

# Budgeting for Disasters

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# Outline

- I. Findings
- II. Disasters & Their Costs
- III. Policy Responses
- IV. Contribution of Effective Budgeting
- V. International Practices & Experiences
- VI. Tentative Conclusions

# I. Findings

- Government policies can improve well-being in face of disasters
  - Mostly by effecting change *before* loss
  - But potentially harmful policies exist
- Effective budgeting can help
  - *Key: Ex ante recognition* of future costs
- Many countries have practices consistent with ex ante budgeting, but insufficient information to confirm ex ante recognition of costs

## II. Disasters

- Natural & human causes
- Low frequency, high consequence events
  - Emergencies, disasters & catastrophes
  - Size & timing uncertain
- 5-year plus events

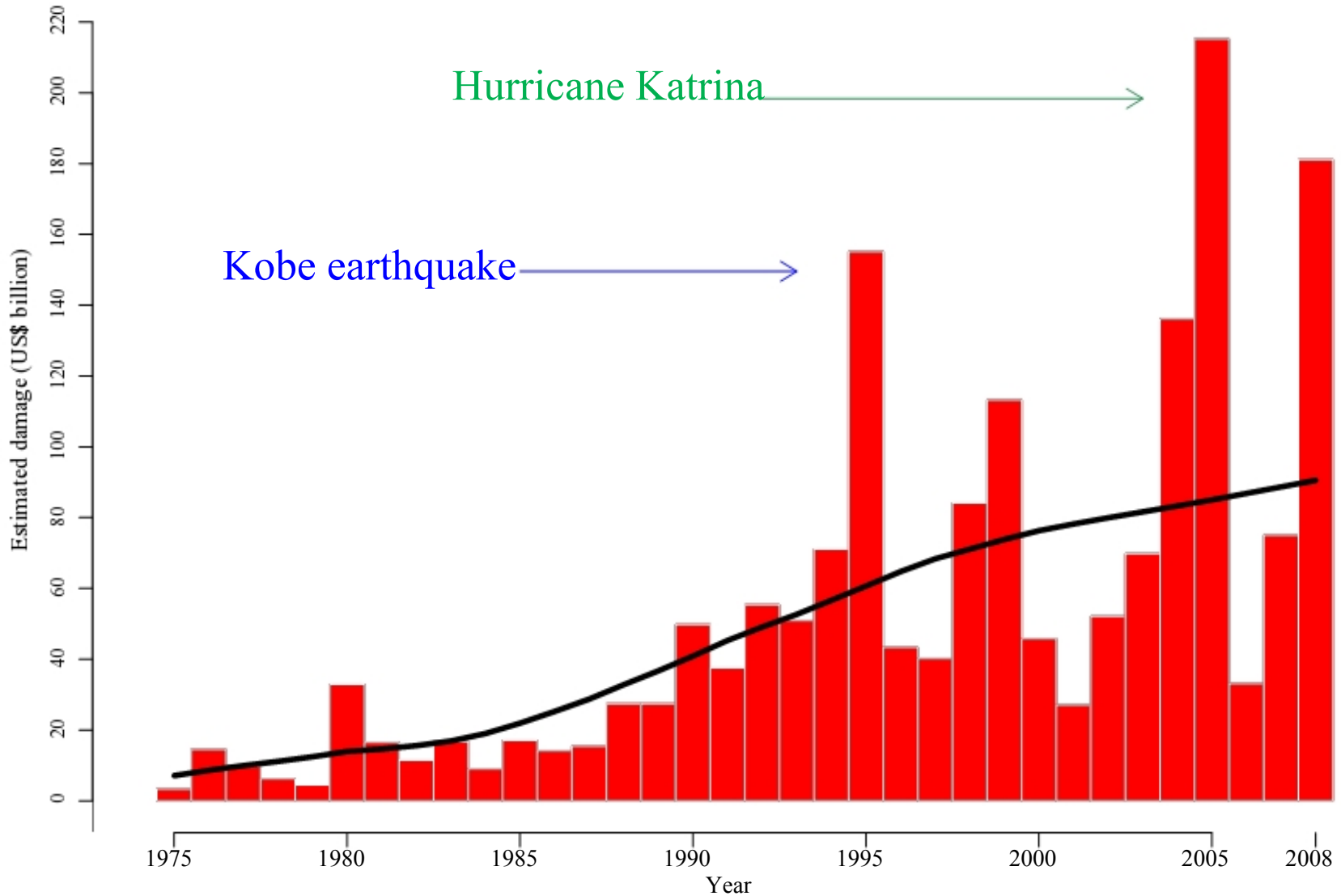
## II. Cost of Disasters

- Significant loss of resources & productive capacity
- Threat to living standards & lifetime consumption plans
- Low frequency increases cost
- Unlikely event occurs often
- Expected value of annual cost greater than zero

## II. Costs of Disaster

- 1995 Kobe Earthquake
  - Property damaged estimated \$100 billion (\$1995)
- 2005 Hurricane Katrina
  - As of April 2006, Bush administration sought \$105 billion for repairs & reconstruction
  - Costliest natural disaster in US history
- December 2004 Indian Ocean Earthquake & Tsunami
  - \$4.5 billion in Indonesia

# II. Estimated Damage Caused by Natural Disasters 1975-2008



# III. Policy Objectives

- Maintain post-disaster living standards
  - Provide relief and post-recovery assistance
  - Mitigation
  - Increase national saving & capital formation
- Efficient & equitable allocation decisions
  - Use all available information
  - Fairness within & across cohorts

# III. Our Critical Assumptions

- Governments have long-term deficit target based on intergenerational equity, independent of expected costs of disasters
- No other budget process assumptions
- Ex ante budgeting only affects numbers & trade-offs
- Consistent with many practices:
  - Insurance
  - Contingency funds
  - Or none of above

# III. Budgetary Alternatives

- Ex Post
  - Focus on response after event
- Ex Ante
  - Focus on disaster threat before event
- Ideally both are used
- Danger of the “middle way”
  - Ex ante disclosure

# III. Ex Post Policy

- Focus on relief & recovery
- Authorize emergency assistance programs including aid for reconstruction
- Defer decisions on exact amounts & types of assistance until event occurs
- Some attention to mitigation
  - Rebuilding convenient, efficient opportunity

# III. Ex Post Budgeting

- Few costs to recognize until resource outflow
  - Emergency planning/training/stockpiles
  - New benefits at zero budget cost
- No fiscal incentive to mitigate or save
- Response to be financed & budgeted after event
  - Often with supplemental appropriations that require few trade-offs

# III. Ex Post Economic Effects

- Financing provided by redistribution to victims from others
- Moral hazard
  - Private mitigation & precautionary saving incentives decline
- Compared with no policy
  - Total event losses increase; capital lower
  - Larger decline in income & consumption

# III. Ex Ante Policy

- Focus on disaster planning before event
- Pre-commit to limits on types & amounts of assistance
  - Disciplines response
  - Clarifies public-private roles
- Create public & private incentives to mitigate risks & to save (offset moral hazard)

# III. Ex Ante Budgeting

- Recognize the present value of government's expected cost, annualized for budget period, before the event occurs
- Increased benefits has budget cost now
- Before loss, government consumes less, saves more
- Recognize savings from policies expected to reduce losses

# III. Ex Ante Economic Effects

- Shifts resources from good times forward to bad times; from before loss to after
  - Reduce low-value consumption, increase high value
  - More saving, investment in mitigation
- Compared with ex post budgeting
  - Fewer total losses
  - More post-loss capital
  - Higher post-loss income/consumption

# III. Ex Ante Advantages

- Lower post-loss taxes, fewer distortions
- Smoother consumption, higher welfare
- More efficient choices
  - Public & private
  - Reduced uncertainty about policy
- No need to sacrifice post-disaster assistance

# III. Ex Ante Disadvantages

- High cost of saving & mitigation
  - Lower consumption now
  - Disaster may not occur: benefits uncertain
- Concern about political misuse of pre-loss funding
- Higher analytical requirements for estimating cost than waiting until loss occurs
- May reduce donor contributions

# IV. Effective Ex Ante Budgeting

- Key feature: recognition of expected cost
  - Recognition means resources *allocated*;
    - Not available for other uses
    - Something must be given up
- Secondary feature: recognition of cost permits recognition of saving
  - “Credits” for mitigation & other activities
    - Risk-based pricing of insurance & deductibles
    - Land use restrictions
    - Regulation

# IV. Disclosure is Not Budgeting

- Disclosure, not recognition, of expected cost ex ante is a favored “middle” way
  - Intra-governmental transfer
  - Supplementary budget information
  - Text notes or projections

# IV. Effects of Disclosure

- The budget shows
  - No public resource use
  - No trade-offs required
  - No credit for savings
- Faux saving
- Perhaps no worse than Ex Post
- *Seems* substantive: opaque
- Same budget effects as ex post

# IV. Budget Effect of Three Examples

	Ex Ante	Ex Post	Disclosure
Expenditures to off-budget before loss	100	0	0
Revenues increase & spending decreases before losses	100	0	0
Change in public saving before loss	100	0	0
Expected post-loss taxes	0	100	100
Post-loss income	Higher than alternatives	Below ex ante	Below ex ante

# IV. Ex Ante Budgeting & Close Substitutes

- Public purchase of insurance
- Mandate private insurance purchase
- Public off-budget insurance or reinsurance
- Contingency funds
- Note effects of each on
  - Mitigation incentives
  - Political resistance to fair premiums
  - Saving
  - Uncertainty

# V. International Practices

- 10 of 27 Countries Responded to Survey

	No Risk	Low Risk	Medium Risk	High Risk
Earthquake	2	5	1	2
Hurricane - Typhoon	2	3	2	3
Tsunami	4	4	1	1
Volcanic Eruption	6	2	1	1
Wild Fires	0	4	4	2
Flood	0	0	5	5
Blizzard	1	3	3	3

# V. Governments' Role in Disaster Relief & Recovery

- 9 provide cash grants to individual & businesses; 4 provide loans
- 8 provide cash grants to lower levels of government; 3 provide loans
- 6 provide tax advantages to disaster victims
- 8 provide emergency services
- 5 stockpile relief supplies

# V. Budgeting for Disaster Relief & Recovery

- 8 budget ex post
- 2 budget at expected actuarial costs
  - Unused funds are available for later relief & recovery use in 1 country (ex ante)
  - Unused funds expire or revert back to treasury in 1 country (disclosure/ex post)
- All 10 countries use supplemental appropriations to fund relief & recovery costs in excess of budgeted amounts

# V. Budgeting for Mitigation

	Each Budget Cycle	In Capital Budget	Lower Level of Government Responsible	Activity Not in Budget
Research & Development	9	1	4	0
Early Warning	6	2	4	1
Regulation Enforcement	6	0	5	1
Land Conservation	7	2	4	0
Response Communications Systems	7	2	4	0
Training & Exercising	9	1	5	0

# V. Government Policies for Insurance

- 5 of 10 countries involved with disaster insurance

	France	Japan	Norway	Switzerland	Turkey
Mandate private insurers provide coverage for natural disasters	No	No	Yes	Yes	No
Mandate purchase of insurance	No	No	No	Yes, in some cantons	Yes, in municipalities
Government provides insurance	Yes	No	Yes	Yes	Yes
Government provides reinsurance or guarantee	Yes	Yes	No	No	No

# V. Insurable Hazards

- Each of 7 hazards insurable to varying degrees
- All 5 countries insure against earthquake
- France only country with all-hazards approach to insurance
- Correlation between perception of risk & provision of insurance
  - $R = .37$  for all countries
  - $R = .53$  after removing 1 country that insures for all-hazards

# V. Government Insurance Tends to Ignore Moral Hazard

- Only 2 countries cap the amount of coverage below 100% of value of some at-risk properties, but no mandatory deductibles
- Another has mandatory deductibles, but no caps
- Other 2 countries have no caps & no mandatory deductibles
- Premiums for insurance are adjusted for risk in 2 countries

# V. Contingency Funds

- Contingencies more broadly defined to include all difficult to predict events that impose substantial costs on governments (terror events, war, economic crisis, epidemics, etc.)
- Contingency funds useful for increasing government savings, but provide weak incentives for mitigation of specific hazards
- 4 of 10 countries report use of general contingency funds

# V. Elements of Ex Ante Budgeting

- Closer examination of three countries that appear to use ex ante budgeting for earthquakes and other natural disaster
  - Japan
  - New Zealand
  - Turkey

# V. Japan

- High risk of earthquake & volcanic eruption
- Approximately 5% of national budget for disaster relief, recovery, & mitigation
- Residential insurance may be purchased through private insurers as an addition to fire insurance
- Risk adjusted premiums set to cover costs

# V. Japan: Shared Responsibility of Disaster Costs

- Private insurance companies pass premiums on to Japanese Earthquake Reinsurance Company
- JER responsible for paying claims up to 110 billion yen per incident
- Claims greater than 110 billion yen responsibility shared with increasing portion to government
- Government maintains reserve account to cover its portion – 1.1 trillion yen in FY2008

# V. Ex Ante Budgeting in Japan

- Recognizes costs of relief & recovery ex ante
- Funds public mitigation to reduce losses
- Limits offsetting effects of moral hazard through caps on insurance
- Achieves pooling of independent losses nationally & diversification of resources with taxes & international investments

# V. New Zealand

- 11% chance of magnitude 7.5 earthquake along Wellington fault line in next 50 years
- Earthquake Commission, a Crown Entity, provides residential property insurance for earthquakes & other natural disasters
- Automatic coverage when residences purchase coverage for fire
- Cap on allowed coverage from EQC, but “top-up” insurance may be purchased from private insurers

# V. New Zealand

- Flat rate premiums & low deductible
- Premiums collected & set aside in “Natural Disaster Fund”
- Prior to 2001, Fund invested in fixed interest securities, such as government stock
- After 2001, invested in international securities to ensure assets held outside of affected area
  - Investment in global equities limited to 27-33%
  - Remainder invested in government stock or cash

# V. New Zealand

- EQC minimizes own risk by purchasing reinsurance from international reinsurers
- State provides ultimate unlimited guarantee if catastrophe exceeds the capacity of Natural Disaster Fund and reinsurance
  - Either through grant or loan
  - In exchange for guarantee, EQC pays underwriting fee to government

# V. Turkey

- 98% of Turkey's population lives in area with seismic activity
- As result of costs from 1999 earthquake, government made insurance compulsory
  - Administered by Turkish Catastrophe Insurance Pool (TCIP)
  - Public-private partnership between government, World Bank & international reinsurers

# V. Turkey

- Earthquake insurance mandatory for residential buildings within municipal boundaries
  - Commercial buildings & buildings outside municipal boundaries may purchase voluntarily
  - Homeowners must show proof of insurance to start account for public utilities
- Maximum coverage limit adjusted annually
  - Homeowners may purchase additional coverage through private insurers

# V. Turkey

- Premiums risk-based
  - Proximity to seismic area, type of construction & size of building
- 2% deductible paid by policy holders
- Revenues kept in segregated accounts & invested according to guidelines set by board of directors

# V. Effective Ex Ante Budgeting?

	Japan	New Zealand	Turkey
Ex ante budgeting for relief & recovery?	Yes	Yes	Yes
Who provides insurance?	Private insurers	Government	Public-private partnership
Insurance mandatory?	No	Yes, automatic with purchase of fire insurance	Yes, for residential buildings in municipalities
Risk-based pricing?	Yes	No	Yes
Limit on amount of coverage?	Yes	Yes, but optional increase coverage	Yes, but optional increase coverage
Government reinsurer or guarantee?	Yes, but capped	Yes	Yes

# VI. Tentative Conclusions

- Possible for government to realize the benefits of ex ante budgeting for disasters
- Many countries appear to do so by:
  - Directly providing insurance
  - Supporting private insurance through reinsurance or guarantees
  - Attempting to increase national savings through general contingency funds
- 7 of 10 responding OECD countries use one or more of these methods
- Additional research required

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