

Incentive effects of social assistance: A regression discontinuity approach

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Introduction

- ▶ Investigating impact of social assistance programs on employment
- ▶ Implement a regression discontinuity approach utilizing discontinuity in social assistance payments in Quebec at age 30
- ▶ Form a first difference estimator in the regression discontinuity design
- ▶ They compare their estimates to common difference in difference specifications

Social assistance in Quebec and Canada

- ▶ Until 1989
 - ▶ Those under 30 received \$185 per month
 - ▶ Those over 30 received \$507 per month
 - ▶ 175% increase
- ▶ After 1989 all receive \$507
- ▶ Benefits are reduced dollar for dollar
- ▶ Basic labor supply model predicts fall in employment
 - ▶ Don't work and receive benefits
 - ▶ Or, work optimal hours
 - ▶ Anyone who's utility with the 30 and up benefits now exceeds utility of working will drop out

Social assistance in Quebec and Canada

Graphical representation

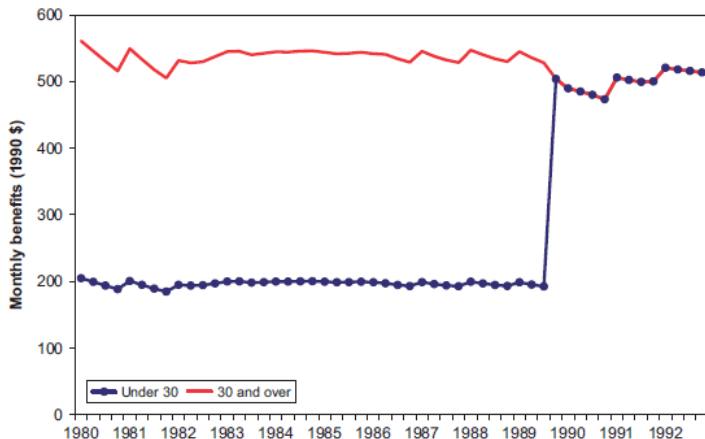


Fig. 1. Social assistance benefits, single individual.

Data and Descriptive Statistics

- ▶ 1986, and 1991 census
- ▶ Labor force survey (LFS). Used as Time series compliment
- ▶ Some questions asked about week prior to survey
 - ▶ Employment status
 - ▶ Hours worked
 - ▶ Marital status
- ▶ Others measure over previous calendar year
 - ▶ Income by source
 - ▶ "Other transfers" is particularly important as it contains social assistance. (85% of category)
 - ▶ Number of weeks worked in previous year

Data and Descriptive Statistics

Subsetting

- ▶ Focus on high school dropouts
 - ▶ 63% of claimants are HS Dropouts (59.7% in their sample)
- ▶ Respondents without children
 - ▶ Having children gets you higher assistance regardless of age
 - ▶ Excluding this makes it a "sharp" RD
- ▶ Men only
 - ▶ By 30 many more women have children
 - ▶ Much lower general employment for High School dropouts among women
- ▶ Ultimately sample of 3000-1000 HS dropouts without kids for each age 24-39

Data and Descriptive Statistics

LFS Data

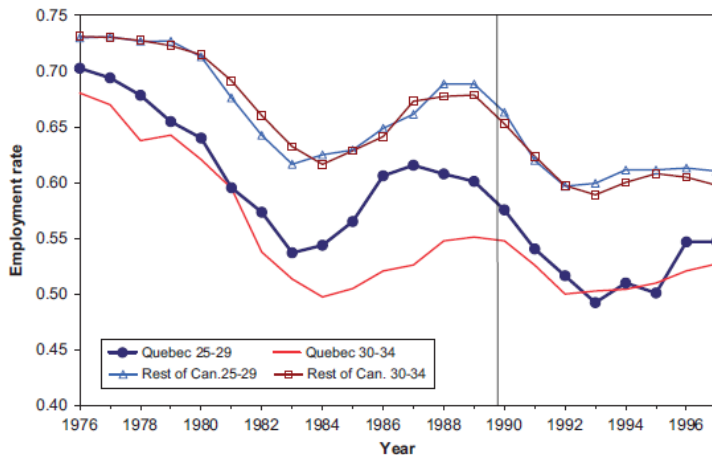


Fig. 2. Employment rates in the Labour Force Survey.

Empirical Approach

Individual Specification

$$Y_{ia} = \beta_0 + \beta_1 \text{TREAT}_{ia} + \delta(a) + \epsilon_{ia}$$

- ▶ $\delta(\cdot)$ must be smooth
- ▶ Treatment is "sharp" (thanks to subsetting)

Variable	Meaning
i	Individual
a	Age
Y	Outcome Variable
TREAT	0 if $a < 30$, 1 otherwise
$\delta(a)$	effect of age on outcome variable
ϵ	random noise

Empirical Approach

- ▶ Can only observe age at time of survey, so age is discrete
- ▶ Age specific means are a sufficient statistic, giving an alternative equation

$$Y_a = \beta_0 + \beta_1 \mathbf{TREAT}_a + \delta(a) + \epsilon_a$$

- ▶ Properly weighting these cells gives the same result as individual regression

Empirical Approach

- ▶ RD is "fuzzy" for variables measured over previous calendar year
- ▶ Assign treatment based on June 1st census day and assumed uniform distribution of birth dates

$$TREAT'_i = \begin{cases} 0 & \text{if } a \leq 29, \\ .170 & \text{if } a = 30 \\ .913 & \text{if } a = 31 \\ 1 & \text{if } a \geq 32. \end{cases}$$

Empirical Approach

- ▶ Define ERC as employment rate based on reference week of Census
- ▶ Define ERL as employment rate based on fraction of weeks worked in last year

$$ERC_a = \beta_0 + \beta_1 TREAT_a + \delta(a) + \epsilon_a$$

$$ERL_a = \beta'_0 + \beta'_1 TREAT'_a + \delta'(a) + \epsilon'_a$$

- ▶ If we assume $\beta_1 = \beta'_1$ we can get a FD-RD estimator

$$ERC_a - ERL_a = (\beta_0 - \beta'_0) + \beta_1 (TREAT_a - TREAT'_a) + \theta(a) + (\epsilon_a - \epsilon'_a)$$

- ▶ This compares employment of same individuals at 29 and 30

Regression Discontinuity Estimates

Graphical Evidence

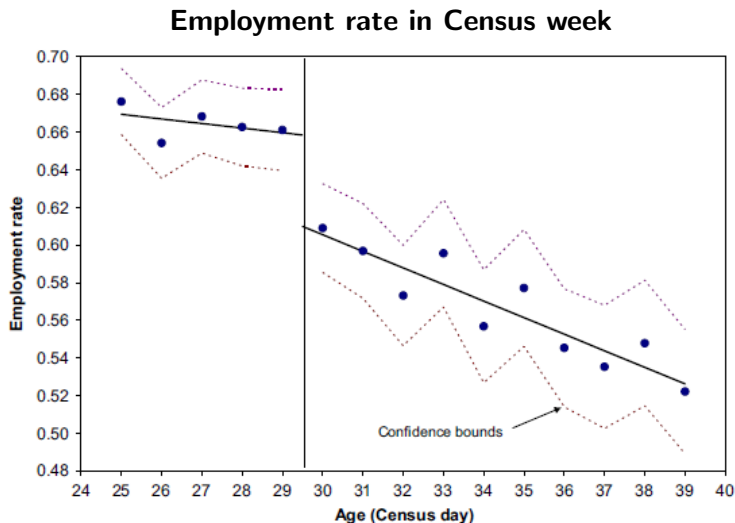


Fig. 3. Employment rate in Census week, Quebec 1986.

Regression Discontinuity Estimates

Graphical Evidence

Employment rate in previous year

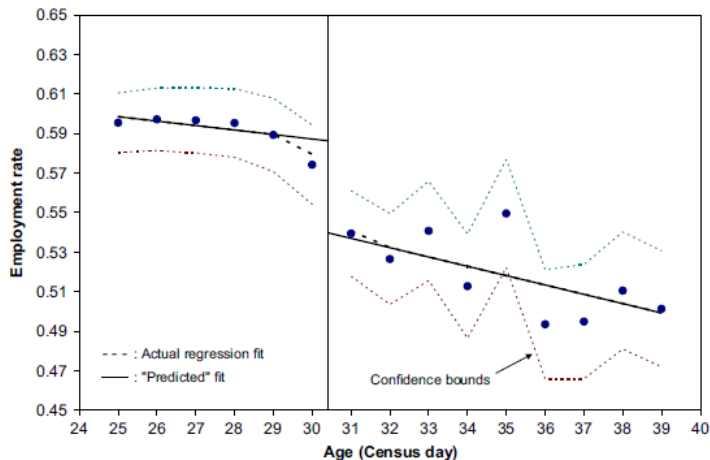


Fig. 4. Employment rate in previous year, Quebec 1986.

Regression Discontinuity Estimates

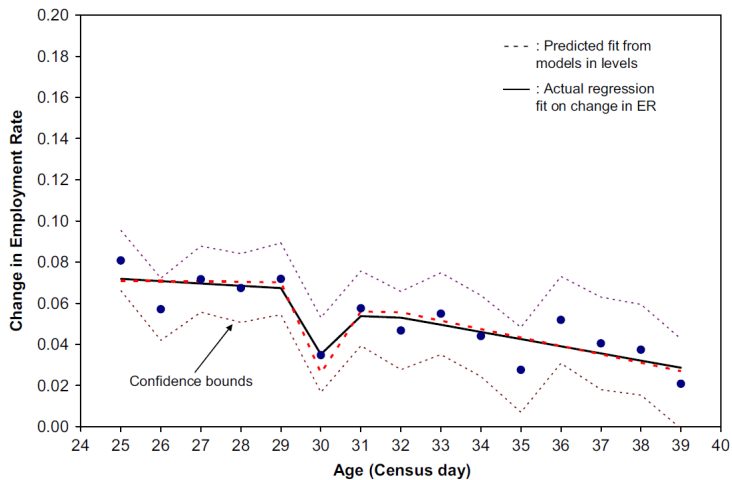
Results

Regression discontinuity estimates of the effect of higher social assistance benefits on labour supply in Quebec, 1986

Specification for age	Empl. rate last year	Empl. rate at Census	Difference in empl. rate	Weekly hours
<i>Mean of the dependent variable</i>				
	0.562	0.618	0.056	24.39
<i>Regression discontinuity estimates</i>				
Linear	-0.045*** (0.012)	-0.041*** (0.012)	-0.029** (0.011)	-1.45** (0.54)
Quadratic	-0.048*** (0.013)	-0.051*** (0.012)	-0.031** (0.012)	-1.75** (0.61)
Cubic	-0.043** (0.018)	-0.048*** (0.014)	-0.030** (0.013)	-1.47* (0.70)
Linear spline	-0.047*** (0.013)	-0.049*** (0.011)	-0.032** (0.013)	-1.72*** (0.55)
Quadratic spline	-0.038 (0.024)	-0.056** (0.018)	-0.035* (0.016)	-1.66 (0.94)
<i>Goodness of fit statistic (p-value)</i>				
Linear	0.48	0.52	0.91	0.48
Linear spline	0.47	0.72	0.85	0.55

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Regression Discontinuity Estimates



Robustness Checks

Checking Bandwidth

Table 2

Linear spline regression discontinuity estimates with different age windows in Quebec, 1986

Window width	Empl. rate last year	Empl. rate at Census	Difference in empl. rate	Weekly hours
All ages 25–39	–0.047*** (0.013)	–0.049*** (0.011)	–0.032** (0.013)	–1.72*** (0.55)
±5 years	–0.056*** (0.014)	–0.046** (0.014)	–0.037** (0.015)	–1.49** (0.66)
±4 years	–0.042** (0.013)	–0.057** (0.015)	–0.038** (0.010)	–2.09** (0.62)
±3 years	–0.050* (0.014)	–0.039** (0.006)	–0.034* (0.012)	–1.37* (0.34)
±2 years	–0.033 (–)	–0.045 (–)	–0.044 (–)	–1.60 (–)

Robustness Checks

Falsification tests

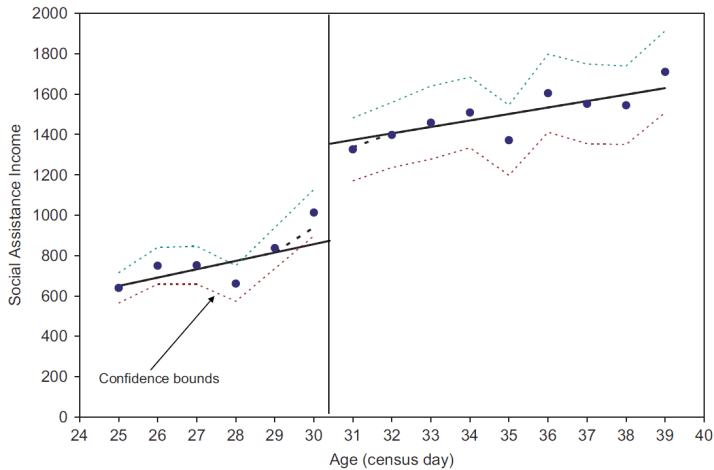
Table 3

Falsification test: comparing labour supply response in Quebec and rest of Canada in 1986 and 1991

Specification for age	Quebec, 1986	Rest of Canada, 1986	Quebec, 1991	Rest of Canada, 1991
<i>Regression discontinuity estimates: employment rate on Census week</i>				
Linear	-0.041*** (0.012)	-0.013** (0.006)	0.041* (0.022)	0.005 (0.011)
Quadratic	-0.051*** (0.012)	-0.013* (0.007)	0.012 (0.023)	-0.017*** (0.006)
Cubic	-0.048*** (0.014)	-0.009 (0.007)	0.037** (0.015)	-0.016** (0.007)
Linear spline	-0.049*** (0.011)	-0.014* (0.006)	0.010 (0.017)	-0.010 (0.007)
Quadratic spline	-0.056** (0.018)	-0.007 (0.010)	0.042* (0.022)	-0.007 (0.007)
<i>Regression discontinuity estimates: difference in employment rate</i>				
Linear	-0.029** (0.011)	-0.009 (0.007)	0.022* (0.011)	-0.007 (0.006)
Quadratic	-0.031** (0.012)	-0.006 (0.007)	0.022 (0.013)	-0.005 (0.006)
Cubic	-0.030** (0.013)	-0.004 (0.006)	0.020 (0.014)	-0.002 (0.006)
Linear spline	-0.032** (0.013)	-0.004 (0.008)	0.021 (0.014)	-0.003 (0.006)
Quadratic spline	-0.035* (0.016)	0.001 (0.009)	0.012 (0.016)	-0.005 (0.008)

Robustness Checks

Other Transfers



Comparing RD and difference-in-differences results

Table 5

Cell means and regression results from the Census

	Sample/specification	Obs.	Employed	Obs.	Positive transfers
Mean of dependent variable	Quebec, age 29, 1986	1859	0.661	1859	0.190
Cell means estimator	<i>Discontinuity</i> Quebec, 1986: Age 30 vs. Age 29	3506	-0.052*** (0.016)	3178	0.058*** (0.015)
	<i>Diff-diff</i> 1986: 29-30 vs. Que-RoC	11924	-0.044** (0.019)	10925	0.039** (0.016)
	<i>Diff-diff</i> Quebec: 29-30 vs. 1986-1991	6819	-0.079*** (0.023)	6360	0.040** (0.020)
	<i>Diff-diff</i> Age 29: 1986-1991 vs. Que-RoC	12908	0.010 (0.018)	12908	-0.019 (0.015)
	<i>Diff-diff-diff</i>	24960	-0.079*** (0.026)	23005	0.045** (0.023)
Regression estimator	<i>Diff-diff-diff</i>	24960	-0.074*** (0.026)	23005	0.034 (0.023)

Comparing RD and difference-in-differences results

- ▶ First diff-in-diff is Quebec 29 vs 30 and the rest of Canada 29 vs 30 all in 1986
- ▶ Second is using Quebec in 1991 as a control group
- ▶ Third is Quebec 29 in 1986 vs 1991 against same thing in rest of Canada
- ▶ diff-diff-diff is 1986 29 to 30 gap in Quebec vs the rest of Canada vs this difference again in 1991

Conclusion

- ▶ Main finding: “more generous assistance benefits reduces the employment probability of less educated men without dependent children”
- ▶ Employment rate drops 3-5 % points with a 175% increase in benefits
- ▶ Identified for men ages 29-30 only
- ▶ Only get TOT that might not generalize to other groups
- ▶ Difference in difference only works well when using a control group from the same time period

The End

Thank You