.149 (0.952)	<i>Heilongjiang</i> -0.661** (0.049)	<i>Gansu</i> -0.823* (0.099)
<i>Fujian</i> Lag -2.813 (0.403)	<i>Heilongjiang</i> Lag -1.070** (0.011)	<i>Gansu</i> Lag -0.403 (0.292)
<i>Guangdong</i> -1.198 (0.588)	<i>Hubei</i> -0.537* (0.089)	<i>Qinghai</i> -0.416 (0.430)
<i>Guangdong</i> Lag -2.162 (0.477)	<i>Hubei</i> Lag -0.895** (0.015)	<i>Qinghai</i> Lag -0.445 (0.336)
<i>Hainan</i> -0.127 (0.954)	<i>Hunan</i> -0.411 (0.219)	<i>Sichuan</i> -0.688 (0.210)
<i>Hainan</i> Lag -1.991 (0.517)	<i>Hunan</i> Lag -0.771** (0.038)	<i>Sichuan</i> Lag -0.361 (0.397)
<i>Hebei</i> -1.575 (0.497)	<i>Jiangxi</i> -0.464 (0.126)	<i>Xinjiang</i> 1.183 (0.411)
<i>Hebei</i> Lag -1.694 (0.628)	<i>Jiangxi</i> Lag -0.727** (0.030)	<i>Xinjiang</i> Lag -3.562*** (0.007)
<i>Jiangsu</i> -0.696 (0.746)	<i>Jilin</i> -0.609 (0.109)	<i>Tibet</i> -0.411 (0.427)
<i>Jiangsu</i> Lag -1.885 (0.506)	<i>Jilin</i> Lag -0.786** (0.047)	<i>Tibet</i> Lag -0.226 (0.666)
<i>Liaoning</i> -0.511 (0.806)	<i>Inner Mongolia</i> -0.437 (0.112)	<i>Yunnan</i> 0.369 (0.612)
<i>Liaoning</i> Lag -1.727 (0.564)	<i>Inner Mongolia</i> Lag -0.659** (0.049)	<i>Yunnan</i> Lag 0.0305 (0.951)

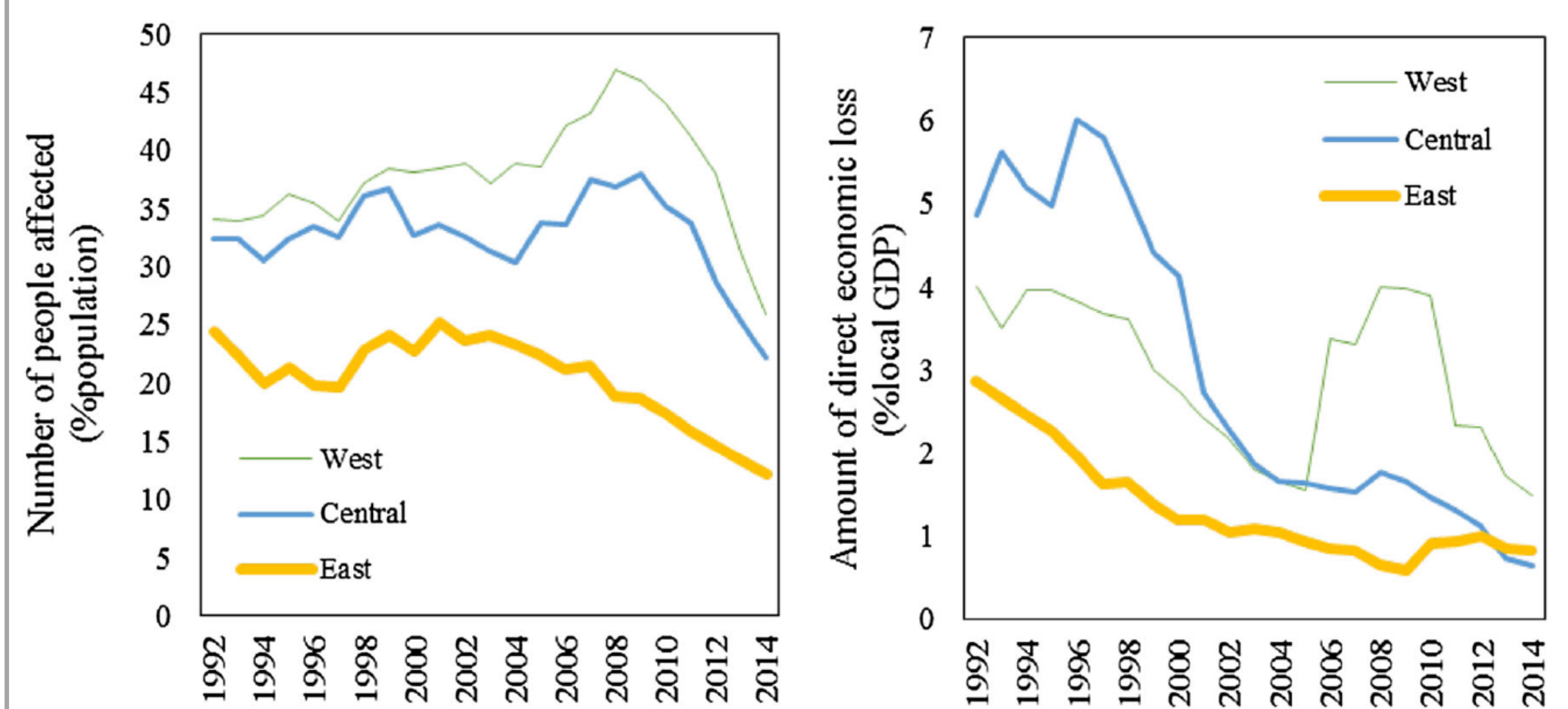
*3 provinces not listed here

*1 provinces not listed here

— Adverse short-term effects of meteorological disasters is most pronounced in the central region.

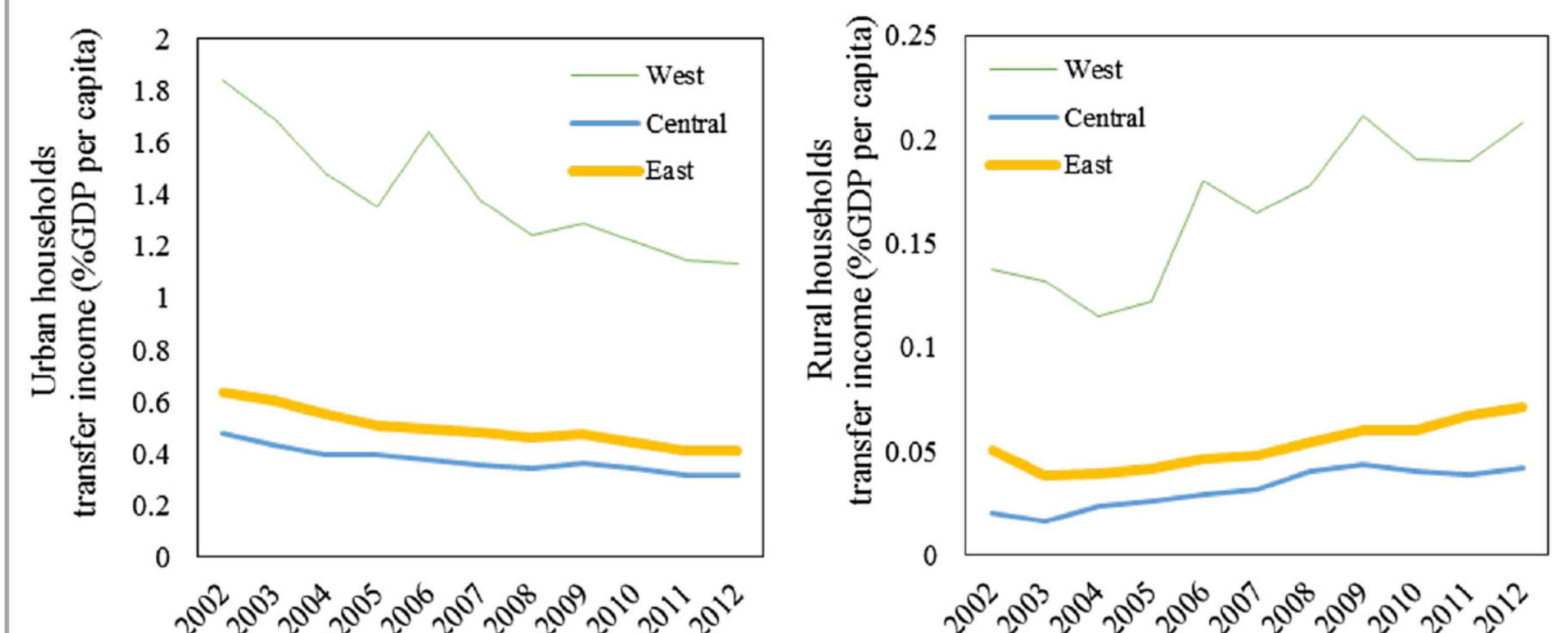
Discussion (2)

Human and economic loss levels in 3 region



— Natural hazard-induced disasters caused considerable losses to the central region.

Transfer income levels in 3 region



— Whereas households lived here obtained the lowest level of transfer income.