

The impact of tax sharing agreements on local fiscal policy

Evidence from the Belgium–Luxembourg border region

Tidiane Ly

Sander Ramboer

Extended abstract

Cross-border commuting can generate substantial economic gains by improving the allocation of labor across space, but it can also create fiscal frictions. A prominent example is the Belgium–Luxembourg border region, where a large share of Luxembourg’s labor force resides in Belgium. Under the bilateral tax treaty, labor income earned in Luxembourg by Belgian residents is taxed at source, implying that these residents do not pay Belgian (and hence municipal) income taxes on that income. Because Belgian municipalities rely heavily on a residence-based local income tax surcharge, this arrangement creates a treaty-induced erosion of the municipal income tax base in the municipalities that host frontier workers. At the same time, these municipalities still provide local public services to these residents and often face additional spending needs related to commuting and associated population dynamics.

To address this mismatch, Luxembourg introduced the *Fonds des Frontaliers* (FdF) in 2004, a transfer scheme designed to compensate Belgian municipalities for the local income tax revenue they forego due to frontier work. The scheme is best understood as a matching-type compensation mechanism: municipalities with larger measured “lost” local income tax revenue receive a larger share of the total fund. Over time, the scheme has been repeatedly reformed. Most notably, in 2015 the fund was expanded and retargeted through tighter eligibility rules, and subsequent reforms further modified eligibility and indexation. These institutional features make the FdF an empirically attractive setting to study how tax-sharing and compensation arrangements shape local fiscal policy incentives in border regions.

This paper provides two contributions. First, we document how a treaty-induced loss of municipal income tax capacity and its compensation through the FdF affected local tax setting. We focus on local income tax surcharges—the margin directly targeted by the policy instrument—and contrast them with local property tax rates, which apply irrespective of the place of work. Second, we highlight how the *design* of the compensation scheme can alter the marginal incentives of local governments. In particular, when the degree of compensation is sufficiently high, the matching structure can raise the marginal fiscal return to setting higher local income tax rates, because higher rates mechanically increase measured foregone revenue and thus grant entitlements. This creates a tension between a standard budget-relief effect (transfers relax the budget constraint and can reduce taxes) and a scheme-design effect (matching can increase the marginal revenue of taxation).

Institutional background and descriptive patterns

The FdF was introduced in 2004 with an initial envelope of €15 million (indexed thereafter). Grants were allocated broadly across Belgian municipalities, but were highly concentrated in municipalities close to Luxembourg and in key provincial centers, as shown in [Figure 1a](#). The 2015 reform doubled the total envelope and simultaneously tightened eligibility: only municipalities for which foregone income tax revenue exceeded a threshold share of their income tax surcharge revenue remained eligible. This change dramatically reduced the number of recipient municipalities while increasing the average grant per capita among the remaining treated municipalities ([Figures 2a](#) and [4](#)). The reform also produced substantial geographic and distributional shifts in grant receipts ([Figures 1b](#), [3a](#) and [3b](#)).

A key metric for interpreting incentives is the extent to which the grant compensates for foregone local income tax revenue. In our data, the compensation rate varies meaningfully over time, driven by fund size, eligibility rules, and the growth of frontier work. [Figure 5b](#) shows that compensation rates fell in the early years as commuter counts rose faster than the fund, reached a low point around the mid-2010s, and then

increased sharply after the 2015 expansion. This evolution is central for distinguishing between budget-relief and incentive effects: when the fund covers only a small share of foregone revenue, the grant mainly relaxes budgets; when the fund approaches full compensation, the matching structure can materially affect marginal incentives. The fiscal importance of the fund among treated municipalities is also visible in the cross-sectional distribution of grants relative to income tax revenue (Figure 5a).

Tax rates exhibit strong election-cycle dynamics, but treated and control municipalities display similar pre-trends in the pre-FdF period, particularly for income taxes, which motivates our baseline identification strategy. Figures 7a and 7b and Figures 8a and 8b document average local income tax and property tax rates for treated municipalities (defined by post-2015 eligibility) relative to other Walloon municipalities, along with indexed evolutions.

Data

We combine several administrative datasets. Grant allocations and the commuter counts used for grant determination are obtained from Belgian federal public finance records covering the full history of the scheme. To measure commuting patterns more broadly and to support robustness checks, we use inter-municipal commuting flows from the National Social Security Office from 2005 onward, and we draw on additional historical sources (e.g. census) to benchmark earlier commuting patterns where feasible (see Figure 6 for the evolution by post-reform treatment status). Local fiscal policy outcomes are measured using municipal accounts from two sources: highly detailed functional accounts from the Walloon Public Service for the Interior (from 2009 onward) and earlier fiscal aggregates from Belfius. We supplement these with socio-demographic and housing market variables from Statbel, Walstat, and Statistics Flanders.

Empirical strategy

Our baseline approach estimates difference-in-differences specifications comparing municipalities with sustained exposure to the FdF (those receiving at least €1 per capita after the 2015 reform) to other Belgian municipalities, controlling for municipality fixed effects and common time shocks. The baseline regression takes the form:

$$Y_{it} = \alpha_i + \delta_t + \beta (\text{Treated}_i \times \text{Post}_t) + X'_{it}\gamma + \varepsilon_{it}, \quad (1)$$

where Y_{it} is a fiscal policy outcome (e.g. log local income tax rate, log local property tax rate), α_i are municipality fixed effects, δ_t are year fixed effects, and X_{it} are time-varying controls. We also estimate richer specifications that include municipality-type-by-year fixed effects based on the Belfius socio-economic typology, which flexibly absorbs time-varying shocks common to similar municipalities.

We assess dynamic treatment effects by interacting treatment status with year indicators (event-study style), and we implement robustness checks that address the 2015 eligibility threshold, including excluding “losers” (municipalities that received non-trivial grants before 2015 but lost eligibility thereafter) and estimating matched difference-in-differences on pre-treatment characteristics. Balance statistics for matched samples are reported in Tables 4 and 5.

A main identification concern relates to treated municipalities being closer to Luxembourg and therefore potentially facing different underlying economic trends. We mitigate this using municipality-type-by-year fixed effects and an analysis restricted to Wallonia (excluding potentially confounding region-specific institutional changes).

Main results: taxation

Our main finding is that the FdF significantly affects local income tax setting, but the direction of the effect depends on the period and thus on the degree of compensation. Table 1 reports baseline difference-in-differences estimates for (log) local income tax rates. Across specifications, treated municipalities set local income tax rates that are approximately 1–2% lower after the introduction of the fund, with estimates remaining stable when adding municipality-type-by-year fixed effects, socio-demographic controls, and when restricting to Wallonia. In contrast, Table 2 shows that local property tax rates exhibit no comparable post-treatment differences once controls are included, consistent with the institutional fact that property taxes apply regardless of the place of work and are not directly targeted by the compensation scheme.

Dynamic specifications reveal that the negative average effect on income taxes is concentrated in the years following the introduction of the fund and in the years preceding the 2015 reform. Figure 9a plots the year-specific treatment effects (with 95% confidence intervals) for income taxes; the estimates move toward zero around the 2015 reform. Property tax dynamics remain largely indistinguishable from zero throughout (Figure 9b). These patterns align closely with the evolution of the compensation rate in Figure 5b. When compensation eroded over time, the fund likely acted primarily as a partial budget-relief transfer, supporting lower income tax rates. When compensation increased sharply after 2015, the matching structure of the scheme likely strengthened the marginal incentive to raise income tax rates, attenuating or reversing earlier tax-cut effects.

Reform evidence and heterogeneity

We further investigate incentives by exploiting variation induced by the 2015 reform. The reform featured both an expansion in the total fund and a retargeting that produced large grant increases for some municipalities and grant reductions for others. In a reform-focused design, we compare municipalities experiencing grant gains to municipalities with zero grants throughout 2011–2019 and estimate how statutory income tax rates respond around the reform. Table 3 suggests that municipalities experiencing a grant increase raised tax rates more after the reform, consistent with a stronger matching incentive when compensation intensity rises. We also document cases of strategic adjustment in which municipalities appear to increase tax rates after a grant cut in order to regain eligibility or increase measured foregone revenue (see the illustrative time series in Figure 11).

Heterogeneity provides additional evidence on mechanism. Treated municipalities vary substantially in grant intensity because commuter exposure differs sharply across space. Splitting treated municipalities by whether grant per capita is above or below the median reveals distinct dynamics (Figure 10). In the early period after 2004, lower-intensity municipalities cut income taxes more strongly, consistent with the grant operating mainly as a lump-sum budget relief. Around and after the 2015 expansion, higher-intensity municipalities increase income taxes more strongly, consistent with the matching mechanism becoming more relevant when compensation is high and commuter exposure is large.

Implications for border-region integration and ongoing work

The results underscore that cross-border compensation schemes can do more than offset fiscal externalities; their *design* can change local governments’ marginal incentives in ways that meaningfully affect tax policy. This has direct relevance for policy debates on border-region governance and integration. If the objective is to foster cross-border labor mobility and reduce border frictions, the key question is whether compensation is delivered as a pure budget-relief transfer or as a mechanism that rewards certain local policies (intentionally or unintentionally) through formula design.

In ongoing work, we study how the fund affects the composition of municipal spending—especially transport, housing, and local services relevant for frontier workers—and we leverage the formula-driven 2015 reform to test whether exogenous increases in grant generosity translate into greater cross-border commuting and deeper border-region integration; we then embed these mechanisms in a quantitative spatial model with endogenous residence and workplace choices and a local government sector to evaluate counterfactual tax-sharing designs.

Conclusion

Tax treaties that assign labor income taxation to the place of work can create substantial fiscal spillovers for local governments in border regions. The Belgium–Luxembourg case shows how a compensation fund can mitigate such spillovers, but also how matching-type design features can create incentives that reshape local tax setting. We find that the introduction of the FdF is associated with lower local income tax rates, while later increases in compensation intensity—especially after the 2015 reform—coincide with a relative strengthening of income tax rates, consistent with the matching incentives embedded in the scheme. Property tax rates show little response. These findings highlight the importance of transfer design for local

fiscal behavior and motivate further work on spending composition, commuting outcomes, and counterfactual policy evaluation.

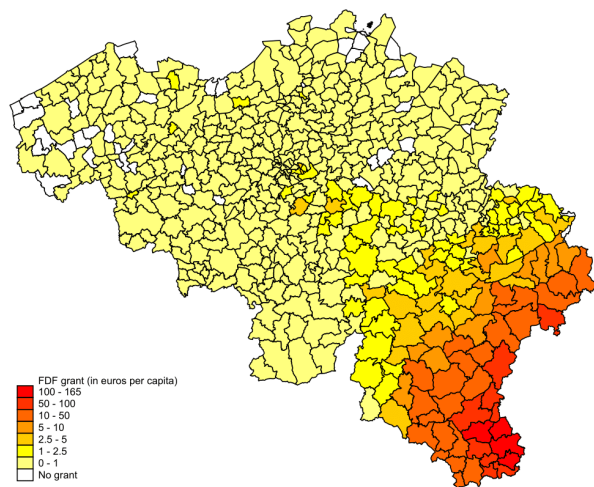
JEL codes: H71, H77, J61, R23.

Keywords: tax sharing; intergovernmental transfers; local income taxation; frontier workers; cross-border commuting; matching grants; border regions.

A Key figures and tables

Figure 1: Fond des Frontaliers grants to Belgian municipalities.

(a) FdF grants to Belgian municipalities in 2014 (€ per working-age resident).



(b) Change in FdF grants between 2014 and 2015 (%).

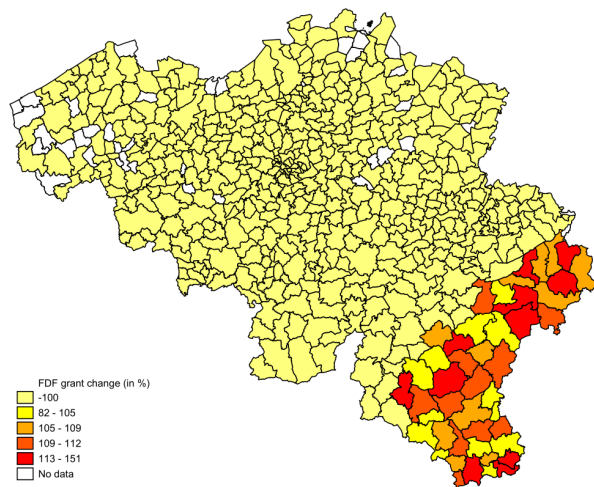


Figure 2: Evolution of the Fond des Frontaliers, eligible municipalities, and cross-border commuters.

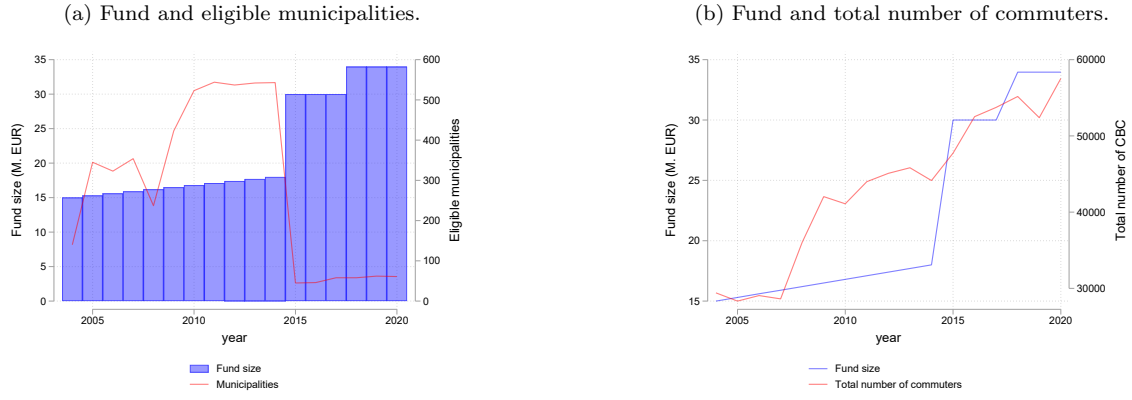
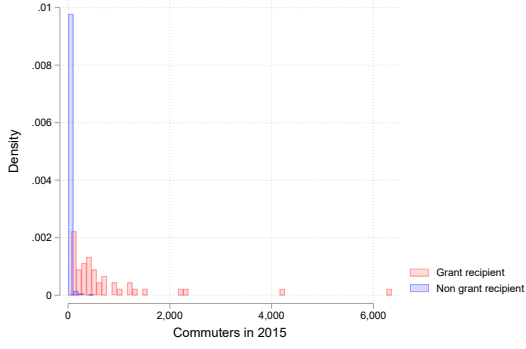


Figure 3: Distributions of cross-border commuters and grants per municipality (2015 reform).

(a) Cross-border commuters in 2015, by eligibility for the fund.



(b) Grant before and after the 2015 reform.

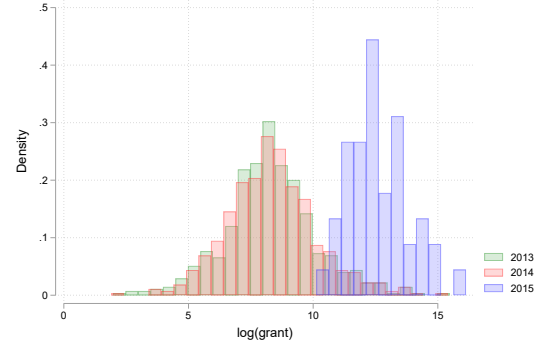


Figure 4: Evolution of the average grant per capita (treated municipalities).

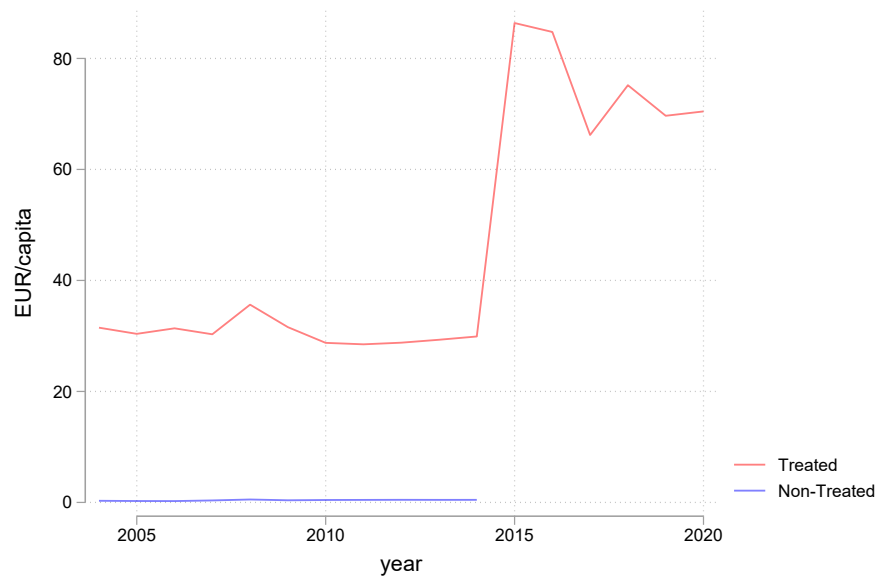
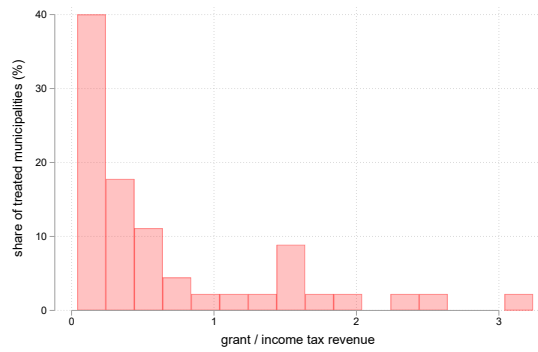


Figure 5: Fund importance and compensation intensity.

(a) FdF grants relative to local income tax (2015).



(b) Grant / lost tax revenue (compensation rate).

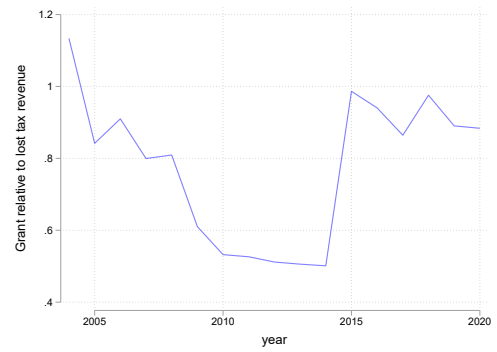


Figure 6: Evolution of commuting to Luxembourg by municipal eligibility for the fund.

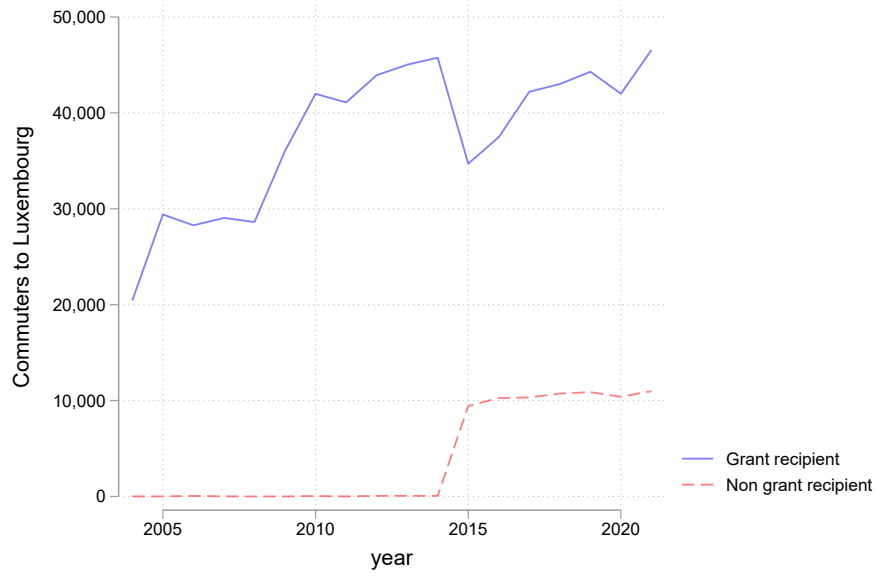


Figure 7: Average local tax rates in Wallonia by post-reform treatment status.

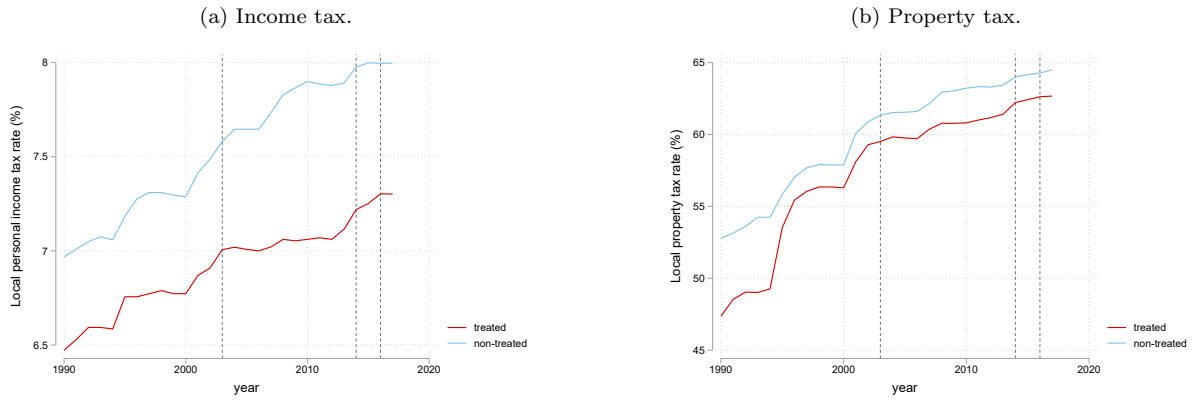


Figure 8: Average local tax rates in Wallonia by post-reform treatment status, relative to 1990.

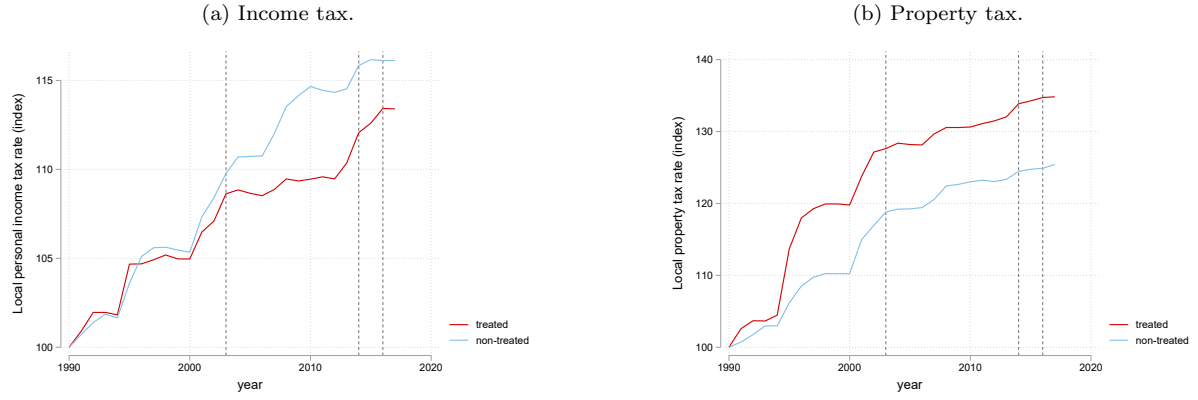


Figure 9: Dynamic treatment effects on (log) local tax rates.

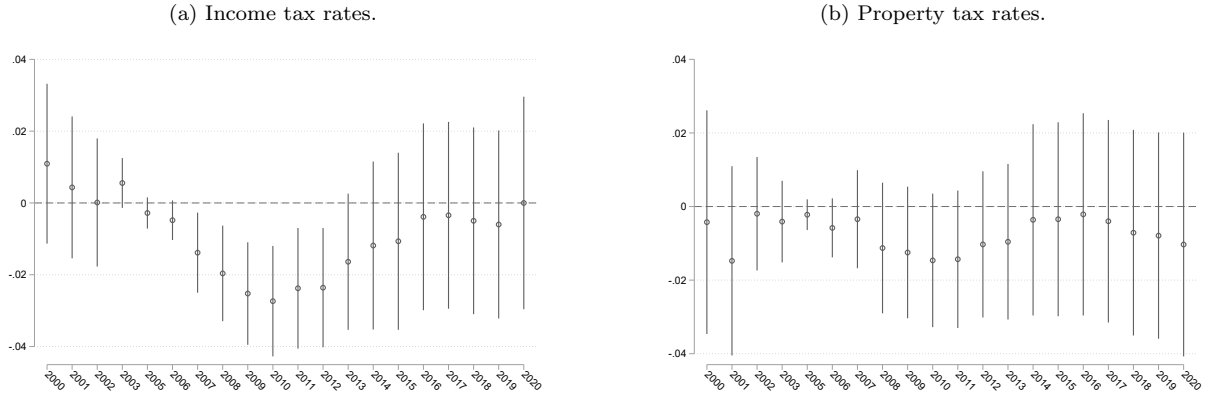


Figure 10: Treatment effect heterogeneity in income tax dynamics (by grant intensity).

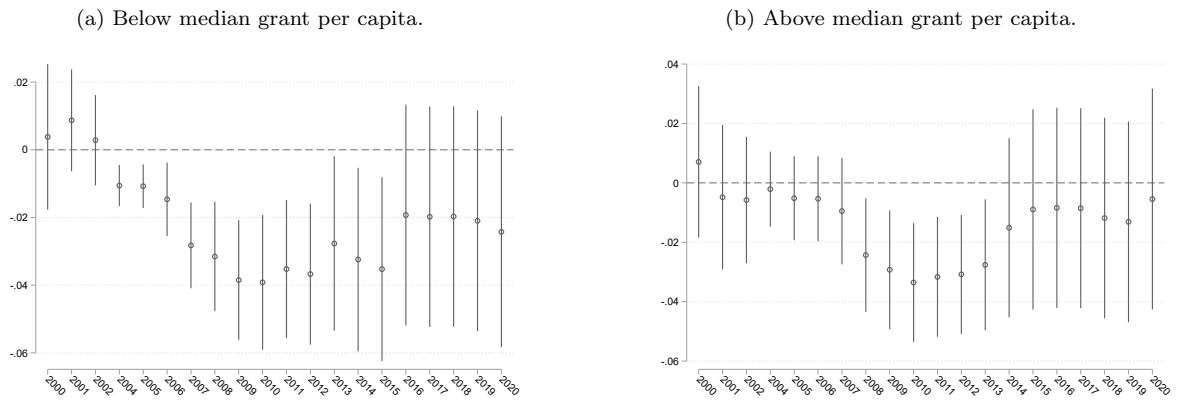


Figure 11: Example of a municipality which strategically increased its tax rate to benefit from the FdF.

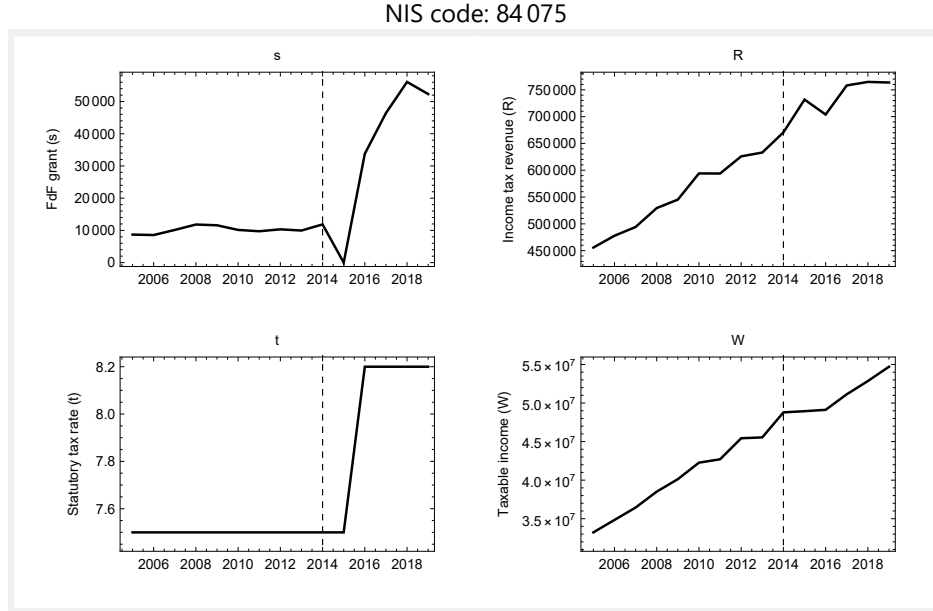


Table 1: Impact of receiving FDF grants on (log of) local income tax rates

	(1) log(LIT)	(2) log(LIT)	(3) log(LIT)	(4) log(LIT)
treated=1 $\times$ post=1	-0014*	-0017**	-0014*	-0016**
Obs.	12282	12282	10158	4653
$R^2 a$	0.106	0.215	0.250	0.271
SE.	cluster	cluster	cluster	cluster
Municipality FE	Yes	Yes	Yes	Yes
Municipality type $\times$ year FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Wallonia only	No	No	No	Yes

Note: * denotes significance at $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at municipal level.

Table 2: Impact of receiving FdF grants on (log of) local property tax rates

	(1) log(OV)	(2) log(OV)	(3) log(OV)	(4) log(OV)
treated=1 $\times$ post=1	−0048***	−0001	0.001	−0002
Obs.	12339	12339	10204	4653
R^2_a	0.210	0.401	0.399	0.238
SE.	cluster	cluster	cluster	cluster
Municipality FE	Yes	Yes	Yes	Yes
Municipality type $\times$ year FE	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
Wallonia only	No	No	No	Yes

Note: * denotes significance at $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors clustered at municipal level.

Table 3: Effect of the 2015 FdF expansion on the statutory income tax rate, 2005–2019.

	(1)	(2)
$(\Delta s > 0) \times Post$	0.121 (0.136)	0.121** (0.0420)
$(\Delta s < 0) \times Post$	0.0359 (0.116)	0.0359 (0.0359)
$(\Delta s > 0)$	−0.324*** (0.0785)	
$(\Delta s < 0)$	0.194** (0.0671)	
$Post$	0.0816 (0.114)	0.0816* (0.0352)
Intercept	7.255*** (0.0658)	7.401*** (0.00376)
N	8325	8325
Fixed effects	no	yes

Table 4: Descriptive statistics and balance table (2000–2003)

	control		treated		difference	
	mean	sd	mean	sd	mean dif.	t
Median income	18 383.54	1977.69	18 258.33	1978.51	125.22	
Income interquartile range	16 907.21	2971.75	16 752.77	2650.81	154.44	
Median house price	78 227.39	14 096.70	77 266.44	12 873.61	960.95	
Dependency ratio	67.28	3.73	68.88	4.57	−1.61**	
Singles/couples ratio	0.58	0.11	0.62	0.11	−0.03*	
Inhabitants	6345.39	3508.93	6151.80	4546.43	193.59	
Population growth	34.56	35.43	41.46	45.86	−6.90	
Net domestic migration	30.08	31.70	25.42	29.09	4.66	
Net international migration	0.58	7.37	1.84	14.83	−1.26	
Grant per inhabitant (2004)	0.25	0.71	31.99	45.43	−31.74***	
Observations	62		62		124	

Note: * denotes significance at $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Descriptive statistics and balance table (2000–2003) — excluding “losers”

	control		treated		difference	
	mean	sd	mean	sd	mean dif.	t
Median income	18 429.71	1977.68	18 258.33	1978.51	171.38	
Income interquartile range	16 839.19	2988.62	16 752.77	2650.81	86.42	
Median house price	77 694.41	14 059.93	77 266.44	12 873.61	427.97	
Dependency ratio	66.91	3.92	68.88	4.57	−1.97**	
Singles/couples ratio	0.59	0.12	0.62	0.11	−0.02	
Inhabitants	6859.11	3974.67	6151.80	4546.43	707.31	
Population growth	32.24	38.11	41.46	45.86	−9.22	
Net domestic migration	28.87	35.45	25.42	29.09	3.45	
Net international migration	2.82	11.82	1.84	14.83	0.98	
Grant per inhabitant (2004)	0.02	0.12	31.99	45.43	−31.97***	
Observations	62		62		124	

Note: * denotes significance at $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.