Childhood Mental Health Effects of Early-Life Exposure to Paternal Job Loss

Vahid Moghani*   Pilar García-Gómez[†]   Tom Van Ourti[‡]

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*Erasmus School of Economics, Tinbergen Institute, and Erasmus Centre for Health Economics Rotterdam

[†]Erasmus School of Economics, Tinbergen Institute, and Erasmus Centre for Health Economics Rotterdam

[‡]Erasmus School of Health Policy and Management, Erasmus School of Economics, Tinbergen Institute, and Erasmus Centre for Health Economics Rotterdam

Childhood Mental Health

- ▶ Childhood mental health important predictor of adulthood outcomes (Currie et al., 2010; Currie, 2020)
- ▶ Half of psychiatric problems occur before age 14. High prevalence rates in Europe (12.8%) and US (17%).
- ▶ Economic conditions and children's mental health link largely ignored (Golberstein et al., 2016)

Related literature

- ▶ Job loss: short-term and long-term income loss (Couch and Placzek, 2010; Couch et al., 2011)
- ▶ Beyond income loss:
  - ▶ Employee: physical/mental health risks, increased hospitalization and mortality rate (Gathmann et al., 2020; Bloemen et al., 2018; Kuhn et al., 2009)
  - ▶ Spouse: similar health risks, higher divorce rate (Gathmann et al., 2020; Bubonya et al., 2017; Bloemen et al., 2018; Eliason, 2012)
- ▶ Adverse household environment, high separation rates, and parent's mental health issues are mentioned among the risk factors for children's mental health (Faraone et al., 2015; Marsh et al., 2020)
- ▶ Our paper estimates the impact of early-life paternal job loss (below five) on later child mental health (five to twelve), focusing on firm closures
  - ▶ item Recently related papers (Mörk et al., 2020; Fontes et al., 2022)

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- ▶ We document large heterogeneities
- ▶ Income drop doesn't seem to explain the findings; chaotic family environment likely the main pathway
- ▶ The effects are concentrated in regions with low prescription rates $\rightarrow$ job loss most likely exacerbate existing conditions

Background of the Study

- ▶ Comprehensive health care system in the Netherlands, free for those under 18.
- ▶ GPs diagnose child mental health disorders (close collaboration with schools and parents). Only specialists can prescribe medications.
- ▶ Unemployment benefits: a significant portion of prior gross salary (up to 75%).
- ▶ Generous welfare benefits

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- ▶ Dutch individual data from 1999 to 2017 (including basic characteristics, SES variables, employee and employer level data, place of residence)
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- ▶ Medication consumption data per calendar year 2006-2017
- ▶ Focus on childhood mental health medication in the study (missing mild or undiagnosed/unprescribed case)
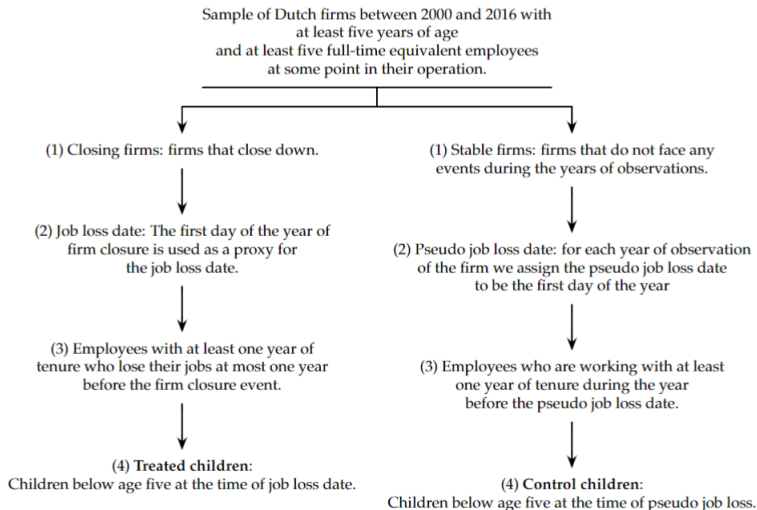- ▶ Main medication category is Psychostimulants.

Data

Sample of Dutch firms between 2000 and 2016 with at least five years of age and at least five full-time equivalent employees at some point in their operation.

(1) Closing firms: firms that close down.

(1) Stable firms: firms that do not face any events during the years of observations.

(2) Job loss date: The first day of the year of firm closure is used as a proxy for the job loss date.

(2) Pseudo job loss date: for each year of observation of the firm we assign the pseudo job loss date to be the first day of the year

(3) Employees with at least one year of tenure who lose their jobs at most one year before the firm closure event.

(3) Employees who are working with at least one year of tenure during the year before the pseudo job loss date.

(4) **Treated children:**
Children below age five at the time of job loss date.

(4) **Control children:**
Children below age five at the time of pseudo job loss.

Figure 1: Sample Construction Method

Summary Statistics (1/2)

	Control Group		Treatment Group		Standardized Difference
	N	Mean(SD)	N	Mean(SD)	%
Child Sex (1:=Female)	878106	0.49(0.50)	68235	0.49(0.50)	0.64
At the time of Job Loss					
Age of the Child	878106	2.70(1.45)	68235	2.65(1.42)	-3.15
Age of the Father	878106	36.33(5.25)	68235	36.12(5.30)	-3.99
Age of the Mother	878106	33.68(4.74)	68235	33.35(4.77)	-7.10
Immigrants Parent	878106	0.19(0.39)	68235	0.22(0.41)	6.37
Birth Order	878106	1.76(0.89)	68235	1.78(0.92)	1.42
Tenure of the Father	878106	7.05(5.10)	68235	6.86(4.82)	-3.78
Dissolved Contract					
Includes UI	878106	0.98(0.13)	68235	0.98(0.13)	1.57
Includes DI	878106	0.98(0.13)	68235	0.98(0.13)	0.15
Full-Time Equivalence Factor	878106	0.95(0.15)	68235	0.94(0.16)	-5.56
Three Years Before the Job Loss					
Father's Salary (€)	878106	37,197(29139)	68235	34,062(22,500)	-10.92
Mother's Salary (€)	878106	15,392(14,742)	68235	13,887(13,469)	-10.28
Father is Working	878106	0.96(0.15)	68235	0.96(0.15)	-0.79
Mother is Working	878106	0.75(0.41)	68235	0.72(0.42)	-6.86
Neighborhood Mean Income	878106	31,529(5,617)	68235	30,771(5,453)	-13.51
Parents Living Together	878106	0.94(0.23)	68235	0.94(0.24)	-1.59

Summary Statistics (2/2)

	Control Group		Treatment Group		Standardized Difference
	N	%	N	%	%
Closing Firm Sector					
Agriculture and Forestry	16941	1.93	1532	2.25	2.29
Industries	203763	23.22	15406	22.61	-1.46
Construction	94896	10.8	10155	14.90	13.01
Retail	177457	20.22	12782	18.76	-3.66
Transport and Storage	85118	9.70	4867	7.14	-8.72
Financial Institute	28007	3.19	1843	2.70	-2.78
Real state	204124	23.27	17050	25.02	4.15
Education and Health	6872	0.78	696	1.02	2.67
Others	60039	6.84	3800	5.57	-3.2
Closing Firm Size (fte)					
Below 50	318916	36.32	36299	53.20	34.99
50 to 500	202180	23.02	17910	26.25	7.63
More than 500	357010	40.66	14026	20.56	-41.41

Pre-existing differences

▶ Use mental-health medication uptake from age 5-12 to predict job loss due to plant closure during the year after

Variables	Facing an Actual Job Loss Next Year
Mental-health Medication Last Year	0.000247
	(0.00116)
Observations	1,126,053
R-squared	0.039

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

▶ No differences in parental outcomes such as employment or mental health before plant closure Parental employment

Method

▶ We run the following regression at each age from five to twelve:

$$y_{i,a} = \alpha_a + \beta_a t_i + x_i' \gamma_a + e_i' \theta_a + s_i' \lambda_a + \varepsilon_{i,a} \tag{1}$$

x_i is a vector of basic characteristics (cohort of birth dummies, gender of the child, age of parents etc.)

e_i includes employment information (dummies for the year of job loss, tenure of the dismissed parent, dummies for the size of the firm, dummies for sector of the firm etc.)

s_i includes the socioeconomic status information of the household (salary of the parents before the job loss, average household income in the neighborhood etc.)

Baseline Results: Mental Health Medications
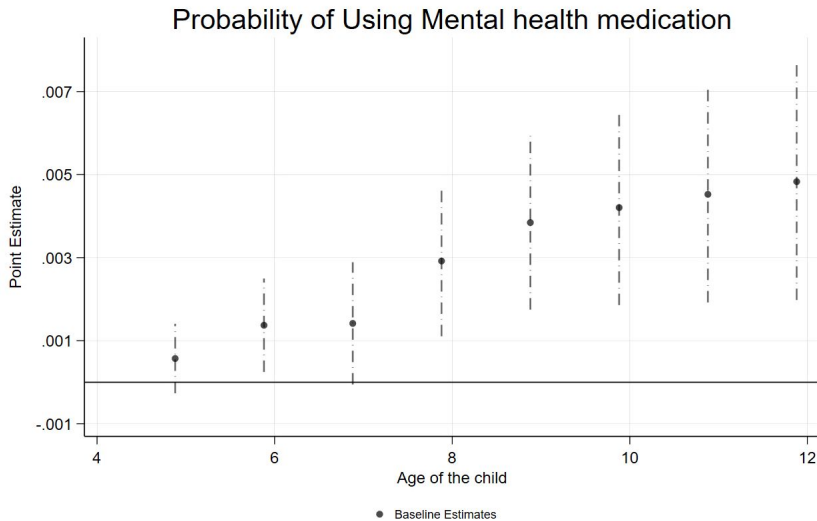
Probability of Using Mental health medication

Placebo regression

- ▶ Treatment children: they will face a parental job loss in the future.
- ▶ Control: constructed in the same way as the baseline.

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Robustness Checks and Heterogeneity

- ▶ Different sets of control variables (including neighborhood FEs)
- ▶ Using non-linear methods (Doubly-Robust and Causal Random Forest)
- ▶ Check for different Sample inclusion Criteria (tenure and firm size)
- ▶ Multiple hypothesis testing

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Robustness Checks

- ▶ We follow Athey and Wager (2019) to analyze the heterogeneity of our findings agnostically
- ▶ The results show large heterogeneity: paternal job loss little to no effect for half, while substantial effects for the other half.

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Baseline Results: Psychostimulants vs Other Medications
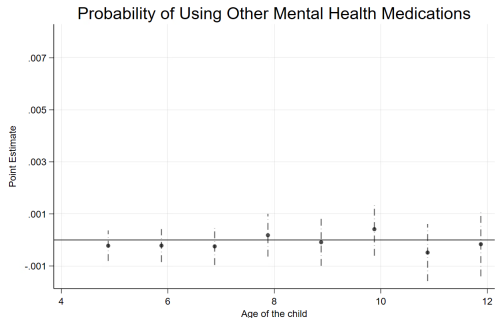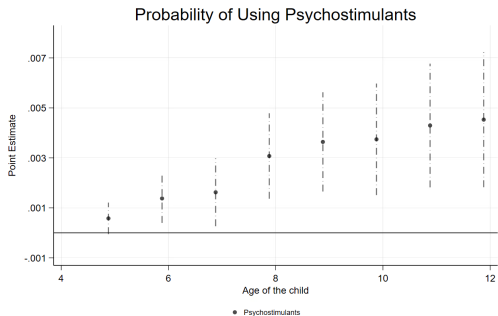
Mechanisms

▶ Income drop (Income Drop)
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    - ▶ Suggestive evidence of adverse mental health effects on the father

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- ▶ Household environment `Household Environment`
    - ▶ Increased separation of the parents
    - ▶ Suggestive evidence of adverse mental health effects on the father
- ▶ External environment `Mobility`
    - ▶ Moving patterns, neighborhood income, violence rate, regional prescription rates
    - ▶ Very little evidence of differences

Does Job Loss Lead to More MH Problems?
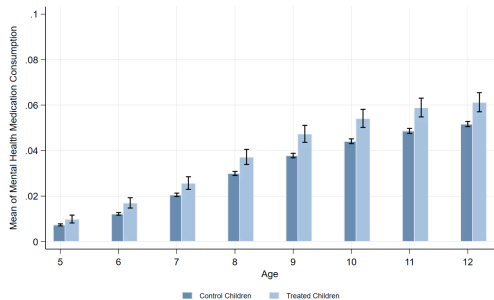
► We split the sample into two groups, ones living in high prescription regions, and low prescription area

► Stylized Framework (Persson et al., 2021)

Figure: High-Prescription Areas

Figure: Lower-Prescription Areas

Does Job Loss Lead to More MH Problems?
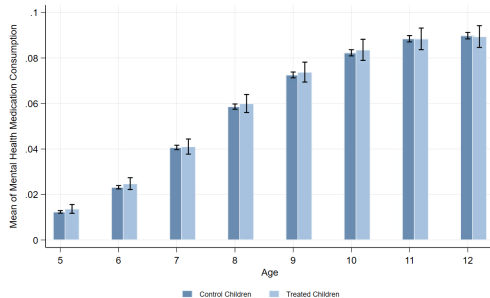
Estimates

Conclusion

- ▶ We find evidence that an early-life paternal job loss leads to more mental health medication uptake later in childhood.
- ▶ We document significant level of heterogeneity
- ▶ Suggestive evidence that family environment is driving the effects
- ▶ Suggestive evidence that paternal job loss exacerbates existing conditions
  - ▶ American Psychiatric Association (2013): *"family interaction patterns in early childhood are unlikely to cause ADHD but may influence its course or contribute to secondary development of conduct problems"*.

Appendix: Trends: Employment
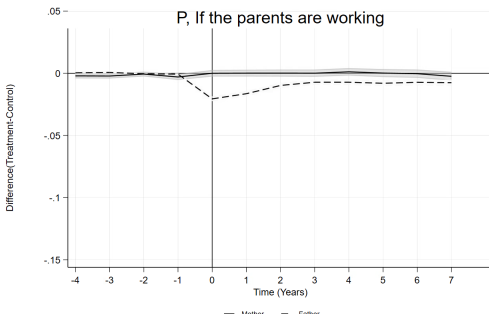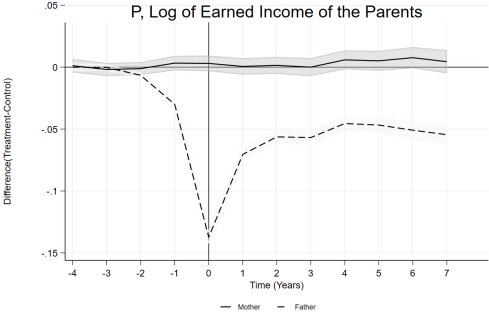
Appendix: Pre-trends: Exact Date
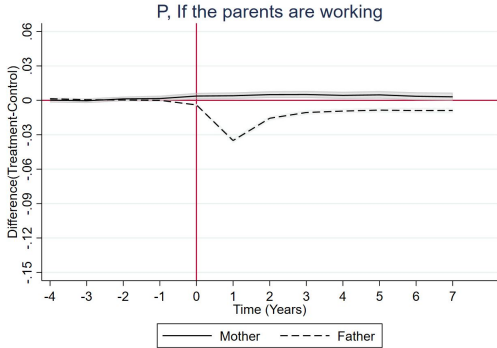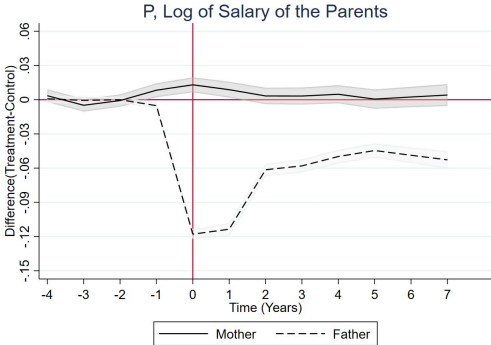
Appendix:Baseline Results: Fixed Sample

Probability of Mental health medication
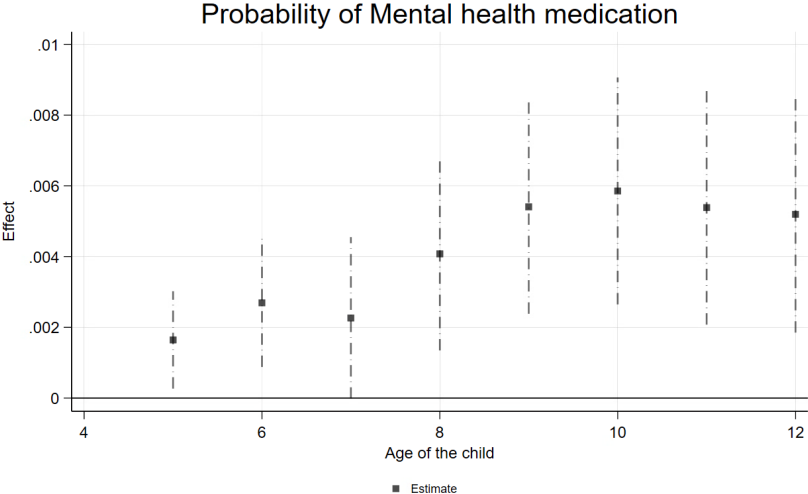
The sample of children that we can observe from age 5 to age 12

Appendix: Robustness Check, Specifications

Probability of Mental health medication
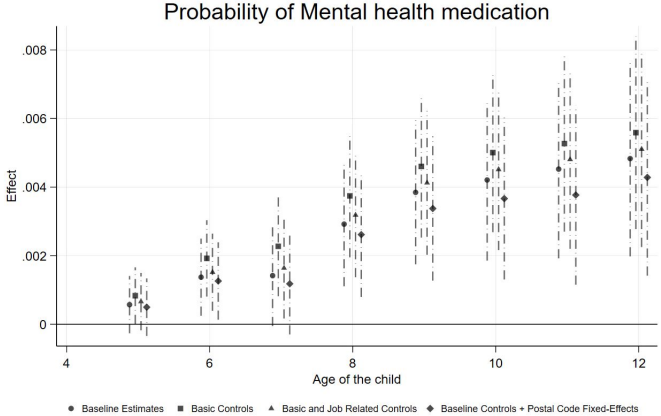
Appendix: Robustness Check, Doubly Robust

Probability of Mental health medication
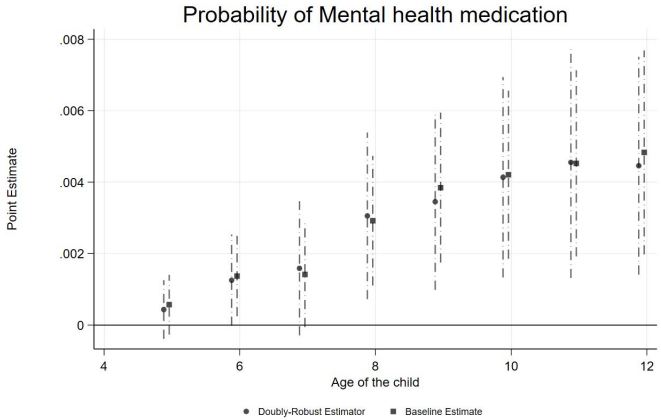
Appendix: Different Subsamples, Tenure

Robustness - Tenure
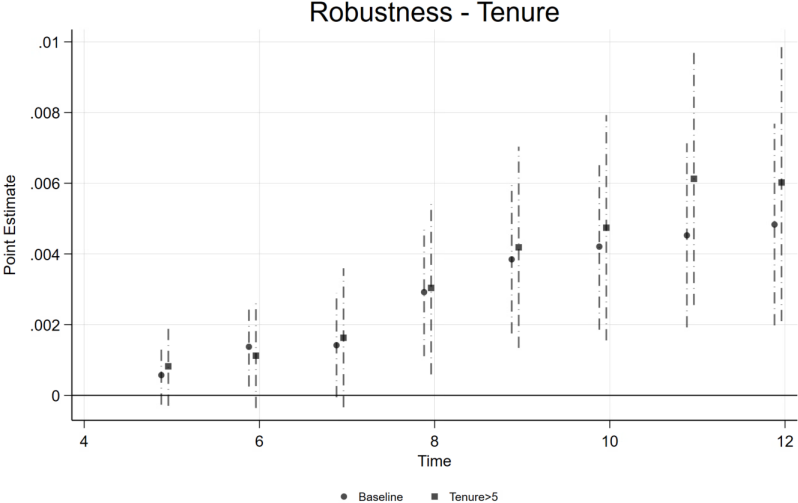
Appendix: Different Subsamples, Firm Size

Mental Health Medication Uptake by Firm Size

Below 50 fte   ■ Between 50 and 500 fte   ▲ More than 500 fte
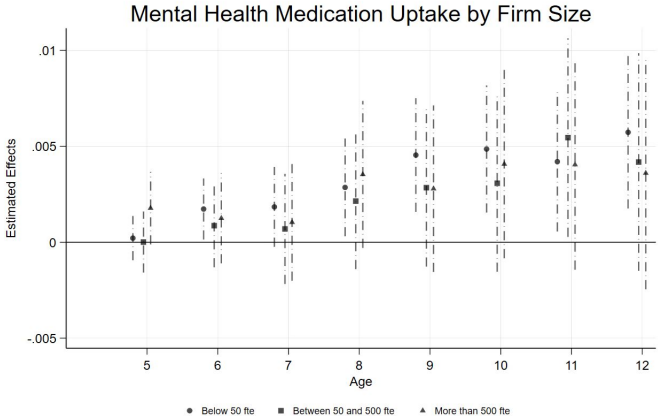
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Appendix: Different Subsamples, FTE

Robustness - Full-time
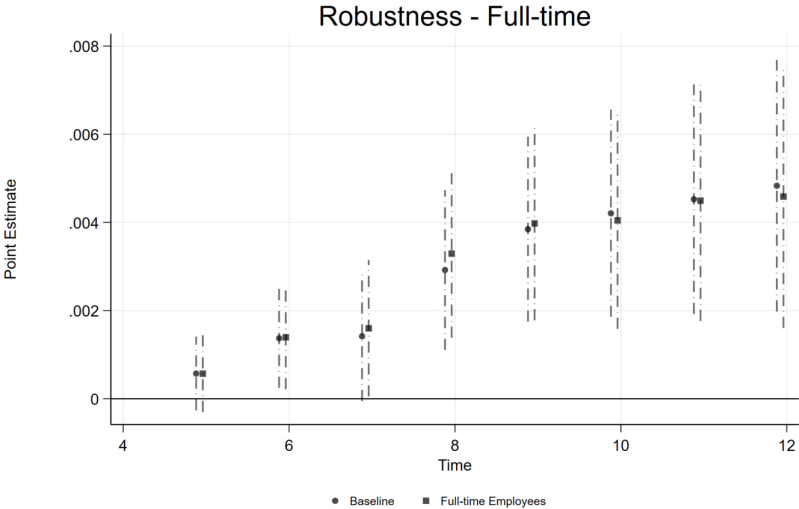
Heterogeneity Analysis

Table: Average Treatment Effects (Ever Using MH Medication (Age 5-12))

Effect	Estimate	95% CI
ATE	0.0065	± 0.003
ATE (above median CATE)	0.011	± 0.004
ATE (below median CATE)	0.002	± 0.004

Table: Best Linear Fit Using Forest Predictions (Chernozhukov et al., 2018)

	Estimate	Std. Error	t-value	
Mean Forest Prediction	0.98926	0.32570	3.0374	**
Differential Forest Prediction	0.58193	0.18057	3.2227	***

Appendix: Causal Random Forest Estimator

$$\hat{\tau}(x) = \frac{\sum_{i=1}^{n} \alpha_i(x) \left(Y_i - \hat{m}^{-i}(X_i)\right) \left(W_i - \hat{e}^{-i}(X_i)\right)}{\sum_{i=1}^{n} \alpha_i(x) \left(W_i - \hat{e}^{-i}(X_i)\right)^2} \tag{2}$$

Appendix: Causal Random Forest CATEs Distribution
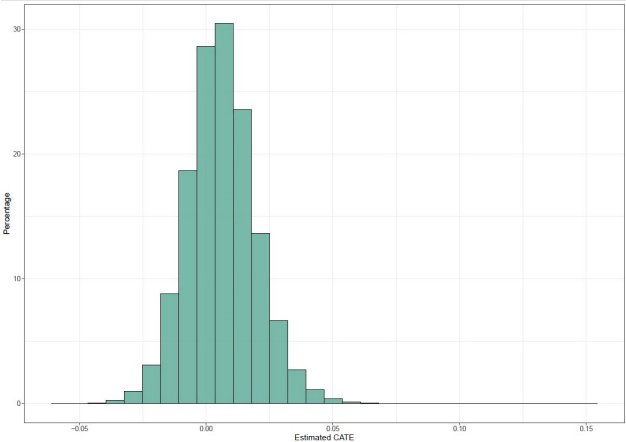
Appendix: Causal Random Forest Variable Importance
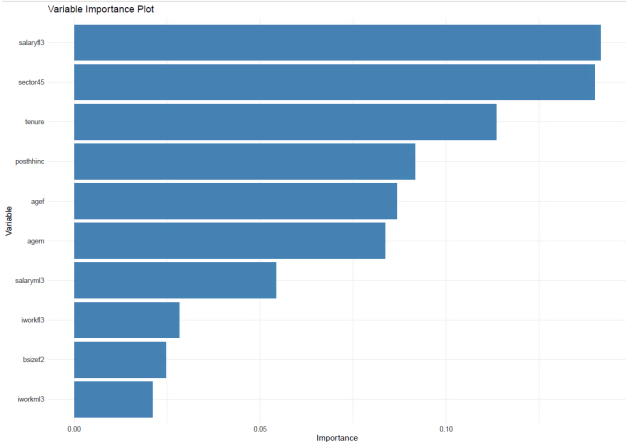
Appendix: Causal Random Forest Best Linear Fit

- OLS: $Y_i - \hat{m}^{(-i)}(X_i)$, serving as the dependent variable, and C_i and D_i functioning as independent variables (Chernozhukov et al., 2018)

$$C_i = \bar{\tau}(W_i - \hat{e}^{(-i)}(X_i))$$
$$D_i = (\hat{\tau}^{(-i)}(X_i) - \bar{\tau})(W_i - \hat{e}^{(-i)}(X_i))$$

(3)

Appendix: Income Drop

- ▶ The household income drop is small (less than 3%) but persistent
- ▶ Health care is free for minors, and there are protective rules to support households against (income) effects of job loss
- ▶ We split the sample by the main breadwinner of the household before the job loss
  - ▶ The income shock for the household is smaller when the breadwinner is the spouse

Back

Appendix: Income Drop
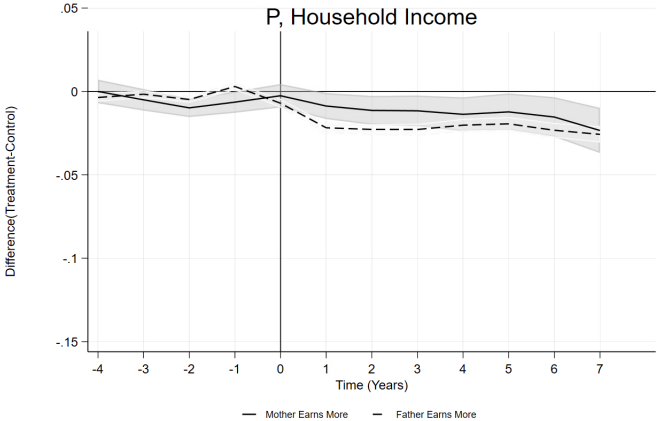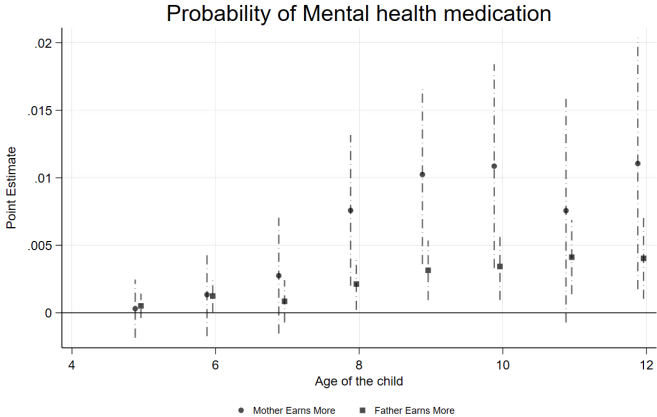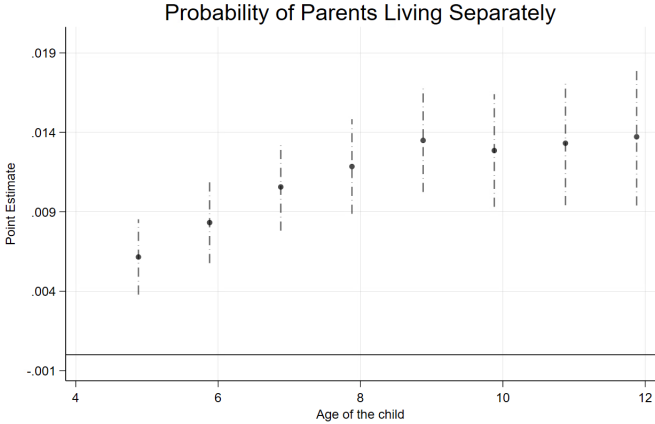
Appendix: Income Drop

Probability of Mental health medication

Appendix: Within Family Dynamics

Probability of Parents Living Separately

Appendix: Within Family Dynamics

P, If the parents are using mental health medication

Appendix: Within Family Dynamics

Paternal, Mental Health Medication of the Parents

Mechanisms: Mobility

Paternal, Probability of living in the same address (FE Model)

Back

Mechanisms: Mobility

Paternal, Standardized Average Neighborhood HH income

Mechanisms: Mobility

Paternal, Violence rate in the neighborhood (2017)

Mechanisms: Mobility

Paternal, Average neighborhood psychostimulants rate

Appendix: Neighborhood Splits

Increase in Probability of Mental health medication

Appendix: Neighborhood Splits

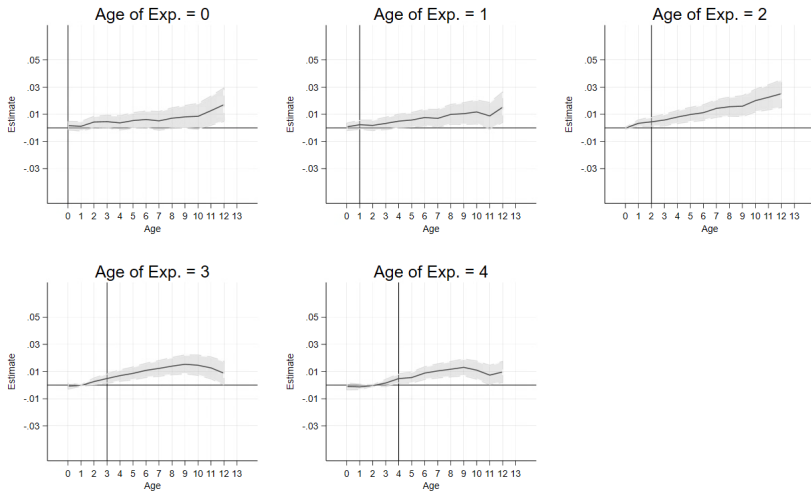Increase in Probability of Mental health medication
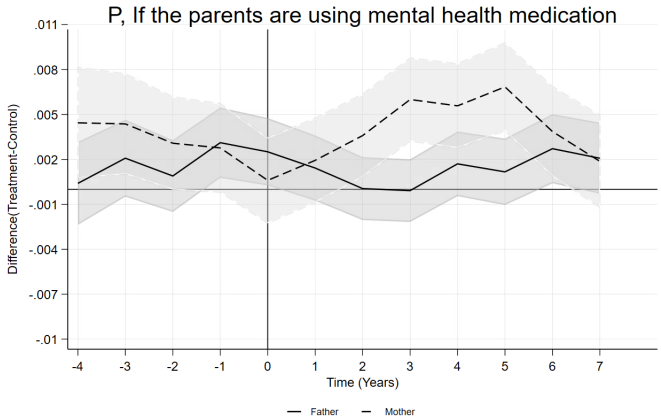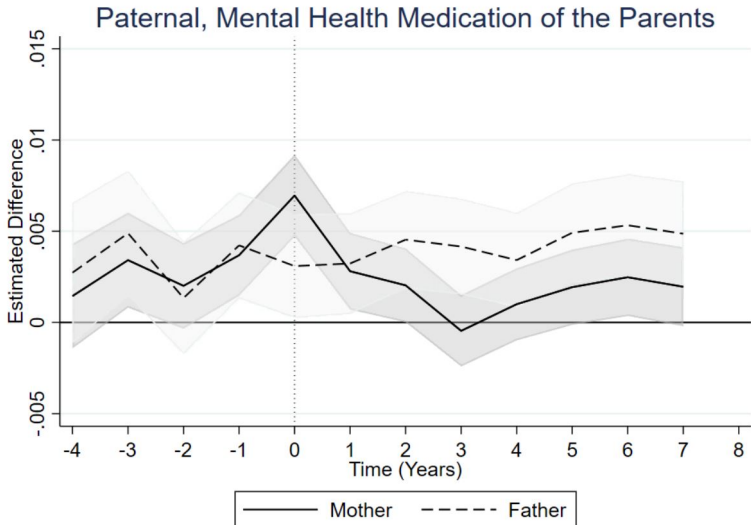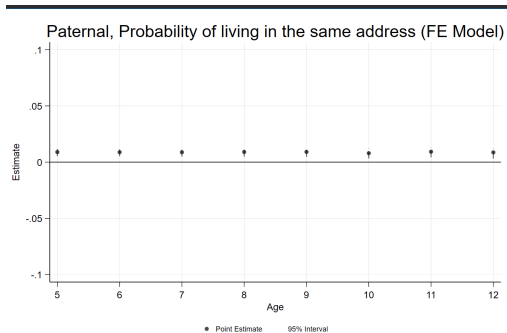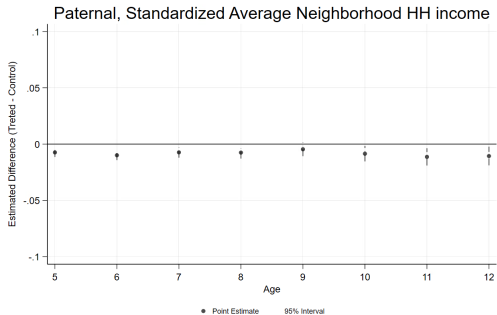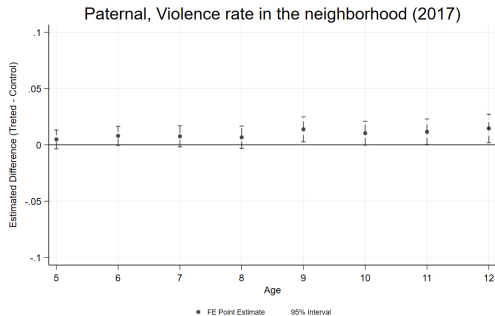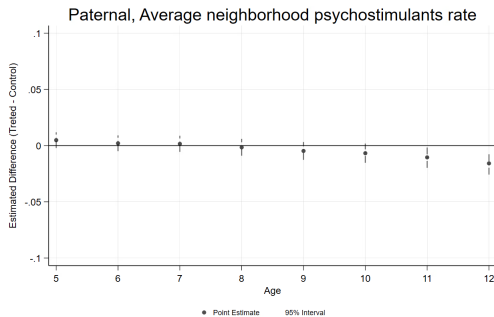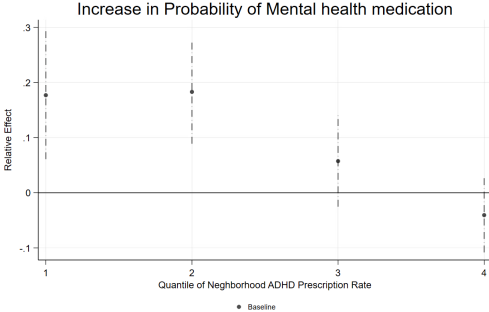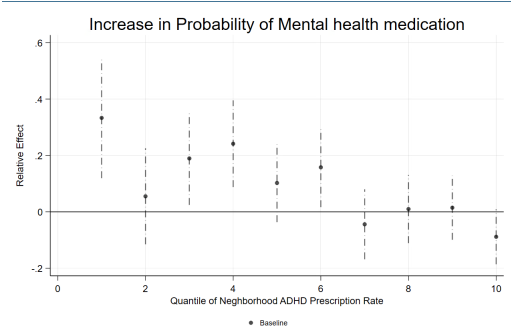
Appendix: Effect by Age of Exposure

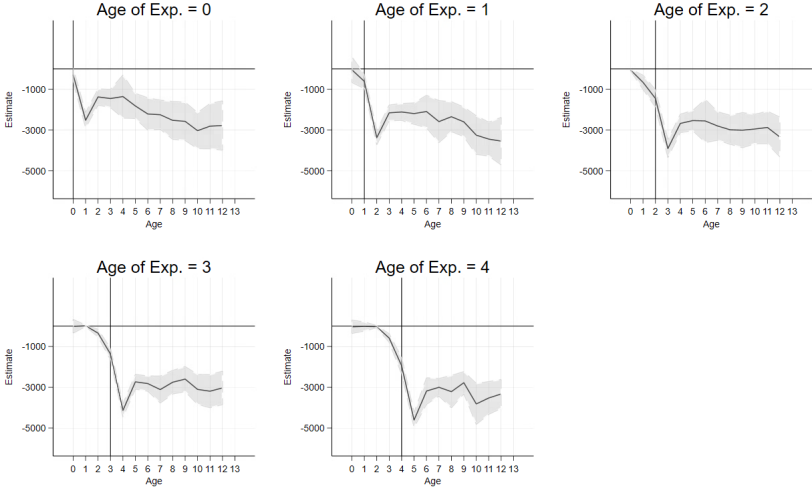## Psychostimulant usage, Paternal Job Loss
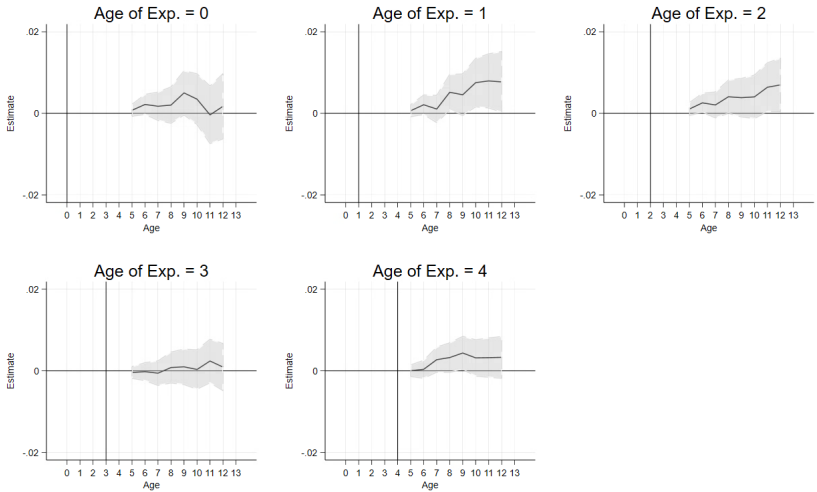
Appendix: Sep by Age of Exposure

Parents Living Separately, Paternal Job Loss

Appendix: Salary by Age of Exposure

Salary of the Father, Paternal Job Loss

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