Is universal child care leveling the playing field?

Journal of Public Economics, 2015

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Paper presentation ECON 232M , UCLA.
June 3, 2022

This work

Question: What is the case for **universal** child care programs?

What this paper does:

(a) Performs non-linear difference-in-differences (DiD) methods to estimate the quantile treatment effects (QTE) of the reform on adult outcomes (mainly income).

(b) Estimates local linear regressions of the child care effects on adult outcomes by family (of the child) income.

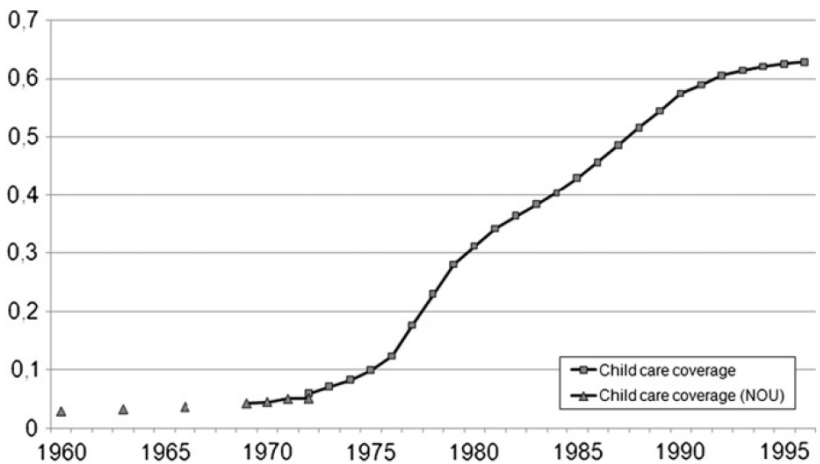
(c) Rationalizes the results using a simple model where parents make a tradeoff decision between current family consumption and investment in children.

Key take away: Children of low-income parents increase their adult earnings by going to daycare, whereas upper-class children experience a loss in earnings.

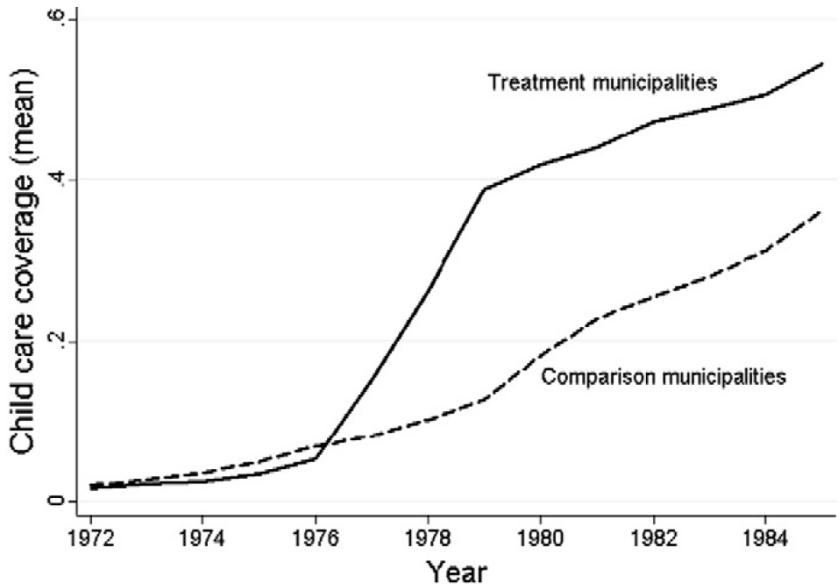
$\Longrightarrow$ Universal child care programs might explain some differences in earnings inequality and income mobility.

Universal childcare reform in Norway, 1975

- All children 3-6 years old were eligible regardless of their parents' employment and marital status.
- Expansion of subsidized child care across Norway's more than 400 municipalities.



Total coverage rates



Coverage rates treatment vs comparison group

Identification strategy

DiD approach: Adult outcome of interest for 3 to 6 year olds before and after the childcare reform.

Treatment group: People from municipalities where child care coverage rate expanded above the median percentage from 1976 to 1979.

Comparison group: Below the median.

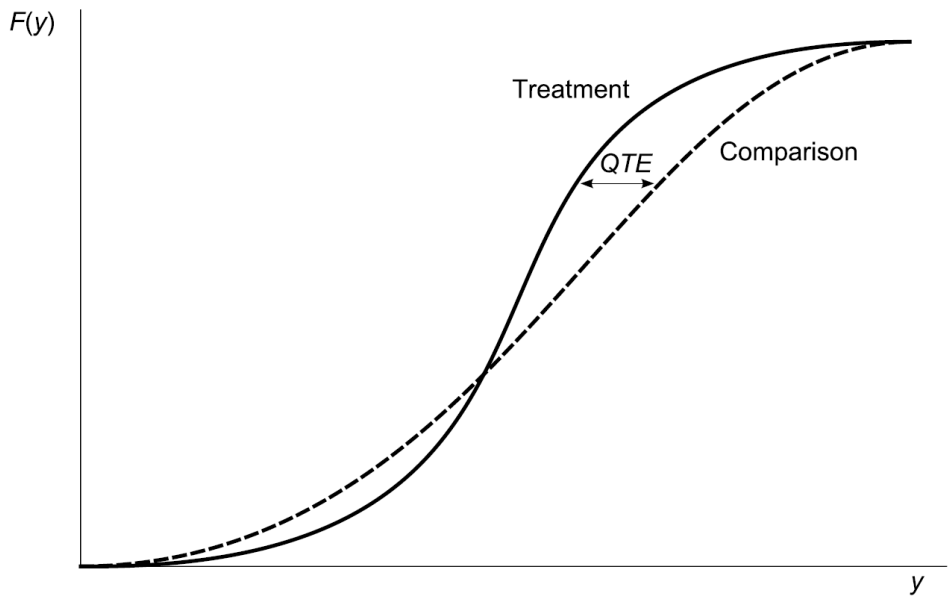
Two main potential selection issues:

- Selection of municipalities into expanding child care depending on the gains in child development from subsidized child care.
- Depending on the underlying time trends in child outcomes in the absence of the child care expansion.

Econometric model (i): QTE

Non-linear DiD methods: Quantile treatment effects (QTEs) to assess the impact of the universal child care program at different parts of the outcome distribution.

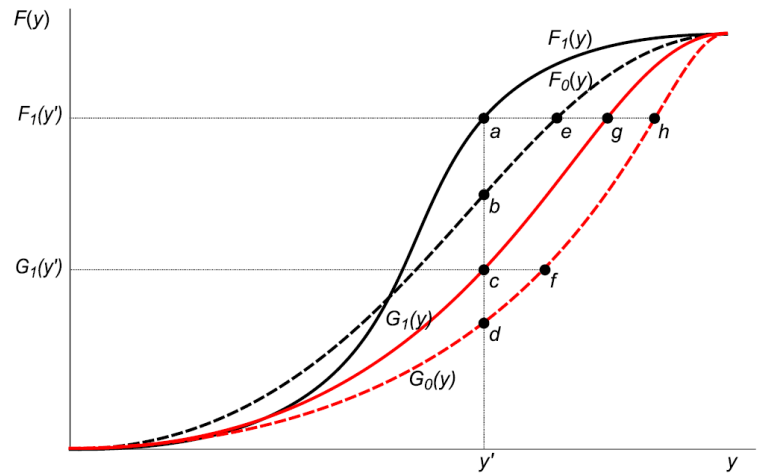
QTE (Random treatment): Difference in the τth earnings quantile in the treatment versus the comparison group.
$\Longrightarrow$ horizontal differences in the CDF of the outcome between the treatment and the comparison group.



QTE

Econometric model (ii): Non-linear DiD

1. Compute the observed change in the distribution of the comparison group, from before (G_0) to after (G_1) treatment assignment. Use it to estimate the change that would have occurred in the treatment group in the absence of treatment.
2. Define the counterfactual earnings distribution of the post-reform cohorts from treatment as: $\mathbb{F}_1(y)_{RIF} = F_0(y) + [G_1(y) - G_0(y)]$.
3. DiD-effect: $F_1(y) - \mathbb{F}_1(y)_{RIF}$.
4. Divide this difference by a kernel estimate of the joint density of earnings at y' to arrive at the associated QTE. This is the recentered influence function (RIF) regression



$\Longrightarrow$ QDiD (at $y' = y$): $(a - e) - (g - h)$.

$\Longrightarrow$ RIF-DiD (at $y' = y$): $-[(a - b) - (c - d)]$

Econometric model: Comments

Why is this important: "Usual" DiD methods will deliver the average tretment effects, which hides many composition effects; in this case driven by earnings distribution heterogenous effects.

RIF-DiD fundamental Identification assumption: The change in population shares from before to after treatment around a a given level of earnings would be the same in the treatment group as in the comparison group in the absence of treatment.

Data

Different merged data sets with individuals' and families' unique identifiers (matched parents-child) to get:

- Individual demographic information (including gender, date of birth, and the municipality of residency).
- Socioeconomic data (including education and earnings).
- National military records with information on cognitive test scores.
- Child care institutions characteristics (enrolled children and their characteristics)
- Primary outcome variable of interest: Child's average earnings over the period 2006-2009.

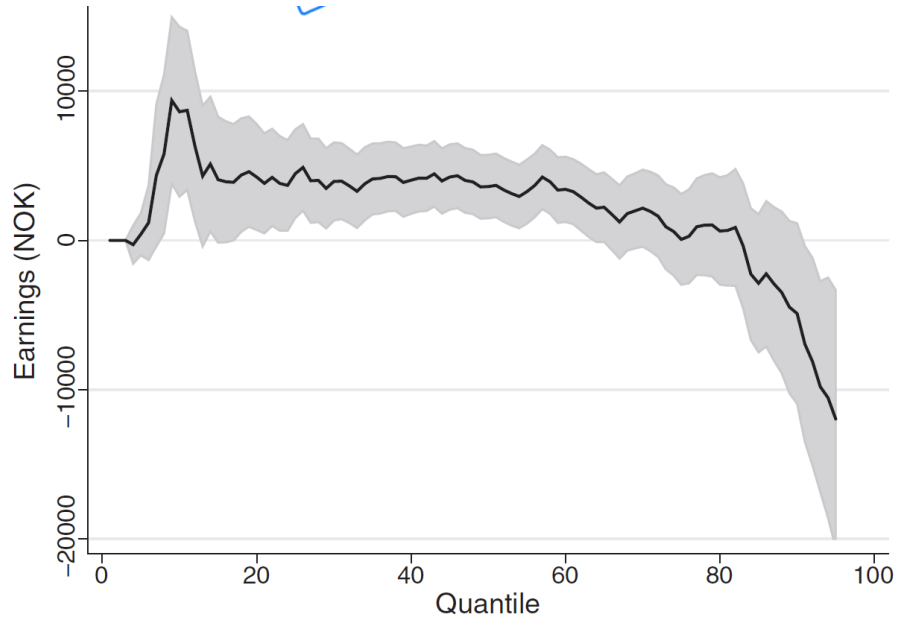
Descriptive stats

Average earnings over the period 2006-2009 measured in NOK (NOK/USD = 6).

	Level	Differences		DiD
	Treated	Treated – comparison		Treated – comparison
	Pre-reform	Pre-reform	Post-reform	Post-reform – pre-reform
5th percentile	4,965	596	1,381	785
10th percentile	85,068	−654	6,666	7,320
25th percentile	243,990	3,817	6,888	3,071
50th percentile	358,769	4,082	7,004	2,922
75th percentile	476,324	9,336	9,787	451
90th percentile	652,850	22,057	17,388	−4,669
95th percentile	798,376	31,454	18,198	−13,256
Mean	383,897	9942	10,176	234

Positive effects in the lower and central parts and negative effects in the upper parts of the earnings distribution.

Main results: QTE estimates from Rif-DiD estimator



- The point estimates are zero or positive for all percentiles until the 82nd percentile.
- The effect peaks at the 11th percentile, \$1.27 increase in earnings per dollar spent in childcare.
- Between the 15th and the 60th percentile, estimates remain positive but then fade out and turn negative in the the upper part of the distribution.

$\Longrightarrow$ The introduction of subsidized care equalized the outcome distribution of children.

DiD effects by family income

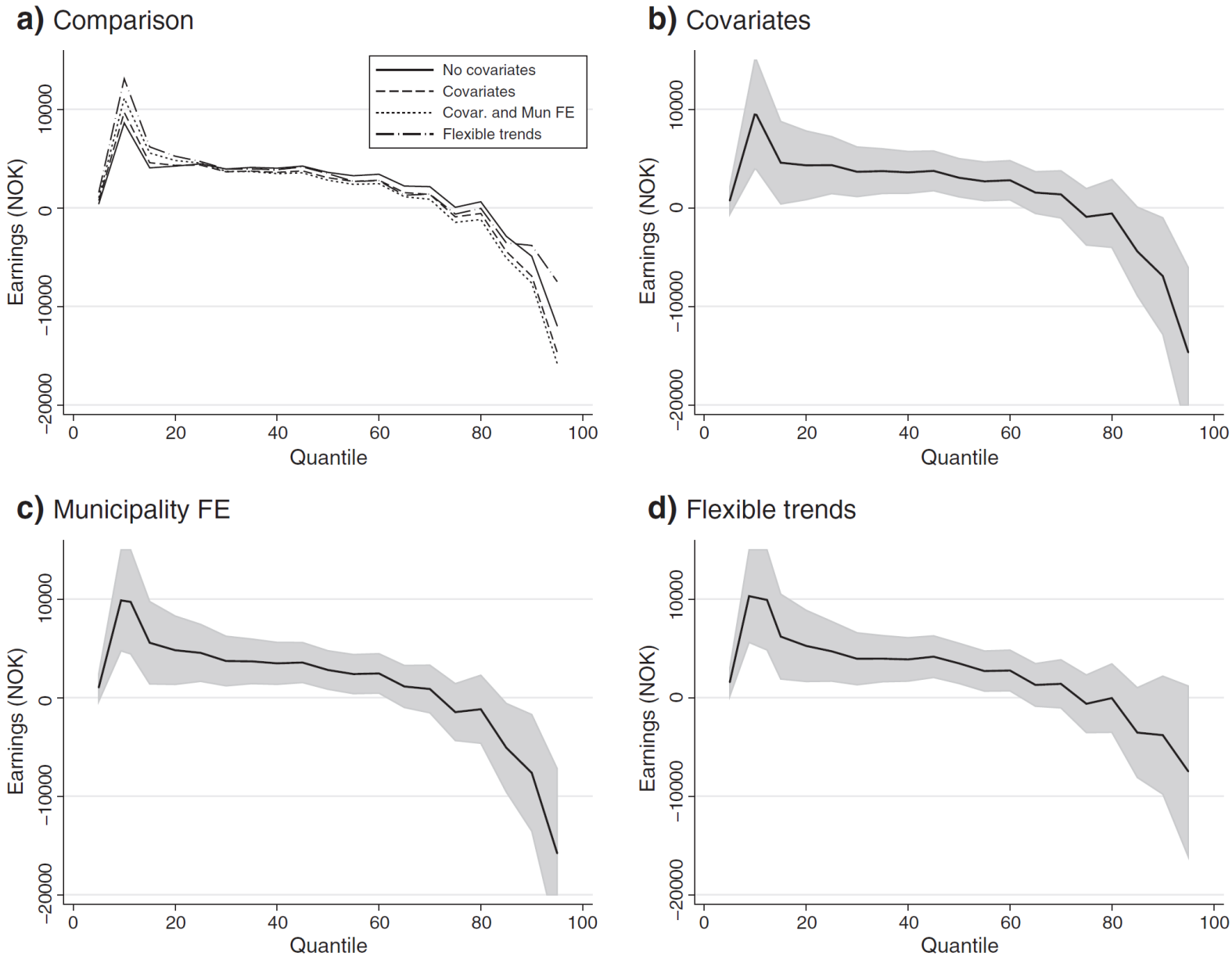
	A. Earnings		B. Years of schooling		
	Coef (SE)	Mean	Coef (SE)	Mean	N
Overall	333 (1,596)	361,860	0.074 (0.017)	12.83	498,947
Child gender					
Boys	−978 (2,504)	440,020	0.084 (0.024)	12.62	253,677
Girls	631 (1616)	281,020	0.066 (0.025)	13.06	245,270
Family income					
High	−8,095 (4,575)	410,678	0.018 (0.041)	13.82	99,761
Mid	−1,785 (3,403)	355,887	0.081 (0.037)	12.69	99,793
Low	9,287 (3,331)	325,523	0.241 (0.039)	12.20	99,801

Notes: This table reports mean impact estimates from the standard DiD estimator, and the

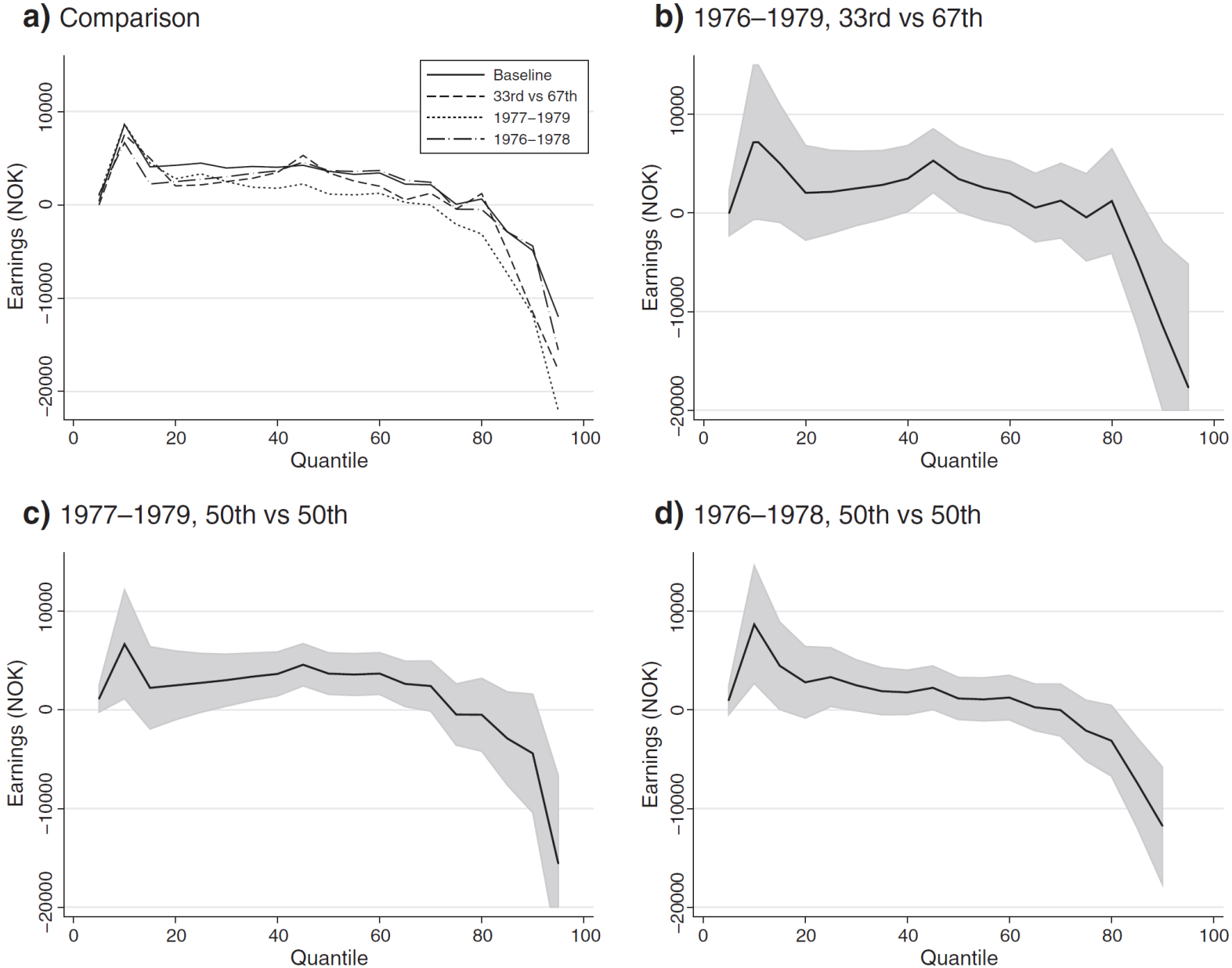
It seems that the mechanism driving a more equalized income distribution is the increase in years of schooling.

$\Longrightarrow$ The differential effects by parental income suggest that the child care reform could be improving social mobility. Which in fact does, there is a 9% decrease in intergenerational persistence in earning

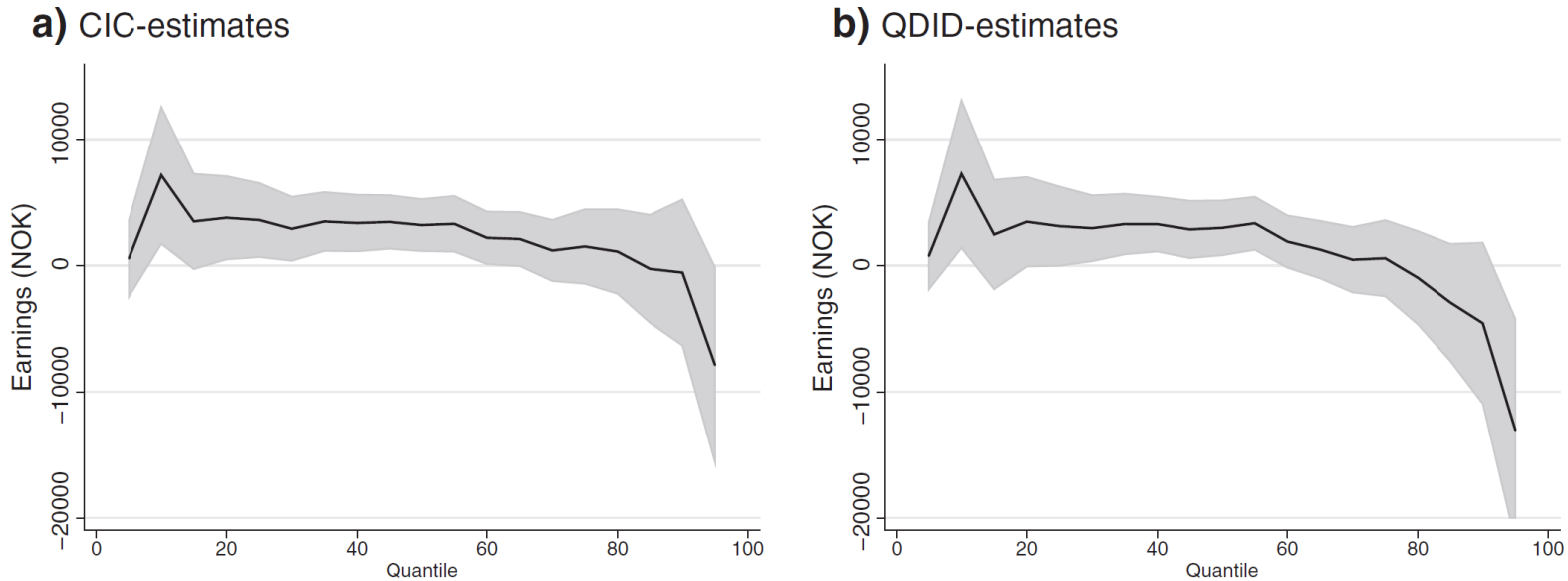
Robustness 1: Different specifications



Robustness 2: Alternative treatment group definitions



Robustness 3: Alternative non-linear DiD Estimators



The CiC-estimator is a three-step procedure:

1. Find the quantile of y in G_1 (Comparison CDF after).
2. Find the earnings level at that quantile in G_0 (Comparison CDF before).
3. Find the quantile of that earnings level in F_0 (Treatment CDF before).