Cross-border Investment, Heterogeneous Workers, and Employment Security: Evidence from Germany

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Research motivation

- large and growing share of global economic activity accounted for by multinationals

	1990	2005	Increase (%)
Sales of foreign affiliates	6, 026	21, 721	260
Exports of foreign affiliates	1, 498	4, 319	188
Exports of goods and services	4, 414	12, 954	193

Value at current prices (in billion US$)
Source: UNCTAD, WIR 2010

- impact on the labour market likely

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Research questions

1. What is the effect of inward and outward foreign direct investment (FDI) on individual employment security?
2. How does this effect vary by
   - worker characteristics (age, sex),
   - source/destination region of FDI,
   - FDI margin (extensive/intensive)?

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Labour market effects of FDI – theoretical considerations I

No clear-cut theoretical predictions due to various motives for and types of FDI as well as potential third-party effects

Outward FDI

- horizontal FDI may replace domestic production and exports (e.g. Helpman et al., 2004)
- vertical FDI may replace upstream production stages but also lead to productivity improvements (Grossman and Rossi-Hansberg, 2008)
- in addition, vertical FDI may also affect labour demand in (domestic) supplying firms

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Labour market effects of FDI – theoretical considerations II

Inward FDI

- may create new jobs and generate productivity spillovers
- may crowd out domestic production (Kosova, 2009) or lead to reduced innovation incentives for technological laggards (Aghion et al., 2009)

Labour market effects of FDI – existing literature I

Outward FDI

- studies using firm-level data on MNEs (e.g. Konings and Murphy, 2006, for Europe; Desai et al., 2009, for the US)
- study using linked employer-employee data (Becker and Muendler, 2008)
- mixed results regarding substitutability between foreign and domestic labour
  - ▸ Harrison and McMillan (forthcoming): distinction between horizontal and vertical FDI motives important
  - ▸ Muendler and Becker (2010): distinction between extensive and intensive margin important

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Labour market effects of FDI – existing literature II

Inward FDI

- mainly concerned with spillover effects on the domestic economy or with direct wage and employment effects of foreign takeovers

Contributions

- micro-macro study: effects work throughout industry (taking into account competition effects, spillovers, partly also upstream/downstream linkages)
- focus on labour market transitions instead of net employment
  $\rightarrow$ short-term adjustment dynamics
  (cf. related literature on international outsourcing)
- estimation of heterogeneous effects for different worker types (skill, age)
- inward and outward FDI
- extensive and intensive margin
- differentiation by source and destination region

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FDI – data source

- AMADEUS database
  - provided by Bureau van Dijk and Creditreform
  - information on financial data as well as ownership and subsidiary information for European firms
  - covers more than 1,000,000 German firms and more than 20,000 (virtually all) foreign subsidiaries, as well as 90% of domestic sales
  - time period covered: 2000–2007
  - computed figures close to official statistics

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FDI indicators – measurement

Inward FDI = Market share of foreign-owned firms on the German market in each industry (cf. Javorcik, 2004):

$$IFDI_{jt} = \frac{\sum_{i \in j} s_{ijt} D_{ijt}(foreignowner)}{\sum_{i \in j} s_{ijt}}$$

s_{ijt} denotes real sales of firm i in industry j in the year t and $D_{ijt}(foreignowner)$ takes the value of one if a foreign firm holds a majority share in firm i, and zero otherwise.

Outward FDI = Ratio of foreign affiliate sales to domestic sales in each industry:

$$OFDI_{jt} = \frac{\sum_{i \in j} foreignsales_{ijt}}{\sum_{i \in j} s_{ijt}}$$

Individual-level data

- Employment Panel of the German Federal Employment Agency (BA Employment Panel)
- large micro data set on individual workers' labour market histories derived from administrative data
- labour market states
  - "employment" := contributing to the social security system
  - "non-employment" := not in dependent employment
- various worker (and establishment) characteristics
- quarterly data for the time period 1998–2007

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The econometric framework

- model the exit probability from employment to non-employment
- discrete hazard model with semi-parametric estimation of the baseline hazard (complementary log-log model)
- Moulton (1990) problem dealt with by clustering at the industry-year level

Sampling

- stock sampling (left-truncation of spells dealt with by using employment information for 1998–2001)
- full-time workers aged 18–64 in regular employment (i.e. no apprentices, part-time employed workers, marginal employed, and individuals who are on leave due to military service, child bearing etc.)

Explanatory variables:

- employment duration
- worker characteristics: age, sex, tenure, level of education/training, nationality
- firm characteristics: establishment size, East/West German location, share of high-skilled workers (degree from university or polytec)
- industry-level variables: **FDI indicators**, industry output (log production value, Y_j), net export intensity ($\frac{EXP_j - IMP_j}{Y_j}$), share of R&D expenditures in industry output ($\frac{R\&D_j}{Y_j}$), log capital stock; source: OECD STAN data base
- full set of industry and wave dummies

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Estimation results: specifications

Dependent variable: Hazard of transiting to non-employment

Explanatory variables:

1. IFDI & OFDI
2. IFDI & OFDI, worker age
3. IFDI & OFDI, worker skills/education
4. IFDI & OFDI, source and destination regions
5. IFDI & OFDI, extensive vs intensive margin

Estimation results: baseline

	Coefficients	s.e.
IFDI	0.7115^{***}	(0.2748)
OFDI	0.2997^{**}	(0.1293)
Observations	2,242,036	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Economic significance of the results

Percentage change for 1 within-industry standard deviation

	Baseline
IFDI	1.94***
OFDI	1.81**

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Estimation results: OFDI & IFDI, worker age

	Coefficients	s.e.	1-s.d.-effect (%)
IFDI * Age 18-25	0.8381***	(0.2699)	2.29
IFDI * Age 26-35	−0.3799	(0.3392)	−1.02
IFDI * Age 36-45	−0.8020**	(0.3397)	−2.14
IFDI * Age 46-55	0.6296	(0.4970)	1.71
IFDI * Age 56-64	3.4328***	(0.3698)	9.71
OFDI * Age 18-25	0.3506**	(0.1403)	2.12
OFDI * Age 26-35	0.1774	(0.1280)	1.07
OFDI * Age 36-45	0.1370	(0.1255)	0.82
OFDI * Age 46-55	0.1340	(0.1485)	0.80
OFDI * Age 56-64	0.6855***	(0.2564)	4.18
Observations	2,242,036		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Wald test, H0: IFDI* Age equal, p= 0.000

Wald test, H0: OFDI* Age equal, p= 0.014

Estimation results: OFDI & IFDI, worker skill

	Coefficients	s.e.	1-s.d.-effect (%)
IFDI * Skill: low	0.7820***	(0.2845)	2.13
IFDI * Skill: medium	0.7474***	(0.2862)	2.04
IFDI * Skill: high	0.3367	(0.4244)	0.91
OFDI * Skill: low	0.4074***	(0.1487)	2.46
OFDI * Skill: medium	0.3240**	(0.1412)	1.95
OFDI * Skill: high	-0.0177	(0.1452)	-0.11
Observations	2,242,036		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Wald test, H0: IFDI* Skill equal, p= 0.259
Wald test, H0: OFDI* Skill equal, p= 0.016

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Estimation results: IFDI source and OFDI destination regions

	Coefficients	s.e.	1-s.d.-effect (%)
IFDI EUW	0.4665**	(0.2354)	1.39
IFDI NON-EUW	0.2304	(0.2777)	0.44
OFDI EUW	0.3179	(0.3943)	1.58
OFDI CEE	2.5299***	(0.9504)	2.12
OFDI US	−0.1255	(2.5320)	−0.10
OFDI ROW	−1.2327*	(0.6726)	−1.23
Observations	2,242,036		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Wald test, H0: IFDI* region equal, p= 0.317
Wald test, H0: OFDI* region equal, p= 0.007

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Estimation results: extensive and intensive margin

	Coefficients	s.e.	1-s.d.-effect (%)
IFDI ext.	0.7451***	(0.1852)	2.89
IFDI int.	−0.1885	(0.2964)	−0.60
OFDI ext.	0.6593**	(0.3081)	1.13
OFDI int.	0.1737**	(0.0827)	0.94
Observations	2,242,036		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Wald test, H0: IFDI* margin equal, p= 0.000
Wald test, H0: OFDI* margin equal, p= 0.140

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Conclusion

- analysis of the impact of FDI on employment security in Germany using a micro-macro approach
- results:
  1. IFDI and OFDI are both positively associated with transitions to non-employment, i.e. a reduction in employment security
  2. heterogeneous effects for workers:
     - ★ young and old workers negatively affected, some positive effects for middle-aged workers (esp. for IFDI)
     - ★ workers with low and medium skills negatively affected
  3. OFDI to CEE and IFDI from Western Europe drives the results
  4. effects mainly driven by extensive margin for IFDI
  5. effects are quantitatively small overall, but large for some worker groups

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Thank you for your attention!

FDI indicators – descriptives

	mean	s.d. total	s.d. within ind.
IFDI	0.130	0.076	0.027
IFDI EUW	0.102	0.065	0.032
IFDI Non-EUW	0.028	0.032	0.038
IFDI int.	0.097	0.062	0.060
IFDI ext.	0.033	0.045	0.054
OFDI	0.051	0.080	0.017
OFDI EUW	0.035	0.066	0.030
OFDI CEE	0.011	0.019	0.019
OFDI US	0.002	0.010	0.049
OFDI ROW	0.003	0.012	0.008
OFDI int.	0.039	0.071	0.008
OFDI ext.	0.012	0.020	0.010
Observations		2,242,036	

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Estimation results: IFDI region and worker skill

	Coefficient	s.e.
IFDI EUW * Skill: low	0.8967***	(0.2778)
IFDI EUW * Skill: medium	0.8301***	(0.2987)
IFDI EUW * Skill: high	0.3720	(0.5074)
IFDI Non-EUW * Skill: low	0.5146	(0.4971)
IFDI Non-EUW * Skill: medium	0.4733	(0.2993)
IFDI Non-EUW * Skill: high	−0.1282	(0.5138)
OFDI	0.3256**	(0.1329)
Observations	2,242,036	

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Estimation results: OFDI region and worker skill

	Coefficient	s.e.
IFDI	0.4065*	(0.2236)
OFDI EUW * Skill: low	0.5540	(0.5761)
OFDI EUW * Skill: medium	0.2281	(0.4131)
OFDI EUW * Skill: high	0.7582	(0.6949)
OFDI CEE * Skill: low	3.4732***	(0.9933)
OFDI CEE * Skill: medium	2.6055**	(1.1504)
OFDI CEE * Skill: high	0.6964	(2.6965)
OFDI US * Skill: low	-1.7369	(3.5155)
OFDI US * Skill: medium	0.7113	(2.6314)
OFDI US * Skill: high	-5.3428	(4.3669)
OFDI ROW * Skill: low	0.2044	(1.0258)
OFDI ROW * Skill: medium	-1.4734*	(0.8435)
OFDI ROW * Skill: high	-3.6658***	(1.0080)
Observations	2,242,036	

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