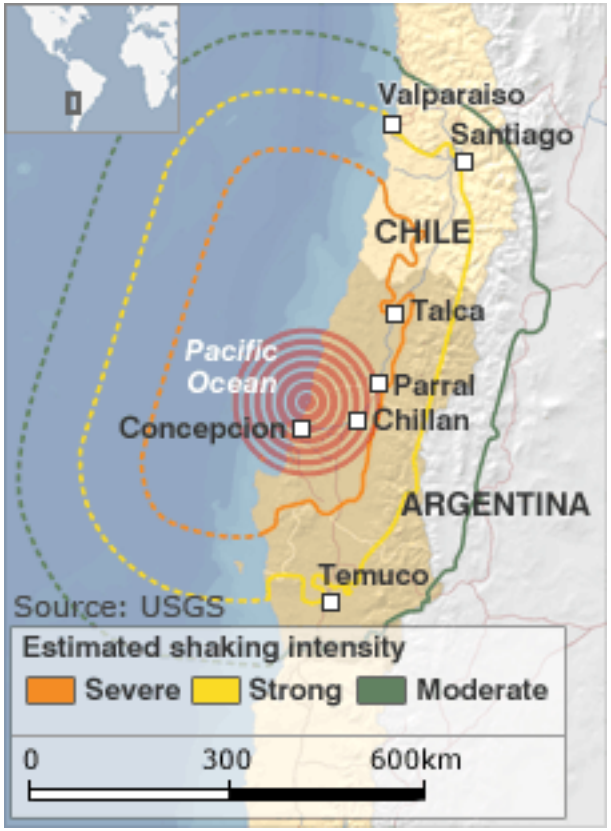
PTSD and the 2010 Chilean Earthquake

Quantifying the Household Effects of Economic Uncertainty

Bryan Kevan
Pomona College
Summer 2012

Goal and Method

- Investigate relationships between economic variables and incidence of PTSD.
- Case Study: The February 27, 2010 Chilean Earthquake
  - Magnitude 8.8
  - 500x energy of Haiti earthquake, yet only 900 deaths vs 250,000
- Can we identify economic and demographic factors that affect psychological resilience in affected populations of disaster victims?

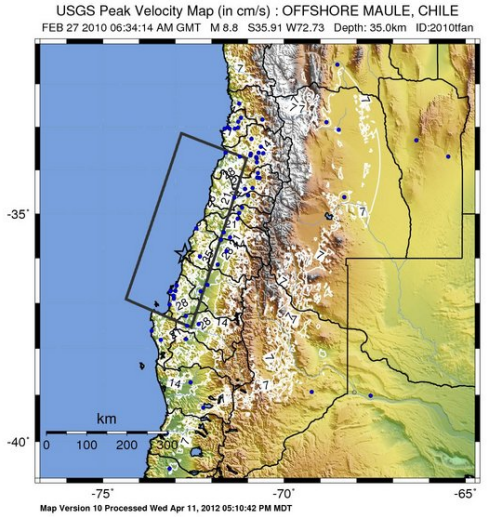


Previous Literature

- Clinical Approach (Psychological research)
  - Demographics, prior trauma, social support, financial loss/ volatility key factors
- Economic Approach (Microeconomic research)
  - Permanent Income Hypothesis: We desire constant consumption, not constant income
  - Consumption Smoothing: Mitigate short-term income losses to keep level of consumption constant
    - Loans, job mobility, insurance, work contracts
- Goal: Bridge these two approaches and explore the economic factors behind incidence of PTSD

Data

- Chilean Post-Earthquake Household Survey (EPT 2010)
  - Before-after household socioeconomic survey
  - 82,000 respondents in affected regions
  - 2010 Davidson Trauma Scale (DTS) score:
    - 136 max score. ~15-20 indicates mild case, ~60-70 indicates severe case.
- US Geological Survey (USGS) Shakemap
  - Coordinate grid with vector for intensity
- First look
  - Move from agriculture to construction jobs (male)
  - Poverty increase, income loss
  - More physical crowding, condition of housing decreases overall



Statistical Model

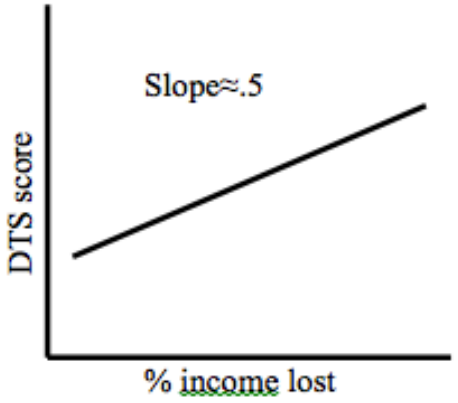
- Heteroskedastic robust regression:

$$D_i = \alpha_0 + \alpha_i X_i + \beta_i T_i + \gamma_i (S \times T_1) + \varepsilon_i$$

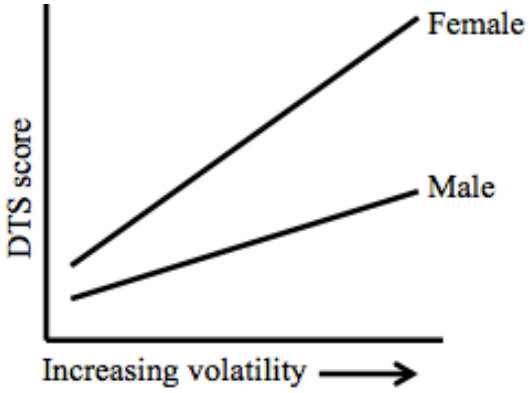
- Conditions DTS score on selected variables
  - D_i is "predicted" DTS score, based on fitting model to data
  - X_i contains demographic, economic variables like income/ production loss, sex, age, etc.
  - T_i contains treatment variables (intensity)
  - (SxT_1) allows for different "returns" to increased intensity for gender

Findings

- Economic Security helps trauma recovery
  - Poverty, lack of pension, other economic variables correlated with higher trauma
  - 1% loss in per capita household income results in ~.5 higher DTS score
  - Agricultural/rural workers score higher (job mobility)



- Demographic Characteristics:
  - Women score 7-8 points higher
  - Severe post-disaster crowding 3-5 points higher
  - Higher "returns" to intensity for women
  - Loss of marriage, moving to new area result in higher scores



Conclusions

- Gendered relationship between economic security and lower rates of PTSD
- Gender-oriented job and income responses
  - Women not as desirable candidates for construction work
  - Cultural expectations of caring for family
- Consumption smoothing mechanisms
  - Pre-disaster: Insurance
  - Post-disaster: Creation of short-term credit markets
  - Job mobility services

Questions?