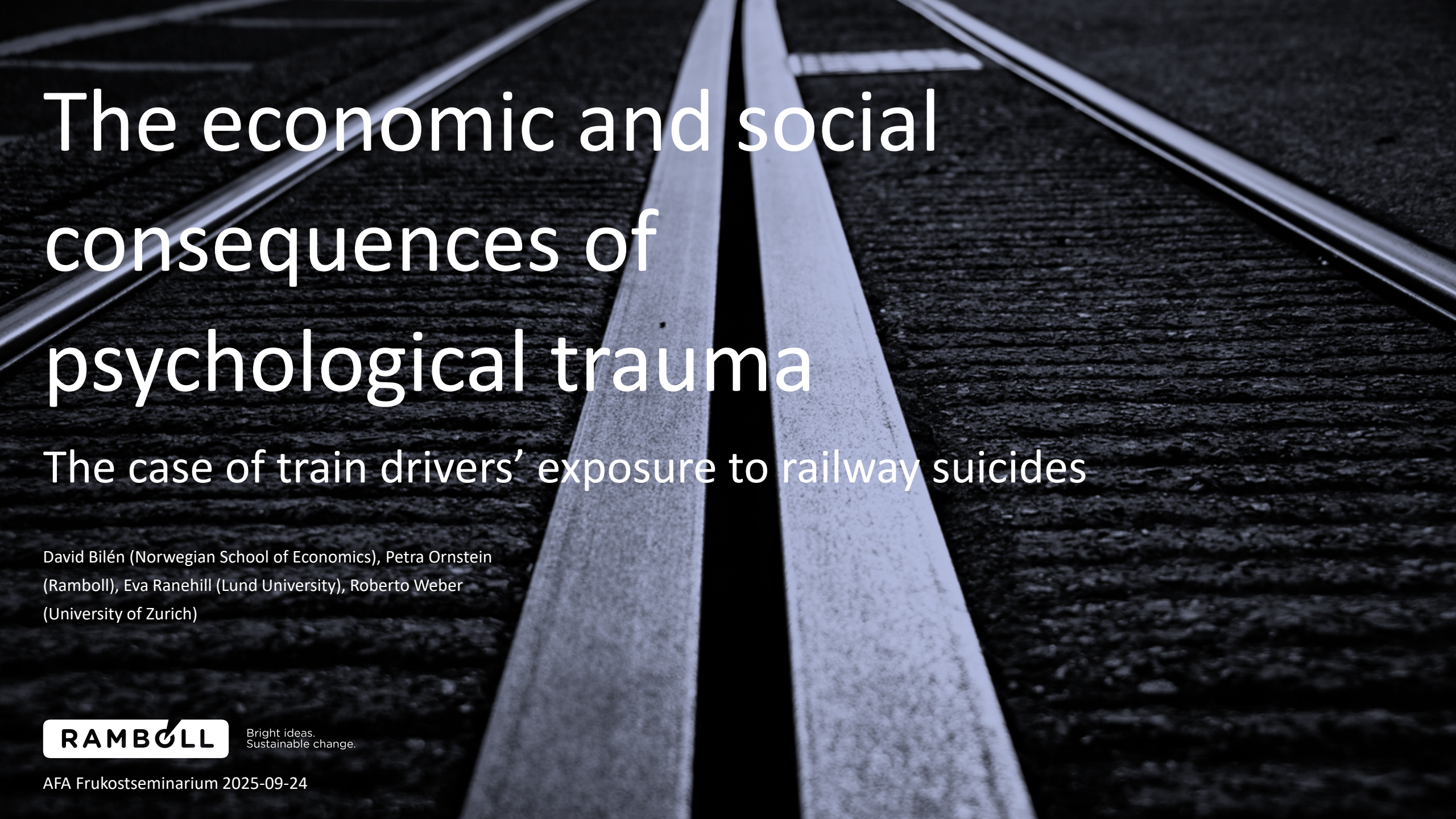

The economic and social consequences of psychological trauma

The case of train drivers' exposure to railway suicides

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AFA Frukostseminarium 2025-09-24

Motivation 1: Exposure to trauma

- Growing literature in economics exploring impact of psychological trauma on economic behaviors and outcomes.
  - macroeconomic conditions impacts investment (Malmendier & Nagel, 2011);
  - wartime experience impacts educational, economic and psychological outcomes (Blattman and Annan, 2010) and investment (Bogan, Just & Wansink, 2013)
  - criminal victimization impacts mental and physical health and economic outcomes (e.g., Cornaglia, Feldman, and Leigh, 2014; Ornstein, 2017; Bindler & Ketel, 2022)
  - family illness/deaths impact mental health and earnings (Black, Devereaux & Salvanes, 2016; Berg, Vikström & Lundborg, 2017; Persson & Rossin-Slater, 2018; Breivik & Costa-Ramon, 2021)

This work

- Focus on understanding the mechanisms and impact of traumatic experiences on mental health
- Closest to this study are recent papers exploring victimization through school shootings (Rossin-Slater et al., 2020; Pienkny, et al., 2024; Cabral, et al., 2024)

Motivation 2: Mental health at work

- Mental health problems have large and rapidly increasing costs
- Largest share related to productivity loss from paid employment.
- A main cause of sick leave in many Western countries. These episodes associated with large human capital loss.

➢ Psychological well-being at work is an important economic and health related challenge for individual employees and for our societies.

Sources: The Lancet 2020, OECD data, The Swedish Social Insurance Agency, 2024 and 2025

Motivation 2: Mental health at work

- Growing evidence that occupational factors are major contributors of poor mental health
  - Large proportions of workers report being exposed to severe time pressure or overload at work (*European Agency for Safety and Health at Work*)
  - Poor mental health more common among workers in precarious employment, with poor work conditions, those exposed to discrimination or harassment etc.
  - Large literatures outside economics (e.g., in occupational medicine, organizational psychology) explore association between psychosocial work environment and mental health

This work

- Part of a research agenda exploring what aspects of our work environment supports or undermines our mental health

- Most closely related to recent strand of work in economics exploring the impact of workplace characteristics and events on employee outcomes, e.g.,
  - Large negative impacts are found from work-place harassment, threat, and violence on employment, gender segregation and pay inequality *(e.g., Folke and Rickne 2022; Adams-Prassl et al. 2024),*
  - Firms with superior work environments perform better (inspections, profitability, innovation) *(Amore et al 2024),* interventions to improve work environment may impact retention and prosociality *(Alan et al., 2023)*
  - Stress, anxiety, psychiatric medication increases after mergers, especially among blue collar workers *(Bach et al. 2024)*

The problem

1. Exposure to psychological trauma is seldom random.
   - Selection makes it difficult to find a suitable comparison group.

2. Many kinds of trauma affects many aspects of life simultaneously.
   - It is difficult to isolate the impact of psychological trauma on outcomes.

This study

Uses administrative data to study the impact of exposure to railway suicides on the outcomes of train drivers in Sweden.

- Main analysis: Event study exploring if exposure to suicide accident negatively impacts mental health care uptake, occupational flight, earnings, employment, and cohabitation.

- Main contribution: Capturing the impact of purely psychological trauma while (to a large extent) addressing the problem of selection on individual characteristics.

The driver's view: 'The memory of a rail suicide never leaves you'

15 November 2017 Share

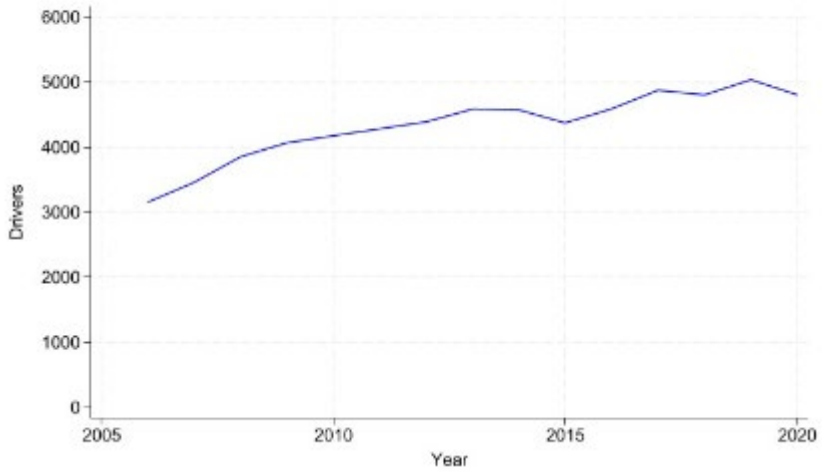
Mr Botham has been a train driver for more than 25 years

Fifteen years ago, somebody took their own life by stepping in front of the train Andy Botham was driving. The 50-year-old, from Matlock, Derbyshire, told his story to BBC Radio 5 live.

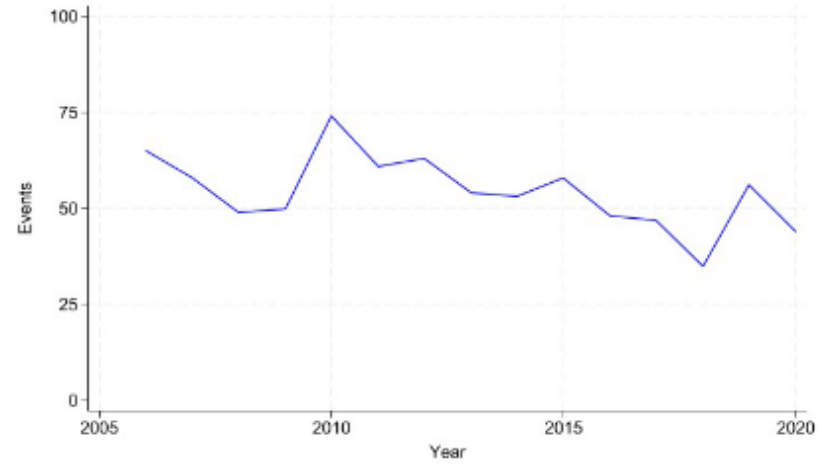
Context

- Number of train drivers in Sweden increased from 3000 to 5000 over the course of the study period from 2005 to 2020.
- The industry comprises about five large companies, a few medium sized and several small.
- Slightly above 50 railway suicides occur in Sweden yearly, exposing 1-2 percent of drivers each year.

(a) Drivers per year



(b) PUT Events per year



Data sources and information

Train drivers' outcomes – Individual level panel data

- Rich information on sociodemographic characteristics (e.g., age, gender, marital status), labor market outcomes (e.g., occupation, income, unemployment) and workplace characteristics, Statistics Sweden.
- Records of prescription medication, inpatient and specialized outpatient health care, the National Board of Health and Welfare

Data on railway suicides – Work-injury reports

- Employers legally required to report occupational injuries to the Work Environment Authority (WEA)
- Records contain various information to classify an accident, (often) together with a text description of the event.
- Quality check through comparison with official railroad accident reports comprising date, place and train/railroad company from the Swedish Transport Agency.

Identification train driver sample

- Detailed occupational codes allow identification of train drivers since 2005 onward.

- Restrictions
  - Registered as train driver at least two years between 2005 and 2020.
  - Not exposed to a suicide accident the first year of employment.
  - N = 8170 drivers.

Identification of treated drivers

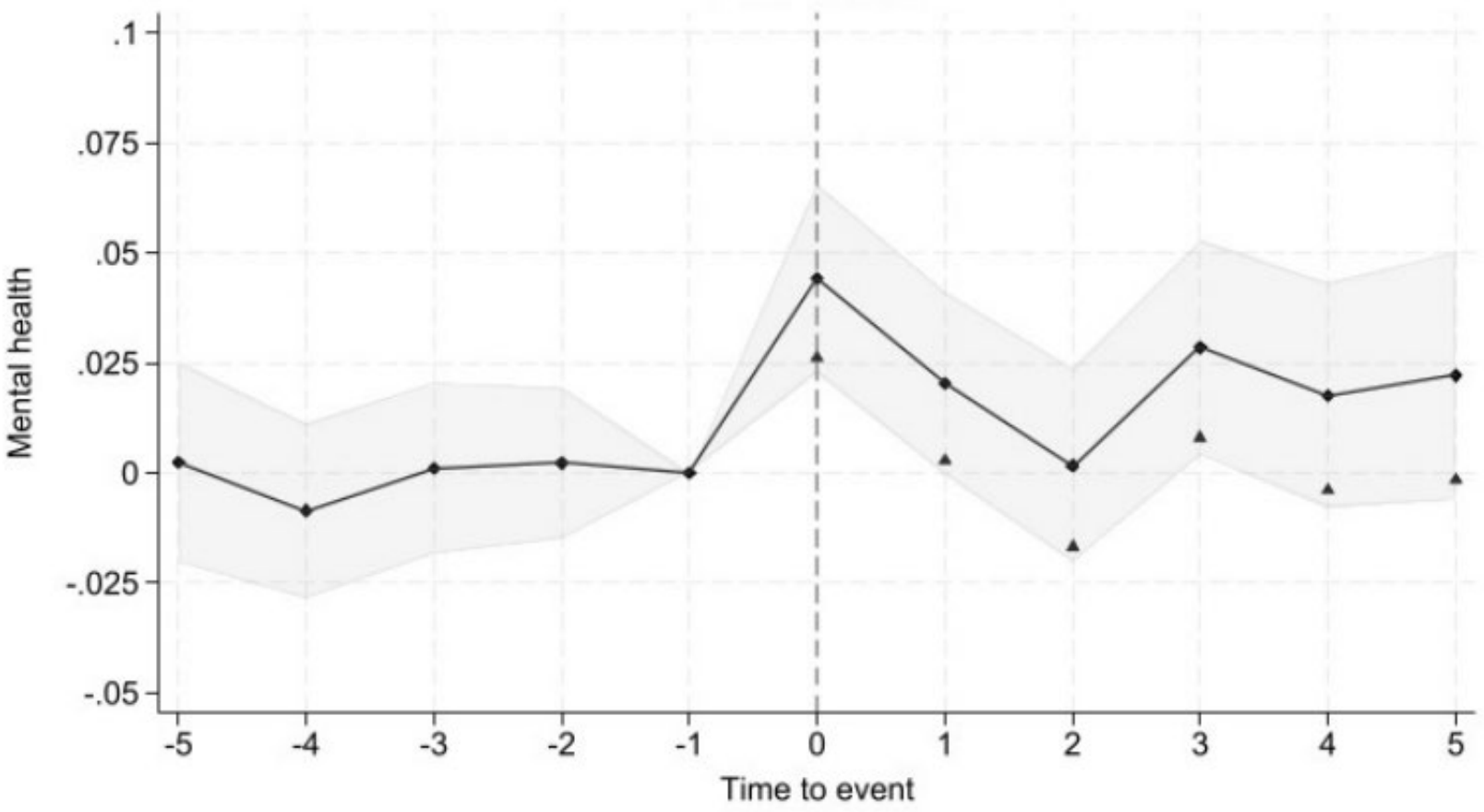
- Relies primarily on work injury reports.
- Coded events as railway suicides or not based on prespecified criteria, with the help of an RA, before outcome data was obtained.
- The approach was preregistered at (link).
  (Preregistration in addition specifies the research questions, research design, hypotheses and definition of outcome variables etc. but not exact matching procedure and final specification).

Study population	N	%
Treated	815	10
Never treated	7 355	90

Matching: Balancing exposure risk

- Time on the rail predicts exposure
  - Restrict samples to those not unemployed and those not experiencing medium- or long-term sick leave before the event.
  - Exclude drivers with very low income in T-1 and T (1st percentile, income is also a proxy for working time)
- Match treated drivers to similar control drivers in T-1 on year, organization, workplace in Stockholm, cohabitation

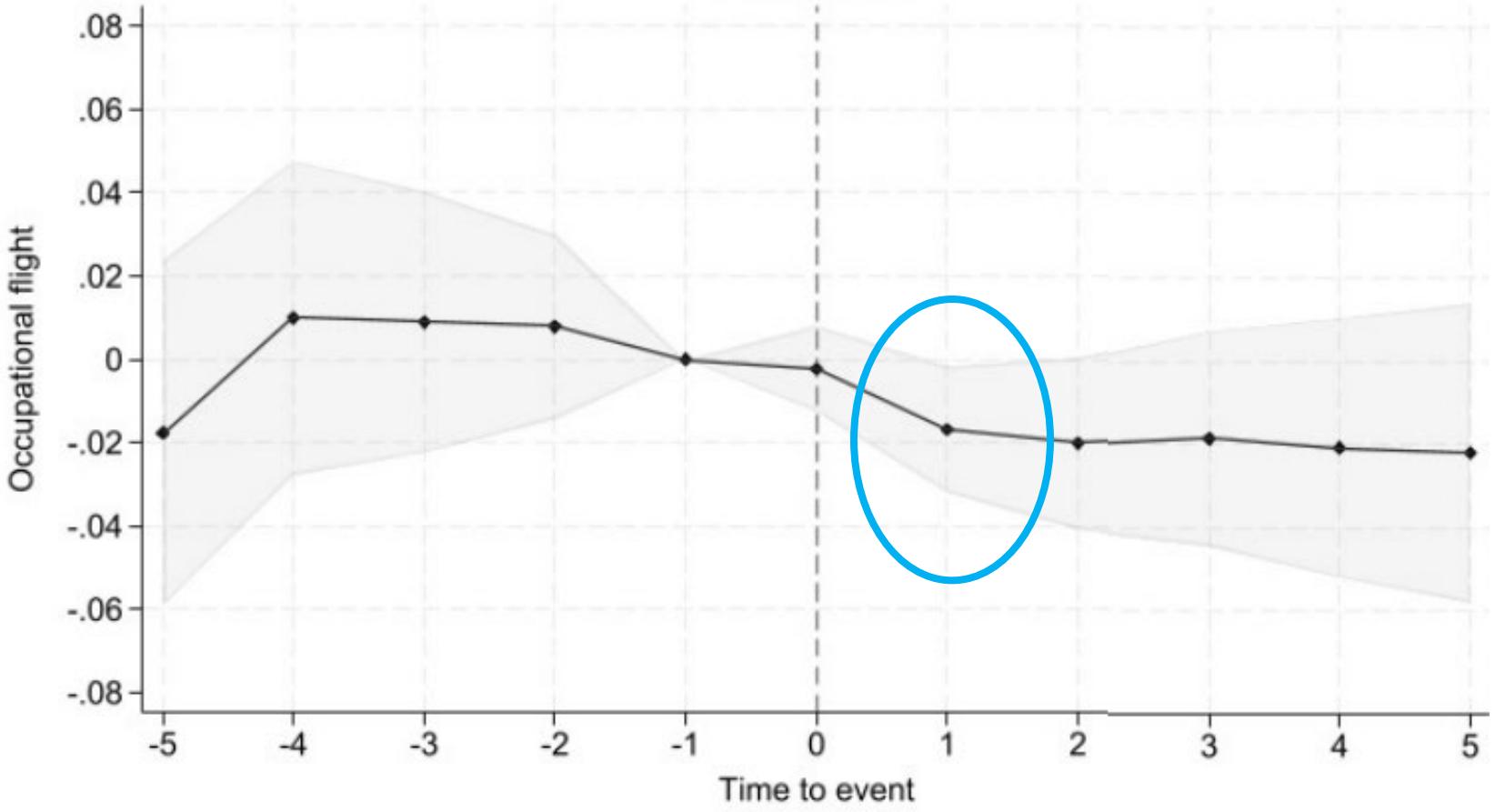
Results (preliminary): Mental health care



We find an immediate but short term effect of exposure on mental health care uptake.

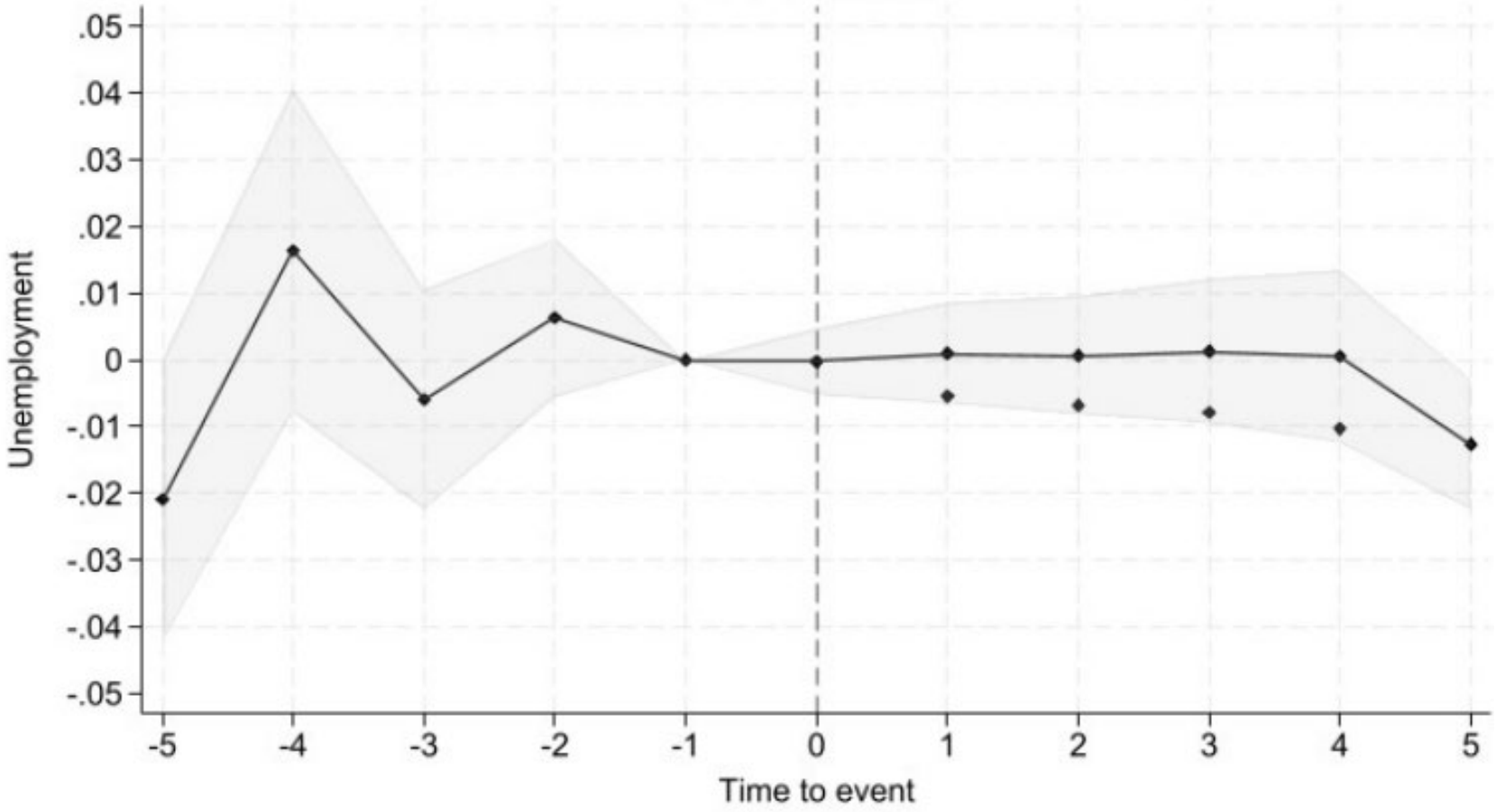
Primarily driven by an increase in medication.

Results (preliminary): Occupational flight



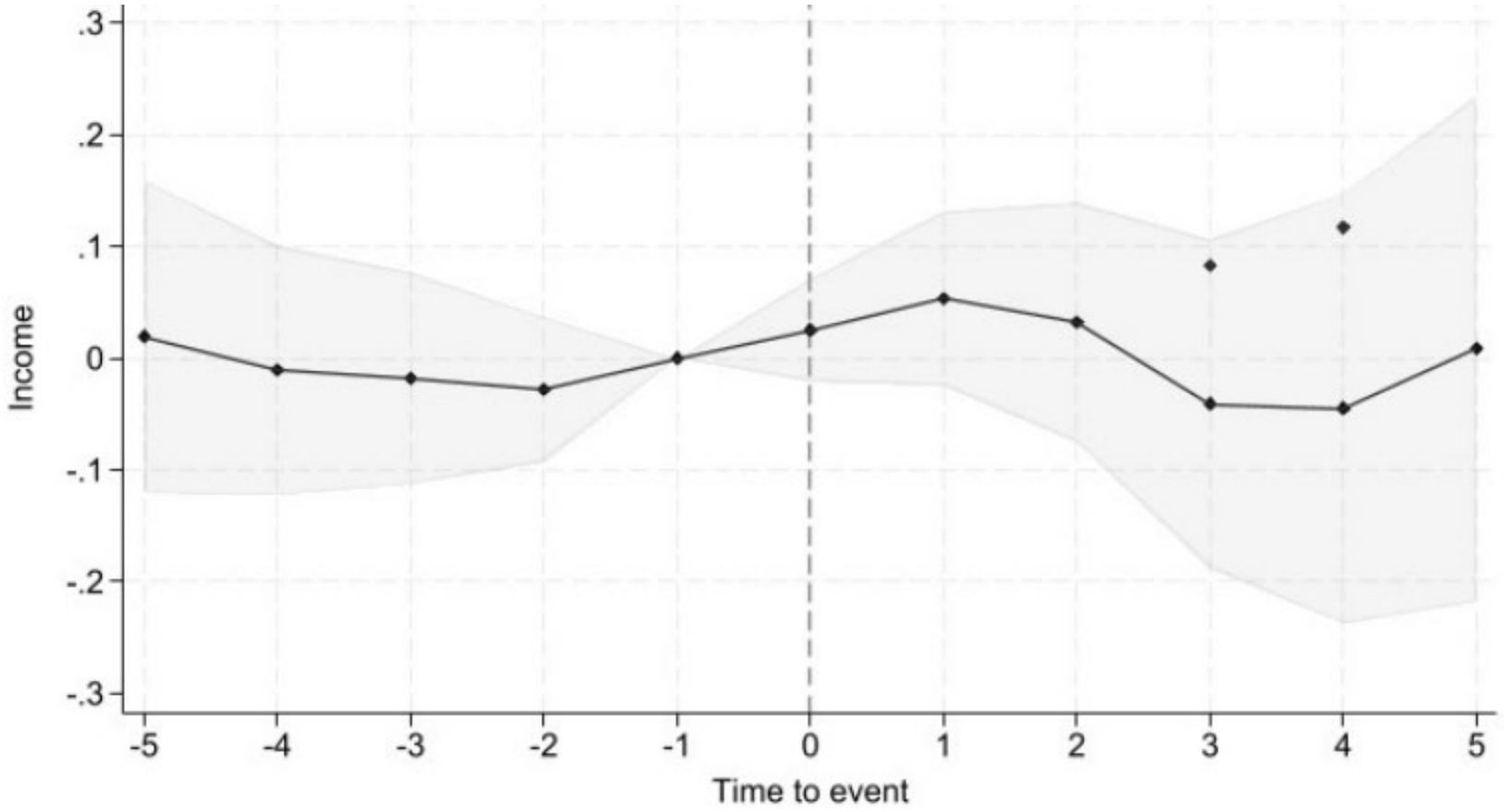
We find a small but surprising effect on occupational flight: Exposed drivers remain in the train driver occupation to a larger extent.

Results (preliminary): Unemployment



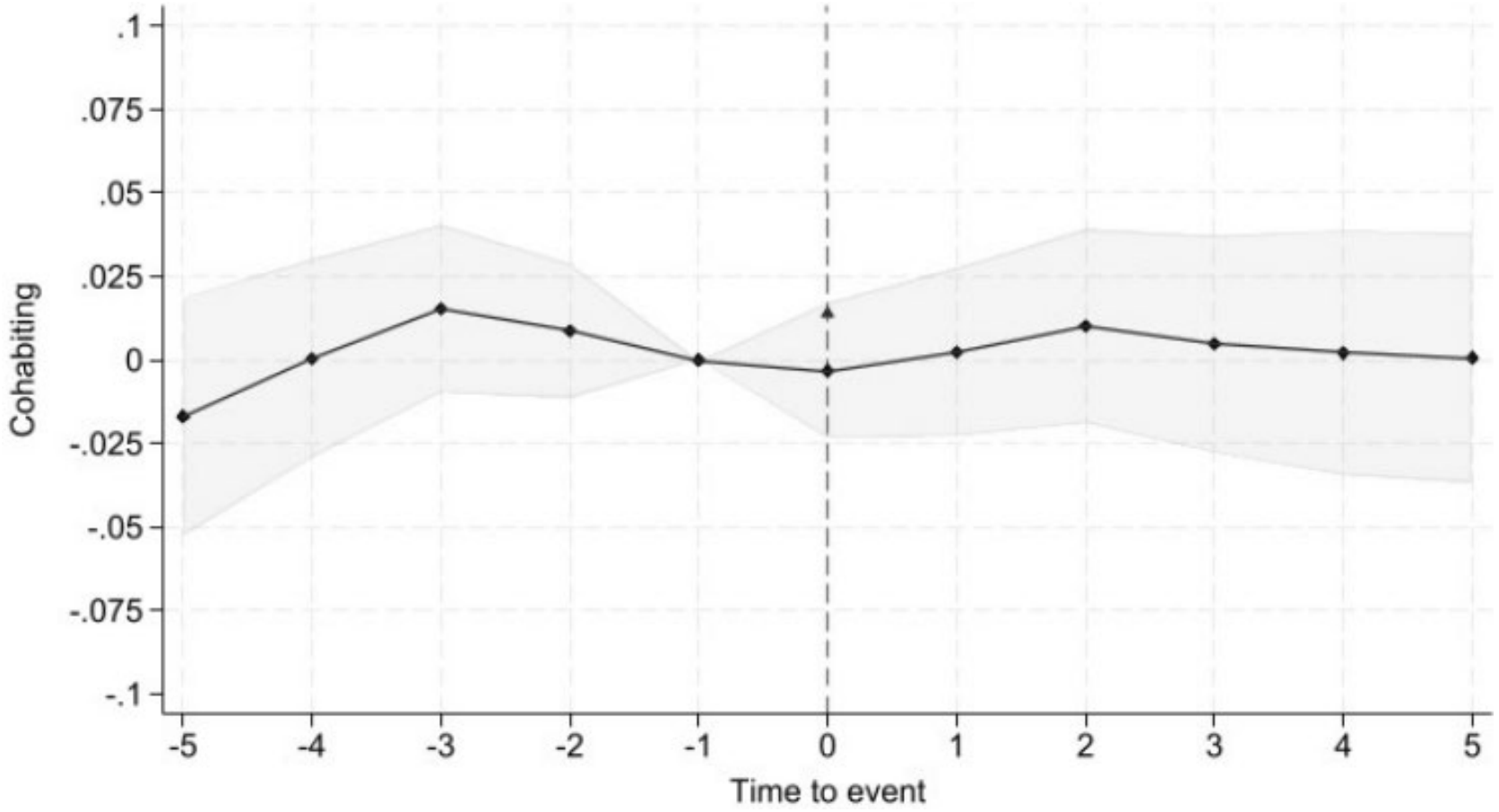
We find no effect of exposure on unemployment.

Results (preliminary): Income



We find no effect of exposure on earnings.

Results (preliminary): Cohabitation



We find no effect of exposure on cohabitation.

Summing up

- Exposure to suicide accidents impact mental health care uptake in the hypothesized direction, primarily in the short term.
- Small or no effect on employment, occupational flight, income or cohabitation

Conclusion

- Tentative takeaway:
  - While traumatic work experiences appear to sometimes have important effects on mental health, we find that some such experiences are less detrimental.
- More work needed to understand why
  - Does the train industry do something effective to mitigate effects? (Existing policy – survey to companies?)
  - Are train drivers mentally prepared?
  - Are there protective characteristics of the traumatic event itself?
  - Other reasons?

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- För akut hjälp, tel 112
- För närmaste psykiatriska akutmottagning, Vårdguiden tel 1177

Du kan också vända dig till

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- Mind Självmordslinjen, via mind.se eller tel 90101
- Bris, för dig under 18, bris.se eller tel 116 111
- Jourhavande medmänniska, tel 08-702 16 80.

Tack!

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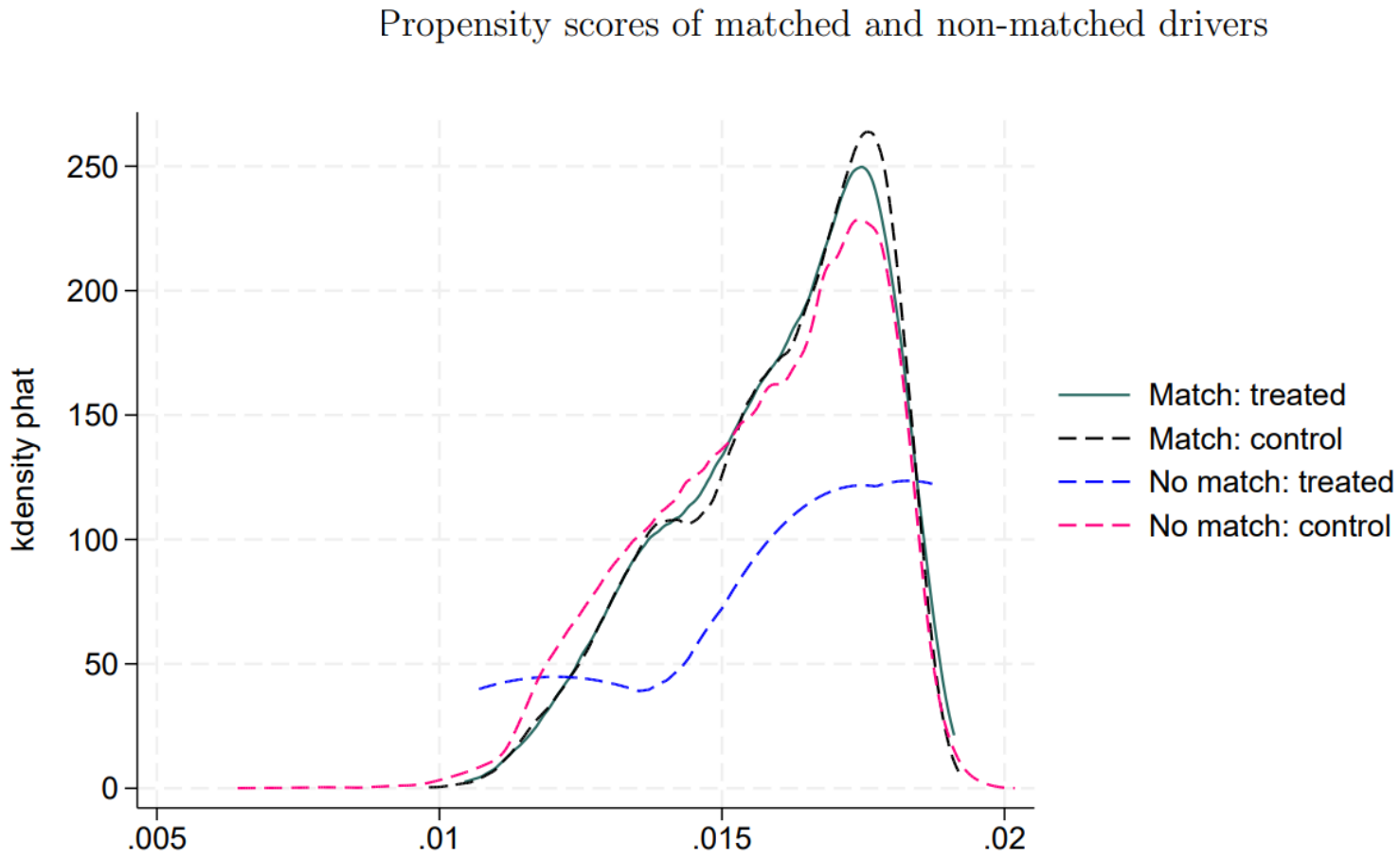
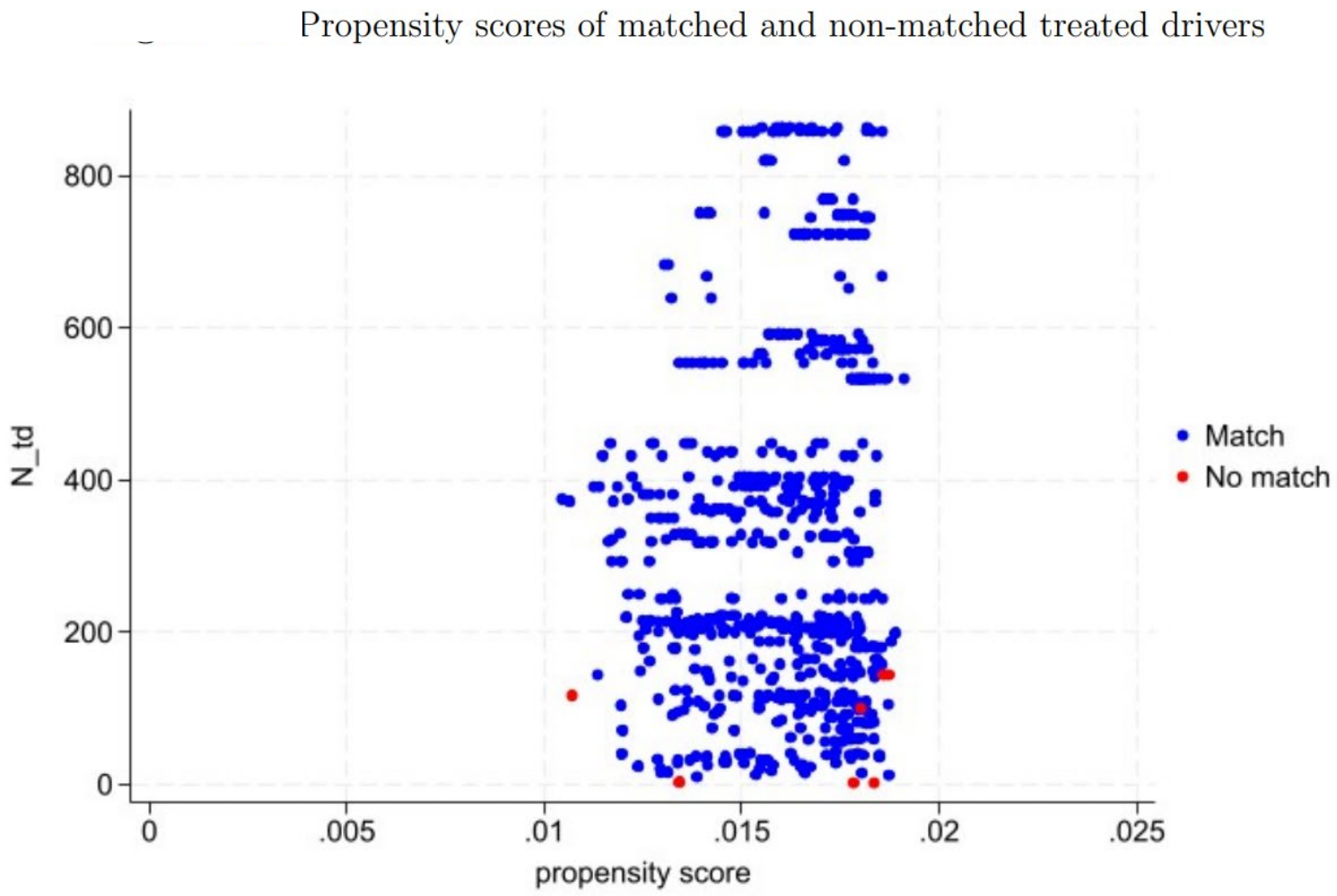
Balancing exposure risk



Balancing exposure risk



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Balance

	Matched Controls	Treated	Nominal difference	p value	standardized mean difference
td_seniority	5.16	5.17	0.03	0.85	0.00
sex	0.14	0.15	0.01	0.43	0.03
Married	0.40	0.39	-0.01	0.64	-0.02
CohabitingP	0.51	0.51	-0.01	0.69	-0.01
CohabitingP_lead1	0.52	0.52	-0.01	0.62	-0.02
small_child	0.14	0.13	-0.01	0.38	-0.04
small_child_lead1	0.15	0.12	-0.03	0.04	-0.09
ExamAr	1,995.68	1,995.23	-0.46	0.49	-0.03
Age_at_ExamAr	25.29	25.66	0.35	0.35	0.05
Education	4.05	4.03	-0.02	0.73	-0.02
age	44.46	44.94	0.47	0.33	0.04
Unemployment	0.00	0.00	0.00		
AntAns	1.34	1.32	-0.02	0.57	-0.03
ForvInk	3,993.41	3,989.23	0.90	0.98	-0.00
Öppenvård	0.24	0.24	0.00	0.84	0.01
Läkemedel	0.53	0.50	-0.02	0.24	-0.05
Mental_dia	0.00	0.00	-0.00	0.09	-0.07
Mental_drugs	0.07	0.07	0.00	0.85	0.00
Mental_health	0.08	0.07	-0.00	0.95	-0.01
Org_AntalSys	2,329.02	2,329.02	-7.72	0.90	-0.00
Share_women_org	0.32	0.32	0.00	0.55	-0.00
Org_Men	1,588.70	1,588.70	-12.48	0.77	-0.00
Urban	0.66	0.67	0.02	0.43	0.03
Stockholm	0.38	0.38	0.00	0.89	0.00
Year	2,011.63	2,011.63	-0.00	0.99	0.00
ALosDag	0.00	0.00	0.00		
SjukSum_Ndag_MiDAS	0.00	0.00	0.00		
Labor_income	8.26	8.26	0.00	0.72	0.01
Num drivers	341.41	341.41	-2.58	0.79	-0.00
Prob(treated)	0.02	0.02	-0.00	0.89	-0.00
N	3,427.00	732.00	-2,695.00	0.00	

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Empirical strategy: Event study specification

Our main analysis is an event study comparing the outcomes for the same driver before and after exposure to a PUT, compared to the control drivers.

For each outcome and driver exposed at $j = 0$:

$$Y_{it} = a_i + b_t + \sum_{j=2}^{K} c_j \cdot D_{it}^{j} + \sum_{j=0}^{L} e_j \cdot F_{it}^{j} + u_{it}$$

Y_{it}: the outcome (e.g., occupational flight)

D_{it}^{j} and F_{it}^{j} : treatment dummies (leads and lags)

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