Online Appendix for

"Voting Systems and Fiscal Policy:

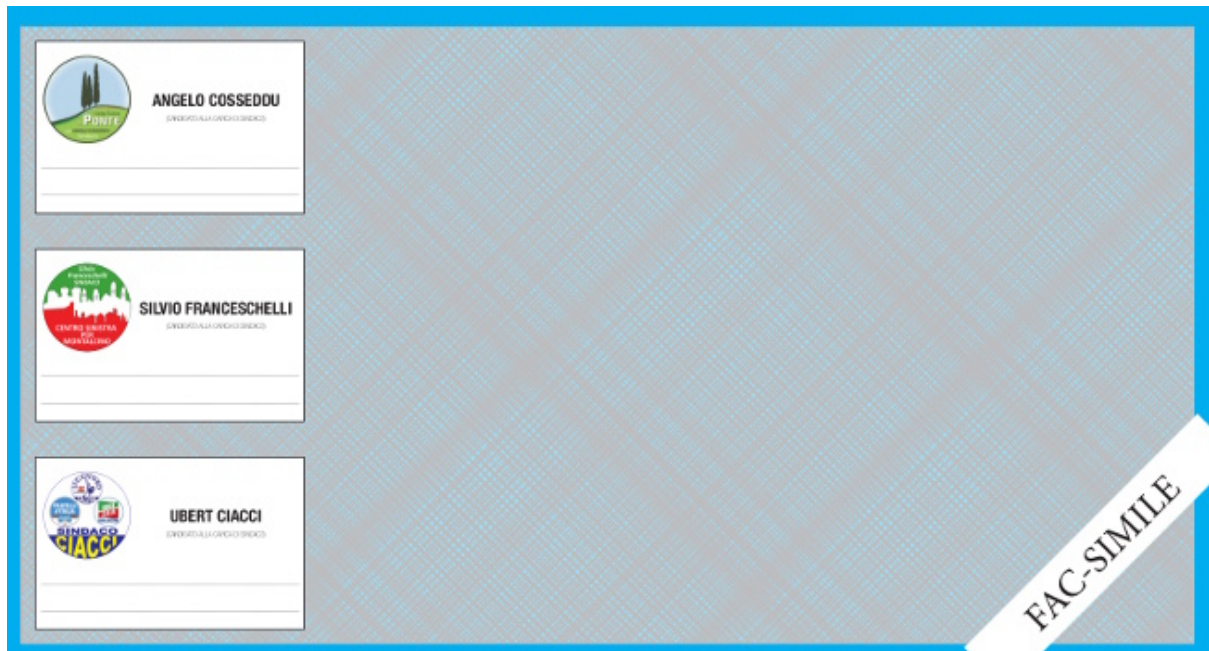# Evidence from Runoff and Plurality Elections"
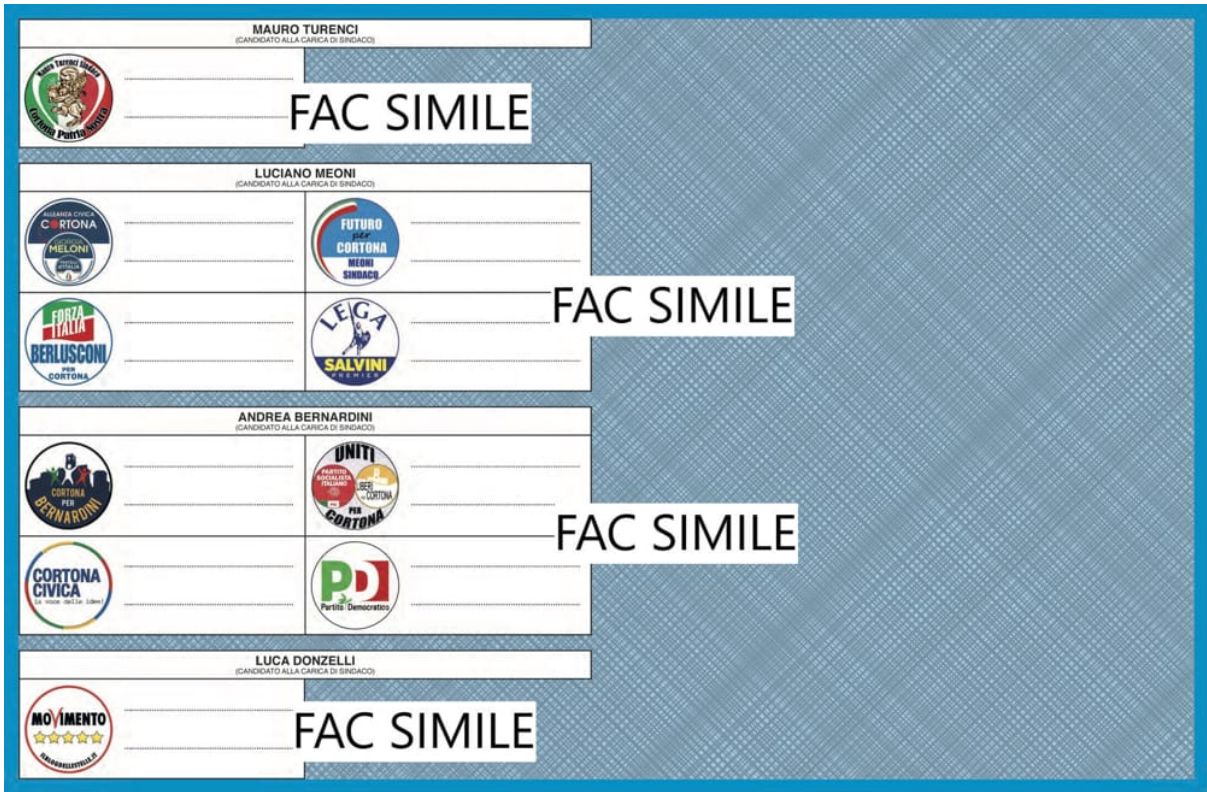
Davide Cipullo[*]

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[*]Department of Economics, Uppsala University and Uppsala Centre for Fiscal Studies (UCFS). Address: Box 513, SE-75120, Uppsala, Sweden. E-mail: davide.cipullo@nek.uu.se.

1 Figures

Notes: Source: Italian Ministry of Internal Affairs.
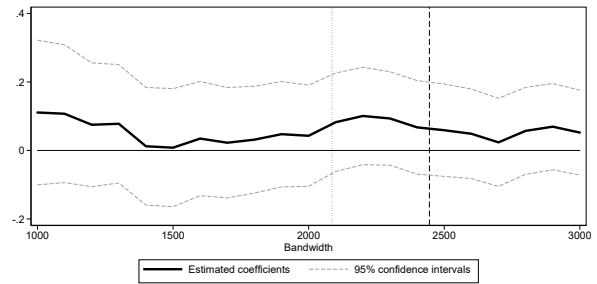
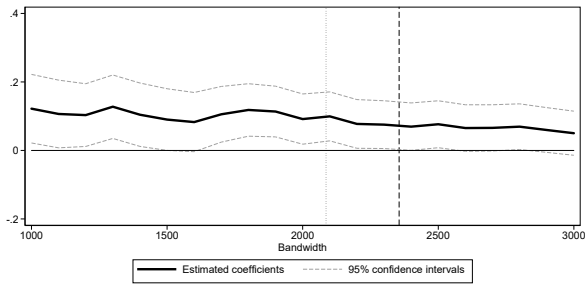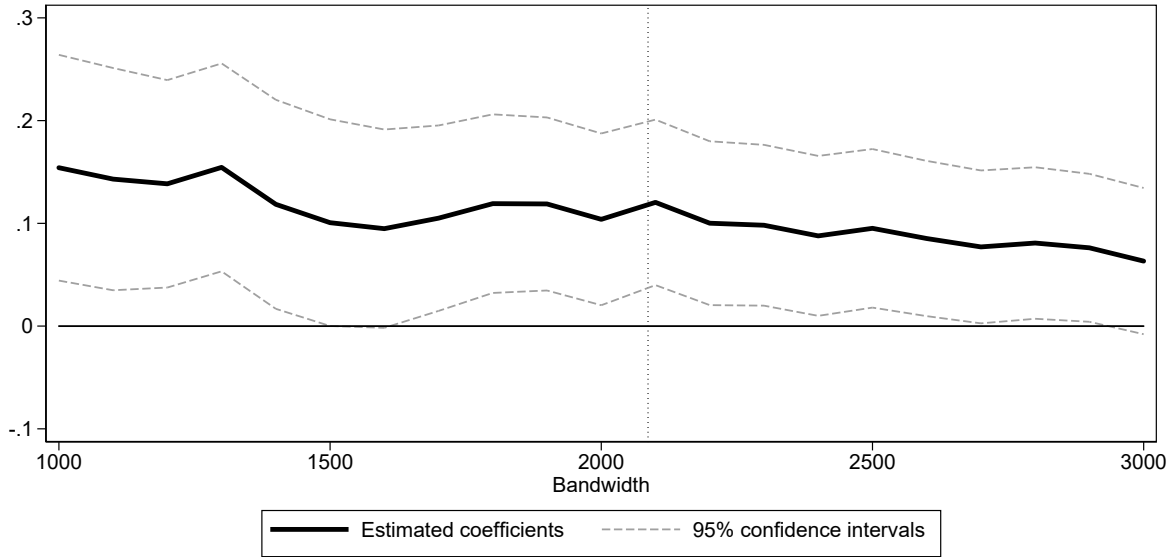Figure B.1: Ballot in municipalities under the plurality rule

(a) First round

(b) Second round

Notes: Source: Italian Ministry of Internal Affairs.

Figure B.2: Ballot in municipalities under the runoff system

(a) Total Spending

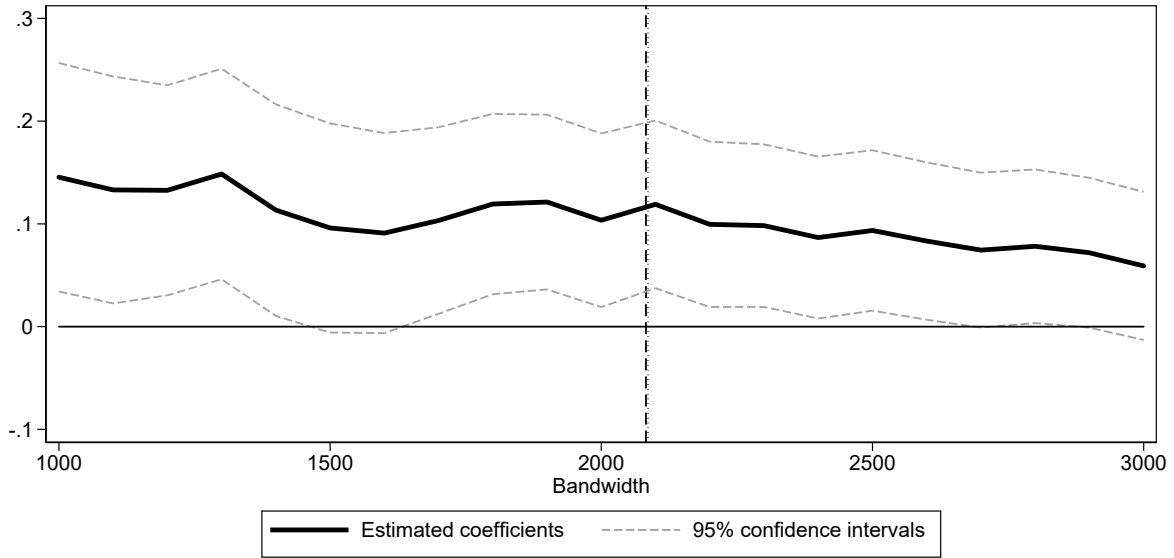
(b) Current Spending

(c) Capital Spending

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The dependent variable is the natural logarithm of the municipal expenditure per capita, as well as the natural logarithm of the current spending and of the capital spending per capita. The horizontal axis represents the bandwidths used to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure B.3: Sensitivity of the local linear regression to the chosen bandwidth
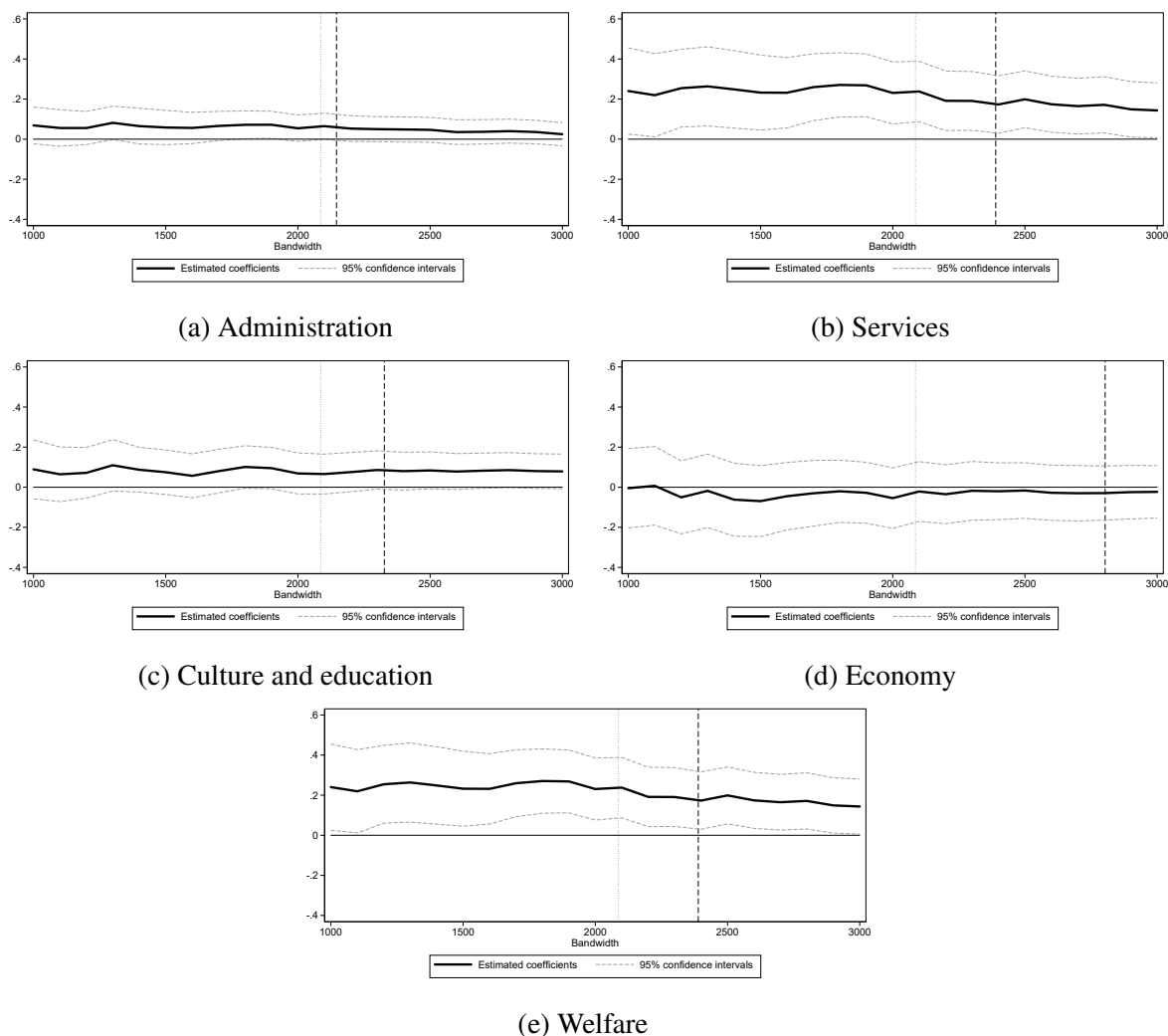
(a) Administration

(b) Services

(c) Culture and education

(d) Economy

(e) Welfare

Notes: Election years between 1994 and 2015. Outcome observed between 1998 and 2015. The dependent variable is the natural logarithm of the yearly municipal expenditure per capita in each of the macro-areas of expenditure described in Section Section III. The horizontal axis represents each of the bandwidths considered to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regressions as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure B.4: Sensitivity of the local linear regression to the chosen bandwidth

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(a) Revenues

(b) Tax Revenues
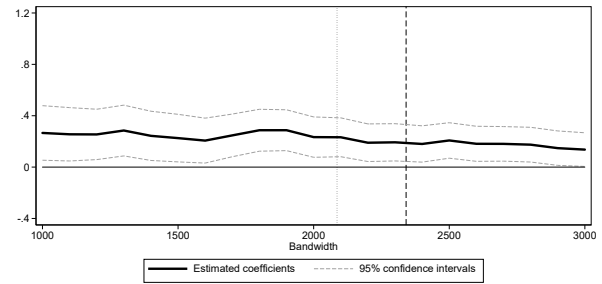
(c) Revenues from Services
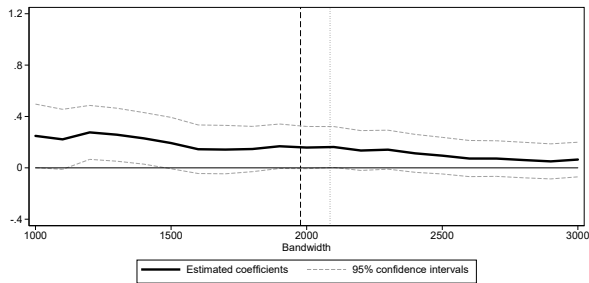
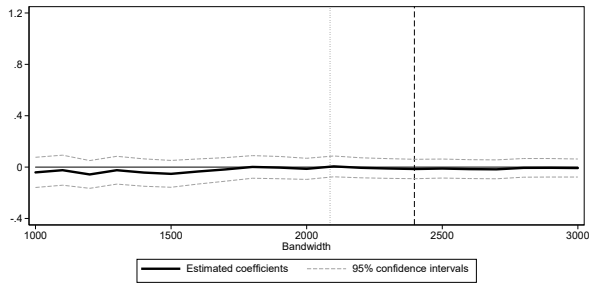(d) Transfers from Nat. Gov.
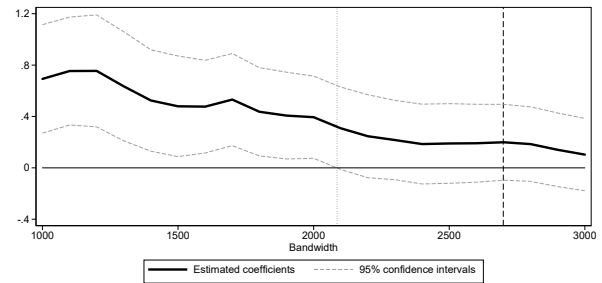
(e) Transfers from Reg. Gov.

Notes: Election years between 1994 and 2015. Outcome observed between 1998 and 2015. The dependent variable is the natural logarithm of the yearly municipal revenues per capita (graph (a), as well as the natural logarithm of the yearly municipal revenues per capita from each source as described in Section Section III. The horizontal axis represents each of the bandwidths considered to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regressions as in equation (1), with bandwidths ranging from 1,00 to 3,000 residents on each side of the threshold and covariates described in Section Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the placebo treatment and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure B.5: Sensitivity of the local linear regression to the chosen bandwidth

(a) Total Spending   (b) Current Spending   (c) Capital Spending

(d) Administration   (e) Services   (f) Culture and Education

(g) Economy   (h) Welfare   (i) Revenues
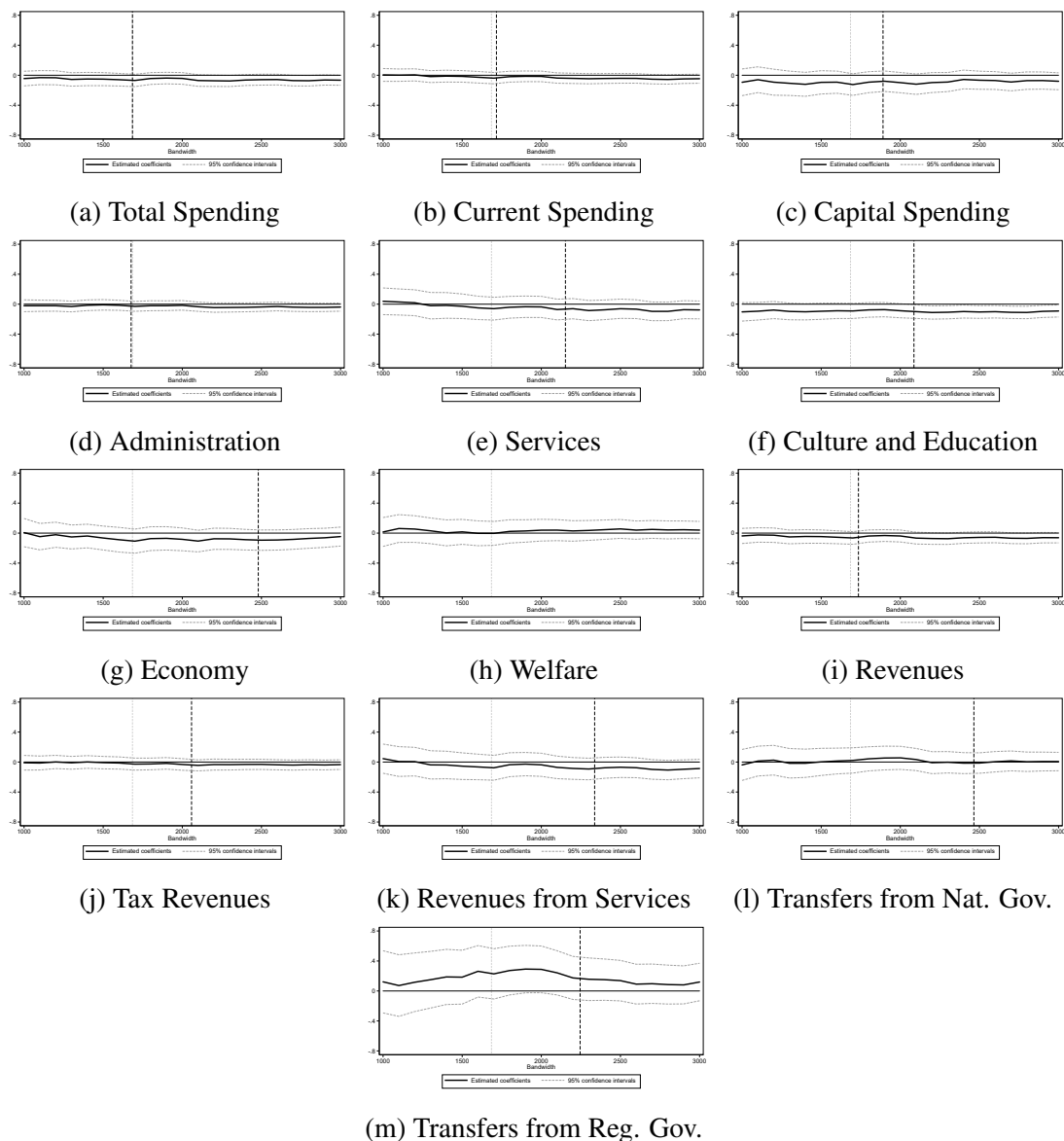
(j) Tax Revenues   (k) Revenues from Services   (l) Transfers from Nat. Gov.
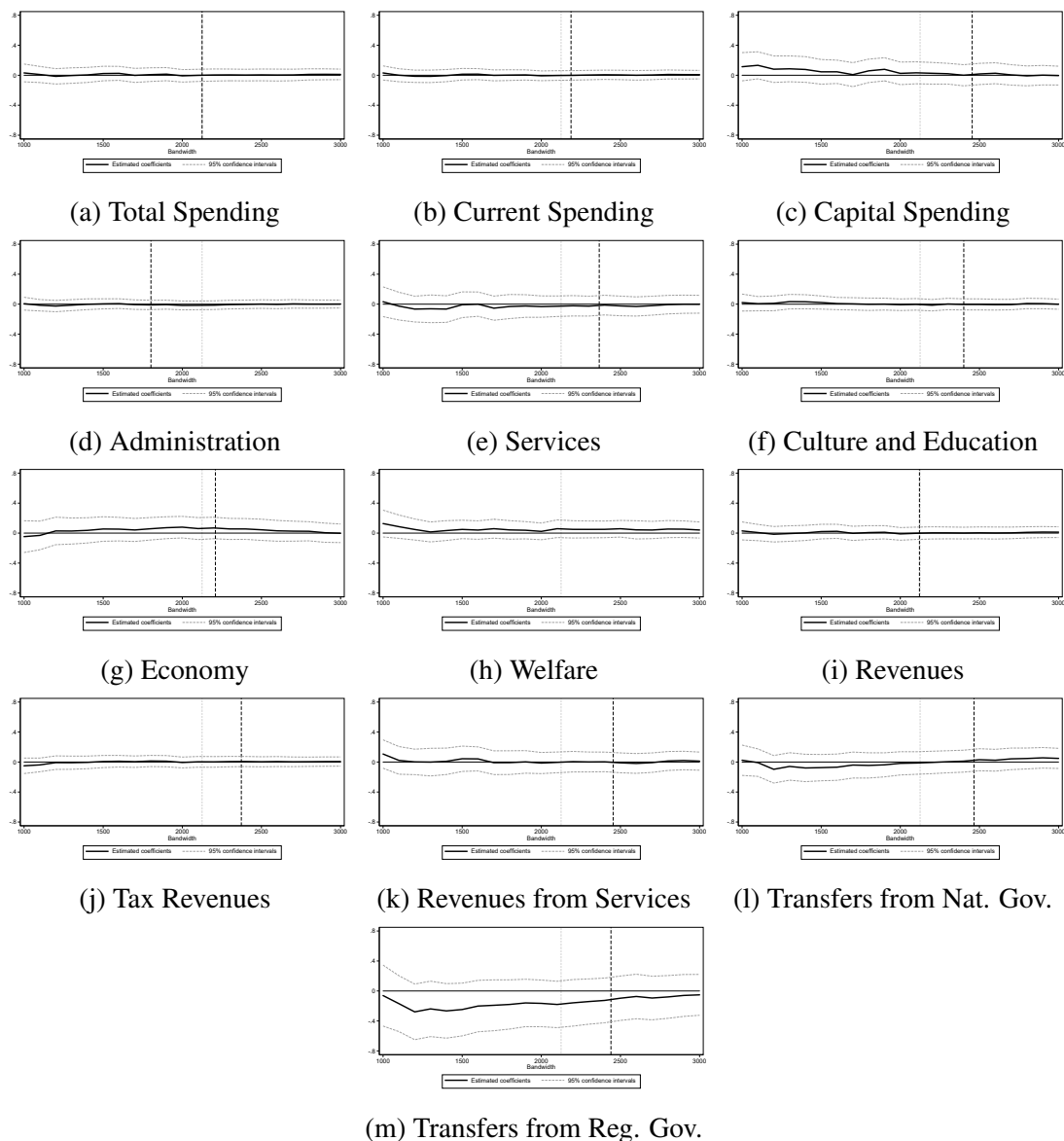
(m) Transfers from Reg. Gov.

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The dependent variable is the natural logarithm of the municipal expenditure per capita, as well as the natural logarithm of the current spending and of the capital spending per capita. The horizontal axis represents the bandwidths used to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure B.6: Falsification tests for the local-linear regression — placebo threshold=13,000

(a) Total Spending

(b) Current Spending

(c) Capital Spending

(d) Administration

(e) Services

(f) Culture and Education

(g) Economy

(h) Welfare

(i) Revenues

(j) Tax Revenues

(k) Revenues from Services

(l) Transfers from Nat. Gov.

(m) Transfers from Reg. Gov.

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The dependent variable is the natural logarithm of the municipal expenditure per capita, as well as the natural logarithm of the current spending and of the capital spending per capita. The horizontal axis represents the bandwidths used to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.
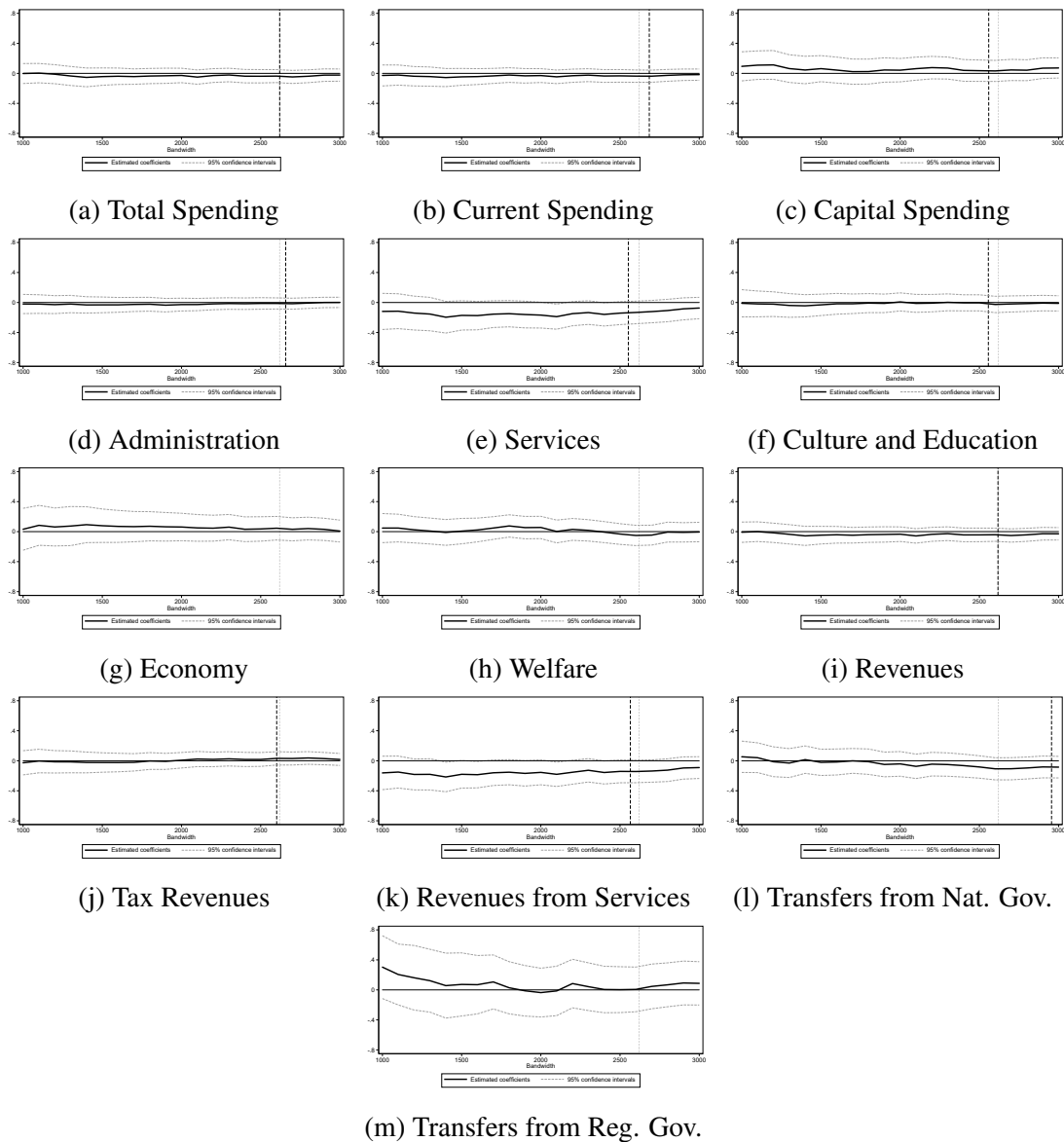
Figure B.7: Falsification tests for the local-linear regression — placebo threshold=14,000

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(a) Total Spending   (b) Current Spending   (c) Capital Spending

(d) Administration   (e) Services   (f) Culture and Education

(g) Economy   (h) Welfare   (i) Revenues

(j) Tax Revenues   (k) Revenues from Services   (l) Transfers from Nat. Gov.

(m) Transfers from Reg. Gov.

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The dependent variable is the natural logarithm of the municipal expenditure per capita, as well as the natural logarithm of the current spending and of the capital spending per capita. The horizontal axis represents the bandwidths used to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.
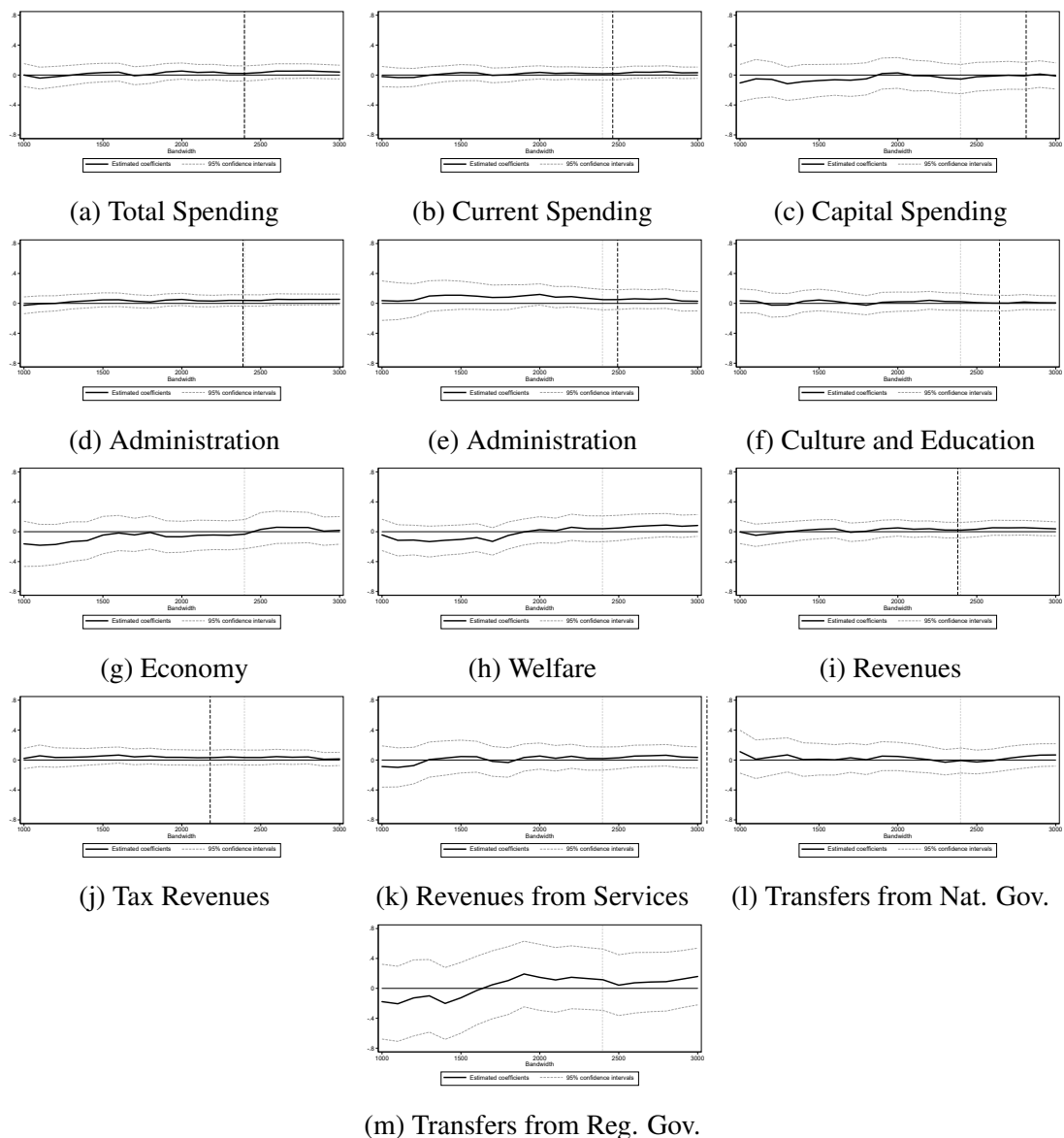
Figure B.8: Falsification tests for the local-linear regression — placebo threshold=16,000

(a) Total Spending   (b) Current Spending   (c) Capital Spending

(d) Administration   (e) Administration   (f) Culture and Education

(g) Economy   (h) Welfare   (i) Revenues

(j) Tax Revenues   (k) Revenues from Services   (l) Transfers from Nat. Gov.

(m) Transfers from Reg. Gov.

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The dependent variable is the natural logarithm of the municipal expenditure per capita, as well as the natural logarithm of the current spending and of the capital spending per capita. The horizontal axis represents the bandwidths used to fit the local linear regression. The solid line represents the estimated coefficients as a function of the chosen bandwidth. Dashed lines represent the 95 percent confidence intervals of each regression. Estimation method: local linear regression, as in equation (1), with bandwidths ranging from 1,000 to 3,000 residents on each side of the threshold and covariates described in Section III. The dashed vertical line represents the bias-corrected optimal bandwidth, as in Calonico, Cattaneo, and Titiunik (2014), while the dotted vertical line represents the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth for the logarithm of the municipal expenditure per capita as reported in the regression tables. All regressions include the interaction terms between the runoff dummy and the assignment variable. Each estimation concerns a variation in the bandwidth of 100 residents from the nearest one. Standard errors are clustered at the municipality level.

Figure B.9: Falsification tests for the local-linear regression — placebo threshold=17,000

2 Tables

Table B.1: Policies assigned on the basis of population thresholds

Residents	Policy change
$\geq 1,000$	Wage of the mayor and of the executive officers
$\geq 3,000$	Size of the council Wage of the mayor
$\geq 5,000$	Wage of the mayor and of the executive officers Domestic Stability Pact Voting Rule — After 2013
$\geq 10,000$	Wage of the mayor and of the executive officers
$\geq 15,000$	Voting Rule Direttore Generale — Until 2009
$\geq 30,000$	Size of the council Wage of the mayor Neighborhood councils (allowed) — Until 2007
$\geq 50,000$	Wage of the mayor and of the executive officers
$\geq 100,000$	Size of the council and of the executive board Wage of the mayor Neighborhood councils (mandatory) — Until 2007 Neighborhood councils (allowed) — After 2007
$\geq 250,000$	Neighborhood councils (mandatory) — Until 2007 Size of the council and of the executive board Wage of the mayor
$\geq 500,000$	Wage of the mayor Size of the Council and of the executive board

Notes: Policy changes assigned on the base of population threshold during the period under investigation in the paper. Notice that some thresholds have been changed since. Source: Legislative Decree 267/2000.

Table B.2: Effects are not driven by material cost of second round

	Total Spending	Current Spending	Administration	Services	Revenues	Revenues from Services	Transfers from Nat. Gov.	Transfers from Reg. Gov.
Above 15,000 × El. year	-0.045**	-0.022	-0.012	-0.021	-0.048**	-0.024	0.011	-0.078
	(0.023)	(0.020)	(0.020)	(0.026)	(0.023)	(0.025)	(0.046)	(0.057)
Above 15,000	0.130***	0.105***	0.070**	0.240***	0.129***	0.241***	0.161**	0.371**
	(0.042)	(0.037)	(0.034)	(0.077)	(0.043)	(0.078)	(0.081)	(0.161)
Observations	3,434	3,434	3,434	3,434	3,434	3,434	3,434	3,434
R^2	0.335	0.372	0.327	0.283	0.322	0.328	0.672	0.167
Covatiates	YES	YES	YES	YES	YES	YES	YES	YES
Bandwidth Selector	CCT	CCT	CCT	CCT	CCT	CCT	CCT	CCT
Mean Dep. Var.	6.893	6.560	5.578	4.652	6.891	5.103	4.230	2.427
Bandwidth	2086	2086	2086	2086	2086	2086	2086	2086

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. The interaction between the treatment dummy and an indicator for the election year is included. All specifications include the interaction terms between the runoff dummy and the function of the assignment variable, year fixed effects, macro-region and election year dummies. Estimation methods: local-linear regression as in equation (1), within the Calonico, Cattaneo, and Titiunik (2014) optimal bandwidth, as well as a fixed bandwidth of 1,000 residents on either side of the population threshold. Standard errors robust to clustering at the municipality level are in parentheses. *,**,*** represent the 10%, 5%, 1% significance levels.

Table B.3: Descriptive statistics and description of the variables — balance sheets.

Variable	Mean	St. Dev.	Obs.	Definition	Source	Unit of Measure
Total Spending	1,059.29	461.40	3,434	Yearly expenditures per capita (total)	Italian Ministry of Internal Affairs	Per capita log
Current Spending	740.34	231.77	3,434	Yearly Current Spending per Capita	Italian Ministry of Internal Affairs	Per capita log
Capital Spending	239.60	298.89	3,434	Yearly Capital Spending per Capita	Italian Ministry of Internal Affairs	Per capita log
Administration	274.04	74.04	3,434	Current spending in Administration + Road Maintenance +Local Police + Justice	Italian Ministry of Internal Affairs	Per capita log
Services	130.09	120.30	3,434	Current spending for the provision of services	Italian Ministry of Internal Affairs	Per capita log
Culture and Education	102.06	45.08	3,434	Current spending in Culture + Education + Sport	Italian Ministry of Internal Affairs	Per capita log
Economy	148.38	76.08	3,434	Current spending in Development + Territory + Tourism	Italian Ministry of Internal Affairs	Per capita log
Welfare	98.44	55.82	3,434	Current spending in Welfare	Italian Ministry of Internal Affairs	Per capita log
Revenues	1,057.16	461.32	3,434	Yearly revenues per capita (total)	Italian Ministry of Internal Affairs	Per capita log
Tax Revenues	392.86	142.91	3,434	Yearly revenues per capita from taxation	Italian Ministry of Internal Affairs	Per capita log
Revenues from Services	198.02	143.63	3,434	Revenues from provision of Services	Italian Ministry of Internal Affairs	Per capita log
Transfers from Nat. Gov.	121.22	115.58	3,434	Yearly Transfers from the national government	Italian Ministry of Internal Affairs	Per capita log
Transfers from Reg. Gov.	19.27	23.53	3,434	Yearly transfers from the regional government	Italian Ministry of Internal Affairs	Per capita log

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. Municipalities between 10,000 and 20,000 residents.

Table B.4: Descriptive statistics and description of the variables — city characteristics.

Variable	Mean	St. Dev.	Obs.	Definition	Source	Unit of Measure
Surface	59.06	58.22	3,434	Total surface of the municipal territory	Census	Km2
Altitude	157.55	150.89	3,434	Meters above the sea level	Census	Meters
Mount. Surface	0.17	0.35	3,434	Montainous Surface	Statistical Municipal Atlas	Km2
Density	0.00	0.00	3,434	Population/Surface	Census	Inh./Km2
South	0.30	0.46	3,434			
Elderly	0.14	0.04	3,434	Share of over 65 in the population	Census	Perc. points
Migrants	0.00	0.00	3,434	Share of migrants in the population	Census	Perc. points
Retired	0.16	0.05	3,434	Share of retired in the population	Census	Perc. points
Students	0.07	0.01	3,434	Share of students in the population	Census	Perc. points
Unemployment	0.03	0.02	3,434	Unemployment Share	Census	Perc. points
Rural Surface	0.59	0.25	3,434	Rural Surface	Statistical Municipal Atlas	Km2
Docg	1.27	3.73	3,434	Surface used for DOCG and DOC productions	Statistical Municipal Atlas	Km2
Farms	652.51	597.05	3,434	No. farms	Statistical Municipal Atlas	Number
Tourism	0.01	0.01	3,434	Share of employed in tourism	Census	Perc. points
Touristic Supply	0.09	0.32	3,434	No. sleeping accommodations per capita	Census	Weightded average Number X Category

Notes: Election years between 1994 and 2015. Outcomes observed between 1998 and 2015. Municipalities between 10,000 and 20,000 residents.

References

Calonico, Sebastian, Matias D. Cattaneo, and Rocio Titiunik (2014). "Robust Nonparametric Confidence Intervals For Regression-Discontinuity Designs". In: *Econometrica* 82.6, pp. 2295–2326.