Are workers more vulnerable in tradable industries?

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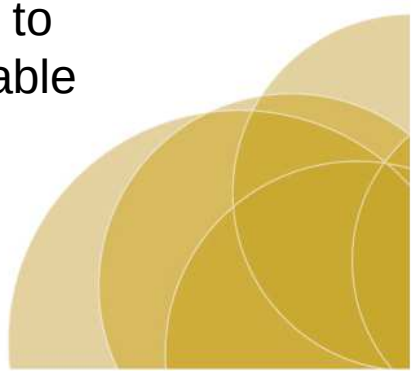
Background and aim of the paper

- Growing international trade in services
- Painful consequences for a growing amount of displaced workers in the service sector (Blinder, 2006)

- Compare the displacement costs of workers in tradable services, manufacturing, and non-tradable services
- Draws on Jensen and Kletzer (2006, 2008) who based on DWS presents descriptive evidence for the United States
- We develop their approach and use a regression framework to examine the costs of displacement in tradable and non-tradable sectors of the economy



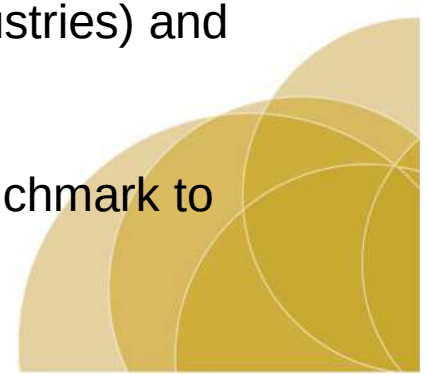
Identification of tradable services

The problem

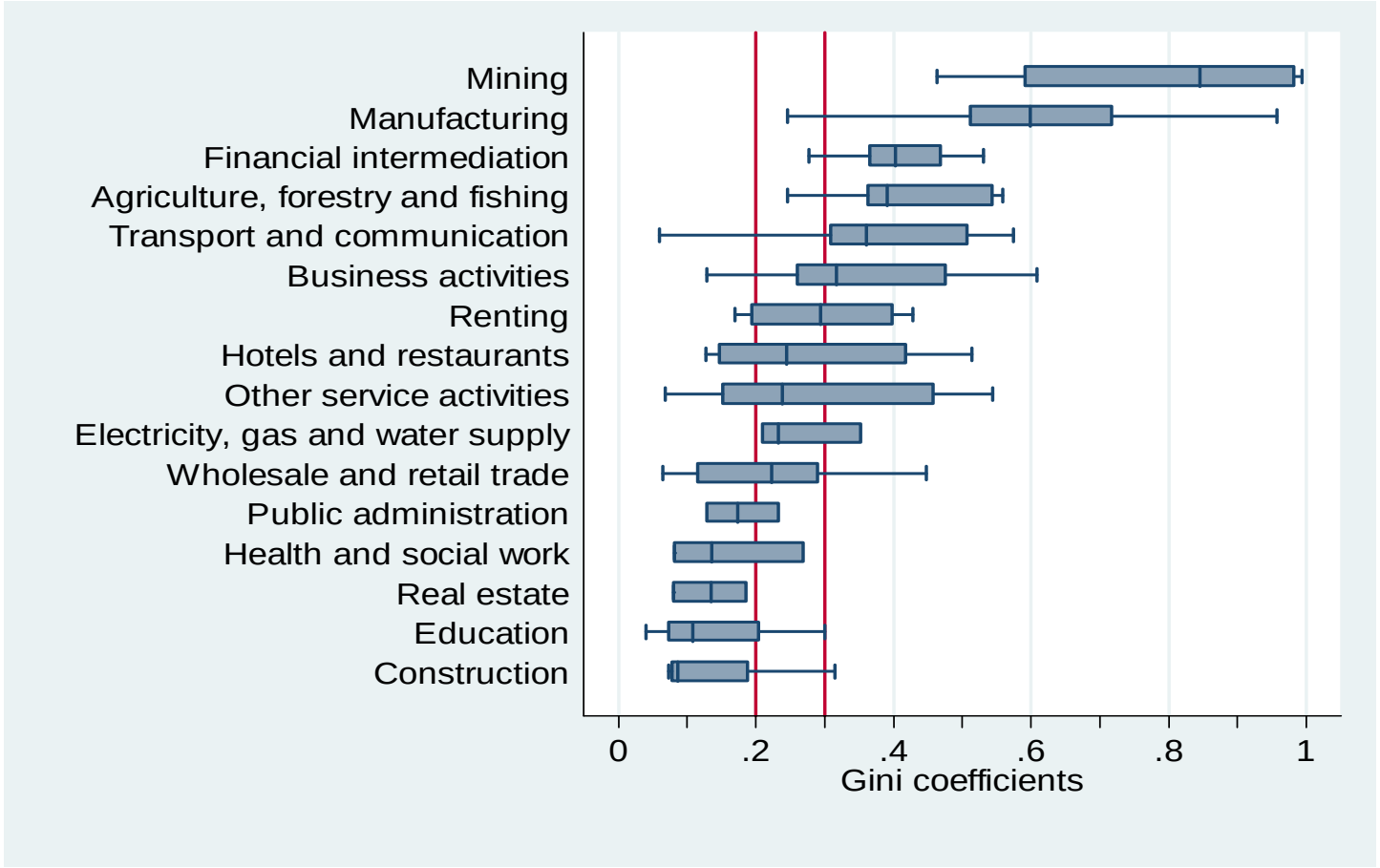
- Data on international trade in services less developed than trade in merchandise
- Which industries in the service sector are exposed to international trade?

The solution

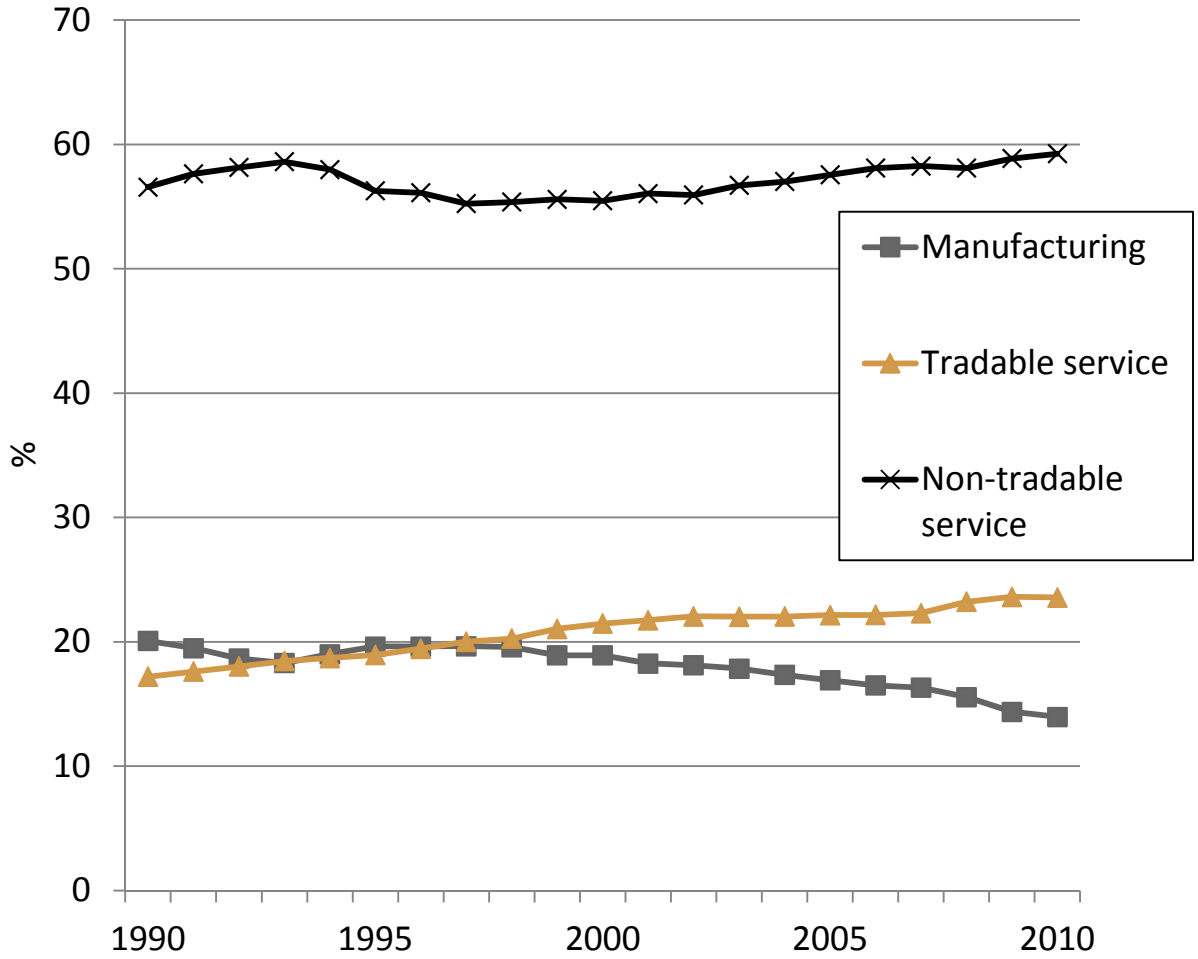
- The degree of geographical concentration of industries indicates domestic trade and potential international trade (Jensen and Kletzer, 2006)
- We calculate locational Ginis based on 3-digit NACE (172 industries) and functional labor market regions (72)
- Locational Ginis in manufacturing industries are used as a benchmark to identify service industries where international trade might exist



Locational Ginis within sectors



Employment shares of manufacturing, tradable and non-tradable services, 1990-2010



Definition of displacement

Underlying data: Linked employer-employee data based on administrative registers kept by Statistics Sweden

Definition based on the units of establishments, rather than firms (establishments more stable unit, tractable over time in registers)

Workers are classified as **displaced** if separated from an establishment between year *t*-1 and year *t* and the establishment in question has experienced either:

a) Mass dismissal: an absolute reduction in employment of 5 employees or more and a relative reduction in employment of 30% or more between year *t*-1 and year *t*

b) Establishment closure: ceased to operate between year *t*-1 and year *t*

Displacement event is attributed to year *t*. The two events are combined into a single category of displacement.

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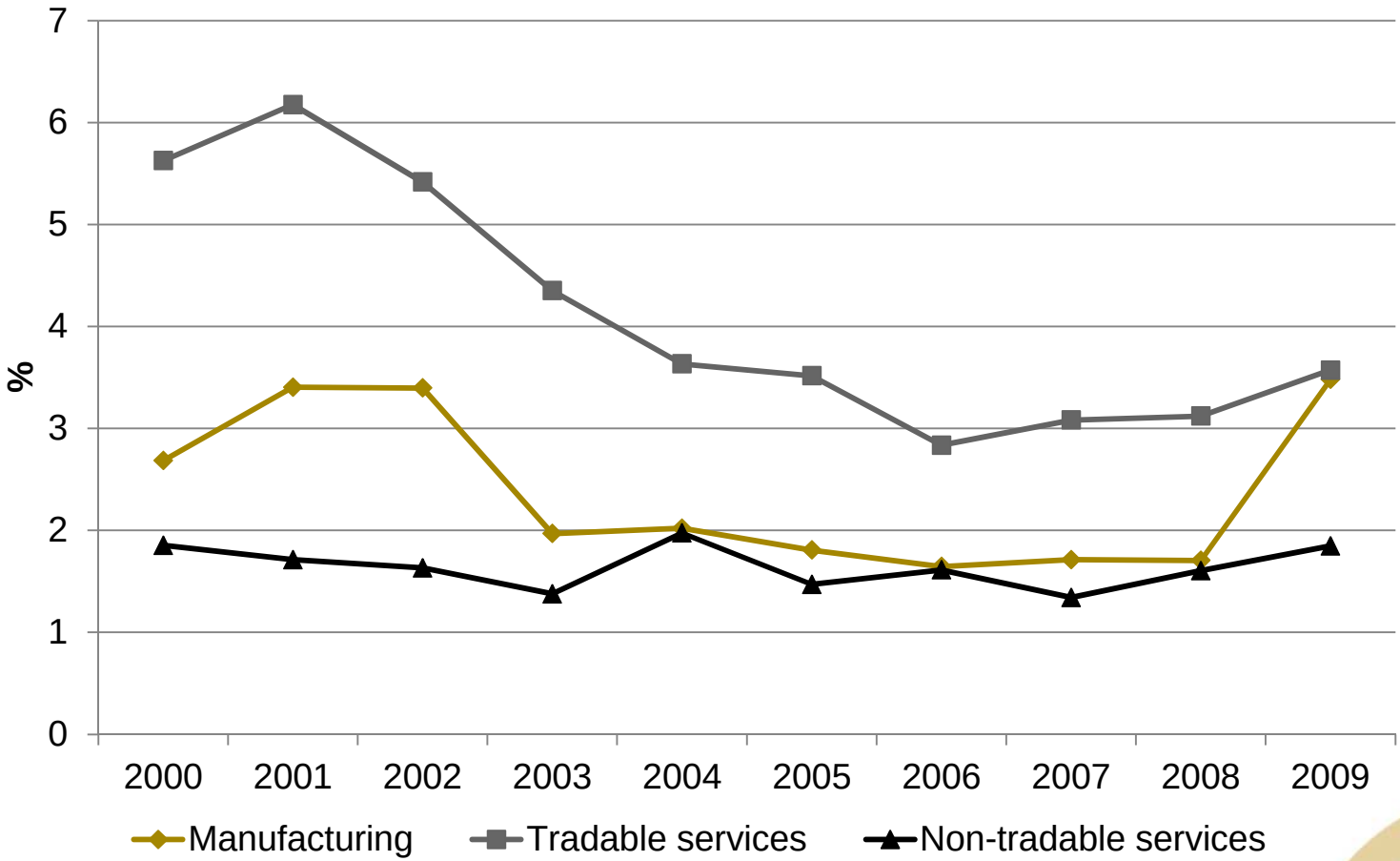
Restrictions on the samples used

- Age: 20-64 / 25-54 years at year *t*-1
- Employment status: employees (excluding employers and self-employed) at year *t*-1
- Tenure: 1 year or more of tenure with current employer at year *t*-1
- Establishment size: employed at an establishment with 10 or more employees at year *t*-1
- Industry: Major categories public administration, private households with employed persons, and extra-territorial originations and bodies (ISIC Rev 3 group L, O, and Q) at year *t*-1 excluded

Displacement rates by sectors, 2000-2009



Econometric analysis of displacement costs

1. **Probability of displacement**

2. **Probability of re-employment**

Data for 2000-2009. 10 % random sample fulfilling base sample restrictions. Pooled sample with 2.1 million individuals. 49,000 (2.3%) classified as displaced in year *t*. 43,000 (88%) re-employed in year *t*.

Econometric analysis of displacement costs

3. The effect of displacement on earnings

Data for 2000-2005. 10 % random sample fulfilling base sample restrictions. Pooled sample with 885,000 individuals observed during a ten year period *t*-5 to *t*+4. 25,000 (2.8%) in the treatment group (displaced in year *t*) and 860,000 in the comparison group (not displaced in year *t*).

- Conditional difference-in-differences-matching
- Dependent variable: Real gross annual earnings (including zero)
- In the differencing, we let the average earnings during the years *t*-3 to *t*-1 represent the pre-treatment outcome
- We compare the results from matching with those obtained with a JLS (1993) fixed-effects specification. A similar approach can be found in Couch and Placzek (2010).

Econometric analysis of displacement costs cont.

3. The effect of displacement on earnings

Match on the propensity score (using single nearest neighbor)

Include the following variables defined in year *t*-1

- age, age square, male, level of education (three categories)
- establishment characteristics (private sector and five categories of employment size)
- region of residence (eight categories)

In addition, the propensity score include pre-treatment annual earnings for the years *t*-5 to *t*-1.

Proportions of displaced workers by characteristics in different sectors, 2009

	Manufacturing	Tradable services	Non-tradable services
Level of education at t-1			
Less than secondary	0.17	0.07	0.14
Secondary	0.65	0.45	0.60
Post-secondary	0.18	0.48	0.25
Establishment size at t-1			
10-49	0.35	0.50	0.60
50-99	0.19	0.16	0.20
100-199	0.15	0.13	0.11
200-499	0.16	0.18	0.06
500+	0.15	0.02	0.03
Region of residence at t-1			
STOCKHOLM	0.06	0.39	0.27
ÖSTRA MELLANSVERIGE	0.16	0.13	0.16
SMÅLAND MED ÖARNA	0.16	0.05	0.06
SYDSVERIGE	0.11	0.13	0.14
VÄSTSVERIGE	0.27	0.17	0.22
NORRA MELLANSVERIGE	0.12	0.05	0.08
MELLERSTA NORRLAND	0.04	0.05	0.04
ÖVRE NORRLAND	0.07	0.03	0.04

Probit estimates of displacement and re-employment

	Displacement		Re-employment	
	Coef.	Sig.	Coef.	Sig.
Sector of employment at *t*-1				
Manufacturing	0,0772	**	-0,1153	**
Tradable services	0,2445	**	0,1052	**
Individual attributes at *t*-1				
Age	-0,0161	**	0,1443	**
Age square	0,0001	**	-0,0018	**
Male	0,0821	**	0,2466	**
Less than secondary education	0,0137	*	-0,2663	**
Secondary education	0,0114	*	-0,0806	**
Establishment size at *t*-1				
50-99	-0,1105	**	0,0399	
100-199	-0,1545	**	0,0855	**
200-499	-0,1814	**	0,1468	**
500+	-0,3939	**	0,2181	**
Public/privat sector at *t*-1				
Private	0,3412	**	0,1264	**
Region of residence at *t*-1				
ÖSTRA MELLANSVERIGE (SE12)	-0,1800	**	-0,0096	**
SMÅLAND MED ÖARNA (SE21)	-0,3243	**	-0,0852	**
SYDSVERIGE (SE22)	-0,2002	**	-0,1203	**
VÄSTSVERIGE (SE23)	-0,2364	**	-0,0760	
NORRA MELLANSVERIGE (SE31)	-0,2329	**	-0,0601	
MELLERSTA NORRLAND (SE32)	-0,1806	**	-0,0149	*
ÖVRE NORRLAND (SE33)	-0,2685	**	-0,1051	

Notes: The model specifications also include time dummies that control for year-specific effects.
**, * indicates significance at the 1 and 5 percent level.

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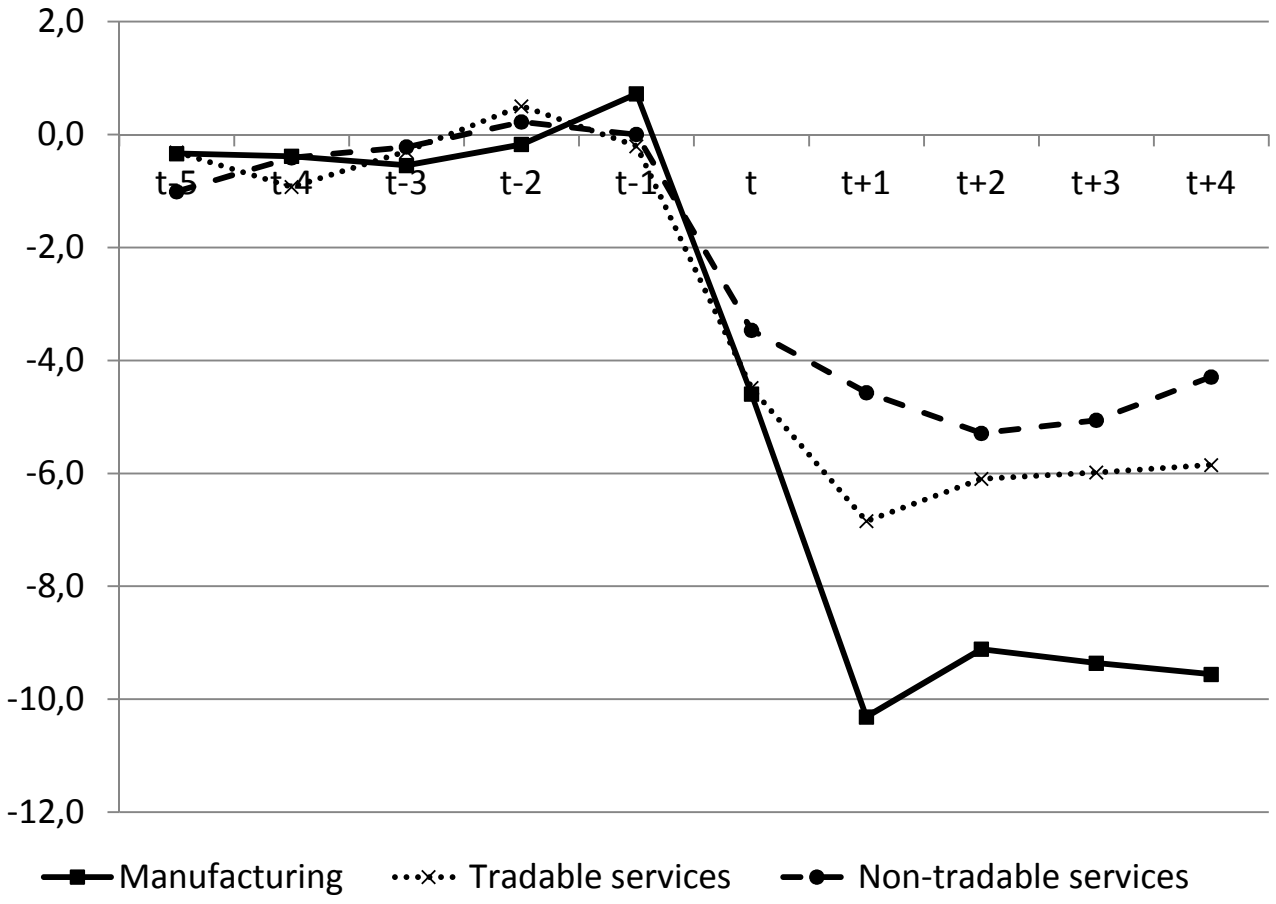
Probit estimates of displacement and re-employment

	Displacement	Re-employment
Sector of employment at t-1		
Manufacturing	0.0772**	-0.1153**
Tradable services	0.2445**	0.1052**

Notes: Reference category is non-tradable services. **, * indicates significance at the 1 and 5 percent level.

Effect of displacement on annual earnings by sector (%). Matching estimates.



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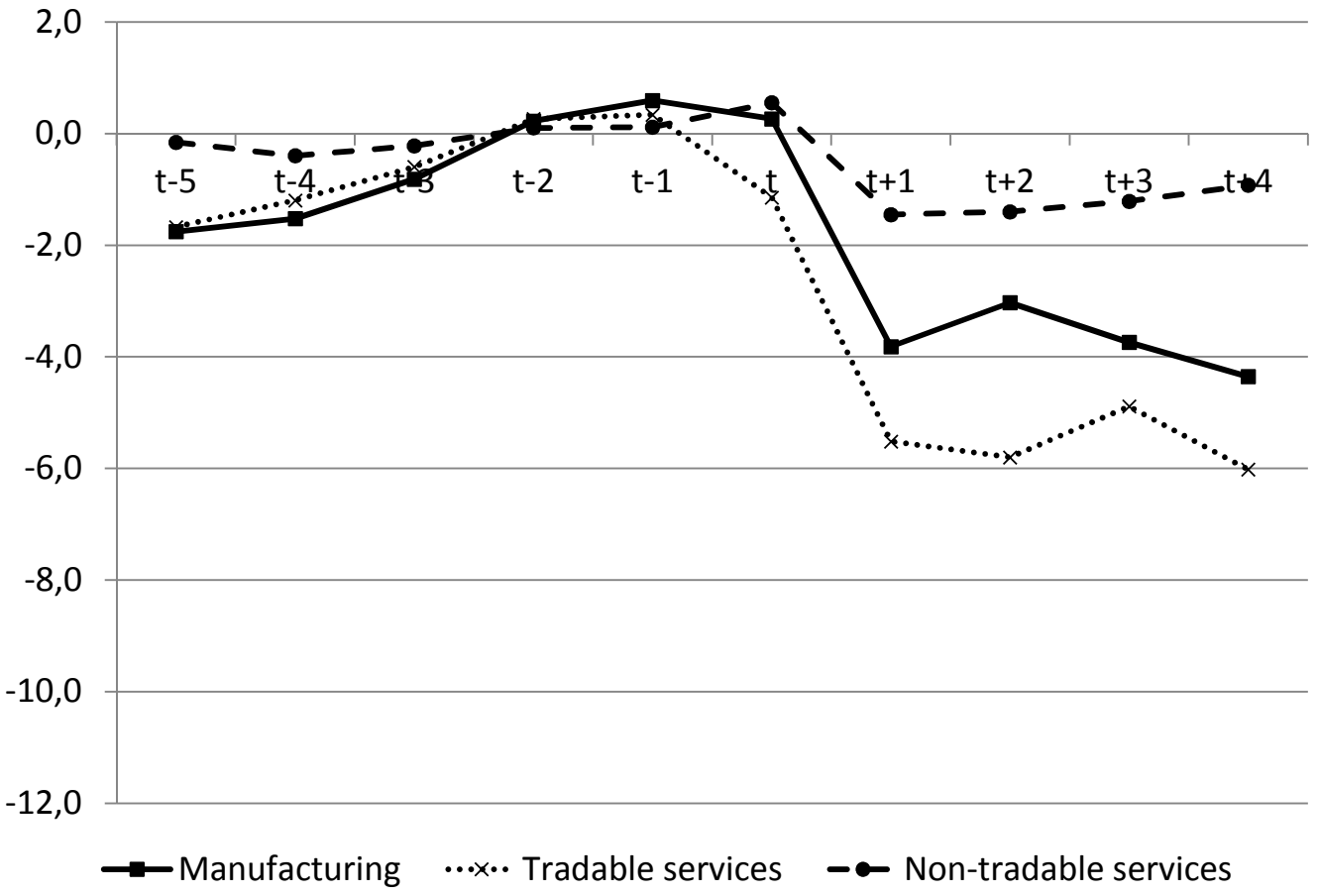
Effect of displacement on annual earnings by sector (%). Conditional of being employed during the years *t* to *t+4*



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Concluding remarks

- The probability of displacement is higher in the tradable sectors, particularly in tradable services
- The prospect of re-employment are most promising for workers displaced from tradable services and least encouraging for workers displaced from manufacturing
- The relatively low probability of re-employment for workers displaced from manufacturing translates into the highest earnings losses during and following displacement for these workers
- Despite promising re-employment opportunities, workers displaced from tradable services suffer fairly high earnings losses
  Why? Loss of firm- and industry specific human capital, loss of seniority, sub-sequent jobs short-tenured?