

# Reinvestigating Who Benefits and Who Loses from Universal Childcare in Canada

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Preliminary

- ▶ Trends in maternal labour supply

Canadian mother's: 31% in 1976 to 71% in 2008

- ▶ Trends in child care

- ▶ Increasing political concern

"This [National Child Care Program] is the number one social priority of an incoming Liberal government." — Michael Ignatieff

"I want to be clear that issues like equal pay, family leave, child care and others are not just women's issues, they are family issues and economic issues. Our progress in these areas is an important measure of whether we are truly fulfilling the promise of our democracy for all our people." — Barack Obama

# What About the Evidence?

- ▶ No better time to invest in human capital (Heckman 2007)
  - ▶ Successful targeted programs  
(Perry Preschool Project / Abecedarian Project / Head Start)
  - ▶ Private Programs  
(Lefebvre and Merrigan 2002, Magnuson *et al.* 2007)  
(NICHD-ECCRN 2003, Loeb *et al.* 2007)
- ▶ Mixed Results on Universal Programs
  - ▶ Cognitive development  
(Henry *et al.* 2004, Gormley *et al.* 2005, Baker *et al.* 2008)
  - ▶ Behavioural and emotional development  
(Baker *et al.* 2008)
  - ▶ Long run benefits  
(Havnes and Mogstad 2009)

# Our Contributions to Childcare Discussion

- ▶ The Quebec Family Policy in the “long-run”
- ▶ Propensity score re-weighting  
Hirano, Imbens and Ridder (2003)  
Calculated using a series-logit  
Average treatment effect on treated
- ▶ Examine heterogeneous effects across quantiles
- ▶ Higher Moment Analysis  
Variance, Skewness, and Kurtosis
- ▶ Breakdown by gender

# Quebec Family Policy

- ▶ Intended to encourage higher birth rates and strengthen governmental support of parents
- ▶ Child care access for children aged 0-4 at a rate of \$5 per day
- ▶ Implemented between 1997-2000  
Aged 4 in 1997, Aged 3 in 1998, Aged 2 in 1999 and Aged 0-2 in 2000
- ▶ New regulations for child care employee qualifications and increases in wages for caregivers

# National Longitudinal Study of Children and Youth

- ▶ 7 Biennial cycles available from 1994-2007  
Program implementation and growth occurs in Cycles 3 and 4
- ▶ 2 Developmental scores and 4 behavioural indexes
- ▶ Health and parenting measures
- ▶ Rich set of family related covariates / variables
- ▶ Sample of 38648 Children 0-4
- ▶ Sample restricted to two-parent families

- ▶ Quebec Family Policy as a natural experiment
- ▶ Use a difference-in-difference (DID) estimator
- ▶ Findings:
  - Motor and social development is worse
  - Increased behavioural problems
  - Negative health effects
  - Worse parenting outcomes
- ▶ Advise caution in adopting the Quebec child care model
- ▶ Not surprisingly these findings ignited quite a controversy

# Extending Baker, Gruber, and Milligan

- ▶ Replicate Baker *et al.* (2008) with additional waves of data
- ▶ Expect change in usage and quality of care over time
- ▶ Robust with additional waves of NLSCY
- ▶ Move on to the more interesting findings



- ▶ Empirical Model:

$$Outcome = \beta_0 + \beta_1 Childcare + \beta_2 PROV + \beta_3 YEAR + \beta_4 X + \varepsilon$$

$$Childcare = \alpha_0 + \alpha_1 Policy + \alpha_2 PROV + \alpha_3 YEAR + \alpha_4 X + \nu$$

- ▶ Series Logit, Inverse Propensity Weights
- ▶ Note that Baker *et al.* (2008) JPE estimate the reduced form:  
$$Outcome = \gamma_0 + \gamma_1 Policy + \gamma_2 PROV + \gamma_3 YEAR + \gamma_4 X + \omega$$
- ▶ Intent to treat effect vs. treatment effect on the treated

# Alternative Estimation

- ▶ Control Function Estimator:

$$\text{Outcome} = \beta_0 + \beta_1 \text{Childcare} + \beta_2 \text{PROV} + \beta_3 \text{YEAR} + \beta_4 \text{X} + \beta_5 \hat{\nu} + \varepsilon$$

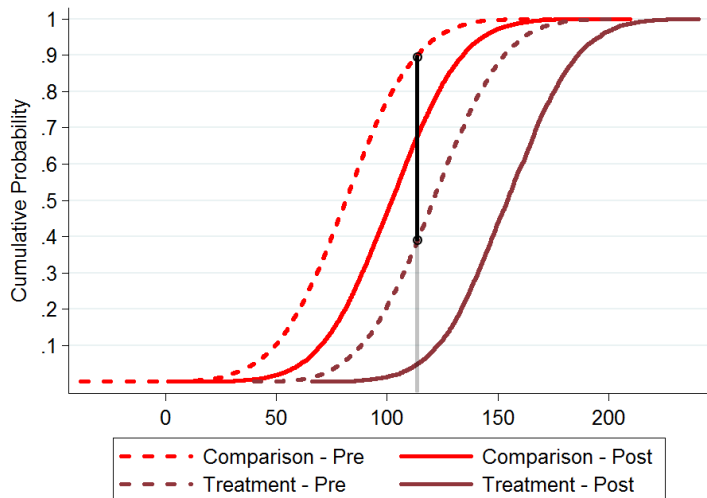
$$\text{Childcare} = \alpha_0 + \alpha_1 \text{Policy} + \alpha_2 \text{PROV} + \alpha_3 \text{YEAR} + \alpha_4 \text{X} + \nu$$

- ▶ Parallel to two stage predictor substitution models
- ▶ Provides control for selection on unobservables
- ▶ Results are robust to this alternative estimation

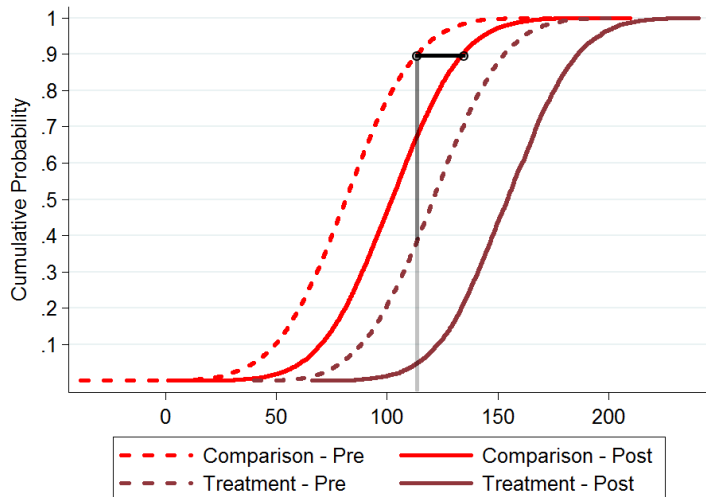
# Change-in-Change Model

- ▶ Generalization of the DID model proposed by Athey and Imbens (2006)
- ▶ This method is not functional form dependent  
Unlike standard DID test scores need not be a linear function of the covariates
- ▶ Allows for treatment effect heterogeneity
- ▶ The model is just identified and requires arguably weaker conditions for identification
- ▶ Recovers the distribution of the counterfactual outcome conditional on intervention

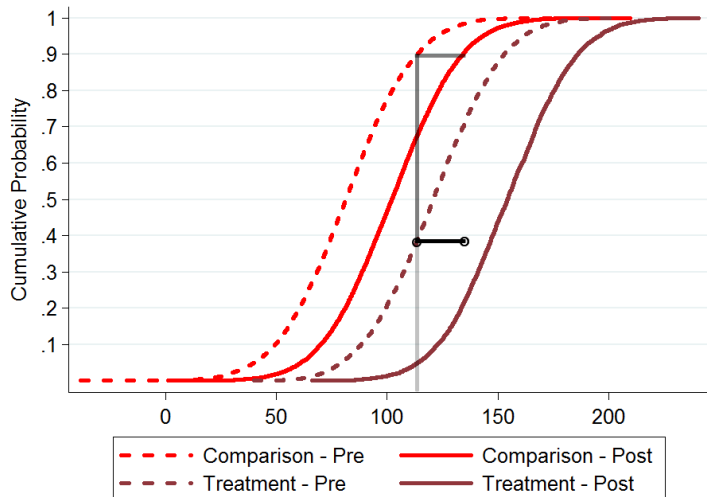
# Change-in-Change Model



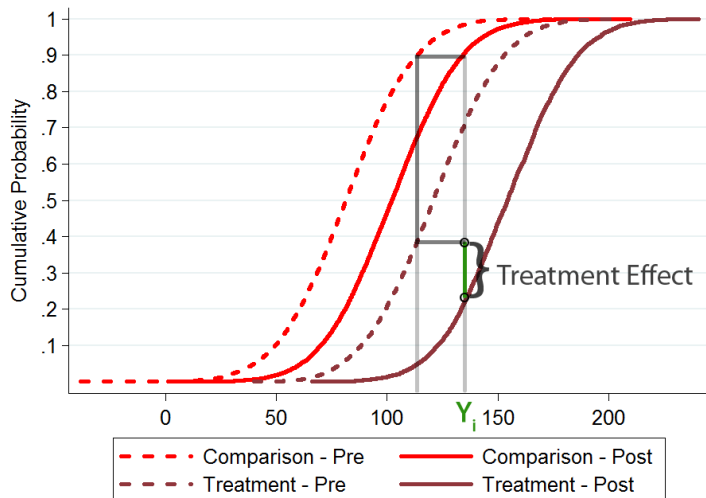
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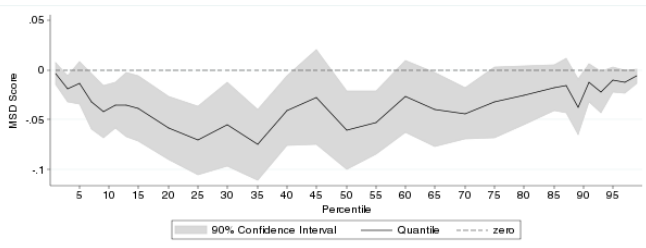
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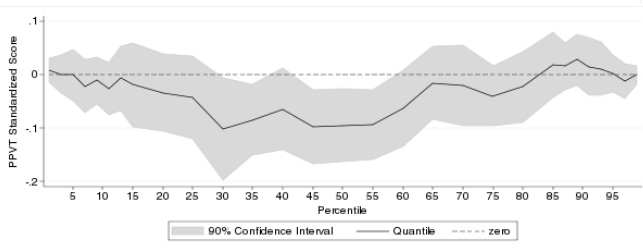
# Change-in-Change Model



# Unweighted Change-in-Change Estimation



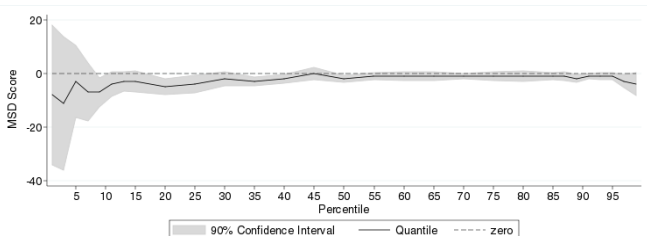
MSD



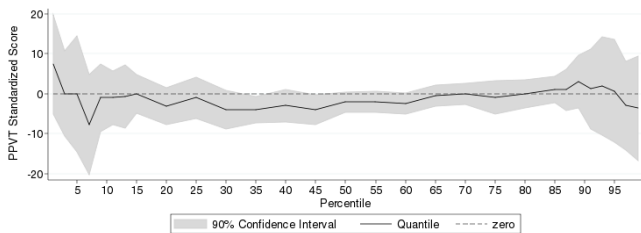
PPVT



# Unweighted Change-in-Change Estimation - Scores

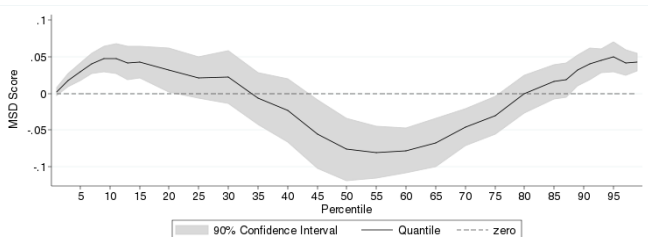


MSD

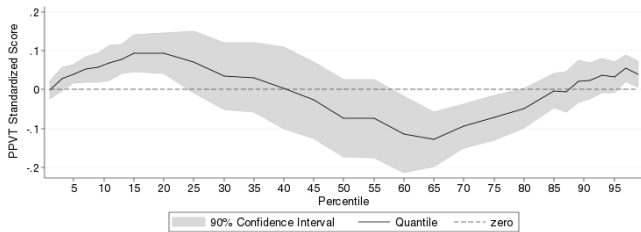


PPVT

# Weighted Change-in-Change Estimation

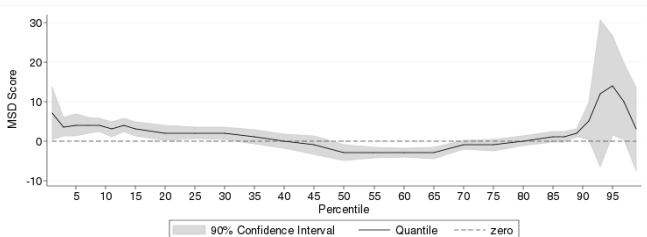


MSD

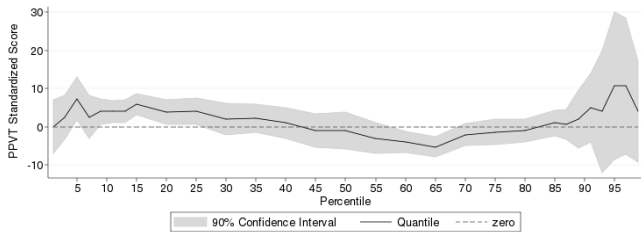


PPVT

# Weighted Change-in-Change Estimation - Scores



MSD



PPVT

# Mean, Variance, Skewness and Kurtosis Results

- ▶ Positive policy effect on variance / kurtosis in MSD score

	Mean	Variance	Skewness	Kurtosis
Without Weights				
PPVT Score	-0.435 (1.29)	-3.489 (21.015)	-0.214 (0.284)	-1.339 (0.931)
MSD Score	-1.688 (0.63)***	32.781 (11.796)***	-0.600 (0.215)***	2.191 (1.066)**
With Inverse Propensity Weights				
PPVT Score	-1.550 (1.046)	0.126 (21.958)	-0.146 (0.332)	-0.523 (1.128)
MSD Score	-0.250 (0.481)	30.879 (12.731)**	-0.342 (0.239)	2.099 (1.192)*

# Treatment Effect Heterogeneity by Gender

- ▶ Substantial heterogeneity in the effects of early childhood education programs by gender

Established in projects such as Perry Preschool Project or Abecedarian Project

- ▶ No difference in cognitive development scores
- ▶ Variance increases in MSD are driven by male children
- ▶ Larger behavioural, emotional, and health impacts for males
- ▶ Parents of male children fare worse  
Higher mother's depression scores and family dysfunction

# Gender Analysis - Mean Effects

	All	Girls	Boys
Hyperactivity and Inattention Score	0.394 0.116***	0.073 0.160	0.717 0.165***
Separation Anxiety Score	0.302 0.090***	0.069 0.130	0.535 0.125***
Child in Excellent Health	-0.060 0.014***	-0.043 0.019**	-0.078 0.019***
Never had an Ear Infection	-0.055 0.016***	-0.035 0.023	-0.077 0.022***
Family Outcomes			
Family Dysfunction Index	0.671 0.144***	0.224 0.206	1.104 0.200***
Aversive Parenting	0.280 0.080***	0.266 0.112**	0.303 0.113***
Mother's Depression Score	0.366 0.142***	0.221 0.203	0.513 0.199***

# Conclusions

- ▶ Mean Effects are unable to capture the whole picture
- ▶ Distributional analysis shows a variety of effects
  - Results suggests that targeting childcare coverage would be more effective than universal coverage
  - Substantial heterogeneity complicates the child care issue, particularly for politicians
- ▶ More negative effects and increased variance for male children
  - Explore links to concerns that male children are falling behind
- ▶ Future Research:
  - Explore causal links for observed heterogeneity
  - Structural approach of mother's labour supply and childcare

