Schooling Provision and Residential Choices

Evidence from Italy

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Introduction

Access to **local public goods** orient **residential choices**

Key relevance of the **school** service
→ *Hoxby (2000); Epple and Romano (2003); Baum-Snow and Lutz (2011); Brunner, Cho and Reback (2012)*

Economies of scale in schooling provision
→ *Urquiola (2005); Alesina, Baqir and Hoxby (2004)*
Rationalisation policies

Core-periphery pattern from school network rationalisation?
→ *New Economic Geography; Gibbons, Heblich and Pinchbeck (2018)*

Do (primary) school closures affect population dynamics on top and beyond preexisting trends? Italy, post 2008 crisis

Talk's Structure:

1. Institutional context and motivation
2. Descriptive evidence
3. Data description
4. Identification strategies
5. Findings
6. Preliminary conclusions

Institutional Context and Motivation

Italian Schooling System:

- Rationalisation policies: the Gelmini Reform (2008)
- School sizing

Italian Regional Divergence:

- Rising internal migrations (ISTAT, 2019)
- National Strategy for Inner Areas (SNAI) - access to services

Table: Primary school closures by Region (2009-2019)

Region	Closures	Percent
Abruzzo	66	5.99
Basilicata	28	2.54
Calabria	126	11.44
Campania	169	15.35
Emilia-Romagna	30	2.72
Friuli-Venezia Giulia	16	1.45
Lazio	68	6.18
Liguria	27	2.45
Lombardia	94	8.54
Marche	14	1.27
Molise	30	2.72
Piemonte	67	6.09
Puglia	53	4.81
Sardegna	58	5.27
Sicilia	133	12.08
Toscana	29	2.63
Umbria	18	1.63
Veneto	75	6.81
Total	1,101	100.00

Figure: Timing of primary school closures

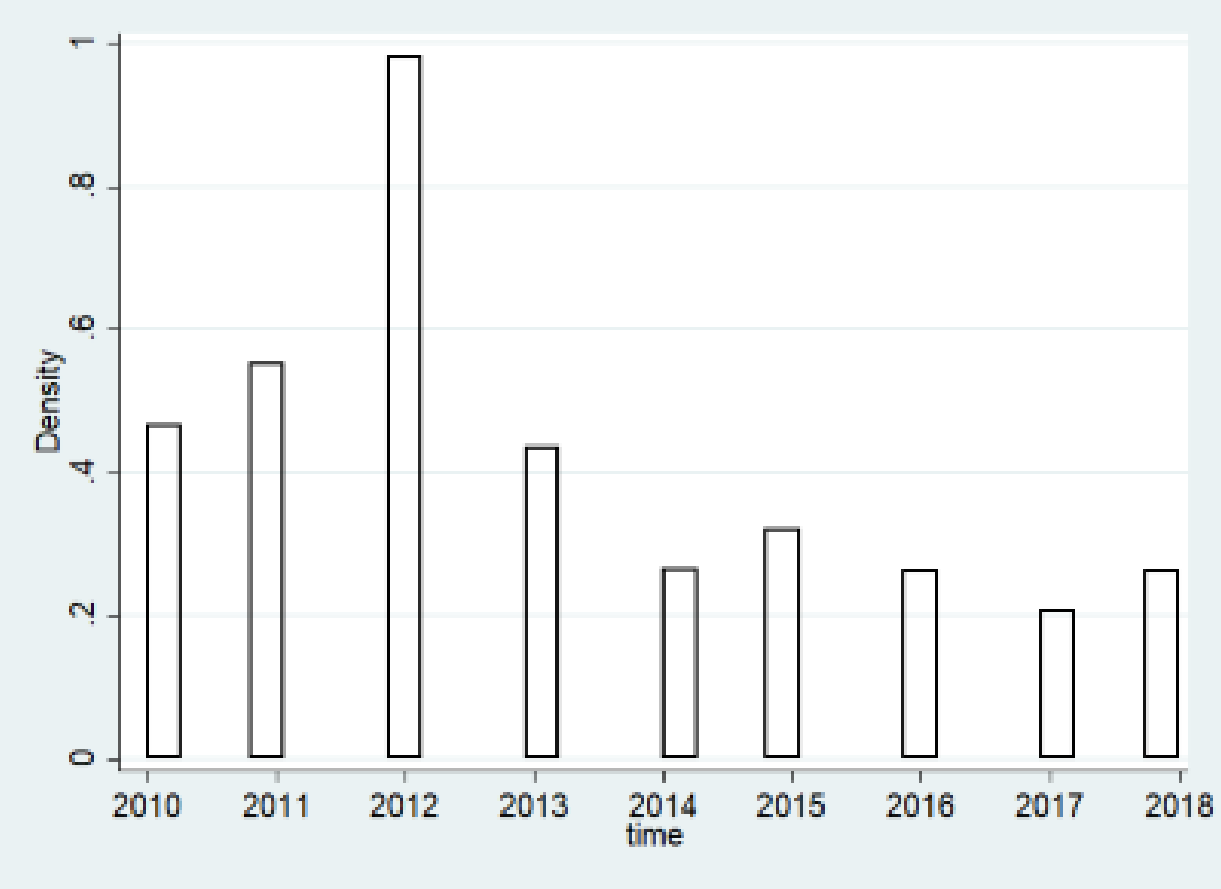


Figure: Municipalities by number of primary schools in school year 2009-2010

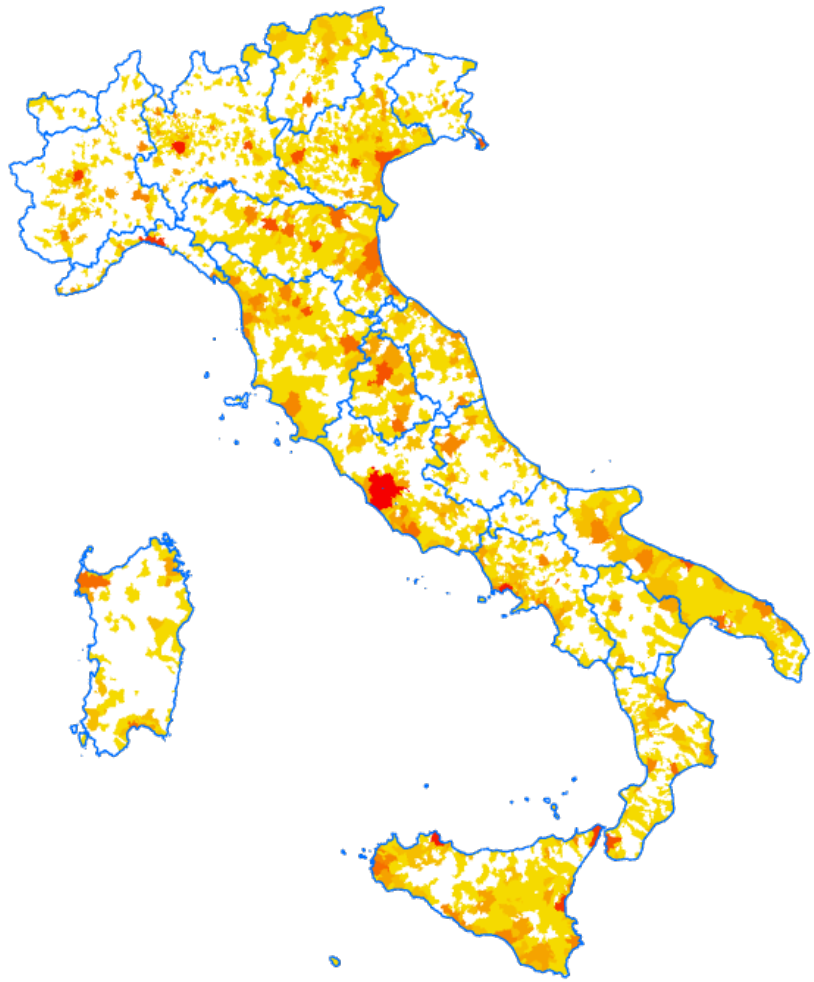
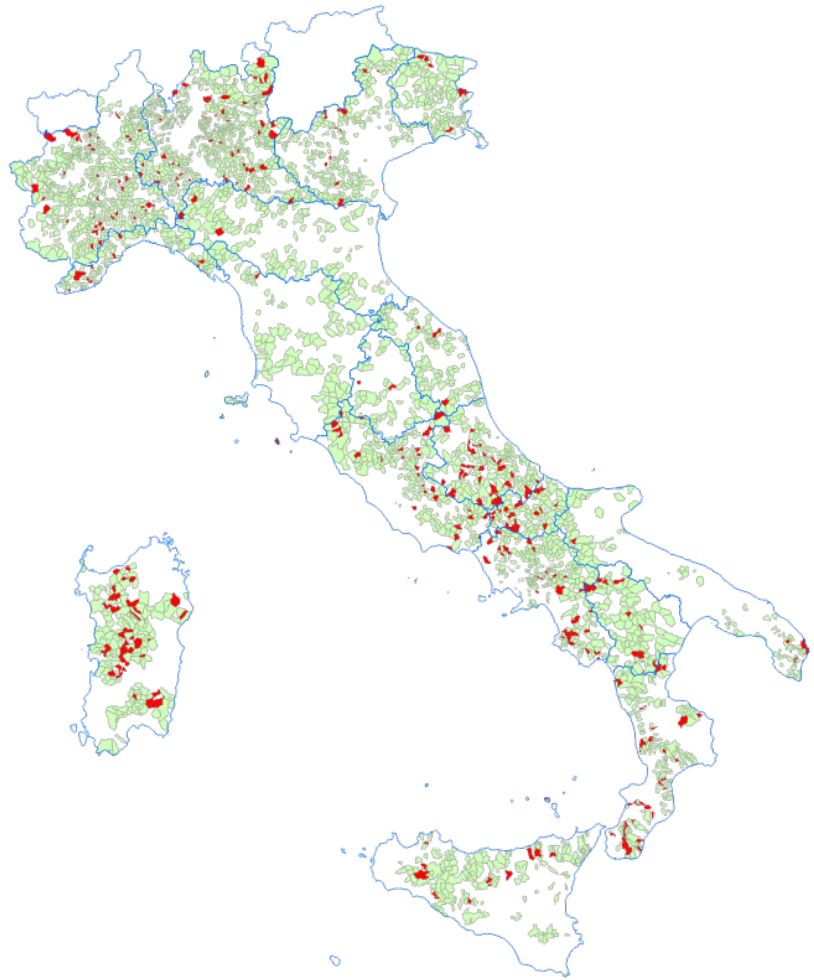


Table: Single-Primary-School Municipalities by Region

Region	Not Closure	Closure	Total
Abruzzo	156	32	188
Basilicata	86	10	96
Calabria	143	29	172
Campania	260	35	295
Emilia-Romagna	136	2	138
Friuli-Venezia Giulia	126	6	132
Lazio	201	27	228
Liguria	124	11	135
Lombardia	776	53	829
Marche	112	4	116
Molise	78	20	98
Piemonte	565	38	603
Puglia	104	5	109
Sardegna	135	46	181
Sicilia	164	11	175
Toscana	97	2	99
Umbria	48	2	50
Veneto	261	11	272
Total	3,572	344	3,916

Figure: Single-Primary-School Municipalities: Closures



Data Description

- **Schools:**
  MIUR - Ufficio Gestione Patrimonio Informativo e Statistica
  2009-2019 first educational cycle, public and private (street address)

- **Population:**
  ISTAT
  2009-2019 yearly resident population by age (municipal level)
  1971-81-91-01-11 censuses (since 1981, census tract)

- **Municipalities:**
  ISTAT - geographical statistics

Identification Strategies

Fundamental empirical challenge: population-services endogeneity

1. Drawing from *Gibbons, Heblich and Pinchbeck (2018)*

$$lnP_{i2019} = \beta treat_i + lnP_{i2010} + \mathbf{x}_i'\gamma + \epsilon_i$$

with $treat = 1$ if ever experienced school closure

reduced and larger sample estimation

2. Entropy Balancing + OLS on current and forward outcomes

with $treat = 1$ in municipality-year where (single) school closures

EB on third moment of balancing covariates

(1)

Table: Overall population effect: single primary school municipalities

Population below 50	(1)	(2)	(3)	(4)	(5)
Single school closure	-0.027***	-0.024***	-0.025***	-0.022***	-0.024***
	(0.0059)	(0.0059)	(0.0059)	(0.0059)	(0.0059)
Population pre-trends	yes	yes	yes	yes	yes
Other school endowments	no	yes	yes	yes	yes
Municipal characteristics	no	no	yes	yes	yes
Regional fe	no	no	no	yes	yes
SLL fe	no	no	no	no	yes
R-squared	0.992	0.992	0.992	0.993	0.993
N	3837	3837	3837	3837	3765

(1)

Table: Overall population effect: municipalities with up to 4 primary schools

Population below 50	(1)	(2)	(3)	(4)
	One school	Up to 4	Up to 2	More than 2
School closure	-0.024***	-0.015***	-0.019***	-0.002
	(0.0059)	(0.0034)	(0.0041)	(0.0080)
Population pre-trends	yes	yes	yes	yes
Other school endowments	yes	yes	yes	yes
Municipal characteristics	yes	yes	yes	yes
Regional fe	yes	yes	yes	yes
SLL fe	yes	yes	yes	yes
R-squared	0.993	0.996	0.995	0.992
N	3765	5367	4658	500

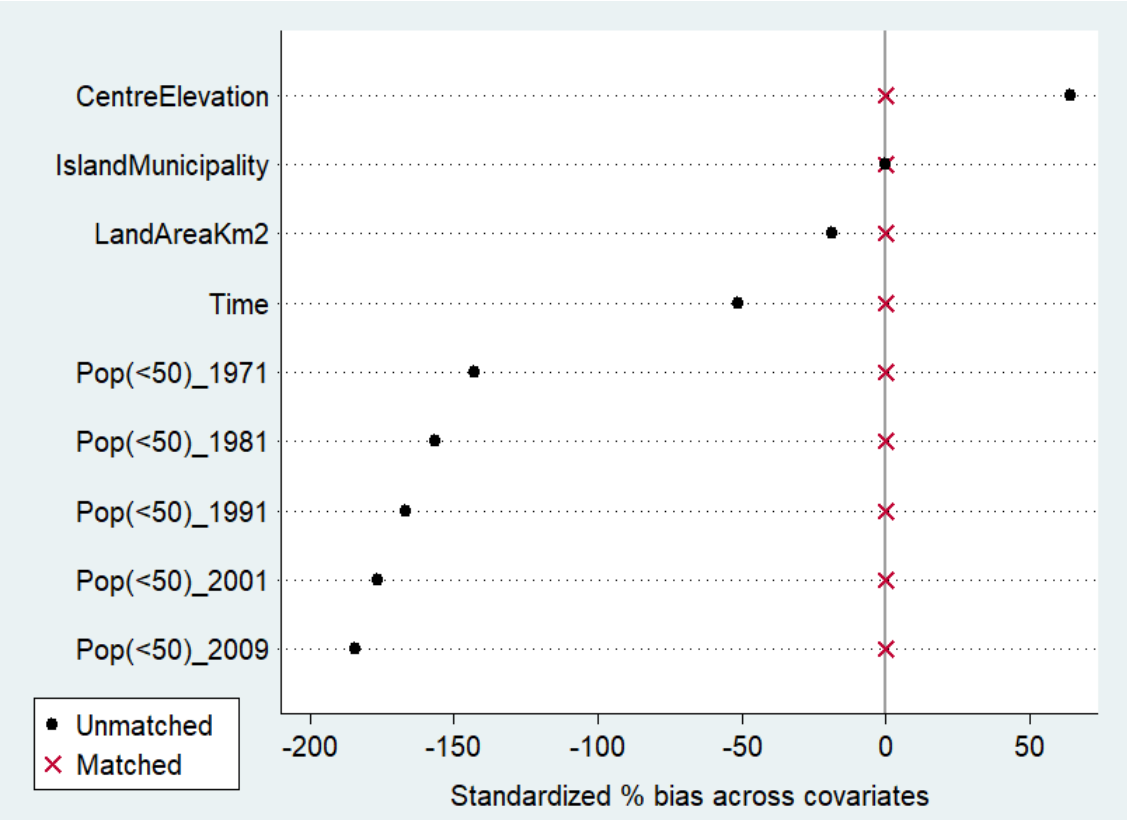
(1)

Table: Placebo test. Dep var: resident population above 50 years old

Population above 50	(1)	(2)	(3)	(4)
	One school	Up to 4	Up to 2	More than 2
School closure	-0.002	-0.001	0.001	-0.006
	(0.0037)	(0.0021)	(0.0025)	(0.0043)
Population pre-trends	yes	yes	yes	yes
Other school endowments	yes	yes	yes	yes
Municipal characteristics	yes	yes	yes	yes
Regional fe	yes	yes	yes	yes
SLL fe	yes	yes	yes	yes
R-squared	0.997	0.998	0.997	0.997
N	3765	5367	4658	500

(2)

Figure: (pre)post EB (un)balancing of covariate distributions



(2)

Figure: EB on mean, variance and skewedness

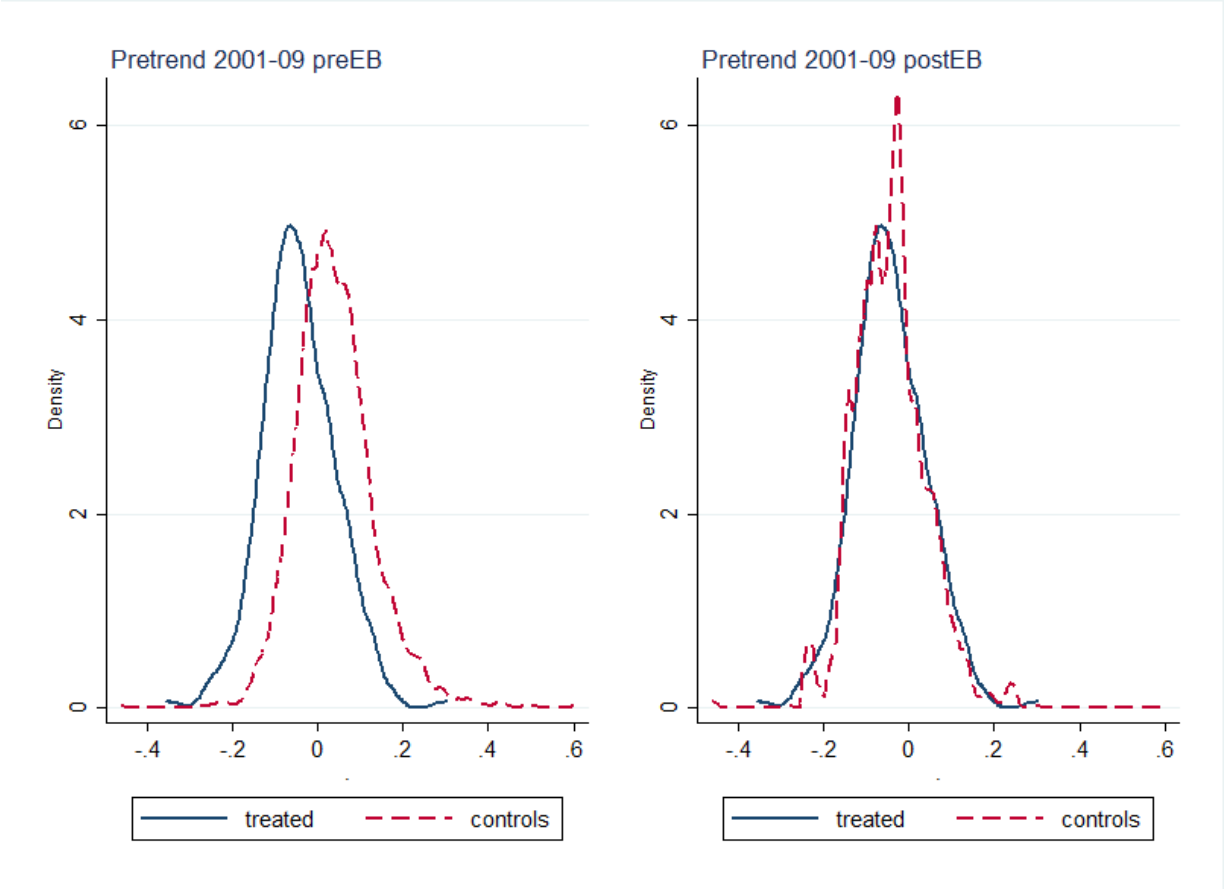


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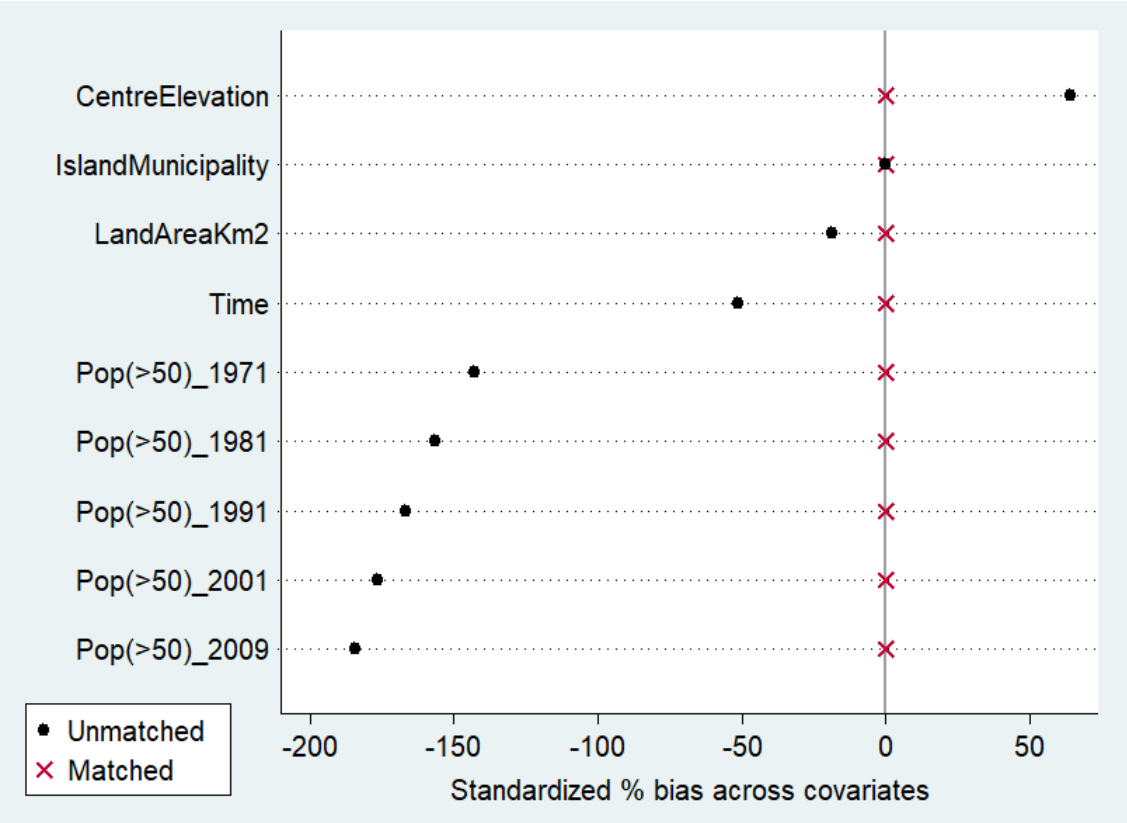
Table: Dynamic effect of school closure: OLS estimates after balancing procedure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Year0	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9
Single school closure	-0.029***	-0.035***	-0.040***	-0.043***	-0.041***	-0.043***	-0.035***	-0.032**	-0.039***	-0.033
	(0.0079)	(0.0084)	(0.0091)	(0.0096)	(0.0105)	(0.0111)	(0.0119)	(0.0134)	(0.0146)	(0.0203)
Balancing covariates	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
EB weights	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Other school endowments	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.974	0.972	0.971	0.969	0.966	0.963	0.960	0.957	0.956	0.952
N	36543	32905	29252	25600	21937	18266	14608	10950	7284	3630

(2)

Figure: Placebo test: (pre)post EB (un)balancing of covariate distributions



(2)

Table: Placebo test. Dep var: resident population above 50 years old

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Year0	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9
Single school closure	0.011	0.010	0.011	0.014*	0.012	0.014*	0.011	0.009	0.009	-0.004
	(0.0074)	(0.0072)	(0.0071)	(0.0072)	(0.0072)	(0.0074)	(0.0075)	(0.0084)	(0.0091)	(0.0110)
Balancing covariates	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
EB weights	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Other school endowments	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.972	0.974	0.975	0.976	0.979	0.979	0.979	0.976	0.977	0.980
N	36543	32905	29252	25600	21937	18266	14608	10950	7284	3630

Preliminary Conclusions

Primary school closures negatively affect population dynamics on top and beyond preexisting trends

Moreover,

- larger impact in single primary school municipalities
- school closures affect resident population below 50 years old
- immediate and persistent effect up until 8 years after closure