# Discussion of "Trade with Nominal Rigidities: Understanding the Unemployment and Welfare Effects of the China Shock" by Rodriguez-Clare, Ulate and Vasquez

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# Welfare effect of the China shock

- **Q**: How has trade with China affected U.S. household welfare?
  1. Lower prices for everyone (+)
  2. Lost jobs due to import competition (- for some)
  3. Lost/gained jobs in other (eg export) industries (+/- ?)
- Standard trade models help us quantify 1, but how about 2-3?
- Step forward: Autor, Dorn, Hanson 2013 AER paper ("ADH")
  - Compare regions more vs less affected by import competition
  - Find: job losses in manufacturing *and* non-mfg, rise in unemployment and nonparticipation, and outmigration in more affected regions
- Existing "structural China shock" literature attempts to match these estimates, but assumes away unemployment
- **Here:** revisit these results by explicitly modeling unemployment

# This paper

1. Take state-of-the-art structural China shock model
   - Caliendo, Dvorkin, Parro 2019 ECTA ("CDP")
   - Trade model with frictional sectoral reallocation + migration
2. Add downward nominal wage rigidity a la Schmitt-Grohe-Uribe
3. Calibrate model so it can quantitatively match ADH cross-X results
4. Reevaluate aggregate + welfare implications of China shock

**Findings:**

- Welfare gains for almost everyone despite unemployment ($P \downarrow$)
- But, nominal rigidities reduce these gains by about 25%

**My discussion:** perspective on motivation, modeling, and quant. results

# The China shock paper

- Basic regression in ADH is a Bartik-type cross-regional regression
- If $i$ is U.S. commuting zone then run, between 2000 and 2007,

$$\Delta y_i = \alpha + \beta \cdot \underbrace{\left( \sum_s \frac{L_{is}}{L_i} \underbrace{\frac{\Delta Import_s}{L_s}}_{\Delta\text{import exposure per worker in sector s}} \right)}_{\Delta\text{import exposure per worker in region } i} + \epsilon_i$$

  for various outcomes $y_i$ (using an instrument for $\Delta Import_s$)
- (Paper points out that if what changes is sector price $p_s$, and model is neoclassical, this is not the theoretically correct regression to run!)
- This is cross-X, use model to address the missing intercept problem

# China shock paper results: employment

TABLE 5—IMPORTS FROM CHINA AND EMPLOYMENT STATUS OF WORKING-AGE POPULATION WITHIN CZS, 1990–2007: 2SLS ESTIMATES

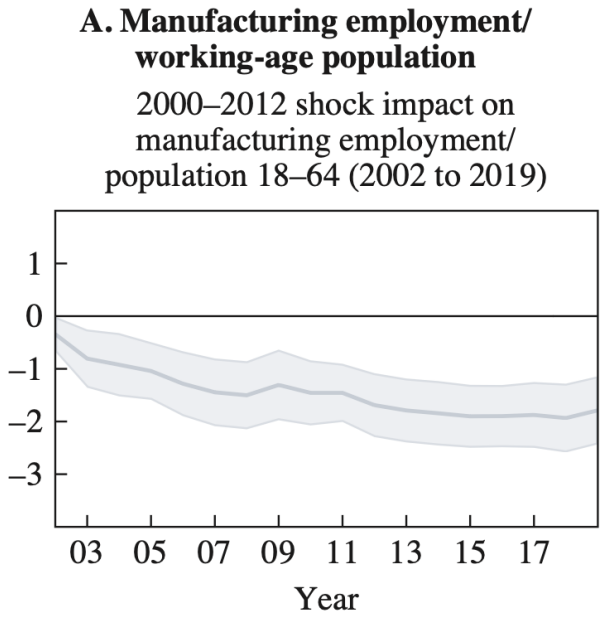
*Dependent variables: Ten-year equivalent changes in log population counts and population shares by employment status*

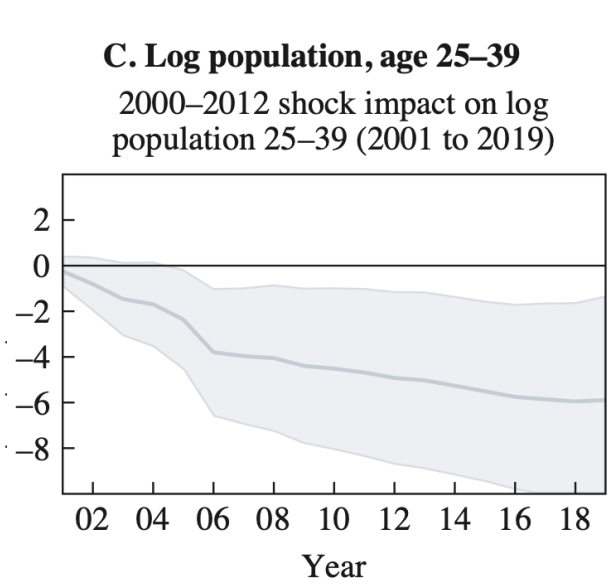
| | Mfg emp (1) | Non-mfg emp (2) | Unemp (3) | NILF (4) | SSDI receipt (5) |
|---|---|---|---|---|---|
| *Panel A. 100 × log change in population counts* | | | | | |
| (Δ imports from China to US)/worker | −4.231*** | −0.274 | 4.921*** | 2.058* | 1.466*** |
| | (1.047) | (0.651) | (1.128) | (1.080) | (0.557) |
| *Panel B. Change in population shares* | | | | | |
| *All education levels* | | | | | |
| (Δ imports from China to US)/worker | −0.596*** | −0.178 | 0.221*** | 0.553*** | 0.076*** |
| | (0.099) | (0.137) | (0.058) | (0.150) | (0.028) |
| *College education* | | | | | |
| (Δ imports from China to US)/worker | −0.592*** | 0.168 | 0.119*** | 0.304*** | — |
| | (0.125) | (0.122) | (0.039) | (0.113) | |
| *No college education* | | | | | |
| (Δ imports from China to US)/worker | −0.581*** | −0.531*** | 0.282*** | 0.831*** | — |
| | (0.095) | (0.203) | (0.085) | (0.211) | |

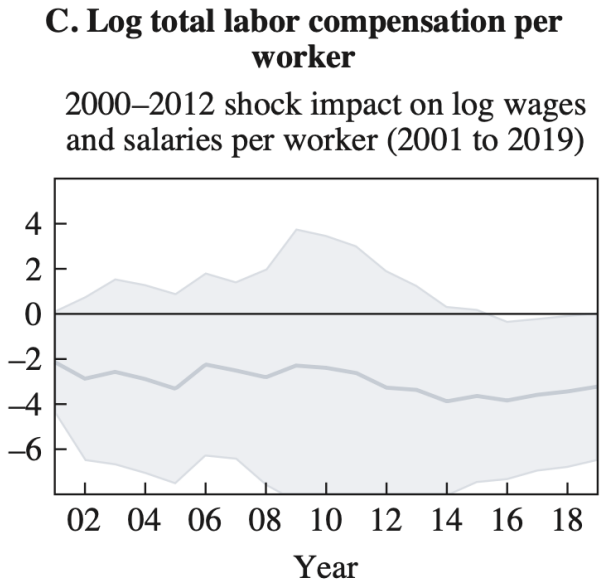
- More affected regions have lower employment in manufacturing
- Workers go to unemployment or exit labor force (not non-mfg)
- Paper targets these moments directly in calibration

# Even more important motivation: persistence+wage effects

- From "On the persistence of the China shock" Brookings paper:




- Movements out of manufacturing and outmigration build up slowly
- Wage effects appear limited throughout

# What are leading models to understand this?

- Canonical model here: Artuc, Chaudhuri, McLaren (2010 AER)
  - Dynamic equilibrium in sectoral labor markets
  - Extended to GE (goods market eqbm with trade) by CDP
- Simplest possible het-agent model: pure dynamic discrete choice
  - **homogeneous workers** in each (sector, region) cell
  - live **hand to mouth**, have fixed costs of changing cell, and EV taste shocks to smoothe out the discrete choice and create churn
- For instance with just sectors $s$, we have:

$$V_{st} = \log\left(W_{st}/P_t\right) + \max_k \left\{\nu\epsilon_{kt} - C_{sk} + \beta\mathbb{E}\left[V_{kt+1}\right]\right\}$$

- Generates share of workers in sector $s$ as a fn of path of sector wages

$$N_{st}^{supply}\left(\left\{W_{kt'}/P_{t'}\right\}_{k,t'}\right)$$

$\rightarrow$ dynamic labor supply function. Note: completely inelastic in SR

# Closing the model + labor demand shock

- Suppose sector $s$ firms produce from labor using $F_s(N_s)$
- Perfect competition, no adjustment costs:

$$p_{st} F_s'(N_{st}) = W_{st}$$

so static labor demand function

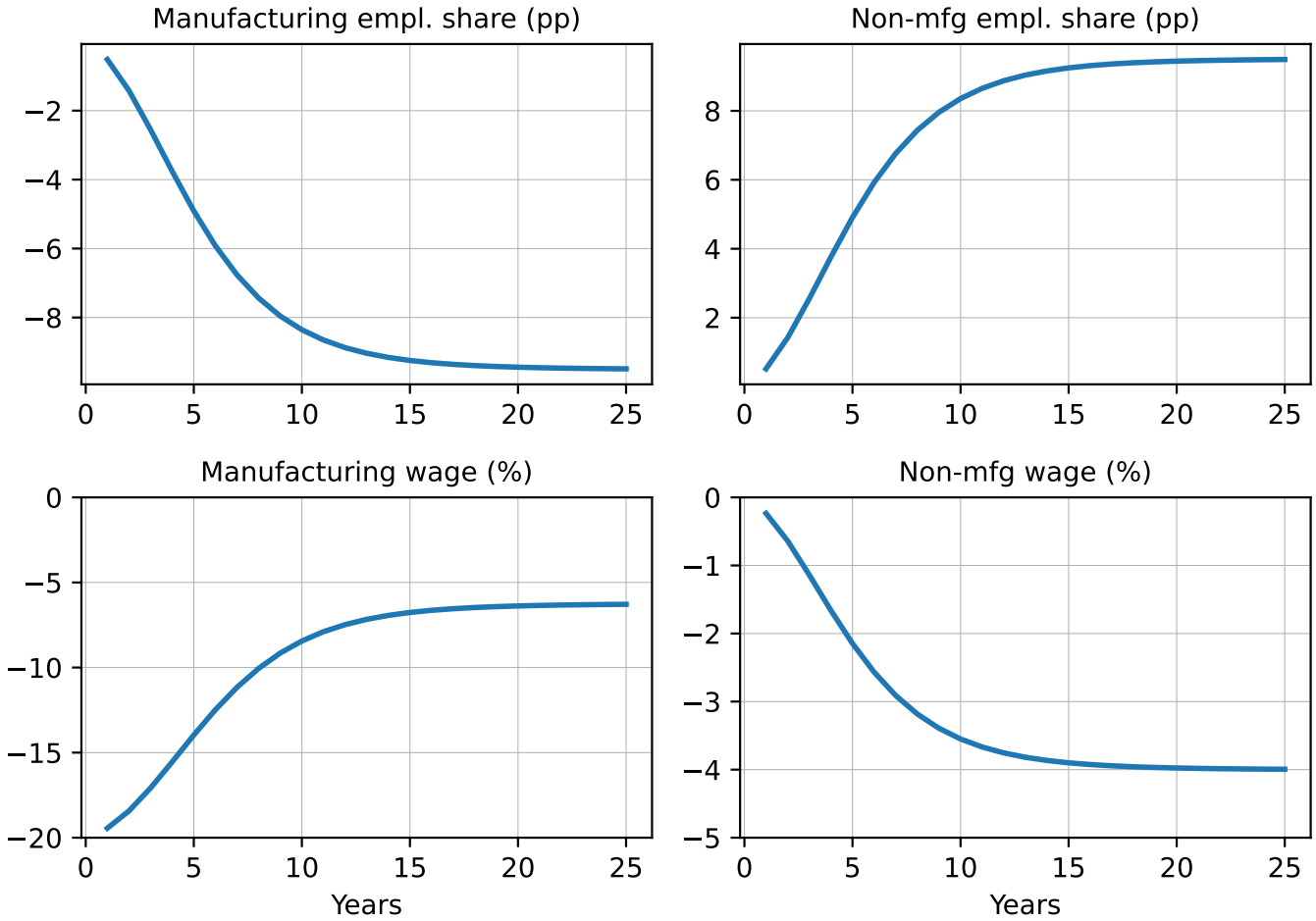
$$N_{st}^{demand} = (F_s')^{-1}\left(\frac{W_{st}}{p_{st}}\right)$$

- Given path of prices $\{p_{st}\}$, equilibrium is set of $\{W_{kt}\}$ such that

$$N_{st}^{demand}\left(\{W_{st'}\}_{t'}, \{p_{st'}\}_{t'}\right) = N_{st}^{supply}\left(\{W_{kt'}\}_{k,t'}\right) \quad \forall s, t$$

- Say $s \in \{\text{Mfg}, \text{Other}\}$. Calibrate $C_{sk}$'s to steady state flows
- Reduce $p_{\text{Mfg}}$ once and for all, what happens?

# Impulse response to manufacturing labor demand shock




- Slow moving manufacturing decline. As in data ✓
- All job reallocation. Not in data! ✗ (Want unemp.+ nonparticip.)
- Manufacturing wage overshoot. Not in data! ✗

# Wage ridigity comes in naturally

- Nominal wage rigitity can simultaneously solve these two issues (get nonparticipation by adding another sector as in CDP)
- Many possible ways to do this...
- This paper follows Schmitt-Grohe-Uribe: in each sector impose

$$W_{st} \geq \delta W_{st-1}$$

when binding, get unemployment

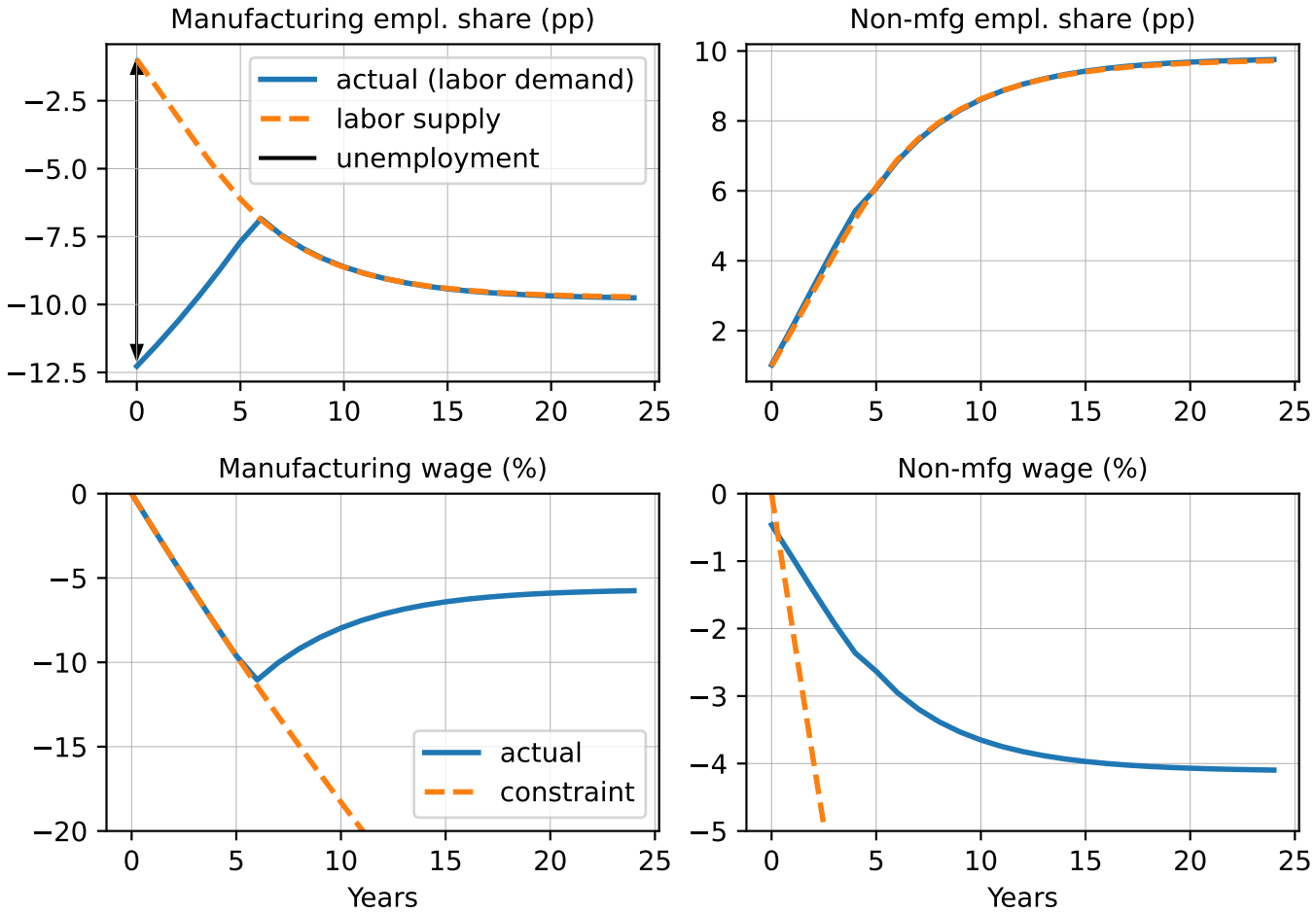
$$U_{st} = N_{st}^{supply}\left(\{W_{st}\}\right) - N_{st}^{demand}\left(\{W_{st'}, p_{st'}\}\right)$$

- Income is rationed proportionally in each sector:

$$\left(1 - U_{st}/N_{st}^{supply}\right) W_{st}/P_t$$

risk sharing... among hand-to-mouth families!

# Implications of labor demand shock - DNWR




- No longer a wage overshoot! ✓
- Delivers unemployment... but now spiking on impact! ✗
- Odd contrast with slow movement of workers across sectors

# Bottom line on motivation and modeling

- Nice way to add nominal rigidities to model while staying inside the realm of what the "hat algebra" solution method can do
- Fixes some implausible dynamics (wages) in the standard model, but adds others (unemployment)
- Please show your impulse responses !

# Results

- Get China shock in model, backing out path of sector-specific Chinese productivity $\{A_{st}\}$ that explains $\Delta Imports_{st}$
- Pick $\nu$, $\kappa$ (migration elasticity) and $\delta$ to hit three moments:

**Table 1:** Employment, population, wage, and welfare effects of exposure to China across U.S. regions and associated parameters generating them

| | ADH (1) | Baseline (2) | NM (3) | $\nu = \kappa$ (4) | DNWRM (5) |
|---|---|---|---|---|---|
| *Change in Population Shares* | | | | | |
| Unemployment (targeted) | 0.221** | 0.221 | 0.221 | 0.221 | 0.221 |
| NILF (targeted) | 0.553** | 0.553 | 0.553 | 0.553 | 0.553 |
| Mfg Employment | -0.596** | -0.331 | -0.337 | -0.340 | -0.543 |
| Non-mfg Employment | -0.178 | -0.442 | -0.437 | -0.434 | -0.230 |
| *Percentage Changes* | | | | | |
| Population (targeted) | -0.050 | -0.050 | -0.000 | -0.521 | -0.050 |
| Mfg Wage | 0.150 | -0.214 | -0.182 | -0.049 | 0.152 |
| Non-mfg Wage | -0.761** | -0.689 | -0.717 | -0.623 | -1.065 |
| *Welfare* | | | | | |
| Welfare vs exposure | | -0.053 | -0.079 | -0.044 | -0.047 |
| Mean welfare change | | 0.229 | 0.235 | 0.225 | 0.197 |
| Mean welf. change no DNWR | | 0.310 | 0.313 | 0.311 | 0.298 |
| *Parameters* | | | | | |
| $\nu$ | | 0.551 | 0.594 | 0.562 | 0.496 |
| $\kappa$ | | 12.30 | | 0.562 | 11.21 |
| $\delta$ | | 0.980 | 0.980 | 0.981 | 0.987 |

- Few non-targetted moments. Show full impulse responses vs data!

# Is $\nu \neq \kappa$ really important? Outmigration

- Nice feature of paper: separate
  - sectoral reallocation elasticity $1/\nu$ (large)
  - migration elasticity $1/\kappa$ (much lower)

  to match limited outmigration results from ADH
- But... is outmigration really that limited?

TABLE 4—IMPORTS FROM CHINA AND CHANGE OF WORKING-AGE POPULATION IN CZ, 1990–2007: 2SLS ESTIMATES

*Dependent variables: Ten-year equivalent changes in log population counts (in log pts)*

| | I. By education level | | | II. By age group | | |
|---|---|---|---|---|---|---|
| | All (1) | College (2) | Noncollege (3) | Age 16–34 (4) | Age 35–49 (5) | Age 50–64 (6) |
| *Panel A. No census division dummies or other controls* | | | | | | |
| (Δ imports from China to US)/worker | −1.031** | −0.360 | −1.097** | −1.299 | −0.615 | −1.127*** |
| | (0.503) | (0.660) | (0.488) | (0.826) | (0.572) | (0.422) |
| $R^2$ | — | 0.03 | 0.00 | 0.17 | 0.59 | 0.22 |
| *Panel B. Controlling for census division dummies* | | | | | | |
| (Δ imports from China to US)/worker | −0.355 | 0.147 | −0.240 | −0.408 | −0.045 | −0.549 |
| | (0.513) | (0.619) | (0.519) | (0.953) | (0.474) | (0.450) |
| $R^2$ | 0.36 | 0.29 | 0.45 | 0.42 | 0.68 | 0.46 |
| *Panel C. Full controls* | | | | | | |
| (Δ imports from China to US)/worker | −0.050 | −0.026 | −0.047 | −0.138 | 0.367 | −0.138 |
| | (0.746) | (0.685) | (0.823) | (1.190) | (0.560) | (0.651) |
| $R^2$ | 0.42 | 0.35 | 0.52 | 0.44 | 0.75 | 0.60 |

- For most other specs (+ persistence paper), $\kappa = \nu$ seems fine!

# Welfare impact with unemployment

- Main result: positive welfare effects, but smaller than CDP

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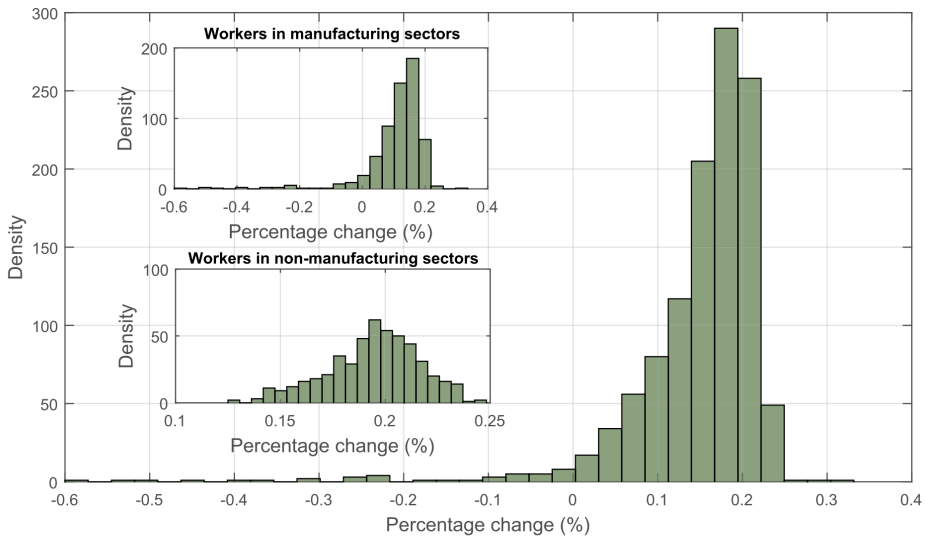
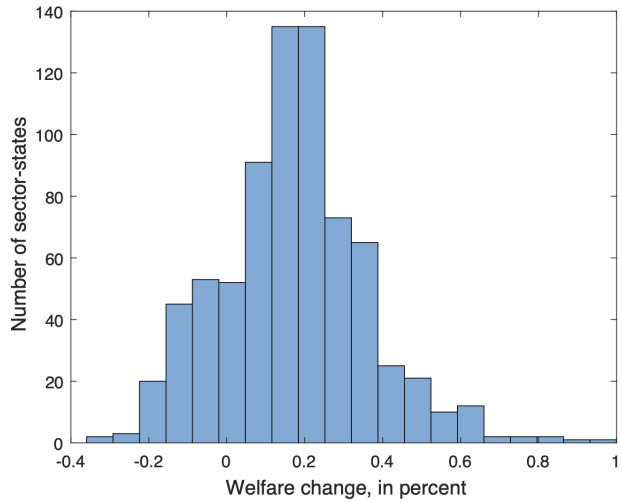



FIGURE 10.—Welfare effects of the China shock across U.S. labor markets. Note: The figure presents the




- Makes sense... but clearly an overstatement still, given risk sharing!
- cf large cost of business cycle with uninsured unemployment

# Monetary and fiscal policy

- Other limitation of this setting: can only study token monetary policy (eg constant nominal GDP), and not at all fiscal policy
- But these are very relevant questions!
  - What implications of trade with China for monetary policy, given impacts on inflation, reallocation, unemployment?
  - How can fiscal policy respond? Trade assitance, etc
- Requires breaking hand-to-mouth assumption; have model with full distribution of agents in each sector-region cell
- Recent advances in computation (Auclert, Majic, Rognlie, Straub) make these types of regional HANK models feasible to solve!
  - "Sequence-space Jacobian" becomes "dynamic hat algebra" in the case of only hand-to-mouth agents and pure discrete choice

# Concluding thoughts

- Great paper! Very well done and very clear
- Unemployment is clearly a first-order issue for the China shock. But are DWNR the way to go?
- Embracing heterogeneity even more, and moving beyond dynamic hat algebra, could increase quantitative realism