Appendix A

Section A1. Propensity score details

Table A1 List of PSM covariates

Municipalities characteristics	Source
Net migration 1999-2006	INSEE population census
Mean Household income 2006	DGCF
Share of municipal surface (2006) :	CLC
artificial	CLC
agricultural	CLC
Semi-natural	CLC
water	CLC
humid	CLC
forest	CLC
Altitude	CESAER
Slope	CESAER
Mayor is also Senateur	CESAER
Mayor is also Depute	CESAER

Ozone concentration	European Air quality database
PM10 concentration	European Air quality database
Railway Station	SNCF
Time travel to closest :	CESAER
Highway access	CESAER
urban pole <100 000	CESAER
urban pole <50 000	CESAER
nb of social housing per hb	DGCF
Tax potential per hb	DGCF
Municipal road length	DGCF
Fiscal cooperation	DGCF
Rural tax exemption policy 2006	DATAR
population density 2006	INSEE population census
unemployment rate 06	INSEE population census
employment rate 2006	INSEE population census
population growth rate 2006	INSEE population census
dependance rate 2006	INSEE population census
Share of sectoral employment (2006) :	INSEE population census

Agriculture	INSEE population census
Public	INSEE population census
Business and Services	INSEE population census
Industry	INSEE population census
High education rate 2006	INSEE population census
Time travel to proximity services	INSEE BPE
Pays 2008	DATAR
Pays 2003	DATAR
Population by occupation (2006)	INSEE population census
Farmer	INSEE population census
Craftsmen, merchants and business leaders	INSEE population census
Managers and higher intellectual professions	INSEE population census
Employees	INSEE population census
Workers	INSEE population census
Other people without occupation	INSEE population census

Table A2: results of propensity score estimations

	Design 1	Design 2	Design 3
Net migration 1999-2006	-0.000156***	-4.68e-05	-0.000157***
	(3.98e-05)	(3.66e-05)	(5.86e-05)
Mean Household income 2006	-6.85e-10**	0	-1.92e-09***
	(2.79e-10)	(2.35e-10)	(4.17e-10)
Share of municipal surface (2006) :			
artificial	-0.00447*	-0.00317	-0.000223
	(0.00240)	(0.00327)	(0.00441)
agricultural	0.00226	-0.00460	0.00190
	(0.00180)	(0.00285)	(0.00318)
Semi-natural	-0.00228	-0.00832***	-0.00458
	(0.00174)	(0.00303)	(0.00297)
water	0.000208	-0.00247	-0.000834
	(0.00225)	(0.00260)	(0.00397)
humid	-0.00274	0.0107**	-0.0116*

	(0.00405)	(0.00444)	(0.00630)
forest	0.00836***	0.00404***	0.0100***
	(0.00100)	(0.00119)	(0.00169)
Atlitude	0.000309***	-0.000399***	5.54e-05
	(7.75e-05)	(8.76e-05)	(0.000125)
Slope	0.000834	0.0109***	-0.0105*
	(0.00354)	(0.00392)	(0.00584)
Mayor is also Senateur	0.00706	0.0808	0.131
	(0.0867)	(0.0895)	(0.139)
Mayor is also Depute	0.0514	0.0484	0.0553
	(0.0755)	(0.0780)	(0.114)
Ozone concentration	-8.89e-05***	4.80e-05***	-7.20e-05***
	(1.57e-05)	(1.78e-05)	(2.62e-05)
PM10 concentration	0.000139***	-0.000136***	0.000136**
	(3.19e-05)	(3.34e-05)	(5.46e-05)
Railway Station	0.0784**	0.0825**	0.00217
	(0.0337)	(0.0351)	(0.0544)
Time travel to closest :			

Highway access	9.93e-05	-0.00533***	0.00228
	(0.00104)	(0.00112)	(0.00195)
urban pole <100 000	0.00315***	0.00235***	0.000639
	(0.000433)	(0.000443)	(0.000890)
urban pole <50 000	0.0145***	-0.00161**	0.0160***
	(0.000621)	(0.000634)	(0.00123)
nb of social housing per hb	-0.433	-1.271***	-0.899
	(0.417)	(0.445)	(0.765)
Tax potential per hb	-0.000175***	-4.83e-05	-0.000294***
	(3.73e-05)	(3.65e-05)	(8.15e-05)
Municipal road length	0.00215**	-0.00248**	0.00129
	(0.00108)	(0.00119)	(0.00177)
Fiscal cooperation	-0.135***	-0.00307	-0.183***
	(0.0181)	(0.0194)	(0.0366)
Rural tax exemption policy 2006	0.341***	-0.185***	0.250***
	(0.0223)	(0.0242)	(0.0453)
population density 2006	-0.000271***	-0.000295***	-0.000118

	(7.69e-05)	(7.66e-05)	(0.000122)
unemployment rate 06	2.341***	1.034***	3.924***
	(0.346)	(0.366)	(0.768)
employment rate 2006	0.0590**	-0.00818	0.00519
	(0.0231)	(0.0297)	(0.0708)
population growth rate 2006	-0.000419	0.00228***	0.000191
	(0.000756)	(0.000811)	(0.00173)
dependance rate 2006	0.974***	0.0831	0.405
	(0.211)	(0.226)	(0.488)
Share of sectoral employment (2006) :			
Agriculture	0.0138	0.0658	0.0104
	(0.0740)	(0.0801)	(0.200)
Public	0.197***	0.0326	0.371**
	(0.0707)	(0.0764)	(0.179)
Business and Services	0.0850	0.00407	0.0759
	(0.0674)	(0.0729)	(0.173)
Industry	0.235***	0.138*	0.665***
	(0.0754)	(0.0807)	(0.191)

High education rate 2006	0.904***	0.392*	2.541***
	(0.196)	(0.213)	(0.459)
Time travel to proximity services	-0.00583	-0.00278	-0.00959
	(0.00370)	(0.00411)	(0.00685)
Pays 2008	0.175***	0.283***	0.0334
	(0.0199)	(0.0220)	(0.0401)
Pays 2003	2.151***	0.0280	1.696***
	(0.115)	(0.0837)	(0.223)
Population by occupation (2006)			
Farmer	0.298	-0.700**	2.227***
	(0.269)	(0.292)	(0.699)
Craftsmen, merchants and business leaders	0.335	0.363	0.0436
	(0.305)	(0.330)	(0.682)
Managers and higher intellectual professions	-1.059***	-0.0682	-1.407**
	(0.275)	(0.299)	(0.686)
Employees	-0.252	0.225	-0.627
	(0.187)	(0.201)	(0.459)

Workers	0.122	0.0574	0.368
	(0.162)	(0.175)	(0.405)
Other people without occupation	-0.458**	0.201	-0.350
	(0.178)	(0.191)	(0.430)
Regional Fixed effects			
Ireg_21	0.0807	0.313***	-0.0652
	(0.0695)	(0.0696)	(0.162)
Ireg_22	0.205***	-0.0386	0.629***
	(0.0670)	(0.0682)	(0.170)
Ireg_23	-0.424***	-1.061***	-0.244
	(0.0787)	(0.110)	(0.185)
Ireg_24	0.752***	-0.121*	0.660***
	(0.0661)	(0.0708)	(0.148)
Ireg_25	1.908***	0.157**	2.144***
	(0.0738)	(0.0714)	(0.204)
Ireg_26	0.514***	0.407***	0.551***
	(0.0648)	(0.0659)	(0.154)

Ireg_31	1.040***	0.760***	0.750***
	(0.0689)	(0.0689)	(0.156)
Ireg_41	1.300***	0.386***	1.456***
	(0.0655)	(0.0663)	(0.169)
Ireg_42	0.964***	-0.0328	1.017***
	(0.0744)	(0.0794)	(0.161)
Ireg_43	-0.0194	-0.0553	0.0734
	(0.0708)	(0.0747)	(0.167)
Ireg_52	1.474***	0.386***	1.602***
	(0.0684)	(0.0699)	(0.160)
Ireg_53	1.450***	-0.0986	1.427***
	(0.0716)	(0.0779)	(0.158)
Ireg_54	0.835***	0.234***	0.867***
	(0.0677)	(0.0710)	(0.150)
Ireg_72	1.065***	0.511***	1.116***
	(0.0649)	(0.0658)	(0.149)
Ireg_73	0.887***	-0.00654	0.822***
	(0.0650)	(0.0690)	(0.152)

Ireg_74	1.459***	0.396***	1.397***
	(0.0842)	(0.0857)	(0.174)
Ireg_82	0.739***	0.130*	0.722***
	(0.0675)	(0.0704)	(0.148)
Ireg_83	2.329***	0.515***	2.270***
	(0.0915)	(0.0770)	(0.182)
Ireg_91	1.678***	0.271***	1.383***
	(0.0787)	(0.0800)	(0.162)
Ireg_93	1.001***	-0.439***	0.798***
	(0.0955)	(0.114)	(0.183)
Ireg_94	-0.0757	0.112	
	(0.161)	(0.170)	
Constant	-2.305***	-1.104***	-1.752***
	(0.253)	(0.341)	(0.528)
R^2	0.2534	0.2581	0.2248
Observations	36,090	23,780	12,743

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section A2. Common support and balancing properties

The causal effect of the LEADER programme on involved municipalities is estimated by a propensity score matching procedure. The propensity score, which represents the conditional probability that a municipality will participate in the programme, is calculated by estimating a probit model, which includes a set of municipalities characteristics (X_i) that are presumed to influence both attractiveness and the decision of a municipality to participate in the LEADER programme (Table A2). We then compare the results for each LEADER municipality and to a set of non LEADER municipalities with similar values in propensity score: to be valid, this approach needs to have LEADER and non LEADER municipalities with similar conditional probabilities. The figure A3 shows that the distributions in the treatment and control groups are large enough for a wide range of conditional probabilities, confirming that the use of the propensity score matching approach is likely to work. However, very few LEADER municipalities have conditional probabilities that are too high which implies no control municipalities with such values. The municipalities outside the common support that are excluded from the analysis are 30 (0.2% of the treated group) for design 1, 4 (0.1% of the treated group) for design 2 and 177 (2.9% of treated group) for design 3.

Then, we compare the covariates balancing between the LEADER and non LEADER groups before and after the propensity score matching procedure. We compute the standardized bias (Stuart, 2010) in covariate means between treated and control groups for each design, before and after matching , such as:

$$\Delta_X^k = \frac{\underline{X}_k^1 - \underline{X}_k^0}{\sqrt{V_k^1 + V_k^0}}, \forall k = 1, \ldots, K \qquad (7)$$

Where $\underline{X}_k^j$ and V_k^j respectively denote the mean and the variance of the observed variable X_k in the group *j*. In almost all cases, the sample differences in the unmatched sample (Figure A4, above) exceed those after matching (Figure A4, below). Moreover, most of the standardized biases after matching are below the suggested rule of thumb of 0.25 (Imbens and Wooldridge, 2009). This result suggests that our propensity score matching allows a large degree of balance between the LEADER municipalities and the matched group of non LEADER municipalities.

Figure A3: distribution LEADER municipalities before (above) and after matching (below) for all municipalities belong a LAG LEADER (left), LAG LEADER municipalities benefiting from a RDP project vs non leader municipalities (center) or vs non leader municipalities benefiting from a RDP project (right).

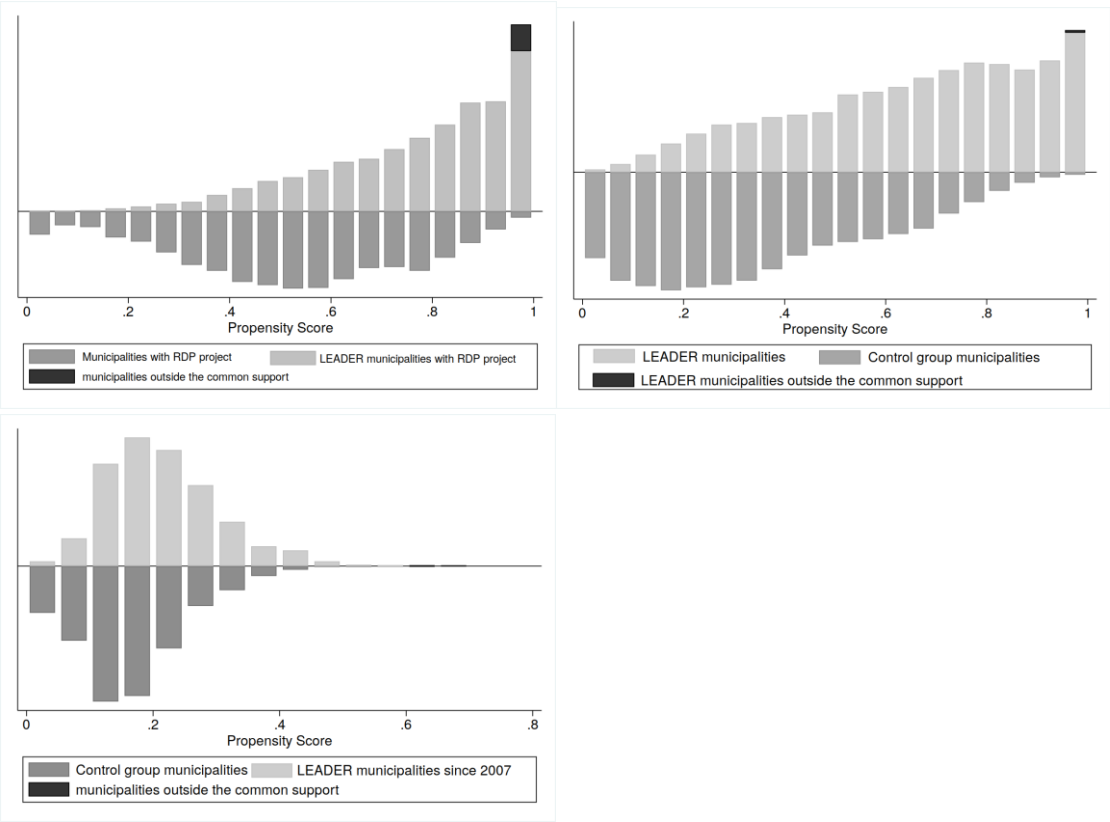


Figure A4: distribution of covariate standardized bias before (above) and after matching (below) for all municipalities belong a LEADER LAG (left) and new LEADER municipalities (center) vs non leader municipalities, LAG LEADER municipalities benefiting from a RDP project vs non leader municipalities benefiting from a RDP project (right).

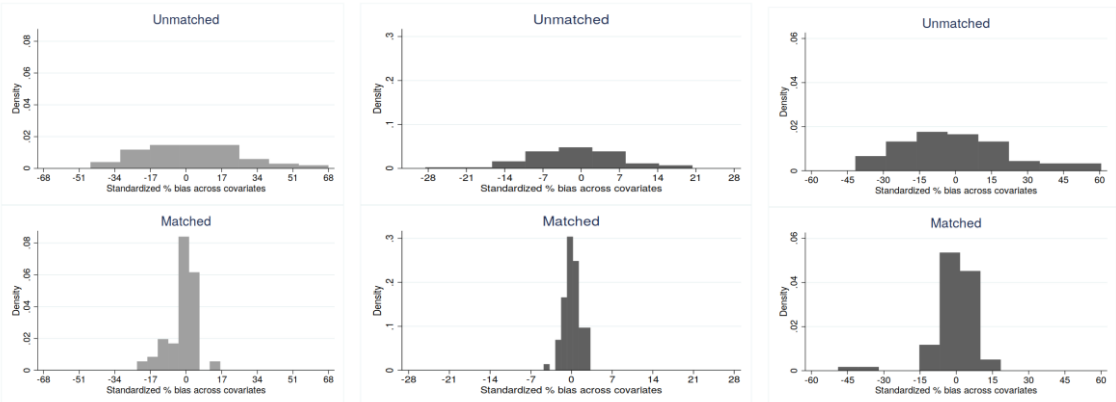
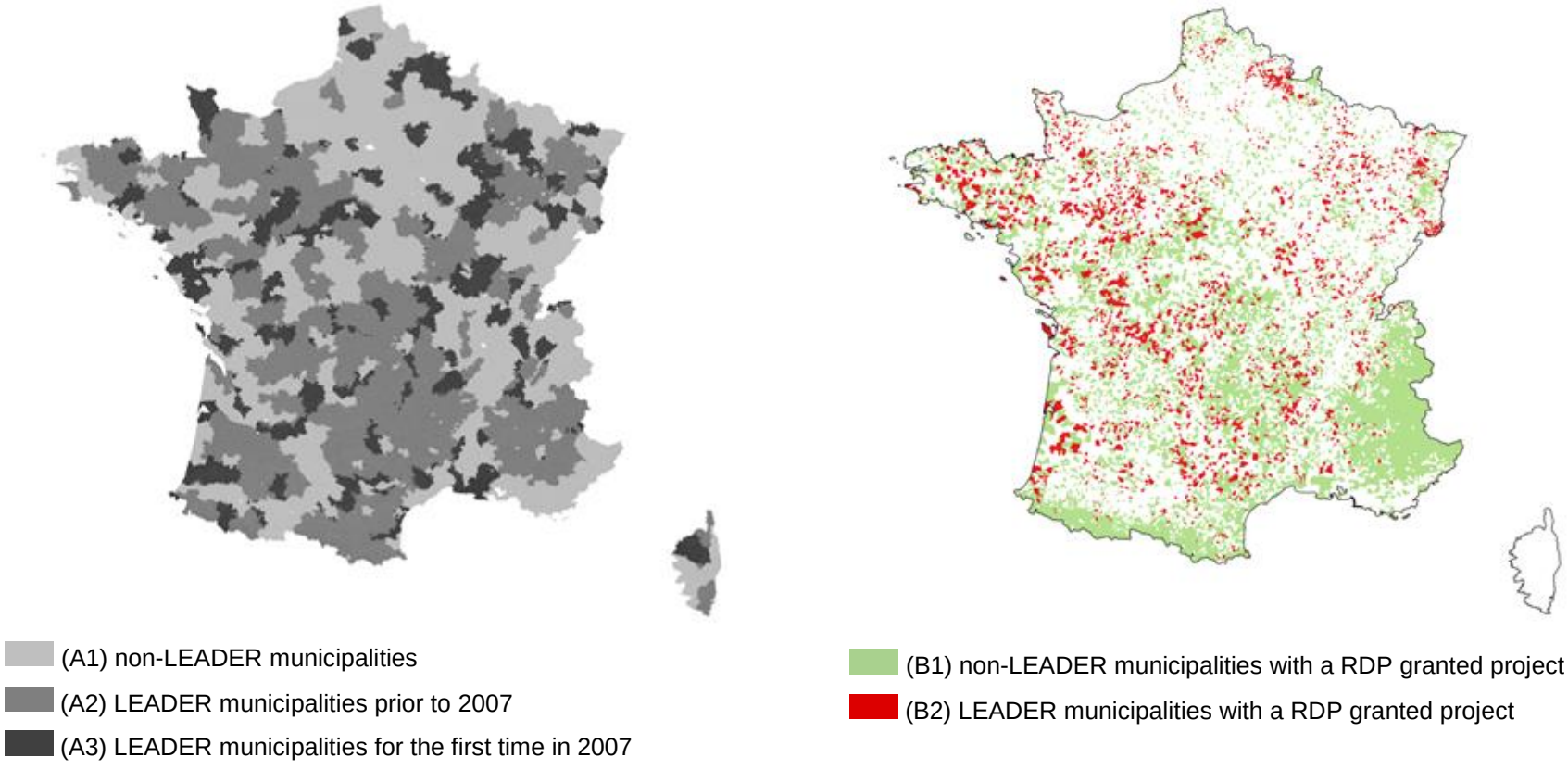


Figure A5. Maps of the various samples in designs 1, 2 and 3



Appendix B. Robustness checks

The robustness checks and heterogeneous effects of our results are tested in four ways.

First, estimation results appear to be insensitive to the choice of the matching algorithm. Indeed, the ATT estimates are rather the same, using either a Kernel (results presented in the previous section), or a nearest neighbour, or a five nearest neighbours, or caliper propensity score matching (Table B1).

Table B1 Sensitivity to the choice of the PSM algorithm

	Design 1	Design 2	Design3
Economic attractiveness			
	Employment variation		
ATT (PSM nearest neighbor)	-0.31	4.12	-2.76
	(5.25)	(3.26)	(18.32)
ATT (PSM 5-nearest neighbors)	1.39	1.80*	1.67
	(5.30)	(1.05)	(18.65)
ATT (caliper PSM)	1.31	4.12	1.02
	(5.25)	(3.26)	(5.29)
	Population based employment variation		
ATT (PSM nearest neighbor)	-0.25	-4.62	1.08
	(3.71)	(2.26)	(10.37)
ATT (PSM 5-nearest neighbors)	-0.39	-2.04	2.89
	(3.18)	(1.49)	(11.55)
ATT (caliper PSM)	-0.25	-4.62	2.91
	(3.70)	(2.26)	(6.47)
Residential attractiveness			
	Migratory balance		
ATT (PSM nearest neighbor)	2.29	1.37*	-3.81
	(1.62)	(0.69)	(24.19)
ATT (PSM 5-nearest neighbors)	2.30	3.56*	-2.93
	(1.48)	(2.12)	(26.92)
ATT (caliper PSM)	2.23*	1.37**	-1.54
	(1.26)	(0.69)	(15.47)
	Population growth rate		
ATT (PSM nearest neighbor)	0.62*	0.45**	0.39
	(0.36)	(0.22)	(0.77)
ATT (PSM 5-nearest neighbors)	0.53*	0.40**	0.10
	(0.29)	(0.17)	(0.64)
ATT (caliper PSM)	0.62*	0.45**	0.41
	(0.37)	(0.22)	(0.68)

*Note: standard errors are displayed beneath parentheses; asterisks indicate significance: * pv<0.1; ** pv<0.05;*** pv<0.01.*

Second, the empirical strategy chosen here for measuring the additionality of the LEADER programme could be carried out using a multi-treatment approach (Lechner, 2001). The results obtained by this alternative approach lead to very similar interpretations (Table B2).

Table B2 Estimation using PSM with Multiple Treatment approach

Economic attractiveness	
	Employment variation
ATT (LEADER municipalities with a granted RDP vs control municipalities)	-0.62
	(3.59)
ATT (LEADER municipalities with a granted RDP project vs non LEADER with a granted RDP project)	-0.93
	(5.30)
	Population based employment variation
ATT (LEADER municipalities with a granted RDP vs control municipalities)	-0.10
	(0.96)
ATT (LEADER municipalities with a granted RDP project vs non LEADER with a granted RDP project)	1.43
	(10.18)
Residential attractiveness	
	Migratory balance
ATT (LEADER municipalities granted RDP vs control municipalities)	9.47*
	(4.98)
ATT (LEADER municipalities with a granted RDP project vs non LEADER with a granted RDP project)	4.30
	(6.45)
	Population growth rate
ATT (LEADER municipalities with a granted RDP vs control municipalities)	0.92**
	(0.36)
ATT (LEADER municipalities with a granted RDP project vs non LEADER with a granted RDP project)	1.10
	(0.98)

*Note: standard errors are displayed beneath parentheses; asterisks indicate significance: * pv<0.1; ** pv<0.05;*** pv<0.01.*

Third, the PSM approach could be affected by the spatial diffusion of the effects of the LEADER programme and influence our conclusions. To analyze the sensitivity of our main estimates to the presence of spatial externalities, we apply our PSM procedure by excluding municipalities spatially close to municipalities in the LEADER programme (Table B3). This test decreases the quality of our PSM procedure, but does not affect the interpretation we can make of our main results. In addition, the spatial diffusion/diversion effect of the LEADER programme is tested by applying the PSM procedure only to municipalities spatially close to LEADER municipalities (as the treatment group). This test does not reveal the presence of spatial diffusion of the effect of the policy (Table B4).

Table B3 Sensitivity to the presence of a policy spatial spillover

	Design 1	Design 2	Design3
Economic attractiveness			
	Employment variation		
ATT (Kernel PSM)	1.43	0.58	-4.47
	(7.29)	(5.68)	(33.70)
	Population based employment variation		
ATT (Kernel PSM)	0.71	-0.44	-1.98
	(4.31)	(3.58)	(20.75)
Residential attractiveness			
	Migratory balance		
ATT (Kernel PSM)	1.28**	4.23*	-4.67
	(0.44)	(2.24)	(41.20)
	Population growth rate		
ATT (Kernel PSM)	0.63***	0.52*	-0.74
	(0.21)	(0.20)	(0.53)

*Note: standard errors are displayed beneath parentheses; asterisks indicate significance: * pv<0.1; ** pv<0.05;*** pv<0.01.*

In addition, we estimate the spillover effect (diversion effect) on municipalities close to LEADER municipalities. In this context, we estimate the effect of being close to LEADER (10 km buffer zone as the treatment group) against a situation without LEADER, beyond the buffer zone (as the control group). The results do not suggest a significant diversionary effect of the policy. We observe a modest diversion effect on the growth of the population of municipalities close to LEADER municipalities.

Table B4 Estimation of a policy spatial spillover

	Design 1	Design 2	Design3
Economic attractiveness			
	Employment variation		
Spillover effect (10 km buffer)	-7.05	-6.04	-9.60*
	(6.02)	(5.47)	(4.90)
	Population based employment variation		
Spillover effect (10 km buffer)	-3.25	-3.50	-4.10
	(3.58)	(3.70)	(2.92)
Residential attractiveness			
	Migratory balance		
Spillover effect (10 km buffer)	4.65	4.42	4.15
	(7.43)	(3.70)	(6.17)
	Population growth rate		
Spillover effect (10 km buffer)	-0.47***	-0.07	-0.71***
	(0.18)	(0.12)	(0.16)

*Note: standard errors are displayed beneath parentheses; asterisks indicate significance: * pv<0.1; ** pv<0.05;*** pv<0.01.*

Fourth, the present estimation strategy relies on the conditional independence assumption, which implies that the choice to participate in the LAG-LEADER program is, conditionally to the matching

variables, random to potential results of municipalities. Despite the rich set of matching variables selected, there can remain unobservable confounding factors, factors that could influence past dynamics. In such a case, a "systematic" difference between LAG-LEADER and matched municipalities should appear, before the implementation of the policy. This assumption is stressed by leading a placebo analysis, which reveals that there is no average difference in employment and residential trends between LAG-LEADER and their matched municipalities, before the implementation of the programme (Table B5).

Table B5 Placebo test on outcome measured before the program participation

	Design 2
Economic attractiveness	
	Employment variation (1990-99)
ATT (Kernel PSM)	1.49
	(4.52)
	Population based employment variation (1990-99)
ATT (Kernel PSM)	1.08
	(3.25)
Residential attractiveness	
	Migratory balance (1990-99)
ATT (Kernel PSM)	0.38
	(3.86)
	Population growth rate (1990-99)
ATT (Kernel PSM)	0.18
	(0.18)

*Note: standard errors are displayed beneath parentheses; asterisks indicate significance: * pv<0.1; ** pv<0.05;*** pv<0.01.*