Big Data for Macroeconomists and Policy Makers

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CEPR & TFI Event – Household Welfare: Do We Need Big Data?

A total of five exabytes of information was created between the dawn of civilization through 2003. That much information is now created every two days.

Eric Schmidt, former CEO of Google, 2010

Big data in household finance

1. Why are big data useful to the policy maker?
   - Ex-ante: to *monitor* household financial fragility
   - Throughout: to *target* policy interventions
   - Ex-post: to *evaluate* effectiveness of intervention

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2. Are big data always superior to survey data?
   - Some *thoughts*

Ex-ante: monitor household balance sheets

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  - Policy response: stress tests on banks' side
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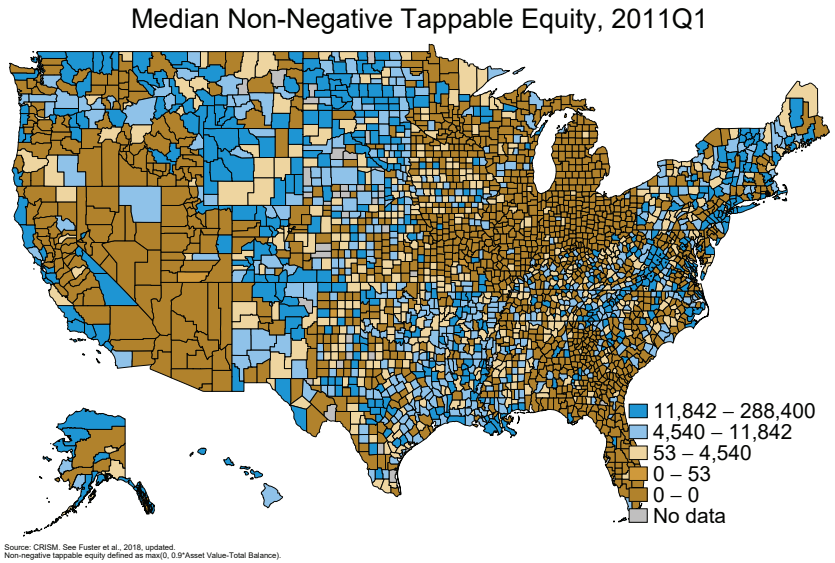
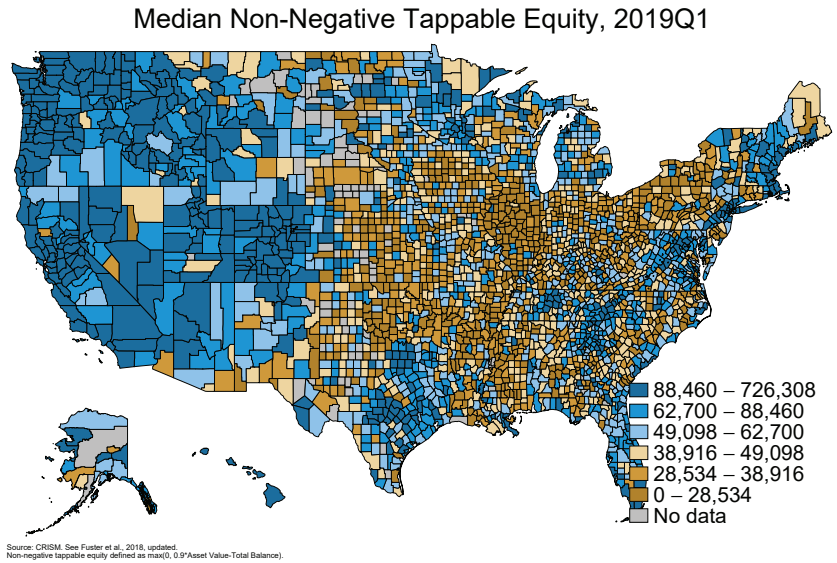
  - Feasible because banks collect big data at their own cost
- Equally important, but absent: households' stress tests
  - Need: detailed, high frequency data on hh balance sheets
  - Simulate 'crisis scenarios' and estimate impact of shocks
  - Inform intelligent design of policy
  - Ongoing research with economists at the NY Fed

Ex-ante: monitor household balance sheets





- Only one determinant of household shock absorbtion capacity
- Challenging measurement (with available data), but important
- You can trace distribution by: area, income, age, credit score, etc.

Throughout: target policies

- Social insurance: credit or transfers to households in need
- Crisis: urgency calls for easy-to-implement policies
  - Easy to implement: depends on available data you have
  - You end up with universal policies with low impact
  - CARES Act: Any family of 4 with $AGI < \$150,000$ gets $\$3,400$
- Big data allow to tailor intervention: more bang for the buck
- You channel financial help to those who really need it

Throughout: target policies

- Lockdown has heterogeneous effects in the population
  - Key: whether you are in a flexible or rigid occupation
  - Dingel-Neiman definitions based on O*NET tasks

Occupation	Income	Flexible
Economist	\$100K	Y
Optometrist	\$100K	N
Secondary school teacher	\$50K	Y
Flight attendant	\$50K	N
Telemarketer	\$25K	Y
Cook	\$25K	N

- A transfer conditional on occupation could be more generous

Ex-post: policy evaluation

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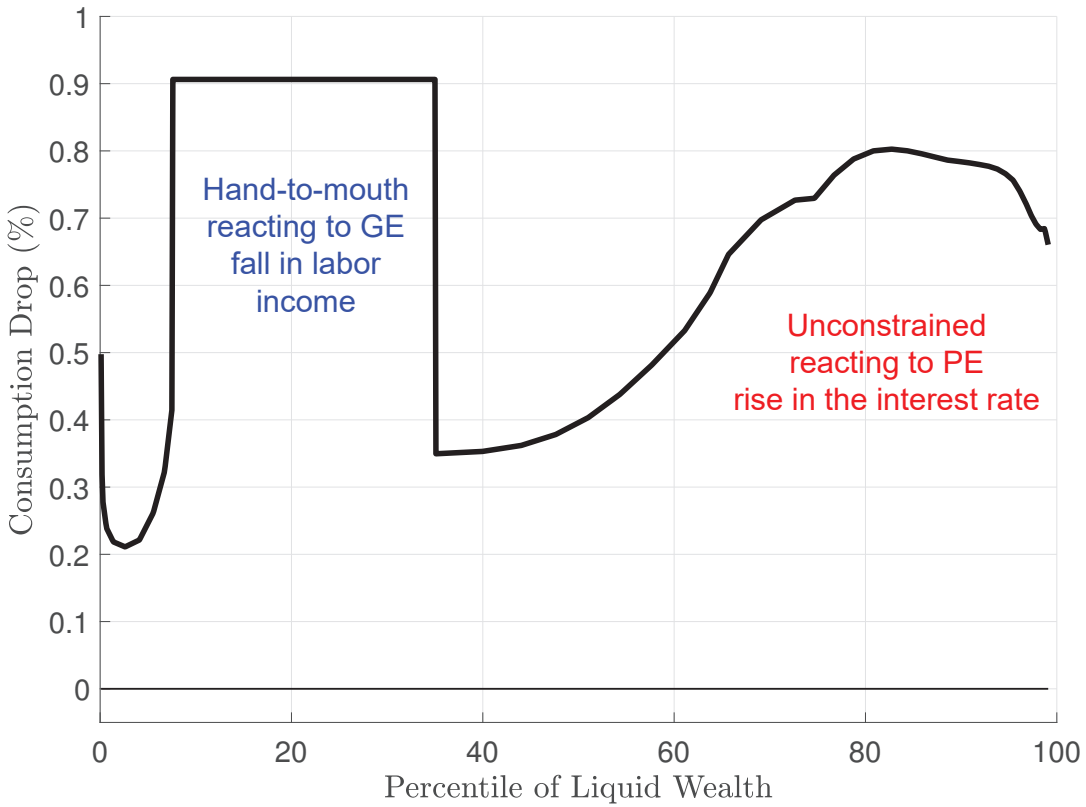
2. Impact evaluation using: structural equilibrium models
   - State-of-the-art macro models capture heterogeneity in MPC
   - Key for transmission mechanism of shock and policy response
   - Big data allow to properly calibrate these models
   - Assess distributional impact of policy

Ex-post: policy evaluation

- Example: monetary policy tightening in HANK models



- Do we see this same heterogeneity in (big) data?

Are big data always superior to survey data?

1. Virtues of big data vis-à-vis survey data
   - Large-scale
   - Contain novel variables (e.g., individual stocks, mobility)
   - High-frequency
   - Real time
   - High quality (less measurement error)

They allow to truly embrace and measure heterogeneity

(household balance sheets, preferences, financial literacy, etc...)

Are big data always superior to survey data?

2. Challenges associated with the use of big data

- Representativeness of the underlying universe
  - Data that are not meant to be representative
  - Coverage is often time-varying / endogenous
- Access to the dataset is often restricted
  - Inequality in access (connections / research budget)
  - Replicability of the findings
- Privacy issues
  - It's about protecting: not an argument against collecting