

# Exposure(s) to Trade and Earnings Dynamics: Evidence from the Collapse of Finnish-Soviet Trade

Costinot, Sarvimäki, and Vogel

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# Summary

- Approach

- Compare outcomes for workers whose initial firms sold a larger or smaller share of output to the USSR in 1989 (before cancellation of trade agreement)
- Heterogeneity in this comparison in locations with larger or smaller share of regional output sold to USSR in 1989

- Empirical findings

- Workers with more initial-firm exposure to USSR had relative earnings reductions
- Larger gap in locations with higher average exposure

- Interpretation

- Downward wage rigidity explains temporary employment reduction and slow wage reduction following shock

# Contribution

- Incorporates two emerging trends in the trade and labor literature
  - Institutional details of labor markets and imperfect labor market adjustment
  - Focus on dynamics of labor market responses to trade shocks
- Introduces downward wage rigidity
  - An excellent idea, largely neglected in prior literature (concurrently Rodríguez-Clare, Ulate, and Vasquez 2022, presented yesterday)
  - Implies distinct dynamics from industry/location moving costs or frictional unemployment

# Wage Rigidity Mechanisms

- Model of wage rigidity is very simple and reduced-form

$$\dot{W}_t = \gamma(\bar{W}_t - W_t)$$

- Meant to capture a variety of underlying microeconomic mechanisms
  - Long-term contracts, either explicit or implicit – firm owners insure workers  
(Barro 1977)
  - Efficiency wages: wage cuts lower worker productivity  
(Keynes 1936; Summers 1988; Bewley 1999)
  - Trade unions may prioritize employed insiders over unemployed outsiders  
(Shister 1943)
- **Recommendation:** briefly survey these mechanisms to introduce wage rigidity into the trade and labor literature and guide future work

# Wage Rigidity Magnitude

- What magnitude wage reduction is implied by the USSR shock?

$$d \ln \bar{W}_t = \frac{d \ln \Phi_t}{\sigma} = -\frac{1}{\sigma} \sum_j \varphi_j S_j = -\frac{S_m}{\sigma}$$

$$\text{where } \varphi_j = \frac{\phi_{jt}}{\sum_{j'} \phi_{j't}} = \frac{\ell_{jt}}{\sum_{j'} \ell_{j't}}$$

- With  $\sigma \geq 1$ , market-clearing wages fall by at most market exposure
- 90<sup>th</sup> percentile of market exposure  $S_m$ 
  - Working-age population: 0.007
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- Is downward wage rigidity strong enough in Finland that it will bind when market clearing wages would fall by 2% or less?

# Wage Rigidity Magnitude

Empirical evidence on Finnish wage rigidity from Vainiomäki (2020)

- Observed wage changes
  - For job-stayers in consecutive years, 16% experience nominal wage declines
  - Average wage decline for these workers is 8.1%
- Maximum-rigidity scenario
  - All workers are job-stayers, or new hires face same rigid wages as stayers
  - Feasible yearly average wage decline: 1.3% ( $= 0.16 \cdot 0.081$ )
- After parametric measurement error adjustment following Dickens et al. (2007)
  - Increased rigidity
  - Administrative data: parametric adjustment exaggerate degree of rigidity (Elsby and Solon 2019)

# Wage Rigidity Magnitude

- Plausible downward rigidity binds in many Finnish markets
- In some markets, shocks may be small enough that wage rigidity is not binding

**Recommendation:** consider magnitudes of shocks relative to observed extent of wage rigidity to gauge plausibility that wage rigidity is binding / restrict to cases where binding is plausible.



# Identification

- Shock measure:  $s_i$  = firm's exports to the USSR as a share of total firm sales
- Design: compare outcome growth for workers whose initial firm sold a larger vs. smaller share of output to the USSR

$$\Delta y_{it} = \beta_t s_i + \text{Controls}'_i \zeta_t + \varepsilon_{it}$$

- Concern: firms exporting more output to the USSR likely export more output to other international destinations, on average
- Implication: any developments in the global economy will load on  $\beta_t$ , potentially biasing its level and influencing its dynamics

# Identification

- Example of concern: exchange rate changes

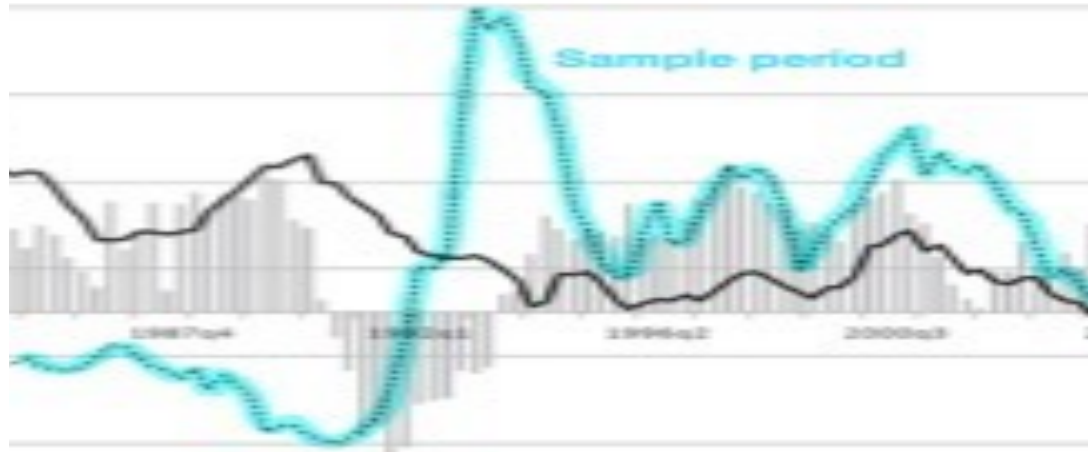


- 1985-1991 steady appreciation
- 1992 devaluation upon float
- 1992-1995 value remained low
- 1996-1999 European ERM
- 1999 onward Euro peg

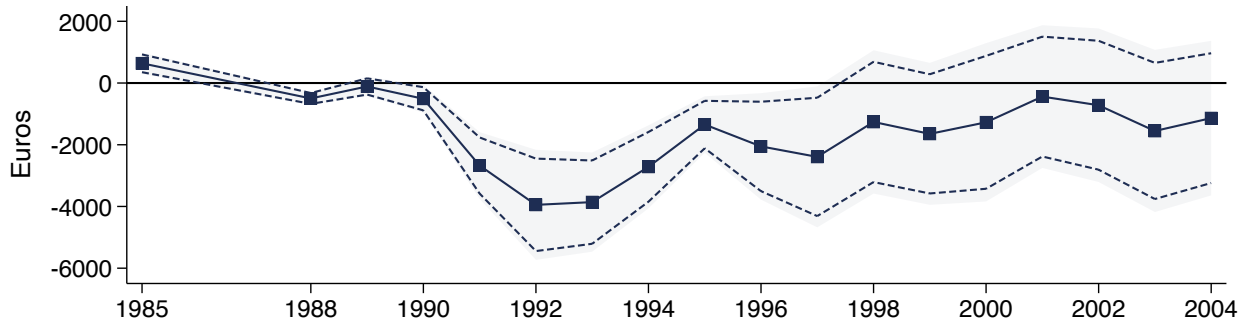
Fig. 1 Cycle, inflation and exchange rate in Finland

Cheikh and Rault (2016)

# Identification



Period of low currency value corresponds to 1992-1995 recovery in exposed workers' relative earnings

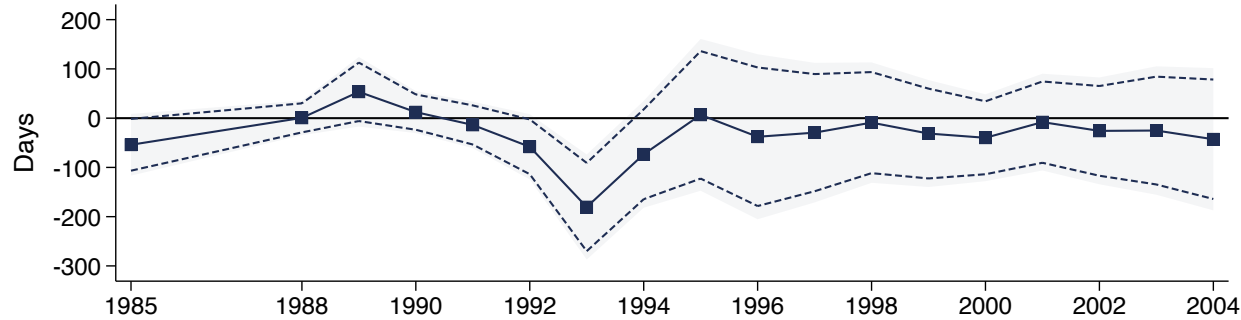


**Figure 4:** Direct Effect of Worker Exposure ( $s_i$ ) on Earnings

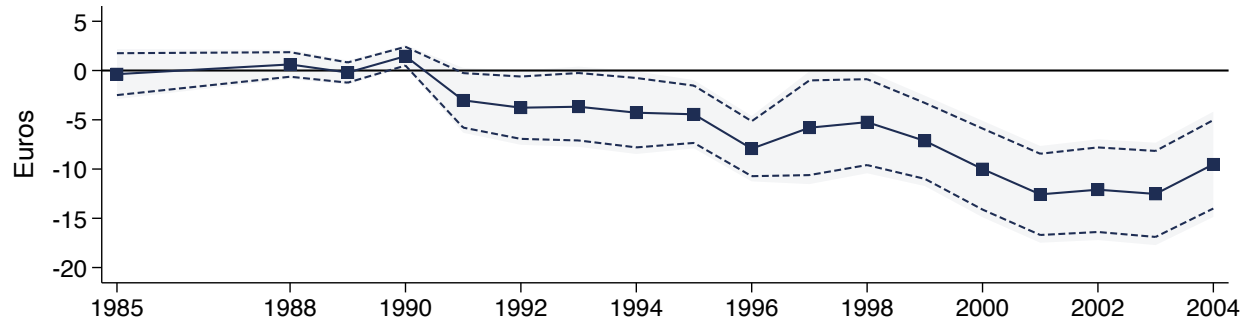
# Identification

- **Recommendation:** control for firms' initial export share of firm sales
  - Compare outcomes for workers initially at firms with similar engagement with the global economy but that happen to sell more or less to the USSR vs. other destinations
  - Akin to “incomplete shares” problem in shift-share shock designs, and with same fix
- May help resolve unexpected dynamics in market-level analysis and in heterogeneous effects by market exposure

# Identification



(a) Direct Effect of Market Exposure ( $S_m$ ) on Days Employed



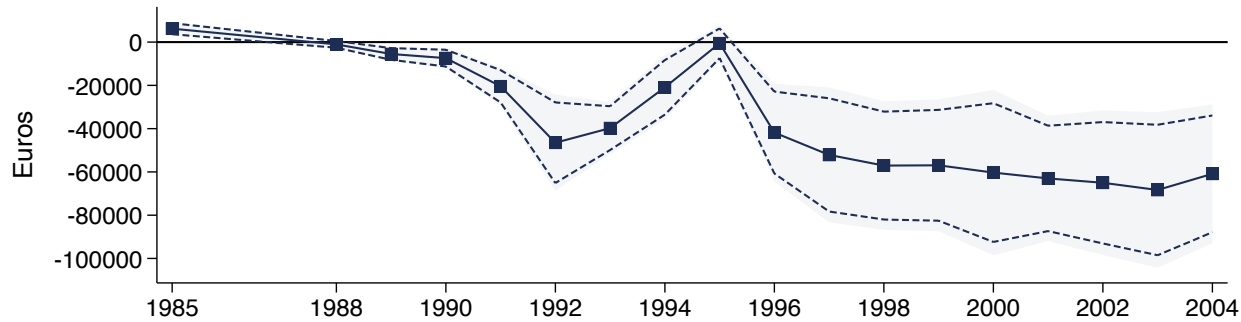
(b) Direct Effect of Market Exposure ( $S_m$ ) on Hourly Wage

1993-1995  
Relative employment  
recovers while relative  
wages are flat

1996-2004  
Relative employment  
flat while wages decline

**Figure 8:** Market Exposure and Labor Market Dynamics

# Identification



Larger effects of initial-firm exposure in more exposed markets fades during 1992-1995 and returns thereafter

**Figure 5:** Interaction Effect of Worker and Market Exposure ( $s_i \times S_m$ ) on Earnings

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UN Comtrade



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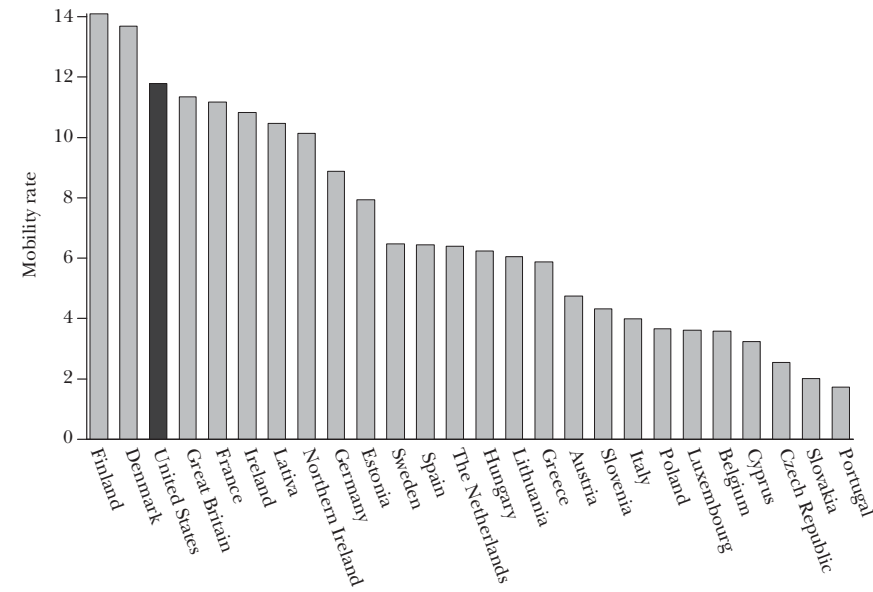
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Figure 5

Molloy, Smith, Wozniak (2011)

Fraction of the Population in 2005 that Moved Residence in the Previous Year



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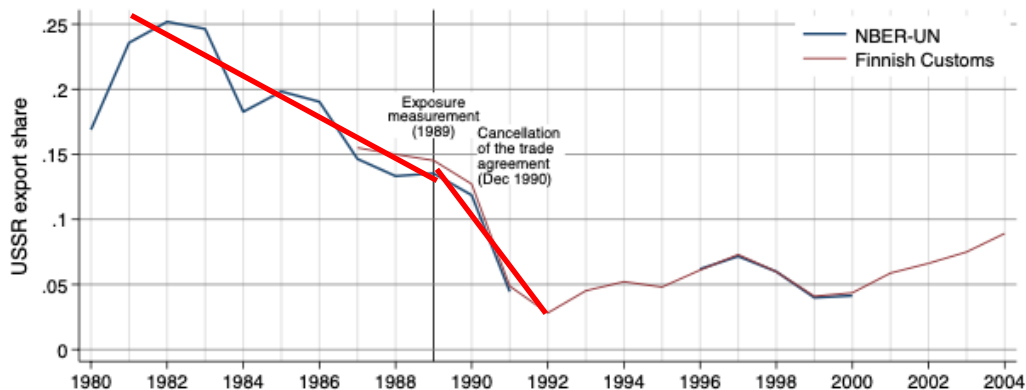
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  - Finns are particularly geographically mobile
    - Distinction between Figure 8 and Dix-Carneiro and Kovak (2017) – former attributes new location outcome to worker's initial location, latter to the new location
- **Recommendation:** investigate these margins of adjustment
  - Addresses possibility of dynamic shock vs. dynamic labor market adjustment
  - Does wage rigidity apply to continuing workers only or new hires as well?

# Pre-Trends

- Normally hope to find no pre-trend (as here), but there is a strong pre-trend in the shock that should affect outcomes



**Figure 1:** The USSR Shock

Notes: Figure 1 reports the share of Finnish exports sold to the USSR from 1980 to 2004.

Pre-shock (1980-1989)  
slope is about 40% of  
post-shock (1989-1992)  
slope

Why don't we see the  
shock pre-trend in the  
outcome pre-trends?

# Summary

- Very nice paper introducing wage rigidity into the empirical study of trade effects on labor markets
  - Exceedingly clear and well written
  - Nice empirical context with impressive data
- Recommendations
  - Consider whether/where the shock is of sufficient magnitude for wage rigidity to bind
  - Compare firms with similar international exposure but different USSR exposure (control for export share of sales)
  - Examine firm and worker adjustment margins
  - Think about the absence of outcome pre-trends given shock pre-trends

# Smaller points

1. Consider citing papers that consider the relationships between industry and market shocks (paralleling your firm and market shocks). Examples include Helm (2020 REStud), Hakobyan and McLaren (2016 REStat), and Acemoglu, Autor, Dorn, Hanson, and Price (2016 JoLE)
2. Consider citing papers using longitudinal data to track outcomes over time. Examples include Utar (2018), Dix-Carneiro and Kovak (2019), Dauth Findeisen and Suedekum (2014,2021), Pierce, Schott, and Tello-Trillo (2020)
3. An additional citation focused on dynamic labor market responses to trade shocks: Dix-Carneiro, Pessoa, Reyes-Heroles, and Traiberman (2022)
4. Figure 5 would be more easily interpreted with an alternative interaction specification. Rather than showing the coefficient on the interaction, you could interact  $s_i$  with indicators for each quartile of  $S_m$ . This would give you four profiles to show on Figure 5, with each interpreted identically to Figure 4. This will also show if the interaction effect is roughly monotone, as expected.
5. On p.4 and 15 you frame the results as the reduced form of an IV where the USSR shock is an IV for being laid off. Given the exclusion restriction violation that would be present in this hypothetical analysis (workers can experience reduced earnings without being laid off – even with the limited scope for wage reduction assumed in the paper), I recommend against this framing. More broadly, the link to the displaced worker literature strikes me as tenuous.
6. P.5 mentions the Finnish government tightly managed Soviet trade to maintain trade balance. How was this implemented? Were particular firms given export licenses? If firms with different characteristics or performance are more or less likely to receive a license, this would raise identification concerns.
7. This may be for another paper, but I'd look into cross-plant within-firm spillovers. I've experienced this in my own pre-econ career, when the dot-com bust tanked portions of the business producing physical products that were in high demand.
8. I recommend a robustness test where you use more aggregate local labor market definitions. Given Finland's small population, the municipalities used in the paper look too small. If local labor market equilibrium regularly spans adjacent municipalities, you will end up with bias toward zero because the situation when running this too-disaggregate analysis is isomorphic to classical measurement error in X. Another way to get at the question of aggregation is to check the commuting share of each location and see how it compares to the cutoffs used to generate CZs in other countries.



# Smaller points

9. You mention this on p.14, but I'd highlight on p.11 that your control vector in equation (1) includes municipality fixed effects. This makes clear that you control for the level of each variable in the interaction term. A similar point applies to equation (2) on p.12.
10. You may want to consider comparing your results to those for a sample of workers with lower labor force attachment. My paper on CUSFTA with Peter Morrow finds important differences in effects between workers with high and low labor force attachment. Since wage rigidity may differ for these two groups, you may find something interesting for your broader story.
11. The two panels of Figure 8 should use the same sample. You should limit panel (a) to the sample of workers for whom you can observe wages in panel (b), so quantity and price adjustments are comparable.
12. Extremely small points
  1. Although its interpretation is obvious, you should define the dot notation starting on p.22.
  2. Use large braces in equation (5)
  3. Double check the confidence intervals on the figures. Using t-stats, the 95% interval should be 19% larger than the 90% interval, and it doesn't look that way on the pictures.