# Adjusting to Globalization in Germany

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## Introduction

- What are the distributional effects of globalization and trade?
- Does increased foreign competition lead to job losses at home?
- Who are the winners and losers of increased international trade?
  – And are the gains and losses of economic significance?
- How did individual workers adjust to globalization?

- Germany is one of the most open economies in the world, so export and import shocks can be expected to have large effects on the labor market.
- We consider two trade shock episodes which hit the German economy:
  1. The fall of the iron curtain and the rapid transformation of countries in Eastern Europe
  2. The rise of China and its integration into the world economy

## Contribution

**Workers in industries with growing export exposure have lasting earning gains:**

1. We analyze at which margin export shocks are capitalized into earnings gains: on-the-job with the *original employer* or in a *different firm* but within the original industry?
2. Detect meaningful heterogeneity in the export adjustment mechanisms: Are gains from exports reaped by all workers or do better skilled workers more easily adapt?

**Import competition has only muted total effects on worker earnings:**

3. Are the negative consequences of import competition equally distributed across all exposed industries or do they depend on worker or firm characteristics?
4. Do laid-off workers have higher long-run losses if they worked in import competing industries?

## Data and Measurement

### Individual Data

Data source: 30% sample of the **Integrated Labor Market Biographies** from the IAB

- We identify all individuals in either 1990 or 2000:
  1. between 22 and 54 years old
  2. full-time job in manufacturing, wage above marginal-job threshold
  3. with a tenure of at least two years
- Resulting dataset: complete employment biographies of more than 2.4 million individuals in 1991-2000 or 2001-2010

### Trade Exposure

Data source: United Nations Commodity Trade Statistics Database (**UN Comtrade**)

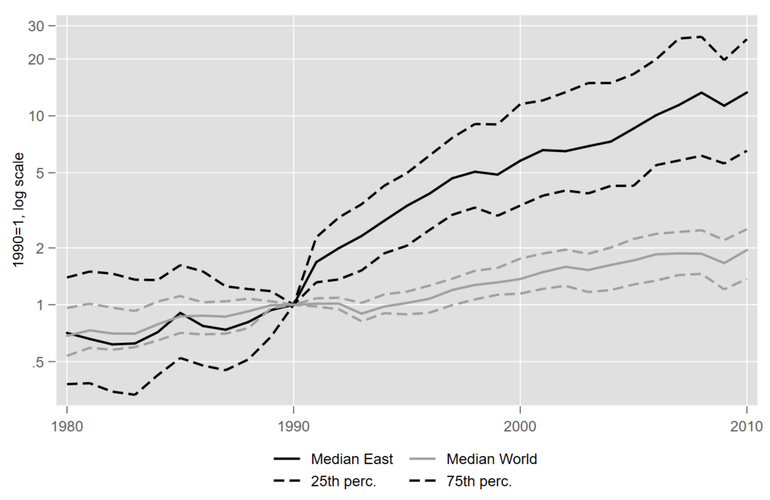

**Figure 1:** Industry level **exports** to the East vs. World

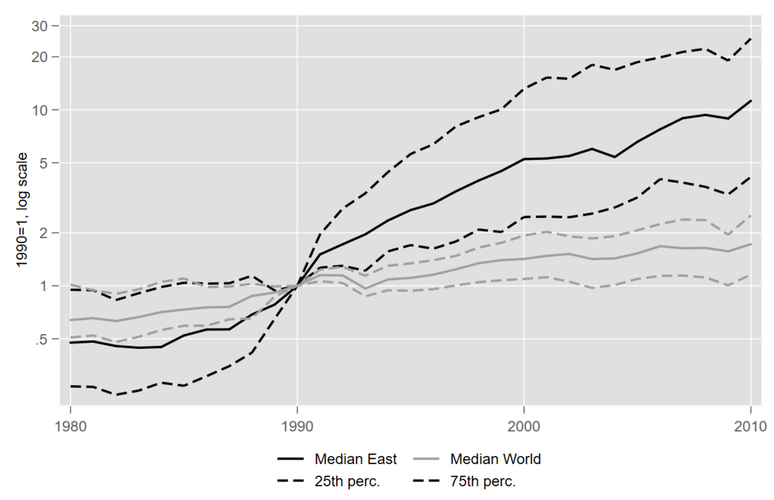

**Figure 2:** Industry level **imports** from the East vs. World

Rising Eastern trade exposure affects workers depending on industry affiliation ($j$):

$$ImE_{jt} = \frac{IM_{jt}^{EAST\to D}}{\overline{w}_{j(t-1)}L_{j(t-1)}} \quad \text{and} \quad ExE_{jt} = \frac{EX_{jt}^{D\to EAST}}{\overline{w}_{j(t-1)}L_{j(t-1)}} \qquad (1)$$

**Table 1:** Descriptive overview

| | 1990-2000 | | 2000-2010 | |
|---|---|---|---|---|
| observations | 1,230,897 | | 1,207,948 | |
| | mean | ( sd ) | mean | ( sd ) |
| **[A] Outcomes, cumulated over 10 years following base year** | | | | |
| 100 x earnings / base year earnings | 873.6 | ( 414.7 ) | 906.2 | ( 372.1 ) |
| days employed | 2925 | ( 1032 ) | 3179 | ( 881 ) |
| **[B] Trade exposure** | | | | |
| $\Delta$ export exposure | 20.211 | ( 16.874 ) | 34.933 | ( 28.079 ) |
| p25-p75 interval | [ 9.185 ; 26.997 ] | | [ 17.989 ; 50.216 ] | |
| $\Delta$ import exposure | 22.806 | ( 26.198 ) | 28.169 | ( 54.724 ) |
| p25-p75 interval | [ 7.018 ; 32.341 ] | | [ 4.999 ; 30.522 ] | |

## Estimating the Effects of Trade Exposure on Worker Careers

How did increasing exposure to trade with China and Eastern Europe affect the earnings of German manufacturing workers in the subsequent decade?

$$\frac{\sum_{k=1991}^{2000} E_{ijk}}{E_{ij1990}} = \boldsymbol{\alpha}\cdot\mathbf{x}'_{ijt} + \beta_1\cdot\Delta ImE_j + \beta_2\cdot\Delta ExE_j + \phi_{REG(i)} + \phi_{J(j)} + \phi_t + \epsilon_{ijt} \qquad (2)$$

**Identification**
Danger of parallel unobservable shocks that simultaneously affect trade and labor market outcomes. IV approach (Autor, Dorn, and Hanson, 2013; Dauth, Findeisen, and Suedekum, 2014): Instrument the exposure variables with trade flows of Aus, NZ, Jap, Sin, Can, Swe, Nor, UK vis-a-vis *the East*.

## Results

### Adjusting to Rising Import and Export Exposure

**Table 2:** Trade exposure and individual earnings

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | All employers | | Same sector | | Other Sector |
| Same 2-dig industry | | yes | yes | no | no |
| Same employer | | yes | no | no | no |
| Export Exposure | 0.5245*** | 0.3528* | 0.3017** | 0.0344 | -0.1644* |
| | (0.084) | (0.213) | (0.149) | (0.062) | (0.092) |
| Import Exposure | -0.1038** | -0.5469*** | -0.1159** | 0.1141*** | 0.4449*** |
| | (0.043) | (0.111) | (0.055) | (0.023) | (0.063) |

Notes: 2SLS results based on 2,438,845 workers. The **outcome variables** are 100 x earnings normalized by earnings in the base year, cumulated over the ten years following the base year. All models control for demographics, base year earnings, plant size, broad industries and commuting zones. Standard errors, clustered by industry x commuting zone x base year in parentheses. Levels of significance: *** 1 %, ** 5 %, * 10 %.

**Magnitudes:** (Median annual income in 1990: 42,870 €)
Earnings difference of a worker at the $75^{th}$ percentile and one at the $25^{th}$ percentile in 1990-2000:
Import exposure: $= -0.10\times(32.34-7.02)\times 42,870/100 =$ **-1,085€** (2000-2010: **-1,206 €**)
Export exposure: $0.52\times(27.00-9.19)\times 42,870/100 =$ **+3,990€** (2000-2010: **+7,865 €**)

### Heterogeneous Effects

**Adjustment by tercile of worker skills (Card, Heining, and Kline, 2013):**

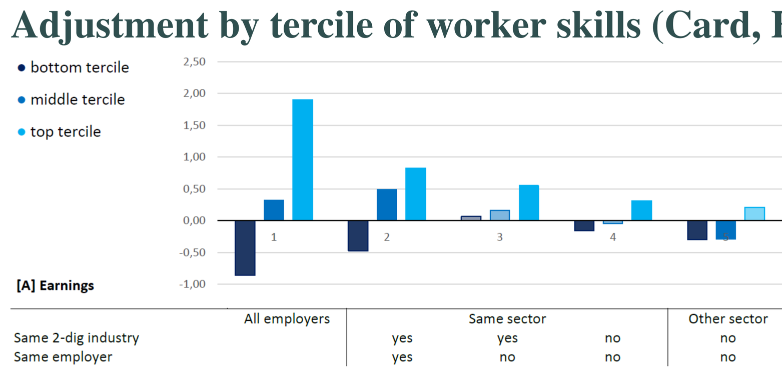

**Figure 3:** Export exposure

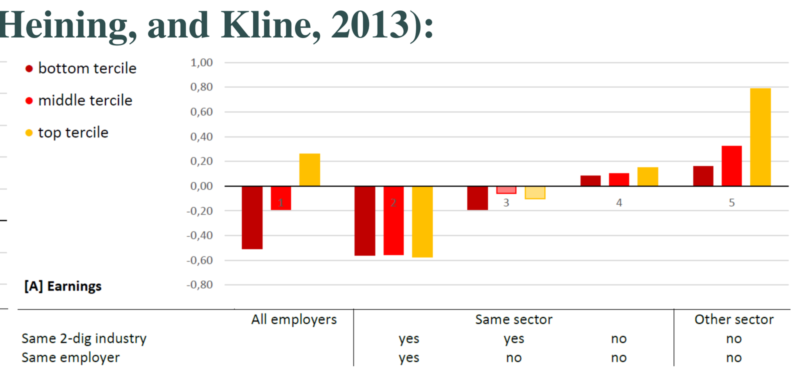

**Figure 4:** Import exposure

**Adjustment by tercile of firm quality (Card, Heining, and Kline, 2013):**

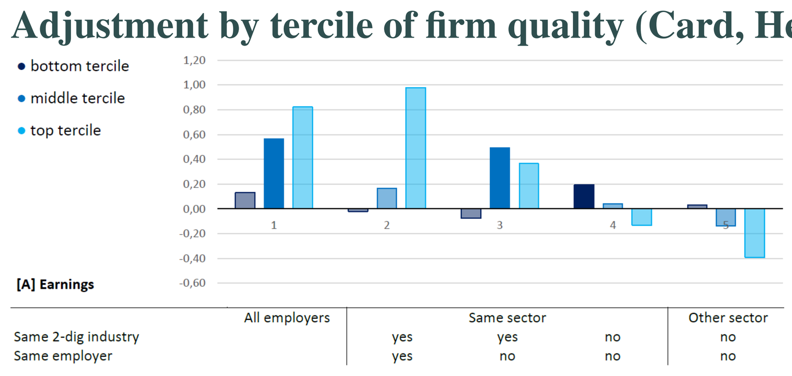

**Figure 5:** Export exposure

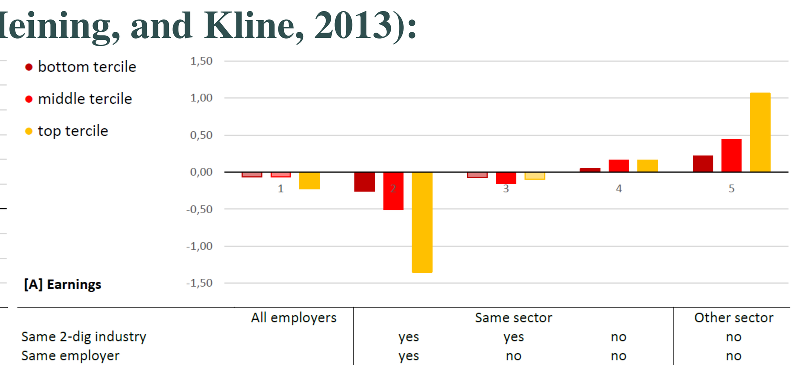

**Figure 6:** Import exposure

### Adjusting to Job Displacement

The cost of experiencing a mass-layoff in different industries:

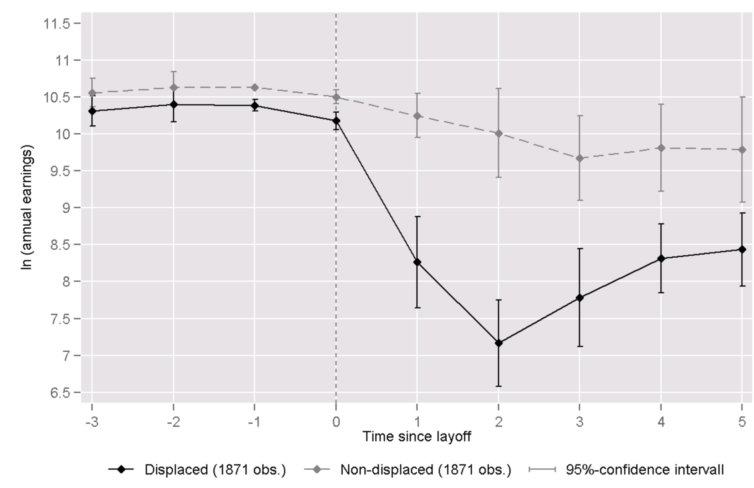

**Figure 7:** TV and radio receivers

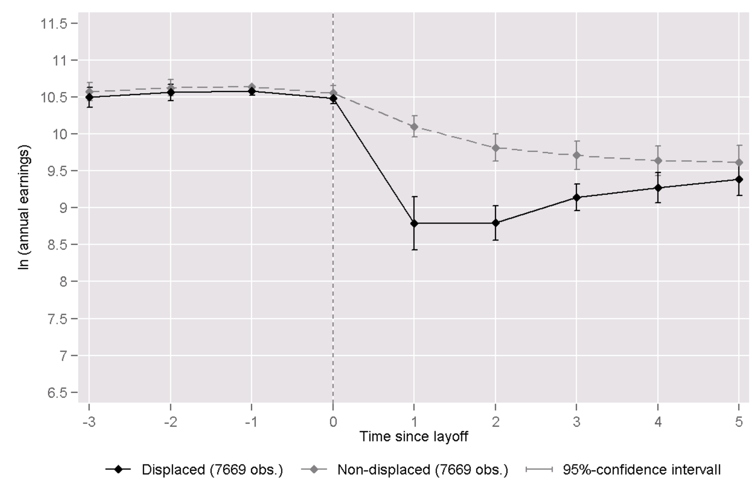

**Figure 8:** Special purpose machines

**Across all industries:**
The average worker loses 38 percent of income due to being displaced. Each %-point of additional import exposure increases this loss by additional 0.25 %-points. (Effect of exports is also negative but insignificant.)

## Conclusions

- Workers in export intensive industries gain on *two different margins*:
  1. on-the-job
  2. by moving to a better paying firm within the same sector
- Better skilled workers benefit more. They also switch firms more often.
- Import competition has negative but small effects:
  1. mostly destroys worker rents at the highest paying firms
  2. better skilled workers adapt more easily by moving to the service sector
- Workers in import competing industries adapt more slowly after a layoff (because their specific human capital is less valuable)

## References

Autor, David H., David Dorn, and Gordon H. Hanson (2013). "The China syndrome: Local labor market effects of import competition in the United States". In: *American Economic Review* 103(6), pp. 2121–68.

Card, David, Joerg Heining, and Patrick Kline (2013). "Workplace heterogeneity and the rise of West German wage inequality". In: *Quarterly Journal of Economics* 128(3), pp. 967–1015.

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