Child Disability and Parental Labor Supply

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Introduction

- Severe child disability creates a double burden on parents:
  - higher needs both time and financial resources

- In developing countries informality offers flexibility, but research is scarce

- Challenges:
  - Data on informality is rare
  - Endogeneity of child disability

This Paper

- Study the 2015 zika virus outbreak in Brazil

- Unexpected nature addresses endogeneity

- Data on informal labor

- Results:
    - Parents' employment, formal and informal
    - Household Income
    - Family composition
    - The role of social assistance programs

Background

Background
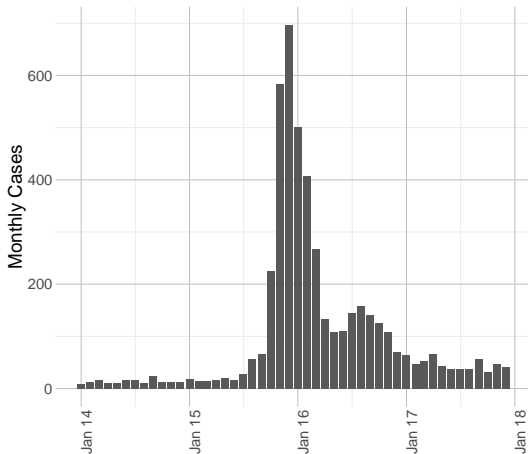
- Spike in CZS cases in Brazil starting in mid-2015

- CZS is a severe disability, requires therapy and care

- Public health measures start around December 2015

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Background

- Role of preventive behaviors was minimal. **CZS was unknown**. Infections are more likely to cause CZS during the first trimester.

- Selective abortion and fertility responses unlikely.

- No direct effect on the mother.

- Mortality is high. We work with a sample with low mortality and check sensitivity.

Data

- RESP-Microcefalia
    - Record of all cases of CZS

- RAIS
    - Track all formal employees over time

- Single Registry
    - Recipients of any government program: bottom half of population
    - Source on family structure and informal work.

Empirical Strategy

Identification Strategy

- We need to control for **time** and **place** of birth, to address environmental risk of contagion, and **individual risk factors**.
- We use exact matching based on:
  - a) Municipality of residence
  - b) Month of birth
  - c) Maternal age,
  - d) Education (completed high school)
  - e) Parity (firstborn)
  - f) Race (white)
- Based on epidemiological literature and balance checks.

Balance table   Matching details

Estimation

Fully saturated model event-time model:

$$y_{i\tau} = \sum_{k \in \kappa} \mu_k 1\{\tau = k\} + \sum_{k \in \kappa} \beta_k 1\{\tau = k\} \cdot T_i + \varepsilon_{i\tau}$$

- μ_k: average in period k for control
- β_k: average difference for treated .
- **Weights**: Treated units receive a weight of 1 and all control units a weight of $\frac{n_t(s)}{n_c(s)}$
- **Results**: difference over time, average difference, DID average

# Results - Formal Employment

Mother's Formal Employment
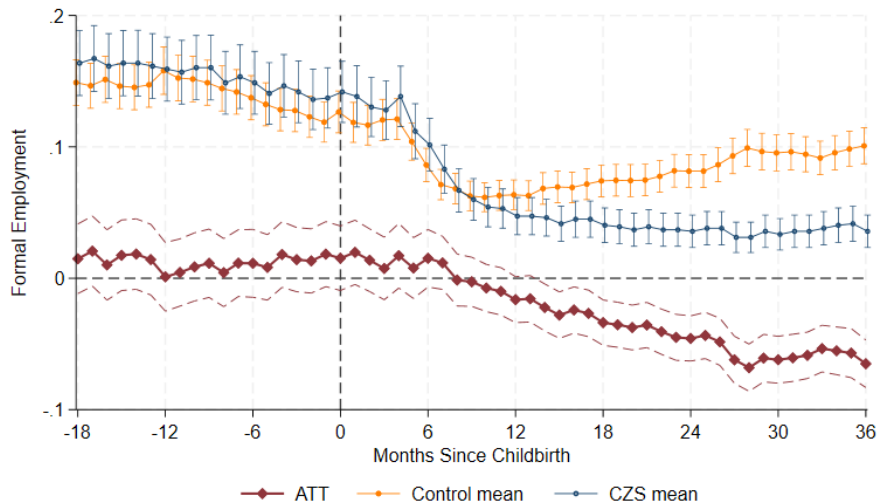
Mother's Formal Labor Market

Variable	SD	DID	Baseline	N	Clusters
Employment	-0.040***	-0.051***	0.149	509,716	852
	(0.007)	(0.013)			
Earnings	-39.47***	-52.05***	155.4	509,716	852
	(8.92)	(14.89)			
Monthly wages if employed	83.29	79.47	1043.7	54,233	596
	(72.17)	(77.54)			
Weekly hours	-2.02***	-2.41***	6.68	509,716	852
	(0.32)	(0.56)			
Weekly hours if employed	-0.68	0.72	42.6	59,659	599
	(0.83)	(1.09)			

Figures

Father's Formal Employment
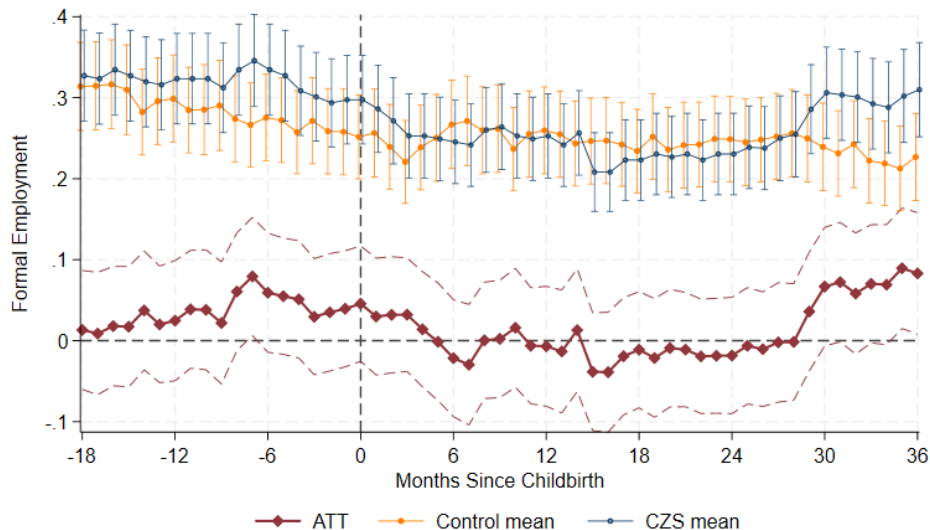
Father's Formal Labor Market

Variable	SD	DID	Baseline	N	Clusters
Employment	0.014	0.011	0.29	39,650	173
	(0.033)	(0.041)			
Earnings	78.10	33.77	387.4	39,650	173
	(64.906)	(59.171)			
Monthly wages if employed	230.79*	92.01	1334.3	10,943	156
	(124.080)	(113.839)			
Weekly hours	0.421	0.588	13.13	39,650	173
	(1.562)	(1.836)			
Weekly hours if employed	-0.417	-0.357	44.29	11,492	156
	(0.949)	(0.837)			

Figures

Results - Informal Employment

Mother's Informal Employment
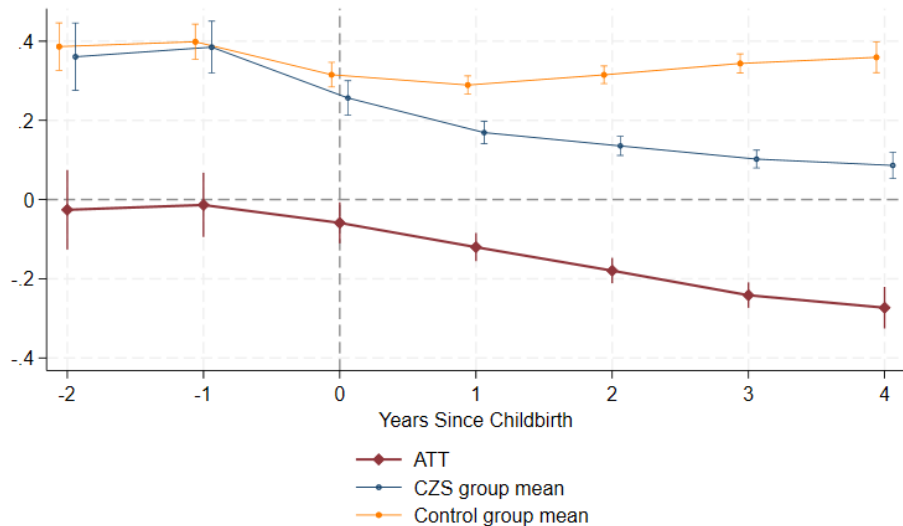
Mother's Informal Labor Market

Variable	SD	DID	Baseline	N	Clusters
Employment	-0.204***	-0.190***	0.399	29,979	852
	(0.015)	(0.041)			
Earnings	-384.6***	-493.57***	690.9	29,979	852
	(45.9)	(132.719)			
Conditional months of work	0.010	0.641	7.81	9,984	647
	(0.473)	(0.663)			
Conditional earnings	55.5	-870.4	1779.3	9,984	647
	(259.1)	(779.4)			

Figures

Father's Informal Employment
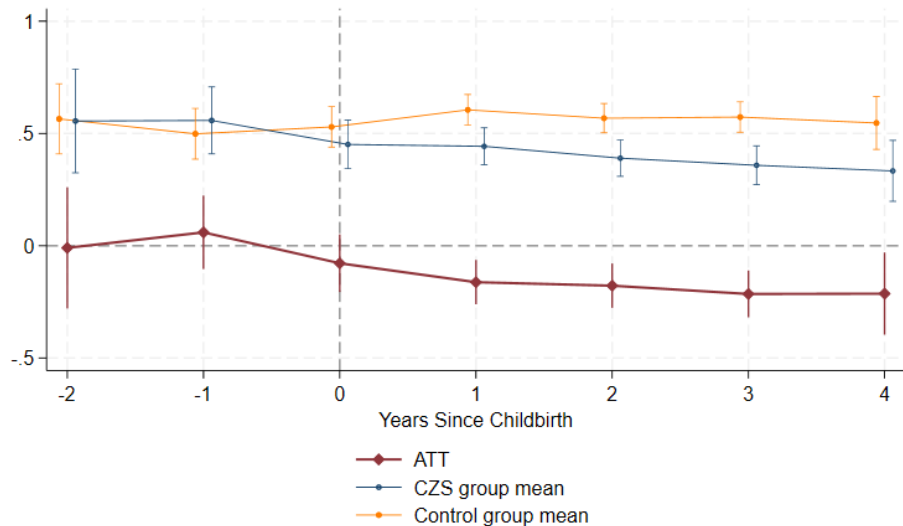
Father's Informal Labor Market

Variable	SD	DID	Baseline	N	Clusters
Employment	-0.192***	-0.252***	0.499	2,196	173
	(0.047)	(0.087)			
Earnings	-342.0	-457.1	1256.3	2,196	173
	(245.3)	(407.8)			
Conditional months of work	1.059*	1.198	8.139	1,168	157
	(0.629)	(1.262)			
Conditional annual earnings	563.6	609.9	2579.4	1,168	157
	(457.8)	(758.1)			

Figures

Social Assistance

Household Income by Source

Social Assistance: BPC
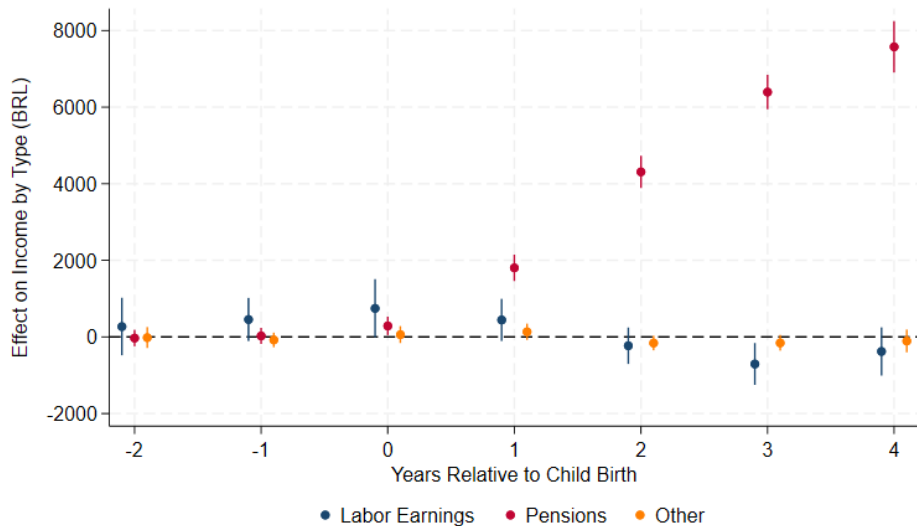
- BPC: social security program – one minimum wage to poor disabled people.
- Important to understand heterogeneity of effects based on recipient status.
    - Income effects may be important, as well as employment disincentives.
- We analyze heterogeneity interacting CZS with the BPC.
- We estimate the propensity score of receiving the BPC and control for it, and its interaction with CZS.
    - Controls for heterogeneity in characteristics that determine recipient status.

Effects on Formal Employment by Social Security Recipient Status

	(1)	(2)	(3)	(4)
Outcome: **Formal Employment** 2 Years After Childbirth				
CZS	-0.077***	-0.069***	-0.066***	-0.068***
	(0.016)	(0.016)	(0.019)	(0.016)
BPC	-0.017	0.006	0.006	0.010
	(0.017)	(0.020)	(0.020)	(0.020)
CZS x BPC	-0.037	-0.060*	-0.060*	-0.063*
	(0.022)	(0.024)	(0.024)	(0.025)
PS Controls	None	Linear	Cubic	Ventile FE
PS Controls x CZS	-	Yes	Yes	Yes
Observations	8,356	8,354	8,354	8,354
Clusters	852	851	851	851

Placebo

Effects on Informal Employment by Social Security Recipient Status

	(1)	(2)	(3)	(4)
Outcome: **Informal Employment** 2 Years After Childbirth				
CZS	-0.098***	-0.100***	-0.075*	-0.096***
	(0.024)	(0.024)	(0.030)	(0.024)
BPC	0.016	-0.001	0.001	0.002
	(0.023)	(0.025)	(0.025)	(0.026)
CZS x BPC	-0.190***	-0.183***	-0.188***	-0.199***
	(0.031)	(0.034)	(0.035)	(0.035)
PS Controls	None	Linear	Cubic	Ventile FE
PS Controls x CZS	-	Yes	Yes	Yes
Observations	7,494	7,492	7,492	7,492
Clusters	845	844	844	844

Placebo

Family Structure

Results Summary - Family Structure

Variable	SD	DID	Baseline	N	Clusters
Single household	0.005	0.014	0.504	26,782	844
	(0.020)	(0.034)			
Spouse present	0.051***	-0.004	0.253	26,782	844
	(0.018)	(0.031)			
Grandparent present	-0.044***	-0.014	0.178	26,782	844
	(0.011)	(0.018)			
Subsequent fertility	0.009	0.009	0	26,782	844
	(0.010)	(0.010)			

Figures

Effect on Mother's Formal Employment
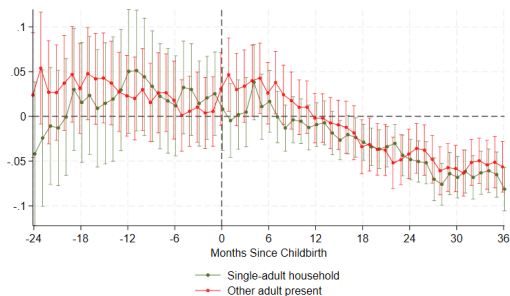
Effect on Mother's Informal Employment
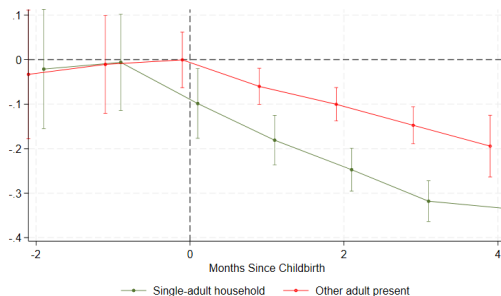
Conclusion

- We exploit the Zika shock to study the effects of child disability.
- Strong negative effects for mothers in formal employment.
- Strong effects on informal labor challenge the notion that informality serves as a buffer.
- Social disability payments seem crucial in buffering family income, but reduce employment
- We find no effects in family structure.
- Single mothers have larger reductions in informal employment but not in the formal sector.

Appendix

Stage	Cases
A. Initial Sample Construction	
RESP records (probable/confirmed CZS)	3,594
After dropping missing birth dates	2,946
After restricting to 2015 – 2017	2,431
After de-duplication	2,411
After SR-2017 linkage	940
After SR-2019 linkage	1,221
Cases available for matching	1,200
B. Sequential Matching Process	
Stage 1: Municipality	669 (6,009 controls)
Stage 2: Microregion	+ 198 (1,480 controls)
Final sample (cases)	**867**
Final sample (controls)	**7,489**

	Microcephaly	Control (raw)	Control (wgt)	p-value
Completed HS (%)	37.37	29.06	37.37	.
Mother's age	24.64	23.08	24.64	.
White	16.84	11.20	16.84	.
Black	11.53	16.33	12.96	0.254
Yellow	0.58	0.51	0.66	0.788
Pardo	70.47	71.76	69.19	0.316
Indigenous	0.58	0.21	0.35	0.344
Firstborn	57.44	60.46	57.44	.
Second	27.22	24.05	26.87	0.767
Third	9.57	10.60	10.18	0.580
Higher	5.77	4.89	5.51	0.765
Employment y-1	14.92	13.17	13.87	0.371
Employment y-2	16.29	14.22	14.70	0.171
Wage y-1	1083.63	990.32	1044.88	0.552
Wage y-2	1062.34	952.13	987.27	0.163

Formal Employment Figures

Mother's formal earnings
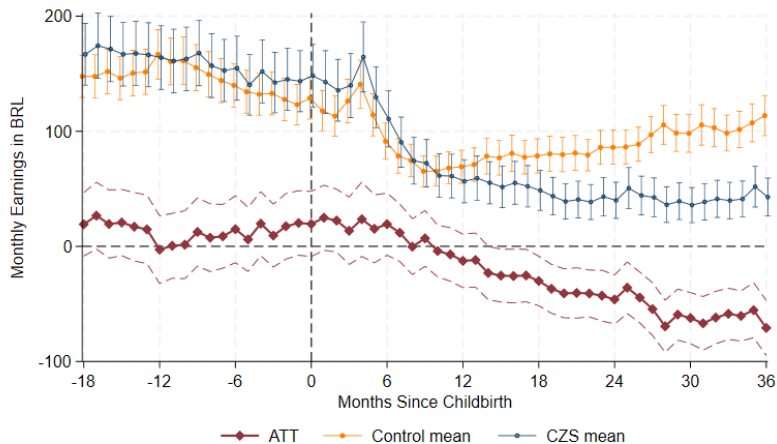
Mother's wages if employed

Weekly contractual hours
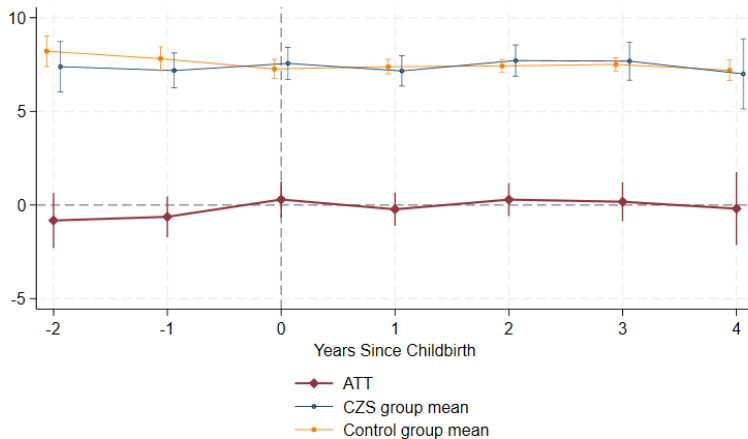
Back
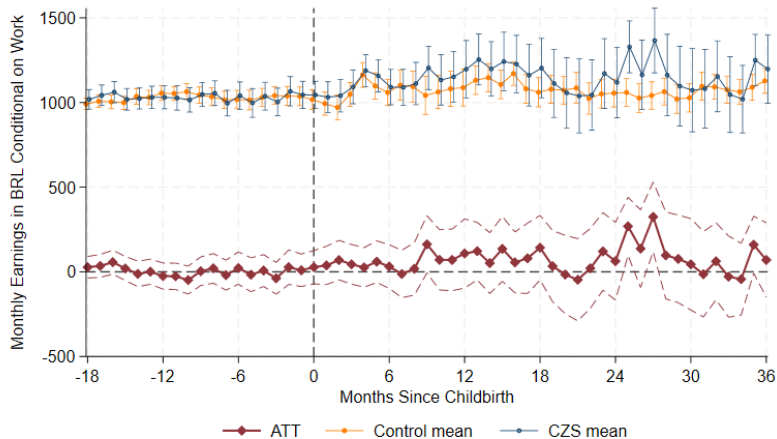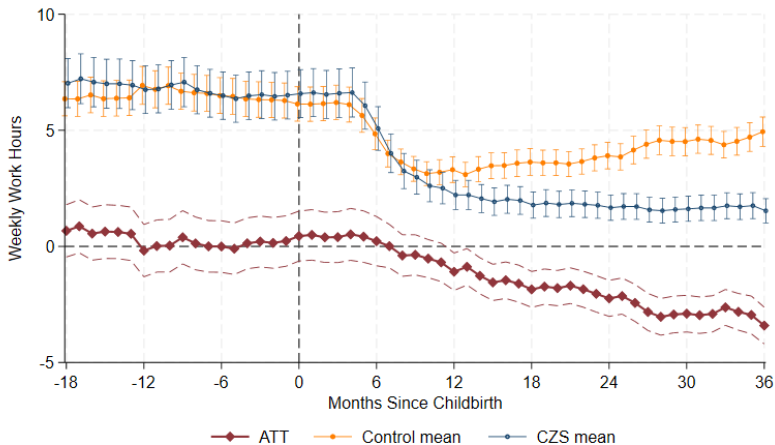
Weekly contractual hours if employed
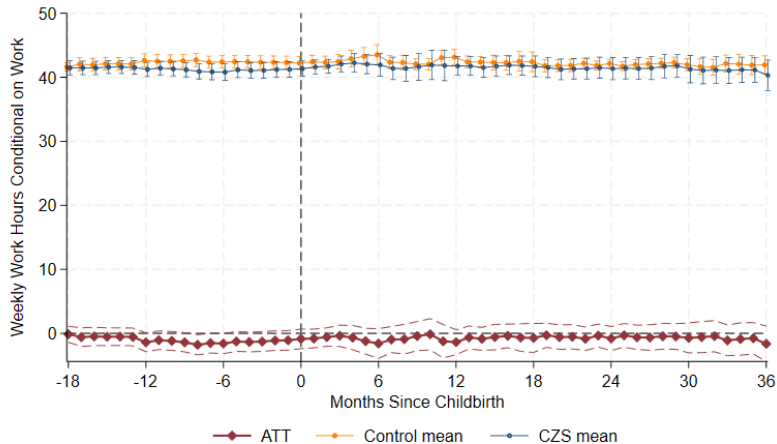
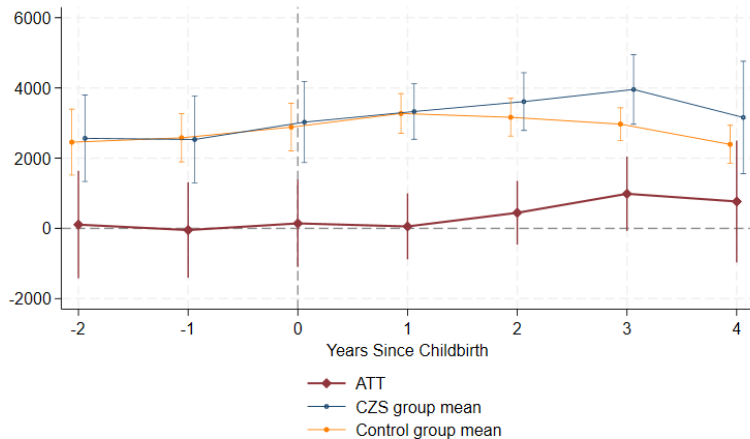# Informal Employment Figures

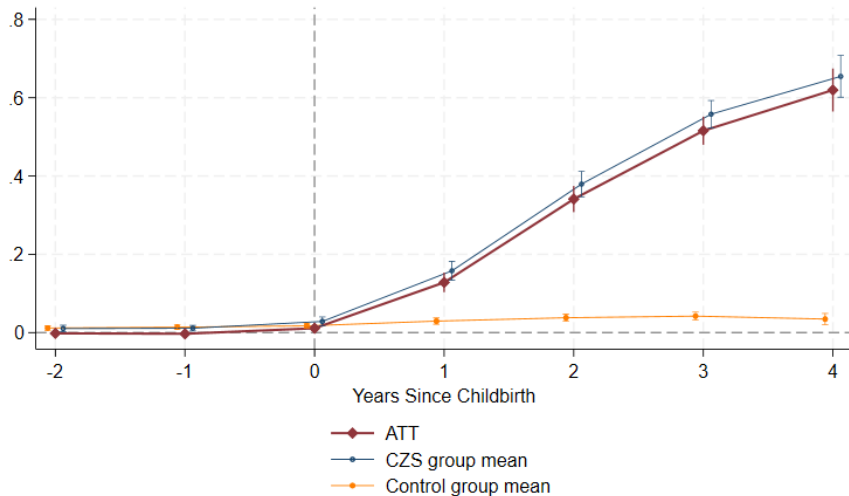# Mother's informal earnings
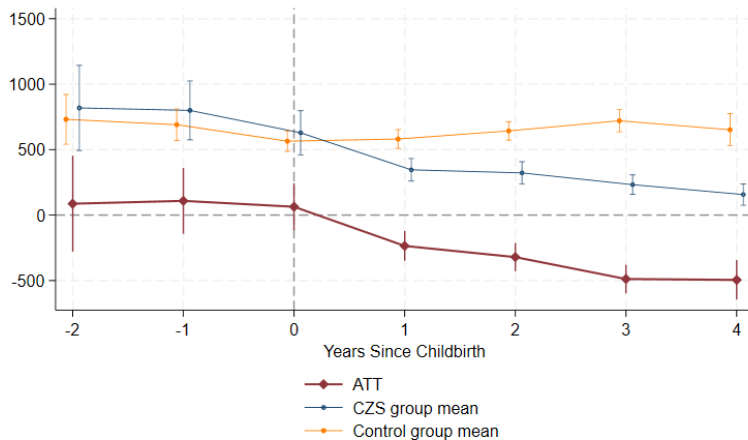
Conditional months of work

Back

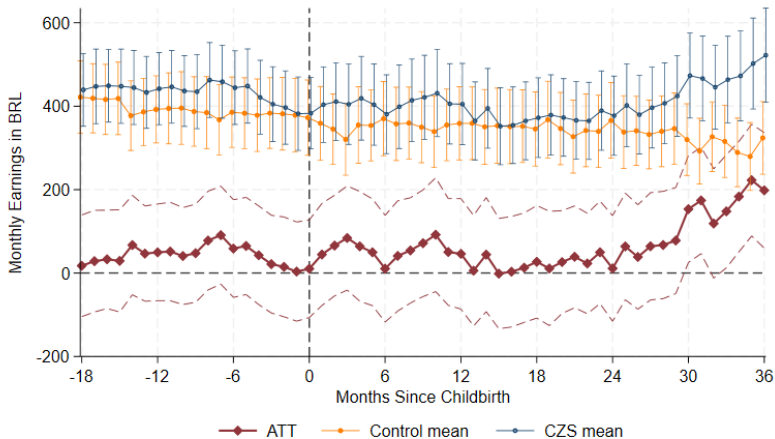# Conditional earnings

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Receives Social Assistance Benefits

Father's Employment Figures
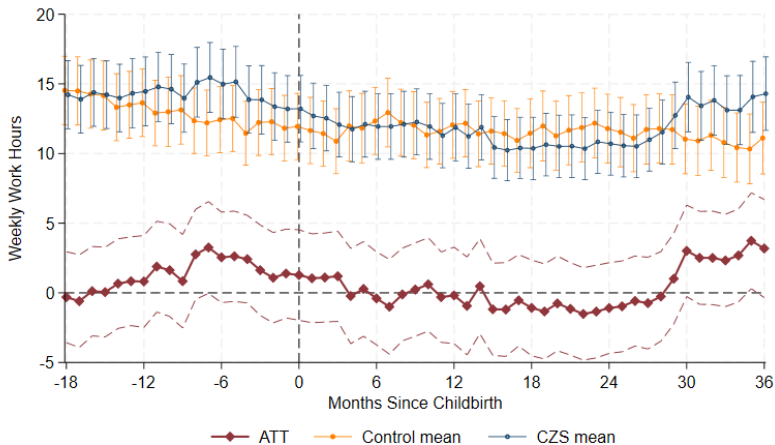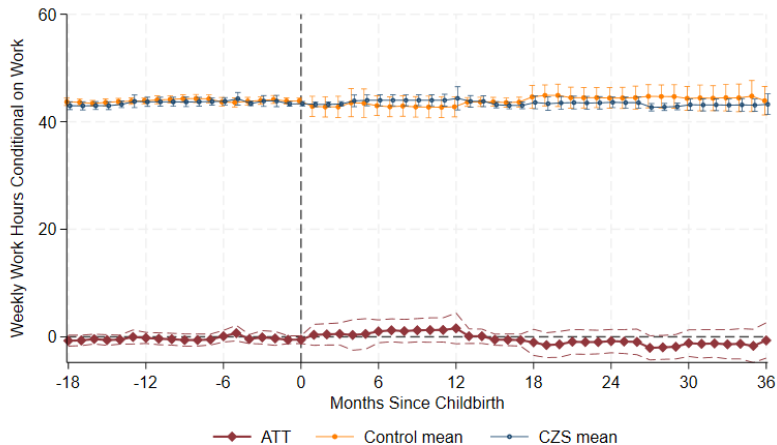
Fathers' formal earnings

Fathers' monthly wages if employed

Back
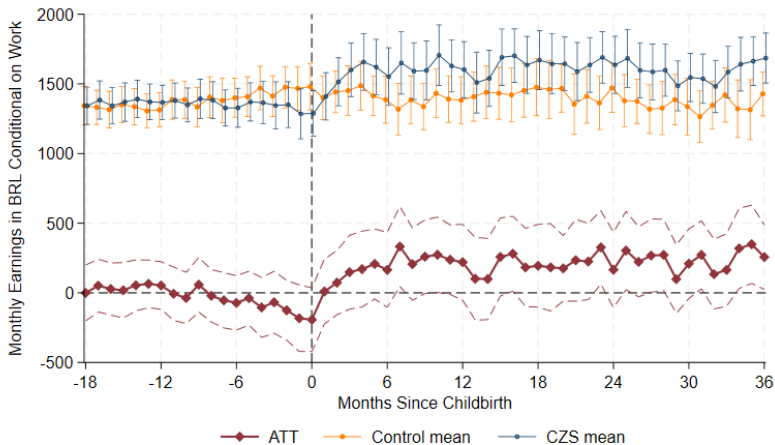
Fathers' weekly contractual hours

Fathers' conditional weekly contractual hours

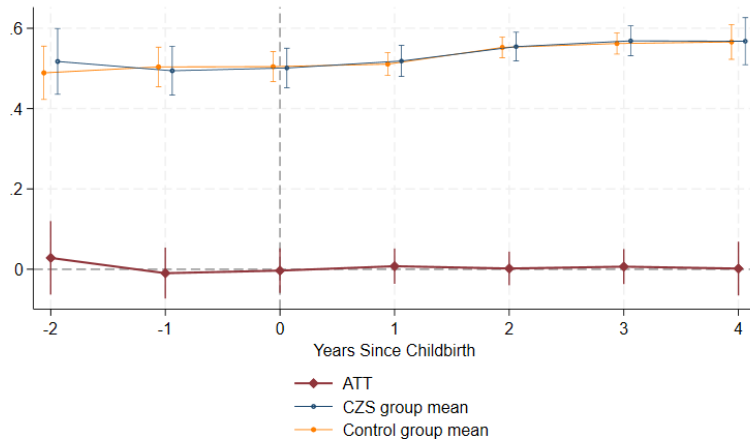## Placebo: Effects on Formal Employment by Social Security Recipient Status

	(1)	(2)	(3)	(4)
Placebo: Formal Employment 1 Year Before Childbirth				
CZS	-0.017	-0.016	0.012	-0.020
	(0.020)	(0.020)	(0.024)	(0.020)
BPC	-0.061**	-0.031	-0.030	-0.024
	(0.021)	(0.023)	(0.023)	(0.022)
CZS x BPC	0.035	0.030	0.026	0.027
	(0.031)	(0.033)	(0.033)	(0.032)
PS Controls	None	Linear	Cubic	Ventile FE
PS Controls x CZS	-	Yes	Yes	Yes
Observations	8,356	8,354	8,354	8,354
Clusters	852	851	851	851

Back

Placebo: Effects on Informal Employment by Social Security Recipient Status

	(1)	(2)	(3)	(4)
Placebo: **Informal Employment** 1 Year Before Childbirth				
CZS	0.009	0.011	0.037	-0.016
	(0.056)	(0.056)	(0.072)	(0.055)
BPC	-0.016	-0.042	-0.039	-0.047
	(0.046)	(0.048)	(0.048)	(0.049)
CZS x BPC	-0.054	-0.057	-0.060	-0.044
	(0.083)	(0.089)	(0.089)	(0.091)
PS Controls	None	Linear	Cubic	Ventile FE
PS Controls x CZS	-	Yes	Yes	Yes
Observations	1,921	1,921	1,921	1,921
Clusters	365	365	365	365

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Family Structure

Mother Lives Alone

Back

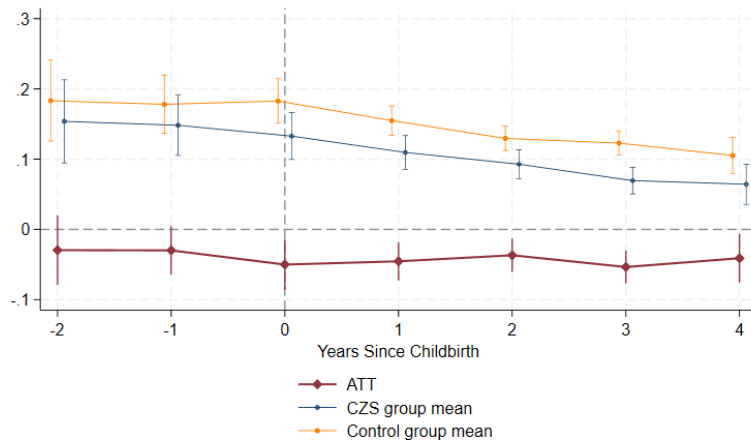# Grandparents Present

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Subsequent Fertility

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