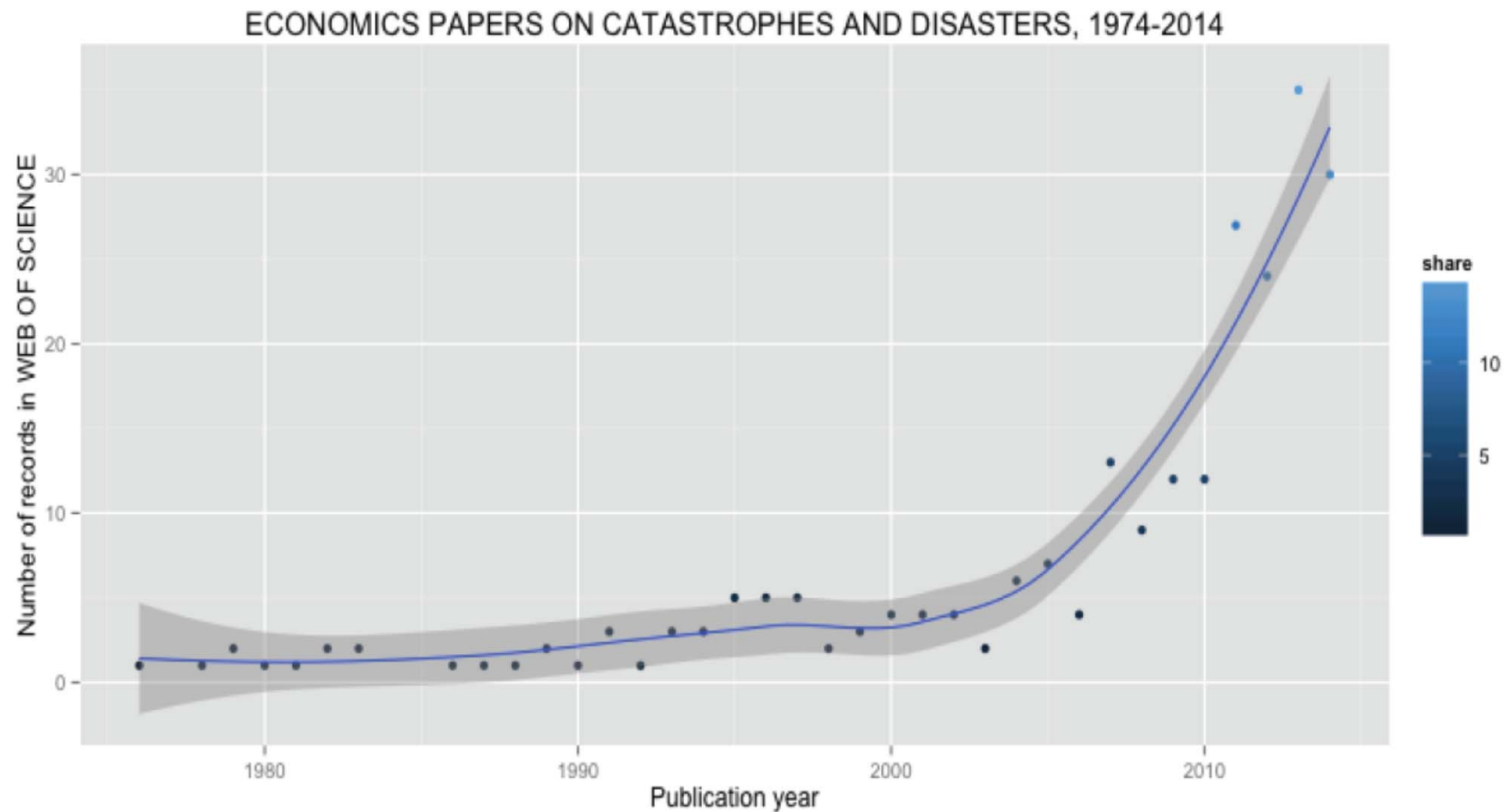


« Policy tradeoffs under risk of  
abrupt climate change »  
by Y. Tsur and A. Zemel

Comments by Nicolas Treich  
(Toulouse School of Economics)

Figure 1: The growing interest of economists in catastrophes and disasters



*Notes: Bibliometric search of the WEB OF SCIENCE™ with the key words <catastrophe>, <catastrophes> <catastrophic>, <disaster>, <disasters>, or <disastrous>; hits are articles published in selected economic journals between 1974 and 2014.*

Source: Rheinberger and Treich (2015)

# The contribution (as I see it)

- The paper:
  - Examines the tradeoff between mitigation and adaptation in a dynamic stochastic model
  - Uses more general functional forms than in previous literature (in particular Zemel 2015)
- My assessment:
  - The paper is well written, and the theoretical analysis well conducted
  - The contribution is welcome because assumptions about functional forms drive the mitigation-adaption tradeoff
  - The paper could yet be more general regarding assumptions about functional forms

# Functional forms

- A general « well-behaved » instantaneous utility:  $u(m,a)$ 
  - $m$ : emissions
  - $a$ : adaptation
  - Zemel (2015) assumes  $u_{aa}=u_{am}=0$
  - Yet, a separable utility  $u(m,a)=m-m^2/2-a^{1-\mu}$  is used in the example
- A damage function  $\varphi$  separable from the utility function
  - Implies for instance that (marginal) benefit of abatement is independent from initial wealth/capital

# Insurance economics

- Model:
  - $U = (1-h(m)) u(m-k) + h(m) u(m - k - \varphi(k))$
  - $k$  drives « self-insurance » and  $m$  drives « self-protection » motives
  - Remark: risk aversion (i.e., concavity of  $u$ ) is enough to induce nonseparability
  - The insurance economics literature has studied the self-protection and self-insurance tradeoff
  - Key references: Ehrlich and Becker (JPE 1972), Jullien-Salanié-Salanié (GRIR 1999)