

Global Supply Chains in the Pandemic

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Cross-Border Supply Chains Transmit Shocks

- Covid-19 led to lockdowns of varying intensity across the world
- Most of the world interconnected by cross-border supply chains
- This leads to a number of questions:
 - ① How much does supply-chain transmission contribute to pandemic-GDP drop?
 - ② Should supply chains be “renationalized”?
 - ③ Does unilateral reopening mitigate the effect of the shock?

What We Do

- ① Build a quantitative model with trade and production
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 - shock calibration: work-from-home intensity + country lockdown stringency
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- 3 “Resilience” counterfactuals: “pandemic” shock in autarky, “key” sectors renationalized

Framework in Brief

- Influence matrix: only require observed shares and relevant elasticities

$$\ln \mathbf{H} = \underbrace{(\mathbf{I} - \mathbf{G})^{-1}}_{\text{Global GE}} \underbrace{\mathbf{\Pi}^{\circ} \mathbf{\Delta}^{-1}}_{\text{Domestic Labor Mkt GE}} \ln \boldsymbol{\xi}$$

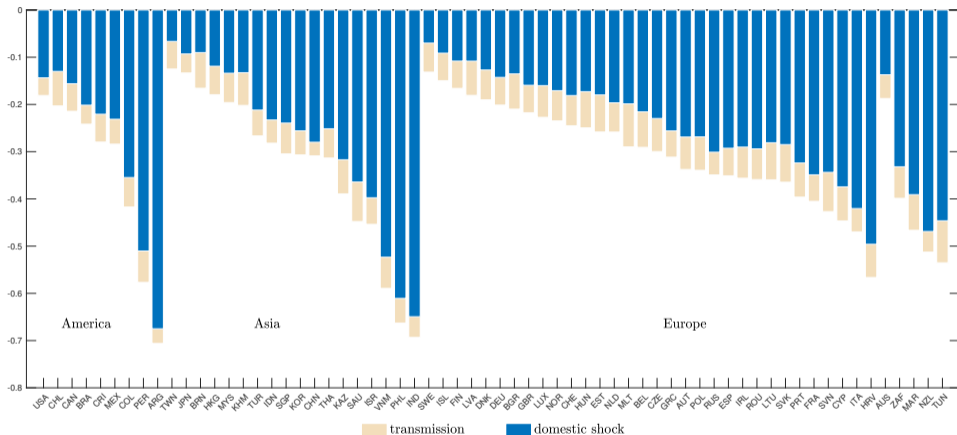
- Domestic shocks vs transmission

$$\ln V_n = \sum_{j=1}^J \omega_{nj} (1 - \alpha_j) \eta_j \ln H_{nj} = \underbrace{\sum_{\ell} s_{n\ell} \ln \xi_{\ell}}_{\mathcal{D}_n \text{ Domestic Influence}} + \underbrace{\sum_{m \neq n} \sum_{\ell} s_{m\ell} \ln \xi_{\ell}}_{\mathcal{T}_n \text{ Foreign Transmission}}$$

- Trade vs Renationalization

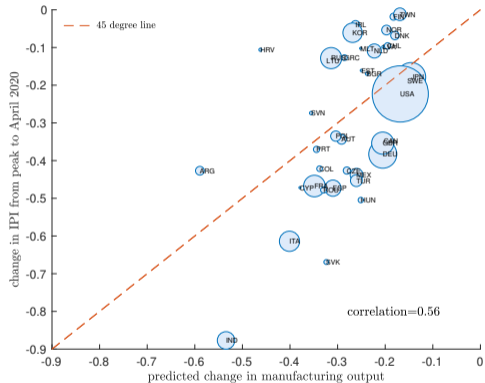
$$\ln V_n - \ln V_n^R = \underbrace{\sum_{\ell} (s_{n\ell} - s_{n\ell}^R) \ln \xi_{\ell}}_{\text{Change in Domestic Influence}} + \mathcal{T}_n$$

Results: GDP Responses

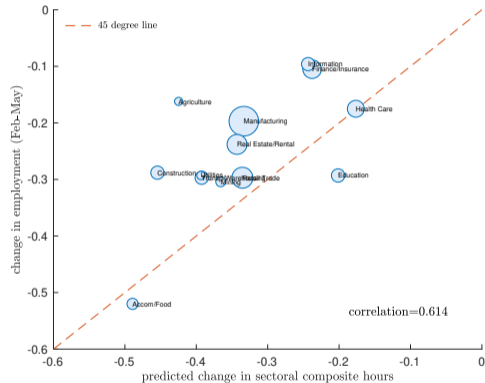


- labor shock: $\ln \xi_{n\ell} = -(1 - \text{work from home}_\ell) \times f(\text{GRT}_n)$
- GDP impacts large and heterogeneous: avg -32.6%
- role of production network: avg 23% of decline due to transmission

Model Fit



Industrial Production



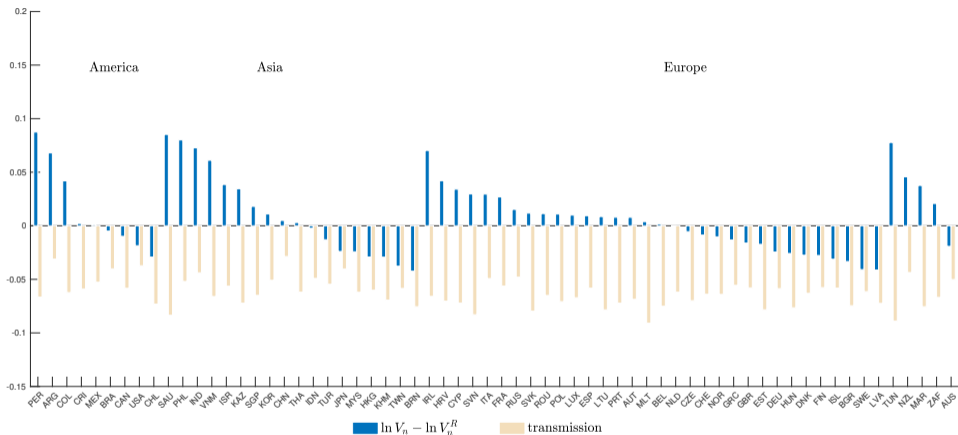
US Sectoral Employment Declines

Renationalization



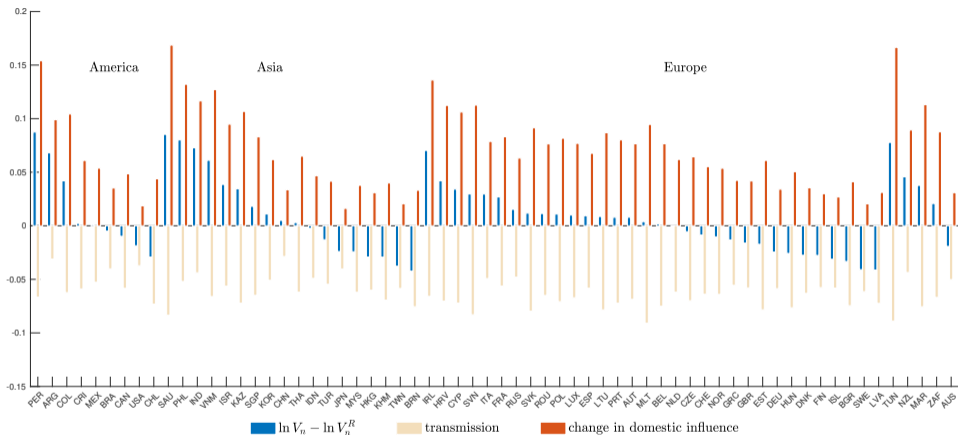
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Conclusion

- Covid-19 lockdown driven labor supply shock generates large GDP declines
 - model captures well observed declines in IP, cross-sector employment
 - 23% of effect due to transmission through global supply chains
- Renationalization unlikely to make economies more resilient to pandemic shocks
 - trade allows countries to “import” looser lockdowns abroad
 - conclusions similar with renationalization of individual sector supply chains
- (In paper:) Unilateral reopening by large countries has significant mitigation effects
 - U.S. reopening increases GDP of other countries by 0.08%-1.57%